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INTER-OFFICE CORRESPONDENCE

Date: JUNE 8, 1978

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R.O.W.

UTAH ... EXPLORATION DEPT.

To: R. O. WHEATON

cc: R. N. HICKMAN
M. W. HOOD

From: L. R. NELSON

Sub: POPLAR LAKE PROPERTY 93E 15
PRELIMINARY FEASIBILITY STUDY

PRELIMINARY

The Poplar Lake copper-molybdenum property in British Columbia, Canada has been subjected to a preliminary feasibility study. The following parameters have been used:

1) Reserves: Reserve figures have been taken from the March, 1978 Summary Report of the Poplar Lake property by A.J. Schmidt and B.K. Bowen. It was suggested that 70% of the estimated 111,000,000 metric tons of reserves could be practically recovered at a strip ratio of 1:1 (tons of waste to tons of ore).

   The grade of the ore body was assumed as follows:

copper	0.35%
Moly	0.015%
silver	1.96 oz/ton concentrate
gold	0.17 oz/ton concentrate

2) Milling rate and recoveries:

Milling rate @ 15,000 metric tons/day		
Recoveries	Cu	93% (from lab work)
	MoS_2	81%

3) Metal Prices:

Cu	$1.00/lb.
MoS_2	~ $4.50/lb.
Silver	~ $4.50/oz.
Gold	~ $180/oz.

4) Capital Expenditures: (000's)

15-yd^3 shovels	(2)	@ $1,700	=	$3,400
100-T Trucks	(12)	@ 500	=	6,000
Drill	(1)	@ 920	=	920
Tractors (D-8)(D-9)				437
Tractor (824)	(1)	@ 155	=	155
Grader (16G)	(1)	@ 157	=	157
Water Truck	(1)	@ 156	=	156

4) Capital Expenditures: (000's)

Mining Equipment (Con't)

Crane 18T	(1)	@ $123	=	$123
Crane 140T	(1)	@ 456	=	456
Explosives Truck	(1)	@ 30	=	30
Pickups	(5)	@ 5	=	25
Flatbed Trucks	(5)	@ 10	=	50
				$11,909
20% Contingency				2,382
Total				$14,291

Mill @ $2,000 per daily ton of capacity	$30,000
Infrastructure: shops, offices, roads, power	$ 7,500
Option payments plus buyout	$ 4,370
Working Capital	$ 500
Total	$56,661

5) Assume property is purchased in 1981 and production starts in 1986, five years later.

6) Operating costs:

Mining @	$0.60/ton
Milling @	$2.00/ton ore
Smelting @	$0.25/lb. Cu
G&A @	$1.10/ton ore

The Discounted Cash Flow Rate of Return on the initial investment of $56,661,000 is 12.33%.

The sensitivity of the project to variations in capital, operating costs and metal prices was tested. The results are shown on the attached graph and tabulated below:

	% Change	ROI	%Change ROI
Original Pro forma	-0-	12.331%	-0-
Investment	+10%	10.849	-12%
	+20%	9.570	-22%
	-10%	14.021	+14%
	-20%	16.031	+30%
	+10%	7.712	-37%
	+20%	1.986	-84%
	-10%	16.317	+32%
	-20%	19.824	+61%

