1030/8E \$ 103P/SW

C. E. Michener

MAPLE BAY PROPERTY

<u>of</u>

YORKSHIRE COPPER MINES LTD.

107 (- 1) - 120

Toronto, Ontario October 1974

Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

NO 5550 MAP

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MAPLE BAY PROPERTY OF YORKSHIRE COPPER MINES LTD.

PROPERTY, LOCATION AND ACCESS

The property is located on Portland Canal, British
Columbia about 35 miles south of the Town of Stewart, B.C. and
85 miles north of Prince Rupert, B.C. It has an excellent
location from the standpoint of ocean-going freight and can
be readily visited by float-equipped aircraft.

The climate is mild, Portland Canal remaining open all year round. There is heavy rainfall which is characteristic of the coastal areas of British Columbia and this results in heavy snowfall at higher elevations.

There are 22 Crown grant claims and 51 staked claims in the property as listed in Appendix B and shown on the Property Map attached to this report. As of September 30th these claims were registered in the name of Maple Bay Mines and Consolidated Maple Bay Mines Ltd. Yorkshire Copper Mines Ltd. is the present owner. It is understood that the claims are now held by Yorkshire Copper Mines Ltd.

According to a B.C. Department of Mines Report of 1970 by E. W. Grove there are 15 veins on the property; the first discovery was made in 1902. One of the main vein systems, the

Outsider, produced about 125,000 tons of siliceous copper ore between 1924 and 1928. None of the other veins have been put in production although all have been explored to a certain extent. It is understood that Granby was interested in the high silica content of the Outsider ores and they were used as a blending material at the Granby smelter.

The author of this report visited the property in 1971 and made an examination of the Outsider vein system, the Princess-Anaconda veins and the Eagle-May Queen vein. A certain exploration programme was recommended at that time but not carried out. The present report has been compiled from our own files, from published reports and from information obtained from L. J. Manning & Associates Ltd., Mining and Geological Consultants of Vancouver, B.C.

GEOLOGICAL SETTING

The geology of the Maple Bay area is similar to that correct of the Anyox area from which 24 million tons of ore from the

Hidden Creek and Bonanza Mines was produced from 1914 to 1936.

Catachest. (ally deformed Catachests)

The veins lie in a series of sediments and volcanics known as the Hazelton Group which in turn have been intruded and surrounded by the Coast Range Batholith. There are three main vein systems at Maple Bay consisting of a strong vein in each

case with satellite veins on strike and parallel to it. vein mineral is generally quartz, containing chalcopyrite, pyrrhotite and pyrite. Some of the sulphide occurrences show banding and there has of course been a certain amount of brecciation during the formation of the vein systems. map attached to this report on a scale of 1,000 feet to the inch shows an outline of the claim boundaries and the location of the vein systems. The Princess-Anaconda, the Eagle-May Queen and the Outsider are considered the important vein systems which will be developed as separate units. The Outsider was naturally developed first as it lies at a much lower elevation than the other two and was more accessible from Portland Canal. The records show that the grade of ore shipped from the Outsider vein was 1.8% Cu and contained in addition 72% silica. It is likely that a higher-grade ore could have been shipped but, inasmuch as the smelter required high silica for smelting, the copper grade was sacrificed to some extent.

OUTSIDER VEIN SYSTEM

Attached to this report is a map showing a plan and longitudinal section, together with a series of cross sections on the Outsider vein system and the underground workings. This material has been reconstructed from various sources, most of which are listed in Appendix A of this report.

Owing to the topography, and the attitude of the vein, it is very difficult to drill this vein system to reach an intersection below the old workings. After a study of all the factors concerned it was decided that the most effective way was to drive an adit on the 600 level under the old workings and develop ore where encountered above the 600 level. The old records indicate continuity of the vein on surface for 1,000 feet to the north beyond the old workings and additional ore could be developed in this area above the 600 level. 1295 level, the 1148 level and the 1070 level all showed mineralization very similar in grade and widths to that encountered in earlier mining. It is anticipated that the oreshoots could be stoped at a reasonable width. Judging by earlier stoping records an average of 10 feet is usual. chance of finding additional shoots of this quality appear to be quite good, considering the large potential area that could be explored from the 600 level.

