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103 P 188 (12E)-07

DOLLY VARDEN MINES LTD.

PROPERTY FILE

August 1973

The following is a brief presentation of facts about Dolly Varden Mines.

It is composed of copies of summary sheets and pertinent economic calculations extracted from the Production Feasibility Study.

Back-up calculations and comprehensive reports on all parts of the proposed 1,000 t.p.d. operation are available at the Company office.

103P188

April 1973

D O L L Y V A R D E N M I N E S

GEOLOGY

SUMMARY

- 1,712,444 tons grading:
 - 9.52 oz. silver
 - 0.53% lead
 - 0.82% Zinc

- Numerous excellent prospects for additional silver ore.

- A strong possibility of a high lead-zinc ore body with higher than usual cadmium values.

- The Copper Belt.

DOLLY VARDEN MINES LTD. (N.P.L.) TOTAL ORE RESERVES MAY 1973

MINE	PROVEN				PROBABLE				POSSIBLE				INFERRED	
	Tons	Ag oz/T	%Pb	%Zn	Tons	Ag oz/T	%Pb	%Zn	Tons	Ag oz/T	%Pb	%Zn	Tons	
DOLLY VARDEN					47,443	(a) 16.00	0.56(b)	0.99(b)					100,000 Estimated	
	TOTAL				47,443	16.00	0.56	0.99						
NORTH STAR	Ag zone				224,182(c)	10.08	0.90	2.36					171,200	
	Pb-Zn zone				22,440(d)	1.59	3.21	11.27	7,590(d)	1.48	3.09	10.49		
	TOTAL				246,622	9.31	1.11	3.17	7,590	1.48	3.09	10.49		
TORBRIT					776,994	(e) 9.07	0.42	0.50	90,149	9.30(e)	0.42	0.50	250,000 Estimated	
	TOTAL				776,994	9.07	0.42	0.50	90,149	9.30	0.42	0.50		
WOLF	#1 vein	31,130(e)	12.37	0.39	0.12	60,115(f)	14.34	0.39	0.12				192,800	
	#2 vein	162,360(f)	8.23	0.39	0.12	96,690(g)	12.08	0.39(i)	0.12(j)	111,870(g)	8.62	0.39(i)		0.12(j)
	#3 vein					22,654(h)	9.66	0.39	0.12	58,827(h)	7.18	0.39		0.12
	TOTAL	193,490	8.90	0.39	0.12	179,459	12.53	0.39	0.12	170,697	8.12	0.39		0.12
		193,490	8.90	0.39	0.12	1,250,518	9.88	0.56	0.99	268,436	8.33	0.48	0.54	714,000

TOTAL ORE RESERVES

MINE	Tons	Ag oz/T	%Pb	%Zn
Dolly Varden (k)	47,443	16.00	0.56	0.99
North Star (k)	254,212	9.07	1.17	3.39
Torbrit (k)	867,143	9.09	0.42	0.50
Wolf (k)	543,646	9.86	0.39	0.12
Excluding Inferred				
TOTAL ALL MINES	1,712,444	9.52	0.53	0.82

NOTES

- (a) Includes Dolly Varden dilution - 10% @ 3.00 oz. Ag/T.
- (b) Dolly Varden Pb & Zn grades included as all other mines Probable diluted Pb & Zn grades.
- (c) Includes North Star Ag zone dilution 10% @ 2.00 oz. Ag/T, 0.10% Pb, 0.25% Zn.
- (d) Includes North Star Pb-Zn zone dilution 10% @ 0.20 oz. Ag/T, 0.35% Pb, 1.20% Zn.
- (e) Includes Torbrit dilution 10% @ 2.00 oz. Ag/T. Pb-Zn grades - not diluted from old Western Miner report.
- (f) Includes Wolf #1 dilution 10% @ 1.21 oz. Ag/T.
- (g) Includes Wolf #2 dilution 10% @ 1.77 oz. Ag/T.
- (h) Includes Wolf #3 dilution 10% @ 2.00 oz. Ag/T.
- (i) Wolf Pb grade undiluted is average of calculated head grades from met. tests.
- (j) Wolf Zn grade - diluted - is calculated head grade.
- (k) Excluding inferred.

D O L L Y V A R D E N M I N E S

METALLURGY

SUMMARY

- Basic Metallurgical tests complete.

- Pilot plant test results:
 - Concentrate contains 416.54 oz. silver per ton
 - 90% silver recovery
 - 81.6% lead recovery

- Flow sheet completed.