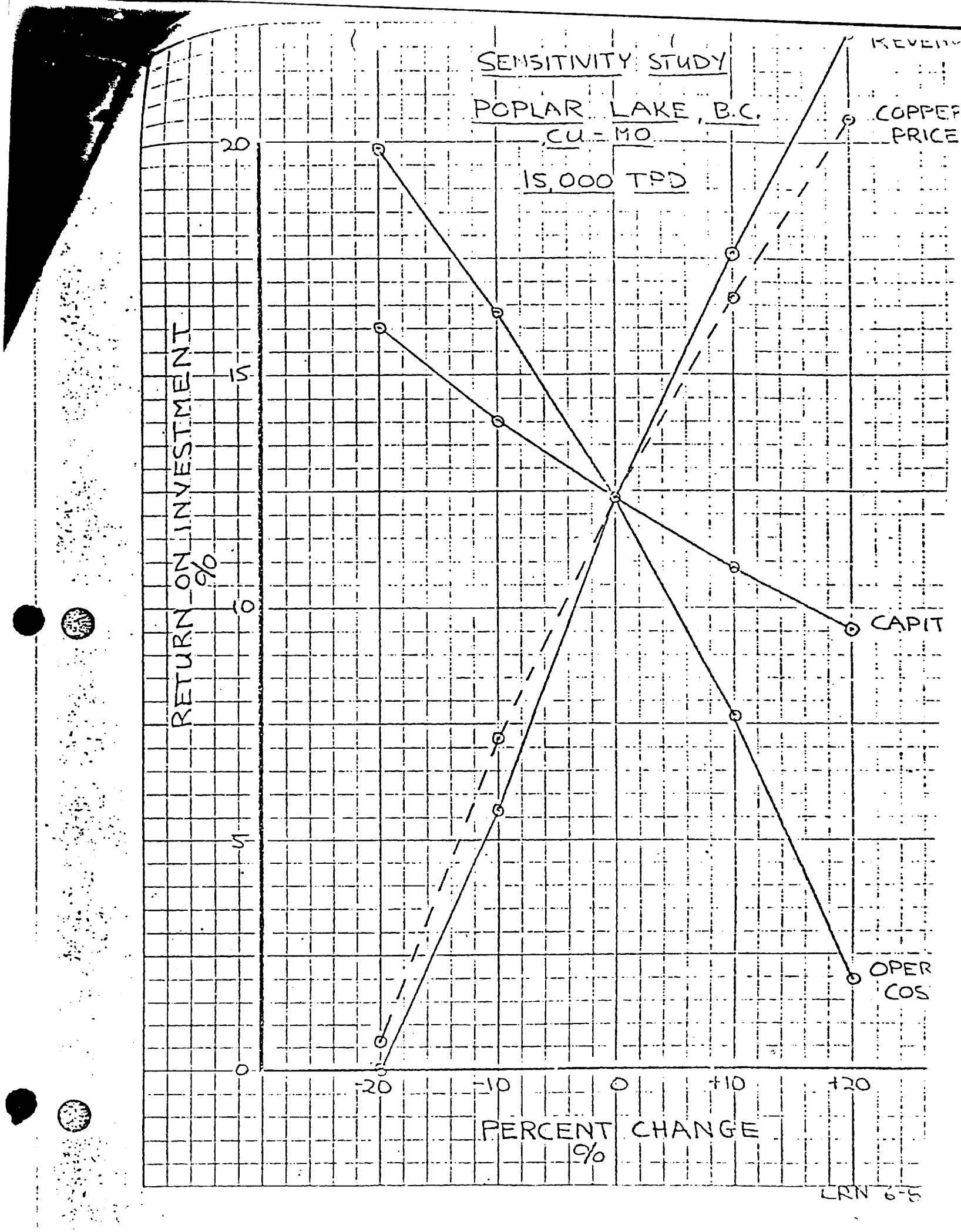
		% Change	ROI	%Change ROI
Revenue				
Copper Price	$1.10	+10%	16.685%	+35%
	$1.20	+20%	20.540	+67
	$ .90	-10%	7.204	-42
	$ .80	-20%	0.679	-94
Total Revenue		+10%	17.683	+43
		+20%	22.302	+81
		-10%	5.757	-53
		-20%	-0-	-100%

The project is least sensitive to Capital Investment and most sensitive to metal prices.

Lewis R. Nelson

L. R. Nelson

JRN:sl


SENSITIVITY STUDY
POPLAR LAKE, B.C.
CU-MO
15,000 TPD
REVEN
COPPER PRICE
CAPIT
OPER COS
RETURN ON INVESTMENT %
20
15
10
5
0
-20
-10
0
+10
+20
PERCENT CHANGE %
LRN 6-5

10.2.4.

