

Fruitvale, B.C.

March 14th., 1958

4240

Mr. J . T . Fyles
Dept. of Mines,
Victoria, B.C.

DEPT. OF MINES

REC'D MAR 18 1958

SUBJECT

FILE

REFERRED TO

Dear Mr. Fyles:

Am sorry that I have lost a few days since I received that paper from the C.M.& S. Co. I was away for a short time and forget to tell the wife to forward same to you. However I am enclosing the copy I received from them and hope with what data you have you will be able to form some conclusions for your report.

You will note from the account written by P.F.Horten that he takes credit for the discovery. It seems that even prospectors find it hard to agree. While not wanting to take any thing away from Horten, I was always under the impression that it was Benson that made the original discovery. However I was not there so absolute proof, I guess we have none. You will no doubt at any rate have enough data to come very near to the exact truth, and I do not know who there is to say you are definitely wrong.

When you get that report all published I would certainly like to get hold of a copy. It should be interesting reading.

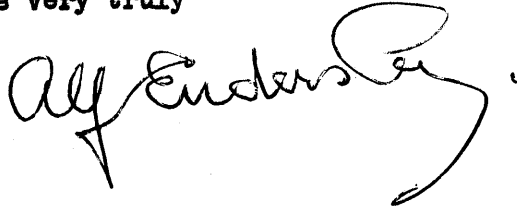
It has been a very nice winter and while I have not spent much time at the mine, I intend starting to poke around up there again in the next few days. I hit a nice streak of ore on the Calhoun vein at the Nugget last fall and intend getting at it again as soon as the snow goes enough. The vein widened from practically nothing to about three feet wide by fifty feet long and assaying about .60 au. I intend working towards a flat fault that should bring higher values. At any rate it looks promising for a good summer.

Stanley is going to be married on April 2nd., in Vancouver and it is possible that I will be down there for the wedding.

I expect that you will be back in these parts before long and if you are around these places I would be glad to see you.

You will find the Smelter dope enclosed and hoping it is of some use to you, I remain

Yours very truly



REFERRED TO	DATE	INITIAL
D. M.		
C. C.		
D.C.C.		
G. C.		
F. C. C.		
CMB	18/3	HS
JTF	19/3	JTF

I Found A Large Piece Of Ore ...

By P. F. Horton

P. F. Horton, one of the co-discoverers of the H. B. Mine, wrote recently to remark on the accuracy of the historical item which appeared last February. To fill in earlier details, he also gave an account of the discovery of the property and the first few years of the Mine.



P. F. Horton

THE GROUP of claims, which make up the H. B. Mine, was staked wholly on the east side of Brisbane Mountain. The discovery came about quite by accident.

In 1910, I had been staking the Silver Fraction of the Aspen Group. To reach the location, I chose a route which took me across the Brisbane Mountain. When I reached the Big Four*, along the way, I spoke to J. A. Benson who had been prospecting in that area for two years. He said that in his travels across Brisbane he had found nothing to encourage him. However I suggested that he accompany me and we might see something worthwhile on the way. Shortly after starting down the east slope I found a large piece of carbonate ore and we decided to stake a group of claims. They joined the Zincton claims on the east. To entitle each of us to a half share, we agreed to stake the claims in both our names. For a name we chose the first letter from each of our surnames, and thus the property became known as the H.B.

In Mr. Horton's Own Words

"In subsequent trenching we found four sep-

*Editor's note: The Big Four was one of three groups of claims already staked in the area. Eventually these groups became part of the H.B. property.

arate ore bodies from which ore was shipped. They were the H.B. zinc ore body, H.B. lead ore body, Zincton lead ore body and Leadville lead ore body. From the H.B. inception it made mining history in the finding of new unknown minerals, one of which is now known as Spencerite. This has further been classified into six other previously unknown minerals. While overseas, I saw in B. C. House in London a large chunk of lead or galena from the Zincton lead ore body that was as bright as the day it was broken. I could hardly credit that it had not been tarnished.