- Mill design is well underway, including construction planning for an underground installation.

- Test projection of barite recovery -- 65 to 70% recovery in a concentrate grading 92 - 94% BaSO₄.

D O L L Y V A R D E N M I N E S

PLANNING

Summary

Mining

- 1,400 tons per day
- 5 days per week
- 70% from Wolf; 30% from North Star
- Sub-level blast hole stoping
- Load/Haul/dump mucking

Milling

- 1,000 tons per day
- 7 days per week
- 350 days per year
- Simple floatation process
- Producing lead concentrate, zinc concentrate, and 50 t.p.d. of barite
- Crusher at bottom of existing Torbrit shaft.
- Underground mill

Plant

- Single large building on foundations of the old mill includes shops, change house, offices, warehouse and power house, services distribution.
- Staff townsite at Alice Arm with bunkhouse accomodation at the mine

or

Lease B.C. Moly Townsite and dock facilities.

- All Necessary Water License, Gravel leases and a lease on the tailings pond area are in hand.
- Existing hydro-electric plant will be rehabilitated.

Other

- Reclamation Report has been accepted on \$6,000 bond.
- Base Line Environmental Study will be done.

Results

- Annual before-tax profit at \$2.75 silver =
\$6,177,500

D O L L Y V A R D E N M I N E S

CAPITAL COST ESTIMATES

SUMMARY

\$6,062,693

The above figure is the result of calculation based on the use of all new equipment. The availability of good used equipment is a variable.

Leasing of the B. C. Moly townsite and the purchasing of what good used equipment is available at the time, can result in a savings in Capital Costs of

\$1,000,000

January 1973

DOLLY VARDEN MINES LTD. (N.P.L.)Estimated Capital Costs

<u>Item</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>TOTALS</u>
1 Pr.Prod.Drilling							15,000	15,000							30,000
2 Wolf Pr.Prod. Devel.									25,225	25,225	25,225	25,225	25,225	25,225	151,350
3 N.S. Pr.Prod. Devel.							54,560	54,560	54,560	54,560	54,560				272,800
4 Site Preparation				31,605	31,605										63,210
5 Tailings Disposal							7,235								7,235
6 Roads				44,965	57,455	49,175	49,175	6,320							207,090
7 Admin.+Consultants	17,045	17,045	17,045	17,045	17,045	17,045	17,045	17,045	17,045	17,045	17,045	17,045	17,045	17,045	238,630
8 Mine Equipment				105,300	210,610	40,665	40,665	145,520							542,760
9 Power					60,740	138,885	138,885								338,510
10 Surface Equip.			86,635	86,635											173,270
11 Service Building					62,940	62,940	62,940								188,820
12 Communications				21,820	3,000	3,500									28,320
13 Mine Services							52,840	12,740							65,580
14 Plant services				15,000	11,580	37,320									63,900
15 Freight			2,000	4,000	18,530	18,530	18,530	2,000	2,000	2,000	2,000	2,000	2,000	2,000	75,590
16 Mill			238,515	238,515	138,515	193,515	435,823	258,323	219,139	235,451	116,978	194,976	97,660	97,660	2,465,070
17 Bunkhouse Complex			146,890	146,890	146,890										440,670
18 A.A. Housing				143,780	143,780	143,780									431,340
19 Beach Warehouse			13,860												13,860
Sub Totals	<u>17,045</u>	<u>17,045</u>	<u>504,945</u>	<u>855,555</u>	<u>902,690</u>	<u>712,590</u>	<u>885,463</u>	<u>511,508</u>	<u>317,969</u>	<u>334,281</u>	<u>215,808</u>	<u>239,246</u>	<u>141,930</u>	<u>141,930</u>	<u>5,798,005</u>
20 Operating Capital															<u>264,688</u>
TOTAL															<u>\$6,062,693</u>

D O L L Y V A R D E N M I N E S

OPERATING COST ESTIMATES

SUMMARY

\$9.07 per ton mined

This calculation includes all costs of operation except concentrate freight from Alice Arm and costs of smelting. These are shown in the smelter return calculations.

Use of the B. C. Moly townsite would lower operating costs by 28.7¢ per ton mined.