September 8th, 1980

K.W. Pickering

T.W. Janes

ORE RESERVES - POPLAR

For a rapid update of Poplar reserves, a computer polygon method was employed to check results after 1980 drilling (holes PC-43 to PC-55). Once assay values had been key-punched the method was quick and handy. R.L. Sandefur made the runs, generating also Calcomp plotted bench plans and variograms to examine the geostatistics.

From the geostatistics it may be shown that a polygon method would be valid if sample density is sufficient and a maximum radius of influence of 150 m is used. R.L. Sandefur notes that histograms and variograms are more continuous in plan at Island Copper than Poplar; vertical continuity is about equal. In plan, both Island Copper and Poplar are more continuous to the N.W. than N.E; Poplar is lower grade than Island Copper.

The following assumptions are made for this calculation:

(1) No reserves were included greater than 150 m from any hole; tons have been broken down as to 0 - 15 m, 15 - 30 m and 30 - 150 m from a drill hole.

(2) A cut-off grade of 0.25% Cu has been used.

(3) A hole must penetrate 6 vertical meters of a bench to generate a polygon; 12 m benches were used.

(4) Dikes and internal waste are taken either as dilution or generating waste polygons.

To compare this method to the 1979 hand calculation, it must be remembered that in the designed pit all the plus 0.25% Cu material was taken from the 708 bench and above, but because of pit configuration, increasing amounts remain in the walls down to the 624 bench. Also, because of a previously predicted "vertical grain" to the deposit, higher grade bench intersection were given limited horizontal extent tending to lower the overall grade of the deposit relative to a polygon method.

Enclosed is a summary of results to date.

contd...

CUMULATIVE TONS AND GRADE

METHOD	708 Bench Tons	708 Bench % Cu	708 Bench % Mo	624 Bench Tons	624 Bench % Cu	624 Bench % Mo
1. Hand Calculation 1979 (Holes PC-1 to PC-42)	63,617,000	.329	.016	78,696,000*	.324	.015
Polygon method; No restriction as to location of internal waste phase or dikes, or to outerr boundary of deposit; not including holes PC-19, 20, 33, 34, 39, 41, 42 and 45 generating polygons in the high stripping ratio eastern extension.						
2. All drilling to PC-55	67,315,000	.364	.013	98,832,000	.345	.013
3. All drilling up to PC-42	87,173,000	.362	.014	112,617,000	.362	.015
Polygon method; No restrictions; including holes in eastern extension.						
4. All drilling to PC-55	79,701,000	.363	.012	135,739,000	.377	.009
5. All drilling up to PC-42	100,282,000	.363	.012	144,117,000	.368	.011
Polygon method; Restriction of ore polygons to estimated 0.25% Cu boundary; but still generating portions of waste polygons within boundary by external holes.						
6. All drilling to PC-55	46,282,000	.367	.014	67,482,000	.363	.014
7. All drilling up to PC-42	54,287,000	.364	.014	71,055,000	.360	.014

* Not including mineralized material greater than 0.25% Cu remaining in the designed pit walls below the 708 bench.

CONCLUSIONS:

1. Method #2 is probably the best estimate of geological reserves.

2. In all three types of polygon estimates, 1980 drilling has decreased reserves (from 4 - 20 million tons).

   Therefore, sample density up to PC-42 had not been sufficient to estimate accurately the total reserves in the deposit, and still may not be up to PC-55, by polygon methods.

3. Average copper grades for the polygon methods are higher than for the 1979 hand contoured estimate. By all methods, grades are about 0.36% copper and 0.013% Mo. Drilling in 1980 has not changed the grade estimate for the deposit.

4. Cumulative copper grades increase to the 828 bendh then decrease with depth; cumulative molydenum grades increase to the 660 bench then decrease with depth. These trends along with, geostatistical evidence and fracture orientation (core orientation program) suggests grade variations may be treated as changing uniformly in all directions with no evidence of a vertical grain.

T. W. Janes

TWJ:ebh