"The H.B. proved difficult to dispose of. Finally in 1911 Cominco was induced to do a considerable amount of work which resulted in a good camp and workings opened up to extract the ore. On Cominco relinquishing their option, the owners shipped lead ore to Trail. The first shipments did not prove profitable due to the fall in the price of lead on ninety day settlement, and to clear the property of debt, shipments had to be continued in the hopes of a better lead price, which fortunately occurred and the property was got out of debt and had something to the good. But, the owners had had enough of shipping ore. W. R. Salsbury, the party who contracted hauling the ore, then ob-

Sheep Creek townsite as it looked in 1914.



A prospecting camp in 1918.



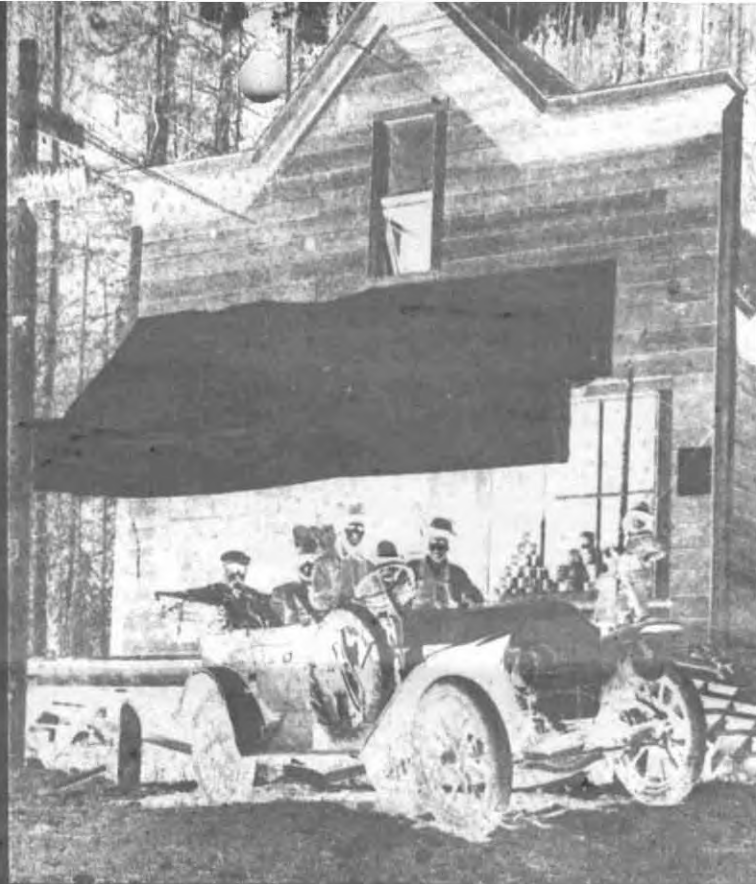
tained a lease at one dollar a ton royalty on the zinc ore, which he turned over to Lou Larsen of the Standard Furniture Company in Nelson retaining the hauling for himself. The price of zinc rose to around 30 cents a pound and it was reported Mr. Larsen was earning big money shipping the dump, while each owner was getting 25 cents a ton. Fortunately I had inserted a clause in the lease to the effect that on obtaining a bona fide purchaser the lease would end. In 1915 I succeeded in interesting Mr. Smith Curtis, a former Minister of Mines for B. C. He in turn got Mr. R. K. Neil to take over the property by getting Mr. Jameson of Spokane to put up \$2,000. Mr. Jameson got \$60,000 when the property was turned over to the Butte & Superior of Montana for a reported six million dollars. In the meantime Mr. R. K. Neil was allowed \$5,000 a month to look for other properties by the Hudson Bay Mining Co., the operating company of the H.B. It was at this time that Mr. Neil examined the Premier Mine at Portland Canal.

"On the property being turned back to the owners from the Butte & Superior, the United Eastern took an option on the Zincton, Garnet and Legal Tender mineral claims and did a lot of surface trenching on all the above claims. Mr. Maurice W. Bacon who had been associated with Mr. Neil then obtained an option on the above claims and did some drifting on the south slope of the Zincton mineral claim. Mr. Rush J. White was in charge of the work for the United Eastern of the Jackling interests.