PRINCESS-ANACONDA VEIN SYSTEM

Although this vein system, including the Thistle vein, is probably the weakest of the three vein systems, the Princess and its two satellite veins is more accessible from the standpoint of mining than the Eagle-May Queen. The Princess vein strikes in a northeasterly direction and dips to the southeast.

It has been sampled on surface by trenching and underground by drifting. Later a crosscut was driven in from the 1875 foot level to the vein. The 1875 crosscut proved that the vein persists over a vertical interval of 600 feet from the 2400 foot level to the 1800 foot level. The vein at the end of the crosscut was sampled by Derry, Michener & Booth in 1971 and showed an average grade of 3.10% Cu over 8 feet. A number of drill holes were put into this vein, intersecting it below the 2400 foot level. The average grade of all the surface trenching is 2.06% Cu over 7.5 feet of width. The diamond drilling showed a very narrow width above the 2400 foot level, but below that level three drill holes give an average grade of 2.27% Cu over 5.1 feet of width.

On the Anaconda vein six trenches averaged 1.79% Cu over 6.1 feet. Eight bore holes averaged 5.53% Cu over 1.8 feet.

In 1971, a proposal was made to do a considerable amount of underground drilling from the 1875 crosscut by stepping back in the crosscut and working from a diamond drill station at varying distances back from the vein. By fanning holes upwards and downwards it was estimated that it might be possible to develop 200,000 tons of mineable ore in one block at a cost of about \$60,000.

EAGLE-MAY QUEEN VEIN

This is probably the strongest vein in the Maple Bay area. It strikes northeasterly in the same direction as the Princess, dips southeasterly and has been traced on surface for over 3,000 feet. The average grade of sampling done in six trenches over a length of 1500 feet was 4.07% Cu with an average width of 7.1 feet. This does not include several trenches with doubtful results. A number of short diamond drill holes were also put in beside the vein on surface; the average of the five holes reported gave a grade of 3.08% Cu over a width of 8.0 feet.

The exploration of the Eagle-May Queen vein would be difficult from a logistics standpoint as it occurs above the 2400 foot level and extends up to the 4000 foot level. However, once an adit was established for mining there would be rapid development of ore above the adit level as the surface slope is very steep at this location.

As a matter of logistics and exploration policy it would probably be better to delay any immediate work on the Eagle-May Queen until a camp were established and positive results obtained from the Outsider and the Princess areas. When the geologic characteristics of these veins are better known, it might then be possible to drive a long adit into the vein from, say, the 1000 foot level, in the vicinity of Eagle Creek Valley.

From the data available it seems likely that the Eagle-May Queen vein is the strongest and most persistent of the three systems and that it would be possible to develop significant reserves on this structure, grading in the range of 2-3% Cu.

SUMMARY OF THE THREE VEIN STRUCTURES

The three vein structures, described above, all have potential for making economic mining units in the minimum range of 500,000 tons each, with the possibility of greatly expanding this figure. The Princess and Anaconda veins are well worth exploring and this could be done simultaneously with the major work carried out on the Outsider vein system. The Princess-Anaconda programme could be done for, probably, less than \$100,000 and would involve a diamond drill programme only. The main effort appears to be best expended on the Outsider vein, of which deposit a good deal more is known about the geological characteristics than of the other two. The problem here, of course, is the cost of exploration but the openings driven for this purpose can also be used for mining.

The Maple Bay prospects as a whole appear to be favoured by:

- (1) Good location with respect to transportation.
- (2) Well located with respect to economic mining.

- (3) Simple mineralogy; a copper concentrate could be easily made with good recoveries probably in the 95% range.
- (4) The grade of ore will depend on the development of oreshoots of better than average grade and these should be in the range of 2 to 3% Cu.