January 1973

D O L L Y V A R D E N M I N E SANNUAL
OPERATING COST SUMMARY

<u>Department</u>	<u>Employees</u>	<u>Labour</u>	<u>Supplies</u>	<u>Other</u>	<u>Total</u>	<u>Cost per ton</u>
Mining	49	\$410,210.88	\$399,480.00	\$119,070.00	\$928,760.88	\$2.654
Milling	26	247,252.32	504,432.00	4,488.00	756,172.32	2.160
Plant	36	311,689.92	291,788.00		603,477.92	1.724
Engineering & Geology	9	77,348.64	42,600.00	60,048.00	179,996.64	0.514
Administration	10	124,380.00	18,100.00	25,320.00	167,800.00	0.479
Overhead		509,546.94		30,507.85	540,054.79	1.543
	—	—	—	—	—	—
	130	\$1,680,428.70	\$1,256,400.00	\$239,433.85	\$3,176,262.55	\$9.07
	==	=====	=====	=====	=====	=====

Average per employee - Salary or wages plus all fringe
benefits including board loss = \$12,926.37

Operating Capital required - per month = \$264,688.00

DOLLY VARDEN MINES

SMELTER RETURN CALCULATIONS

Following is an update of smelter return calculations based on the Cominco Open Smelter Schedule and the following metals prices:

Silver	\$2.75 per ounce
Lead	16.0¢ per lb.
Zinc	25.0¢ per lb.
Cadmium	\$3.75 per lb.
Barite	\$44.00 per ton

NORTH STAR MINE

Lead Concentrate

Silver - (95%) (237.9 - 1) (2.75 - .02)									
95% x 236.9 x 2.73				=	+				\$614.40
Lead - (92.5%) ($\sqrt{15.5 \times 20}$ - 20) (16.0 - .6)									
92.5% x 290 x 15.4				=	+				41.31
Zinc - (47%) (8 x 20) (25.0 - 5.5)									
47% x 160 x 19.5				=	+				14.66
Cadmium- (70%)(5.8) (3.75 - .40)									
70% x 5.8 x 3.35				=	+				13.60
Silica & Lime					+				2.08
Arsenic & Antimony					-				.49
Lead deficiency					-				1.45
Basic deduction					-				15.00
Freight					-				14.95
									<hr style="width: 100%;"/>
Smelter Return per ton concentrate									\$654.16
									<hr style="width: 100%;"/>

$$\text{Per ton mined} = \frac{654.16}{36.23} = \underline{\underline{\$18.06}}$$

Cont'd. . .

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SMELTER RETURN CALCULATIONS
 NORTH STAR MINE cont'd

Zinc Concentrate

Silver -	(80%) (132.9) (2.75 - .02)		
	80% x 132.9 x 2.73	= +	\$290.25
Lead -	([2.4 x 20] - 20) (16.00 - 3.35)		
	28 x 12.65	= +	3.54
Zinc -	(81%) (55.5 x 20) (25.0 - 2.6)		
	81% x 1110 x 22.4	= +	201.40
Cadmium-	(70%) (40) (3.75 - 40)		
	70% x 40 x 3.35	= +	93.80
Silica & Lime		= +	2.08
Arsenic & Antimony		-	.49
Lead Deficiency		-	2.76
Basic deduction		-	15.00
Freight		-	14.95
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Smelter return per ton concentrate			\$557.87
			<hr/>

$$\text{Per ton mined} = \frac{557.87}{83.33} = \underline{\underline{\$6.69}}$$

Barite

$$\text{Smelter return per ton mined} = \frac{50 \times 44.00}{286} = \underline{\underline{\$7.69}}$$

TOTAL NORTH STAR SMELTER RETURN

$$\text{Per ton mined} = 18.06 + 6.69 + 7.69 = \underline{\underline{\$32.44}}$$

Cont'd. . .

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SMELTER RETURN CALCULATIONS
WOLF MINE

Lead Concentrate

Silver -	(95.5%) (416.54 - 1) (2.75 - .02)	= +	1,083.37
	95.5% x 415.54 x 2.73		
Lead -	(92.5%) ([12.68 x 20] - 20) (16.0 - .6)	= +	33.28
	92.5% x 233.6 x 15.4		
Zinc -	([4.47 x 20] - 50) (25.0 - 5.5)	= +	7.68
	39.40 x 19.5		
Cadmium-	(11% x 20) (70%) (3.75 - .40)	= +	5.16
	2.2 x 70% x 3.35		
Silica & Lime		+	2.08
Arsenic & Antimony		-	.49
Lead deficiency		-	1.75
Basic deduction		-	15.00
Freight		-	14.95
			<hr/>
Smelter return per ton concentrate			\$1,099.38
			<hr/>

$$\text{Per ton mined} = \frac{1099.38}{45} = \underline{\underline{\$24.43}}$$

Average Daily Smelter return

$$\frac{(32.44 \times 286) + (24.43 \times 714)}{9,277.84 + 17,443.02} = \$26,720.86$$