"The last option was given to the Victoria Syndicate in 1925 who drove No. 4 cross-cut tunnel and did a large amount of drifting on that level.

"Sometime after the owners of the H.B. accepted an offer from Cominco for the H.B., Mrs. Vellacott, my sister, and I threw the Zincton and Garnet mineral claims in gratis.

"Shortly after the sale of the H.B. and Zincton groups I was able to dispose of the Aspen Group

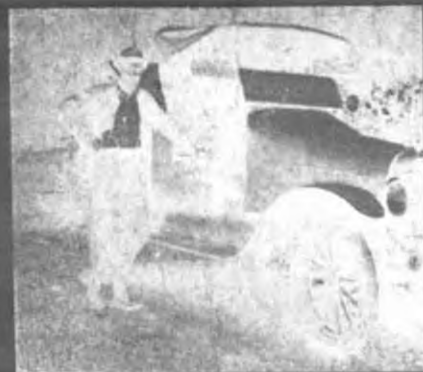


A Stoddard-Dayton car in front of the old store at Sheep Creek in 1912, with M. C. Donaldson at the wheel and Sid Ross beside him. The car was used by Mr. Donaldson to drive the late Pat Stewart to the H.B. property.

to the Salmo Malartic Mines Limited by agreeing to operate the property and by taking some stock, which I still hold."

Editor's note: Mr. Horton now lives in Victoria, B.C. and is still actively engaged in mining. The H.B. Mine, which he helped to discover, was prepared for production by Cominco and was slated to go into operation during the spring of 1953. The market situation caused a postponement of the opening. However, it is ready to go into production as soon as conditions become more favorable.

The last crew operating the mine, 1917, before Cominco took over. Left to right: George Schmidt, Dave Clarkston, P. F. Horton, Ernie Ballinger and Chris Hansen, Jr. S. A. Batalden, one of the crew, took the picture.



P. F. Horton stands beside his renovated Ford in 1917. He supervised the operation of H.B. prior to the time when the property was purchased outright by Cominco. He was one of the original stakers of H.B. property.

H. B.

FEB. 14/58.

DEAR JIM: -

I AM ENCLOSEING MY PRE-TYPING COPY OF A REPORT I'VE JUST FINISHED ON WALL-ROCK ALTERATION, ETC. AT THE MINE - IF YOU TIME TO GO THROUGH OFFICIAL CHANNELS FOR A TYPED COPY YOUR REPORT ON THE SALMO AREA WOULD BE ANCIENT HISTORY. I AM ATTACHING A TYPICAL SECTION TO ILLUSTRATE THE STRUCTURE; BILL RINEE SUGGESTED THAT SENDING A COMPLETE SET OF SECTIONS MIGHT NOT MEET WITH OFFICIAL APPROVAL. I HOPE THE INFORMATION IS OF SOME USE AT THIS LATE DATE.

WE HAVE BEEN ENJOYING A VERY UNUSUAL WINTER, WITH NO COLD WEATHER AND LITTLE SNOW. THE HIGHWAYS ARE STILL BARE, AS IS OUR ROAD TO TOWN.

I TRUST YOU'RE ENJOYING YOUR NEW HOUSE & WE HAVE HAD A VERY COMFORTABLE WINTER IN OURS.

BEST REGARDS TO YOUR FAMILY. WE HOPE YOU WILL BE WORKING AROUND KOOTENAY LAKE AREA THIS SUMMER.

Sincerely

H. B.

inches



centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.



TALC + 5%



TREMOLITE + 5%



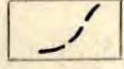
SILICA + 5%



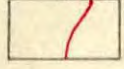
PYRRHOTITE + 2%



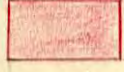
PYRITE + 4%



LIMESTONE BOUNDARY



ORE BODY OUTLINE



HIGH-GRADE ZONE

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
H.B. MINE SALMO OFFICE

GEOLOGICAL RESEARCH AT THE H.B. MINE

INTRODUCTION

THIS REPORT DEALS WITH A STUDY OF WALL ROCK ALTERATION AT THE H.B. MINE. A DETAILED STUDY WAS CARRIED ON FROM DECEMBER 1, 1956 TO MAY 24, 1957, BY J. MURARO, POOL GEOLOGIST, UNDER THE GUIDANCE OF THE WRITER; WORK DONE INCLUDED A RELOGGING OF A LARGE NUMBER OF DRILL HOLES AND A RE-EXAMINATION OF CERTAIN UNDERGROUND WORKINGS. SINCE THAT TIME SPECIAL ATTENTION HAS BEEN PAID TO WALL ROCK ALTERATION IN LOGGING OF CURRENT DRILL HOLES IN EXPLORATION DRILLING IN THE SOUTH PART OF THE MINE.