ECONOMICS

The exploration of the Maple Bay deposit is based on the assumption that economic copper ore could be found and extracted at a profit, possibly at a rate of 500 tons per day, involving a mining plant and concentrator. The concentrates could be shipped by barge to a shipping point or even loaded for overseas shipment right at Maple Bay. The cost of developing, mining and milling these ores is expected to fall within the following limits, using a combination of shrinkage and cut and fill methods. These costs are based on the operating costs of Canadian mines of a similar size operating under similar conditions of stope width and production rate; they have been escalated by 20% over last year's figures and, I think, are quite realistic.

The operating cost for mining should vary between \$10.00 and \$15.00 a ton; the cost for milling would be in the range of \$4.00 a ton making a cost range for mining and milling (operating cost) of \$14.00 to \$19.00 a ton. In order to pay off capital at a reasonably fast rate, say within three

or four years, the grade of ore should be in the range of 2 1/2% recovered copper and whatever small gold and silver values are present. This would require a mining grade of 2.6 to 2.7% copper to take care of dilution and recoveries. The net smelter return for copper, excluding freight, would be about 5% per pound based on 80¢ copper. Fifty pounds of copper recovered from each ton of ore would be worth \$29.00 net at the mine. With an operating cost somewhere between \$14.00 and \$19.00, say \$17.00/ton, there remains a cash flow before capital retirement and taxes of \$12.00 per ton out of which capital repayment and profit could be taken.

We are therefore aiming for not less than 500,000 tons grading 2 1/2% Cu minimum with gold and silver values. These would be basic minimum figures and the profit from the operation would rapidly accrue once these figures have been exceeded.

PROPOSED EXPLORATION PROGRAMME

It is proposed that the Outsider vein be explored by underground methods and that, concurrently with this, the Princess-Anaconda vein system be explored from underground by diamond drilling.

These two programmes would involve first at the Outsider a minimum of 1500 feet of underground drilling, with 2,000 to 3,000 feet of diamond drilling, plus 500 feet of

raising. All this would be carried out under strict geological supervision and control. The Princess-Anaconda drilling would involve about \$60,000. The work at the Princess-Anaconda vein would consist of cutting several diamond drill stations in the main 1875 crosscut and drilling angle holes from these drill stations with the objective of outlining 400 to 500,000 tons of ore.

The cost estimate below is based on figures supplied by local contractors:

Mobilization - Ramp Barge	\$ 10,000
Road	20,000
Set up camp and portal preparation	10,000
Drifting - track or trackless - \$100/ft1500 ft.	150,000
Raising - \$100/ft 500 ft.	50,000
Diamond drilling - \$14/ft say 3000 ft.	42,000
Timber - \$600/1000 in place - say 20,000	12,000
Rock bolts - \$2/ft say 4000 ft.	8,000
Labour - \$10/hr say drift straightening, etc.	
2500 hrs.	25,000
Demobilization	5,000
	\$332,000
Princess-Anaconda drilling	60,000
Supervision and overhead @ \$10,000/mo.	60,000
Contingency	48,000
TOTAL	\$500,000

These two programmes should have a reasonable expectation of accomplishing the objective of proving up between 500,000 and 1,000,000 tons of copper ore grading in the range of 2 1/2% Cu. This would provide a firm base for starting a mining

operation and as mining proceeded new ore could be developed in these two vein systems; in addition the Eagle-May Queen system would be explored and developed by underground methods similar to those used for the Outsider vein.

It would seem feasible to locate the mill at some point near tidewater. The ore from all three operations could be produced through adit systems and conveyed to the mill either by tramway or by truck road.

The overall cost of surface plant and equipment, mine development, equipment and overhead should not exceed \$5,000,000. This could be done by bank financing once the ore reserves are established. Owing to the favourable location, transportation problems are reduced to a minimum. Power would have to be generated from fuel oil and this cost would also be favoured by the seaport location.

INFRASTRUCTURE

Maple Bay is an excellent harbour and there is sufficient flat ground at tidewater to provide for all the plant facilities required by this operation. A limited town site could also be developed but another practical solution would appear to be to use Stewart as a manpower base. Single quarters could be constructed at very much less cost at the mine site and the labour force could be shifted back and forth from Stewart on a

swinging shift basis whereby the men spent five days on the job and then be taken back to Stewart for two days. This could easily be accomplished by a fast ferry boat operating year-round on Portland Canal.