Average Smelter Return per ton mined

$$\frac{26,720.86}{1000} = \$26.72$$

Total Annual Smelter Return

$$26.72 \times 350,000 = \underline{\underline{\$9,352,000.00}}$$

DOLLY VARDEN MINES

OPERATING PROFIT CALCULATIONS

Operating costs per ton mined = \$ 9.07

Smelter return per ton mined = \$ 26.72

Operating Profit per ton mined

26.72 - 9.07 = \$ 17.65

Daily Operating Profit

17.65 x 1000 = \$ 17,650

Annual Operating Profit

17.65 x 350,000 = \$6,177,500

TAX AND CASH FLOW CALCULATIONS

Item	1975	1976	1977	1978	1979	1980
Operating Profit	6,177,500	6,177,500	6,177,500	6,177,500	6,177,500	6,177,500
Provincial Mineral Land Tax	242,890	242,890	242,890	242,890	242,890	242,890
Mining Profit	5,934,610	5,934,610	5,934,610	5,934,610	5,934,610	5,934,610
Accelerated Write-Off	5,934,610	2,065,390	-	-	-	-
Net Mining Profit (Taxation)	-	3,869,220	5,934,610	5,934,610	5,934,610	5,934,610
Deduction for Prov. Mining Tax	-	493,326	-	-	-	-
Base for Depletion Allowance	-	3,375,894	5,934,610	5,934,610	5,934,610	5,934,610
Depletion Allowance	-	1,125,298	1,691,093	-	-	-
Taxable Income	-	2,250,596	4,243,517	5,934,610	5,934,610	5,934,610
<u>Federal Tax</u>						
Acc. Write-Off - Beginning of year	8,000,000	2,065,390	-	-	-	-
- End of year	2,065,390	-	-	-	-	-
Depletion - Beginning of year	1,691,093	1,691,093	1,691,093	-	-	-
- End of year	1,691,093	1,691,093	-	-	-	-
Tax before abatement	-	1,057,780	1,952,018	2,729,921	2,729,921	2,729,921
10% Provincial abatement	-	225,060	424,352	593,461	593,461	593,461
15% Additional abatement	-	-	636,528	890,191	890,191	890,191
Net Federal Tax	-	832,720	891,138	1,246,269	1,246,269	1,246,269
<u>Provincial Tax</u>						
Proc. Depletion - Beginning of year	2,465,070	2,465,070	1,884,687	994,496	104,305	-
- End of year	2,465,070	1,884,687	994,496	104,305	-	-
Net Mining Profits (Taxation)	-	3,869,220	5,934,610	5,934,610	5,934,610	5,934,610
8% of Proc. Depletion remaining	-	197,206	150,774	79,560	8,344	-
15% Min. of Profits	-	580,383	890,191	890,191	890,191	-
65% Max. of Profits	-	2,514,993	3,857,496	3,857,496	3,857,496	-
Total Net Mining Profits (Taxation)	-	3,288,837	5,044,419	5,044,419	5,830,305	5,934,610
Provincial Mining Tax (15%)	-	493,326	756,663	756,663	874,546	890,191
Provincial Corporate Tax (12%)	-	270,071	509,222	712,153	712,153	712,153
Total Provincial tax (Including M.L.T.)	242,890	1,006,287	1,508,775	1,711,706	1,829,589	1,845,234
<u>Total Tax (Federal & Provincial)</u>	242,890	1,839,007	2,399,913	2,957,975	3,075,858	3,091,503
<u>Cash Flow</u>						
Annual Cash Available	5,934,610	4,338,493	3,777,587	3,219,525	3,101,642	3,085,997
Total Cash Available	-	10,273,103	14,050,690	17,270,215	20,371,857	23,457,854

NOTES

- Calculated at \$2.75 Silver
- Pre-production and Capital Cost Allowance = \$8,000,000
- Annual operating profit (before all taxes) = \$6,177,500
- Depletion = $\frac{5,073,280}{3} = \$1,691,093$
- Provincial processing Allowance = \$2,465,070
- B.C. Mineral Land Tax is applicable and included.
- Federal Tax rate 47% in 1976, then 46% thereafter.