A SERIES OF SECTIONS SHOWING ALTERATION ZONES AND SULPHIDE BODIES ACCOMPANIES THIS REPORT.

SUMMARY

WALL ROCK ALTERATION

THE STUDY OF WALL ROCK ALTERATION HAS REVEALED THE FOLLOWING:

1. SILICA-TREMOLITE-TALC ALTERATION ZONES ARE PRESENT, AND THESE ZONES SHOW DEFINITE PATTERNS.
2. A DEFINITE STRUCTURAL CONTROL EXISTS FOR THE ZONES.
3. THE SILICA-RICH SOLUTIONS WHICH GAVE RISE TO THE ALTERED ZONES ARE PRE-ORE.
4. SILICA-TREMOLITE-TALC ALTERATION ZONES WERE NOT NECESSARY FOR THE FORMATION OF ORE; THE SILICA-RICH SOLUTIONS IN PART FOLLOWED CHANNELWAYS WHICH WERE LATER FOLLOWED BY MINERALIZING SOLUTIONS.
5. THE PRESENCE OF ALTERATION ZONES OF THIS TYPE CAN BE USED AS A GUIDE TO EXPLORATION; IN THAT THEY INDICATE CHANNELWAYS WHICH COULD LATER BE FOLLOWED BY MINERALIZING SOLUTIONS.

THE MOST SIGNIFICANT FEATURE OF THE ALTERATION IS THE LOCALIZATION OF THE STRONGEST ALTERED ZONE IN RELATION TO THE X-1 STRUCTURE AND THE DOLOMITE-LIMESTONE CONTACT ON THE UPPER WEST SIDE OF NO. 1 ZONE. THE HANGING-WALL OF THE MAIN X-1 ZONE IS ESSENTIALLY THE LOWER CONTACT OF THE LIMESTONE, AND ABOVE THE X-1 ZONE THE WEST BOUNDARY OF NO. 1 ZONE MARKS THE EAST LIMIT OF THE LIMESTONE. THIS LIMESTONE-DOLOMITE CONTACT IS IN THE FORM OF A "U", WITH A ZONE

OF INTENSE ALTERATION IN THE CROTCH OF THE "U", AND WITH STRONG SILICIFICATION OF THE LIMESTONE IN A BELT AROUND THE "U".

THE POSITION OF THIS LIMESTONE-DOLOMITE CONTACT MAY BE EXPLAINED BY SEVERAL THEORIES:

1. THE CONTACT REFLECTS A FOLD IN THE REEVES LIMESTONE, WITH SOME SLIGHT DIFFERENCE IN THE LIMESTONE BEDS WHICH IS NOW OBSCURED LIMITING THE UPWARD MIGRATION OF MAGNESIUM-RICH SOLUTIONS. LATER BRECCIATION AND MOVEMENT ON X-1 ZONE AND OPENING OF A CHANNELWAY FOR SILICA-RICH SOLUTIONS ALONG THE WEST SIDE OF NO. 1 ZONE ABOVE X-1 WOULD BE LOCALIZED ON THIS CONTACT, WITH STRESSES BEING TAKEN UP IN THE LIMESTONE BY FLOWAGE.

2. FAULT STRUCTURES WERE PRESENT IN LIMESTONE IN THE X-1 AND WEST CONTACT OF NO. 1 ZONE POSITIONS, WHICH LIMITED THE UPWARD AND WESTWARD MIGRATION OF MAGNESIUM-RICH SOLUTIONS. FURTHER POST-DOLOMITIZATION MOVEMENT COULD HAVE PRODUCED X-1 BRECCIA ZONE.