C. E. Michener, P.Eng.

Toronto, Ontario October 1974

CERTIFICATE OF QUALIFICATION

- I, Charles Edward Michener, of Toronto, Ontario do hereby certify that:
- 1. I am a consulting geologist residing at 31 Rosedale Road, Toronto, Ontario.
- 2. I am a graduate of Cornell University and the University of Toronto holding the degrees of B.Sc and Ph.D.
- 3. I am a member of good standing of the Professional Engineers of the Province of Ontario and I am entitled to use the designation, "Consulting Engineer".
- 4. I have been practicing my profession as a geologist for more than 35 years, mainly in North America, South America, South Africa and the South Pacific.
- 5. I have no interest, direct or indirect, nor do I expect to receive any interest in the property described herein.
- 6. I carried out an examination of the Maple Bay property in September 1971 and in the summer of 1974 I updated my information by a study of the geological reports listed in the Appendix. I have also revised the costs and estimates in keeping with escalating prices.

C. E. Michener, P. Eng.

Toronto, Ontario October 22, 1974

- 1. Derry, Michener & Booth Report, September 24, 1971.
- 2. E. W. Grove, B.C. Department of Mines 1970.

There are 15 veins in the Maple Bay area, first found in 1902. The Outsider was the only producer and it was shut down in 1927.

3. Keltic Mining Corp. Ltd. Report by A.C.A. Howe, A.C.A. Howe International Ltd., 1967.

Mr. Howe recommends 14,000 feet of diamond drilling at an estimated cost of \$450,000. This would include line cutting, geological mapping, electromagnetic survey, trenching and sampling.

4. A. G. Pentland, Report on the Eagle-May Queen Group, 1969.

Dr. Pentland says that the Eagle-May is the strongest vein. He estimates 522,000 tons probable ore grading 1.70% Cu and 590,000 tons possible ore grading 1.40% Cu.

5. J. T. Mandy, Ph.D., "Maple Bay Copper Claims", 1952.

Dr. Mandy estimates the Eagle-Bay vein to be 3,300 feet long and 0.5 feet wide, containing 3.03% Cu. The Thistle vein he estimates at 600 feet long, 13 feet wide, containing 3.3% average Cu. The Princess-Anaconda vein he estimates at 6,900 feet in length, 7.7 feet wide, containing 2.56% Cu. The Bluebell vein he estimates at 600 feet, with an average width of 3.2 feet, containing 8.44% Cu. These reports appear to be very optimistic.

6. A. G. Pentland, December 1970.

Quotes various reports from Mandy and the Granby Consolidated Mining Co.

_TO. A14672

REFERENCES (Continued)

- (i) F. T. Hemsworth, Report on Maple Bay Copper Mines, 1956.
 - (ii) F. T. Hemsworth, Report on Maple Bay Copper Mines, 1957.
- 8. B.C. Department of Mines, Memoir 713.
- 9. Granby Mining Co. Ltd., 1926

Description of the Outsider Vein.

APPENDIX B

The property consists of 22 Crown-granted claims and 51 claims held by location. On August 21, 1974 these claims were registered in the name of Maple Bay Copper Mines Ltd. but it is understood that they have since been transferred to Yorkshire Copper Mines Ltd. The list is as follows:

CROWN-GRANTED CLAIMS

	Lot No.
Princess May	489
Princess Alexandria	500
Star	562
Regina	564
Copper King	565
Норе	566
Brown	567
Constance Fraction	568
Tunnel Fraction	569
Bluebell	571
Rose	575
Thistle	576
May Queen	5 7 7
Eagle	57 8
Scotland Forever	579
Duck Fraction	938
Comstock	2877
Anaconda	2878
Gertie	2879
Lizzie	2880
Maple Bay Fraction	2881
Comstock Fraction	2882

2. CLAIMS HELD BY LOCATION

Name of Claim	Record No.	Work Registered to
OB 1	33877	April 30, 1977 (Provided annual rental paid)
2	33878	71
3	33879	ė?
4	33960	11
5	33851	If .
6	33882	n

(Continued)

APPENDIX B (Continued)

Name of Claim	Record No.	Work Registered to
OB 7	33883	April 30, 1977 (Provided annual rental
		paid)
8	33884	para,
9	33885	71
10	33886	11
11	33887	11
12	33888	11
14 Fraction	33890	II .
16 Fraction	33892	l t
22 Fraction	37322	July 21, 1978
		(Provided annual rental
		paid)
23 Fraction	37323	"
ος 28 Fraction	37324	 Ir
29 Fraction 31 Fraction	37325 37326	R
32 Fraction	37327	u
33 Fraction	37328	Ħ
34 Fraction	37329	ŧŦ
36 Fraction	37330	ti
37 Fraction	37331	**
38 Fraction	37332	ŢI
39 Fraction	37333	π · · · · · · · · · · · · · · · · · · ·
40 Fraction	37334	er
17 Fraction	33893	April 30, 1977
		(Provided annual rental paid)
18 Fraction	33894	pard)
19	33895	II
20	33896	
21	33897	it
os 1	33898	n
2	33899	11
3	33900	11
3 4	33901	11
5 Fraction	33902	u
6	33903	er.
7 Fraction	33904	27 Pil
8 9 Fraction	33905 33906	**
9 Fraction 10	33906	11
10 11 Fraction	33908	**
12	33909	u
13	33910	PF

APPENDIX B (Continued)

Name of Claim	Record No.	Work Registered to
os 14	33911	April 30, 1977 (Provided annual rental paid)
15	33912	It
16	33913	"
17 18	33914 33915	 P7
Anaconda Fraction	34757	December 22, 1976
· · · · · · · · · · · · · · · · · · ·	34131	(Provided annual rental paid)

APPENDIX B

. 8 .TO. A 14673

YORKSHIRE COPPER MINES LIMITED

Itemized Cost Statement

Pursuant to "Affidavit on Application to Record Wonk"

re: Geological Report Affidavit dated July 17, 1975

SUB-MINING RECORDER RECEIVED

JUL 18 1975

MR. #100854537000

Geological Report:

(a) Number of days worked - see attached invoices

C. E. Michener 7 days September and October 1974 (8 hour days)
L. J. Manning 4.34 days July to October 1974 (8 hour days)
J. W. Hogan 15.75 days July to October 1974 (8 hour days)

- (b) Rates see attached invoices
 - (i) L. J. Manning & Associates Limited rates varied from \$200 to \$250 per day Total paid to L. J. Manning & Associates for fees only was \$4,050
 - (ii) Derry, Michener & Booth rate for C. E. Michener was \$350 per day Total paid to C. E. Michener & Associates for fees only was \$2,450
- (c) Cost of food and accommodation none billed by consultants
- (d) Cost of ground transportation \$425.75 aircraft: North Coast Air transportation to and from claims site seaplane.
- (e) Cost of support aircraft none billed by consultants
- (f) Cost of instrument rental \$208.00
- (g) Cost of analyses for a geochemical survey and the number of samples analyzed 19 samples analyzed and the cost of analyses included by the consultants in their per diem rates.
- (h) Cost of report preparation \$377.87.

Total Cost (b) through (h) = \$7,511.62



DERRY, MICHENER & BOOTH MINING GEOLOGICAL CONSULTANTS

2302 - The Simpson Tower 401 Bay Street Toronto, Canada M5H 2Y4 Telephone (416) 368-4636

Cable: Dembee Telex: 06-23686

November 25, 1974

W.F. Christensen, Yorkshire Copper Mines Limited, 1710 Board of Trade Building, 1177 West Hastings Street, Vancouver, B.C. V6E 2L3

1082 INVOICE NO.

Fees and expenses, September & October, 1974 TO:

> Professional services of C.E. Michener 6 5/6 days

\$2,392.00

Out of pocket expenses

Drafting, maps Telephone

124.61 19.96

144.57 2,536.57

Invoice 1043, September 20/74 Balance due

58.00 \$2,594.57

L. J. MANNING & ASSOCIATES LIMITED #310 ***** 890 W. PENDER STREET VANCOUVER **** B.C. V6C 1J9

October 31, 1974 Invoice Number 578

IN ACCOUNT:

Consolidated Maple Bay Copper 1710 - 1177 West Hastings Street VANCOUVER, B.C.