3. A MAJOR FAULT MOVEMENT OCCURRED ON THE X-1 ZONE AND THE WEST CONTACT OF NO. 1 ZONE AFTER DOLOMITIZATION, TO BRING LIMESTONE IN CONTACT WITH DOLOMITE. THIS WOULD ENTAIL A HIGHLY COMPLEX FAULT MOVEMENT.

DETAILS

STRATIGRAPHY

ZINC-LEAD OREBODIES IN THE SALMO DISTRICT ARE LOCALIZED IN THE REEVES LIMESTONE MEMBER OF THE LOWER LAIB GROUP, OF LOWER CAMBRIAN AGE. AT THE H.B. MINE THE REEVES HAS BEEN THICKENED BY FOLDING TO SEVERAL TIMES ITS ORIGINAL WIDTH. RECENT INFORMATION OBTAINED FROM A NEW HEADING ON THE 2800 HAULAGE LEVEL INDICATES THAT THE "TRUMAN" MEMBER, WHICH UNDERLIES THE REEVES ON THE WEST SIDE, AND DIPS EASTERLY AT 50° , FOLDS BACK AT ABOUT THE 2800 LEVEL ELEVATION TO FORM THE "HANGING-WALL" OF THE REEVES ON THE EAST, WITH A DIP OF 60° EAST. THIS MAJOR FOLD PLUNGES SOUTH AT 20° .

SEVERAL HUNDRED FEET TO THE EAST OF THE REEVES HANGING WALL A REGIONAL FAULT BRINGS ORDOVICIAN BLACK SLATES OF THE ACTIVE FORMATION IN CONTACT WITH TRUMAN ROCKS. THESE BLACK SLATES CONTINUE TO THE EAST FOR SEVERAL THOUSAND FEET.

THE REEVES LIMESTONE HAS BEEN EXTENSIVELY DOLOMITIZED. ALL OREBODIES OCCUR WITHIN THE DOLOMITE WITH THE EXCEPTION OF A 2' BAND OF PYRRHOTITE-GALENA ORE LYING A FEW FEET ABOVE THE X-1 ZONE. BOTH THE DOLOMITE ZONE AND THE OREBODIES PLUNGE AT 20° TO THE SOUTH WITH THE PLUNGE OF THE FOLDING.

THE OREBODIES ARE OF TWO MAIN TYPES:

1. LARGE NEAR-VERTICAL ZONES, STRIKING NORTH-SOUTH, OF CLEAVAGE BANDED DOLOMITE IN WHICH ZNS, PYRITE, AND MINOR Pbs OCCUR AS ERRATIC STRINGERS FOLLOWING THE CLEAVAGE BANDING. No. 1, No. 2, AND THE NORTH PORTION OF No. 4 ZONE ARE OF THIS TYPE.
2. BRECCIA ZONES IN DOLOMITE, WHICH PLUNGE SOUTH WITH THE PRIMARY FOLDING, AND IN WHICH Pbs AND PYRRHOTITE ARE MUCH MORE PROMINENT THAN IN THE STEEP ZONES.

WHERE THE UPPERMOST BRECCIA ZONE, X-1, INTERSECTS No. 1 ZONE OF THE WEST SIDE, AN ENRICHMENT OF No. 1 ZONE IS EVIDENT FOR A DISTANCE ABOVE AND BELOW THE JUNCTION, PARTICULARLY IN Pbs.

No. 4 FLAT ZONE AND LOWER No. 1 ZONE MERGE AT ABOUT 8150 N., AND AT THE JUNCTION BOTH No. 4 AND No. 1 ZONES ARE HIGH IN PYRITE, WITH THE PYRITE GRADUALLY DECREASING IN No. 4 ZONE AS IT GOES NORTH AWAY FROM No. 1 ZONE. THIS MAY INDICATE THAT No. 4 ZONE MINERALIZATION WAS FED FROM LOWER No. 1 ZONE.