DISBRUSEMENTS:

B.C. Telephone	\$ 1.90	
Xerox - 4 copies @ 15¢ ea.	 .60	\$ 2.50

FEES:

J.W. Hogan 2 hrs @ \$200/day	\$ 50.00	\$ 50.00
		\$ 52.50

STATEMENT:

Invoice Sept. 30	\$ 456.29
Invoice October 31	\$ 52.50
Cheque Received November 7	\$ 456.29
Present Balance	\$ 52.50

By Janiania

L. J. MANNING & ASSOCIATES LIMITED

#310 355 -890 W. PENDER STREET VANCOUVER = B.C. V6C 1J9

> October 9, 1974 Invoice Number 565

IN ACCOUNT: Consolidated Maple Bay Copper 1710 - 1177 West Hastings Street

VANCOUVER, B.C.

DISBURSEMENTS:

2 Claim Maps @ \$1.00 ea.	\$ 2.00
B.C. Telephone	5.65
Altair 132335	3.71
Altair	 1.18

\$ 12.54

FEES:

J. Hogan 12 hrs. @ \$200/day

\$300.00

L.J. Manning

5 3/4 hrs. @ \$200/day

143.75

443.75 \$456.29

STATEMENT:

Balance	September	20th	Nil
	September		\$456.29
Present	Balance		\$456.29

Pa. Lov 4/24

August 31st, 1974 Invoice Number 548

IN ACCOUNT:

Consolidated Maple Bay Copper 1710 - 1177 West Hastings Street VANCOUVER, British Columbia

DISBURSEMENTS:		
Altair Drafting Altair Drafting Bondar Clegg Altair Drafting Altair Drafting B.C. Telephone Western Reproducers Xerox 2 @ 15¢	2.35 4.23 7.00 1.59 3.53 2.84 3.08	\$ 24.92
FEES:		
L.J. Manning 4 hrs. @ 200/Day	100.00	
J.W. Hogan 52 hrs. @ 200/Day	1,300.00	1,400.00
		\$1,424.92
STATEMENT:		
Balance August 27th Invoice August 31st Present Balance	1,180.16 1,424.92 2,605.08——	Sept 20/14 Bediep ck

L. J. MANNING & ASSOCIATES LIMITED #310 ##512-890 W. PENDER STREET VANCOUVER #5 B.C. V6C 1J9

July 31st, 1974 Invoice Number536

IN ACCOUNT:

Consolidated Maple Bay Copper 1710 - 1177 West Hastings Street Vancouver, B.C.

DISBURSEMENTS:			
L & M Equipment Bondar Clegg B.C. Telephone North Coast Air Xerox 7 @ .15¢ Plus 10%	176.00 32.00 10.58 425.75 1.05 64.53		
		\$709.91	
FEES:			
L.J. Manning 6 @ 200/Day	168.75		
J.W. Hogan 12 @ 200/Day	300.00		
•		\$4 68.75	
EXPENSES:			
J.W. Hogan	1.50	\$ 1.50	\$1180.16

L. J. MANNING & ASSOCIATES LIMITED #310 #310 #310 VANCOUVER #3 B.C. V6C 1J9

July 25, 1974
Invoice Number 526

IN ACCOUNT:

Consolidated Maple Bay Copper 1710-1171 w. Wastings Dt. #100 890 West Pender Street 1710-1171 w. Wastings Dt. VANCOVUER, B.C.

DISBURSEMENTS	
Altair Drafting	1.47
Xerox 154 @ 10¢	15.40
"Misc Exp"	74 02
J. W. Hogan	74.81
L. J. Manning	24.00
	115.68
FEES	
L.J. MANNING	
8 hrs @ 250/day	250.00
11 hrs @ 200/day	87.50
19	
1/	337.50
J.W. HOGAN	
24 hrs @ 200/day	600.00
24 hrs @ 250/day	750.00
48/	1350.00

1803.18

STATEMENT

Invoice July 25/74 \$1,803.18