ORE CONTROLS APPEAR TO BE ENTIRELY STRUCTURAL. THE DOLOMITE RECRYSTALLIZED TO A VERY FINE GRAINED ROCK WHICH FRACTURED MORE READILY THAN THE COARSER GRAINED LIMESTONE, WITH STRONG ZONES OF CLEAVAGE BANDING DEVELOPED IN THE DOLOMITE, WITH THE DARKER CARBONACEOUS MATERIAL ORIENTED ON THESE BANDS. THE BRECCIA ZONES HAVE NUMEROUS BRECCIA FRAGMENTS WITH CLEAVAGE BANDING, HENCE ARE LATER THAN THE STRONGLY CLEAVAGE-BANDED ZONES. THE ABSENCE OF ORE IN THE LIMESTONE IS BELIEVED DUE TO LACK OF FRACTURING, WITH STRESSES TAKEN UP INSTEAD BY FLOWAGE.

A "FLAT" FAULT, WHICH DISPLACES THE "FOOTWALL" CONTACT AT LEAST 100', LIES FROM 10' TO 50' BELOW THE X-2 BRECCIA ZONE, AND NO OREBODIES HAVE BEEN LOCATED BENEATH IT TO DATE. ITS ROLE IN ORE CONTROL IS NOT YET CLEAR.

WALL ROCK ALTERATION

THE STRONGEST ALTERED ZONE IS LOCATED CLOSE TO THE LIMESTONE-DOLOMITE CONTACT TO GIVE A TROUGH-LIKE ZONE IN SECTION. THE ALTERATION INCLUDES ABUNDANT TREMOLITE AND TALC IN DOLOMITE, AND SILICIFICATION IN THE LIMESTONE IN THE FORM OF DARK, CHERT-LIKE, REGULAR BANDS. FROM 8650 N. TO 9250 N. A

SHARP DROP AND EVENTUAL DISAPPEARANCE OF TREMOLITE IS NOTED, WITH TALC CONTENT SHOWING A SLIGHT DECREASE.

A SECOND ALTERED ZONE IS PRESENT IMMEDIATELY ABOVE AND SLIGHTLY WEST OF No. 2 ZONE IN THE BLOCK NORTH OF 8700 LATITUDE, SOUTH OF 8700 N. THIS ZONE GRADUALLY DROPS IN ELEVATION AND ASSUMES THE POSITION OF No. 2 ZONE, WHICH HAS CEASED TO BE MINERALIZED, BY 8300 N. THIS ZONE IS A HEAVY TREMOLITE - TALC ZONE.

A THIRD PROMINENT ALTERED ZONE LIES ALONG THE TOP OF No. 1 ZONE. AT ABOUT 8900 N. THIS ZONE GRADUALLY SHIFTS TO THE WEST TO MERGE WITH THE ZONE ALONG THE WEST CONTACT OF No. 1 ZONE. TALC IS THE ALTERATION PRODUCT IN THIS ZONE.

ISOLATED ZONES OF SILICIFICATION IN DOLOMITE OCCUR ABOVE THE BACK OF 92 STOEPE, AND ALONG THE LOWER WEST SIDE OF No. 2 ZONE.

A GRADUAL BUT DECIDED TREND TOWARD "LESS PURE" DOLOMITE OCCURS TOWARD THE NORTH END OF THE MINE; SLATY AND SANDY DOLOMITE AND NARROW INTERSECTIONS OF LIMESTONE INDICATE AN AREA OF INCOMPLETE DOLOMITIZATION.

EVIDENCE THAT THE ALTERED ZONES ARE PRE-ORE IS OBTAINED FROM THIN SECTION STUDY. MASSES OF ZNS CRYSTALS ARE SEEN TO COMPLETELY SURROUND LATHS OF TREMOLITE.

LOWER No. 1 ZONE, No. 4 ZONE, AND X-2 ZONE SHOW A LOW TALC CONTENT, WITH LITTLE TREMOLITE; IT IS CONCLUDED THAT ALTERATION ZONES WERE NOT NECESSARY FOR THE FORMATION OF ORE.

No. 4 ZONE FROM 8300 N. TO 8700 N. HAS A LOW TALC CONTENT BUT THE HIGHEST GERMANIUM CONTENT OF ALL THE ZONES. THE REASON FOR THIS IS STILL UNKNOWN.

TALC

THREE TYPES WERE NOTED:

1. STRATITIC TALC, WITH COMPLETE CONVERSION OF TALC TO GIVE A MASSIVE SOAPSTONE. THIS TYPE IS NOT COMMON.
2. FLAKE TALC CONFINED TO LENTICULAR ACCUMULATIONS OF CARBONACEOUS MATERIAL AND OTHER IMPURITIES; ALSO COATING SURFACES OF BRECCIA PARTICLES.
3. BOTH FLAKE TALC AND STREAT TALC ASSOCIATED WITH TREMOLITE.

ANALYSES OF LIMESTONES IN THE AREA BY PROVINCIAL GOVERNMENT GEOLOGISTS SHOW NEGLIGIBLE SILICA, SO THAT ALL SILICA NECESSARY FOR TALC FORMATION IS CONSIDERED TO BE INTRODUCED SILICA.

SOME TALC IS SHOWN BY THIN SECTION STUDY TO BE AN ALTERATION OF TREMOLITE AND SOME IS CONSIDERED TO BE PRIMARY. TO DETERMINE THE RELATIVE AMOUNTS OF THE ABOVE TWO TYPES REQUIRES THE STUDY OF A LARGE NUMBER OF THIN SECTIONS.

TREMOLITE

TREMOLITE IS ABUNDANT IN THE ALTERED ZONES IN THE SOUTH PART OF THE MINE, BUT FROM 8650 N. TO 9250 N. A SHARP DROP AND EVENTUAL DISAPPEARANCE OF TREMOLITE IS NOTED. UNDOUBTEDLY SOME TREMOLITE HAS BEEN ALTERED TO TALC, BUT IT MAY BE THAT A DECREASE IN TEMPERATURE OF THE SILICA-RICH SOLUTIONS TO THE NORTH ACCOUNTS FOR THE ABSENCE OF TREMOLITE.

THE PRESENCE OF TWO AGES OF TREMOLITE IS DEDUCED FROM THIN SECTION STUDIES. THE FIRST TYPE SHOWS COMPACT MASSES AND FLAMBOYANT TUFTS OF TREMOLITE, COMPOSED OF FINE INDIVIDUAL NEEDLES, WITH SOME PSEUDOMORPHIC TALC AFTER TREMOLITE, ESPECIALLY AT THE EXTREMITIES OF STRUCTURES. THE SECOND TYPE SHOWS COARSER LATHS OF UNALTERED TREMOLITE WITH A MUCH FRESHER APPEARANCE. BOTH TYPES MAY BE PRESENT IN THE SAME THIN SECTION.

A DEFINITE CROSSCUTTING RELATIONSHIP OF TREMOLITE WITH CARBONACEOUS BANDING IN THE DOLOMITE WAS NOTED IN THIN SECTIONS.

THE X-1 ZONE SOUTH OF 8700 N. CARRIES THE HIGHEST PROPORTION OF TREMOLITE, WITH TREMOLITE PRESENT IN DOLOMITE A FEW FEET BELOW THE FOOTWALL OF THE ZONE.

RECENT DRILLING SOUTH OF 8000 N. SHOWS SHORT INTERSECTIONS OF COARSE TREMOLITE IN LOWER NO. 1 ZONE, IN AREAS WHERE IT IS ENTIRELY ABSENT TO THE NORTH, AND THE IMPRESSION IS GAINED THAT TREMOLITE IS BECOMING MORE WIDESPREAD TO THE SOUTH.

SILICA

SILICA IS CHIEFLY CONFINED TO THE LIMESTONE CLOSE TO THE DOLOMITE CONTACT, IN THE GROUND ABOVE X-1 ZONE AND WEST OF

NO. 1 ZONE. ISOLATED CONCENTRATIONS ARE PRESENT ABOVE THE BACK OF 92 STOPE AND ON THE LOWER WEST SIDE OF NO. 2 ZONE.

THE SILICA IN THE LIMESTONE APPEARS IN DRILL HOLES AS RELATIVELY SHORT LENGTHS (1'-2') OF BLACK CHERT-LIKE ROCK SPACED AT 5'-10', 20' INTERVALS IN OTHERWISE NORMAL COARSE GRAINED LIMESTONE. A STRUCTURAL CONTROL IS SUGGESTED RATHER THAN A GENERAL "SOAKING" OF THE LIMESTONE WITH SILICA. THIS SILICA OFTEN CARRIES A SMALL AMOUNT OF FINE PYRRHOTITE IN BANDS.

THIN SECTION STUDY GIVES GOOD EVIDENCE OF SILICA REPLACING CARBONATE GRAINS, WITH THE REMAINING CALCITE GRAINS STRONGLY ATTACKED. THE PYRRHOTITE SHOWS AS POST-SILICA.

PYRRHOTITE

THE PART OF THE MINE SOUTH OF 8700 N. SHOWS A MORE WIDESPREAD DISTRIBUTION OF PYRRHOTITE THAN THAT PART TO THE NORTH OF 8700 N. THERE IS ROUGHLY TWICE THE AMOUNT OF PYRRHOTITE SOUTH OF 8700 N. THAN THERE IS NORTH OF 8700 N.

APART FROM MINOR AMOUNTS WHICH OCCUR AS FINE BANDS IN SILICIFIED LIMESTONE, THE PYRRHOTITE IS ASSOCIATED WITH ALTERED ZONES IN DOLOMITE, MORE OFTEN THAN NOT IN ALTERED ZONES WITH PbS AND ZnS AND PYRITE.

A NOTABLE AMOUNT OF PYRRHOTITE IS ASSOCIATED WITH HIGH Pb VALUES, IN THE "UPPER" BAND OF X-1 ZONE AND IN THE SMALL HIGH Pb ZONE MINED ABOVE THE BACK OF 92 STOPE. HOWEVER, SOME PYRRHOTITE PODS SHOW LOW Pb VALUES, PARTICULARLY IN NO. 1 ZONE.

PYRITE

RELATIVELY LOW CONCENTRATIONS OF PYRITE, IN SHORT SCATTERED LENGTHS, ARE FOUND IN THE ALTERED ZONE. 80% OF THE PYRITE IN THE MINE IS IN LARGER, MORE CONTINUOUS OREBODIES IN UNALTERED DOLOMITE, IN THE UPPER EAST PART OF NO. 1 ZONE, THE BOTTOM PART OF NO. 1 ZONE, ALL OF NO. 2 ZONE, AND THE "FLAT" PART OF NO. 4 ZONE. THE MOST INTIMATE ASSOCIATION OF PYRITE WITH Pb-Zn ORE OCCURS IN NO. 2 ZONE, AS A FINE GRAINED GRANULAR MIXTURE OF PYRITE, SPHALERITE, AND GALENA.

AN INTERESTING OCCURRENCE OF PYRITE IS IN THE UPPER PART OF X-1 ZONE EAST ON 2050 SECTION. HERE VIRTUALLY MASSIVE PYRITE WITH HIGH Pb-Zn VALUES OCCUPIES THE POSITION OF THE HIGH Pb-PYRRHOTITE BAND ABOVE X-1 100' TO THE WEST. THE SPHALERITE IN THE MASSIVE PYRITE IS LIGHT TAN IN COLOR.

Pb-Zn RATIOS

LOWER NO. 1 ZONE, AWAY FROM INFLUENCE OF X-1 ZONE	1:13.6
UPPER NO. 1 ZONE, INCLUDING ZONE OF X-1 INFLUENCE	1:4.7
NO. 2 ZONE	1:6.1
NO. 4 ZONE	1:15.2
X-1 ZONE	1:2.4
X-2 ZONE	1:3.6

IT IS APPARENT THAT THE Pb-Zn RATIO OF FLAT BRECCIA ZONE ORE IS CONSIDERABLY HIGHER THAN IN THE VERTICAL ZONES. THE REASON FOR THIS IS NOT YET APPARENT.

cc W.T.L (1)
MINES DIV. (2)
J.C.M. (1)
G.F.W (1)
FILE (1)

A. F. ...
MINE GEOLOGIST, A.B. MINE.

ATTACHMENTS

(1) CROSS SECTIONS 8000-9250