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HW

1987  
Myra Falls  
885870

## Mining Division



Over the past number of years, Westmin's Myra Falls complex, inland from Campbell River on Vancouver Island, has been in a relatively constant state of expansion.

From an operation which was scrambling to meet its 1,000 tons per day rated capacity in 1984, it went to 3,000 tpd in 1986, exceeded that rate by about 500 tpd in 1987 and is currently in the midst of a further 33 per cent expansion to 4,400 tpd, which should be achieved in the latter half of 1988. Underground development and surface construction are on schedule and within budget.

This continuing expansion has not been without its challenges. Base metals prices have been in the doldrums for years and only recovered to more realistic levels toward the end of 1987. Around mid-year, some production was curtailed by interruptions due to rehabilitation of the underground coarse ore bin . . . while grades were diluted by the processing of development ore associated with the current expansion.

However, these problems were largely resolved towards the latter part of the year, as reflected in significantly improved results in the final quarter. Increased tonnage, better head grades and buoyant prices, resulted in operating profit of \$5,202,000 in the final quarter versus a range of \$1.2-\$2.4 million for the previous three quarters.

Mining Division revenues for the year remained constant, totalling \$86.5 million compared to \$86.4 million in 1986. Revenues from the Myra Falls operation increased two per cent to \$80.4 million from \$78.7 million in 1986, while revenues from coal operations declined to \$6.1 million from \$7.7 million in 1986. Cash flow, before interest, mineral exploration and taxes, was down slightly to \$31.9 million from \$33.9 million in 1986, while operating profit, before the above items, totalled \$16.0 million and \$18.4 million respectively.

Production from the Myra Falls operation increased slightly in 1987 to average 3,327 tons per operating day compared to 3,257 tons in 1986. However, with the expansion beginning to take effect, year-end rates reached approximately 3,850 tons per operating day.

Operating and administrative costs for the Myra Falls operation increased to \$53.9 million in 1987 from \$51.8 million in 1986. Costs per ton of ore milled increased only two per cent to \$44.90.

### H-W Mine Operations

The H-W Mine produced 989,863 tons (898,242 tonnes) of ore during 1987. Development was concentrated on definition diamond drilling of the north and main ore zone lenses and preparation of ore blocks for mining to meet the increased tonnage requirements scheduled in 1988.

Modifications to the hydraulic sandfill distribution system have resulted in improved operating efficiencies. Fill placement quantities at year-end were reaching design capacity.

An extensive development program is planned for 1988. Stope preparation in the main and north lenses will continue. Ore definition will be conducted in the north lenses, the east and west main zone, and exploration will commence in areas lying north, east and south of the present H-W workings.

### Lynx Mine Operations

The Lynx Mine produced 211,092 tons (191,554 tonnes) of ore, which was approximately 18 per cent of the total for the complex. The average monthly production rate was 17,588 tons (15,960 tonnes). Preparation of room and pillar stopes



### British Columbia

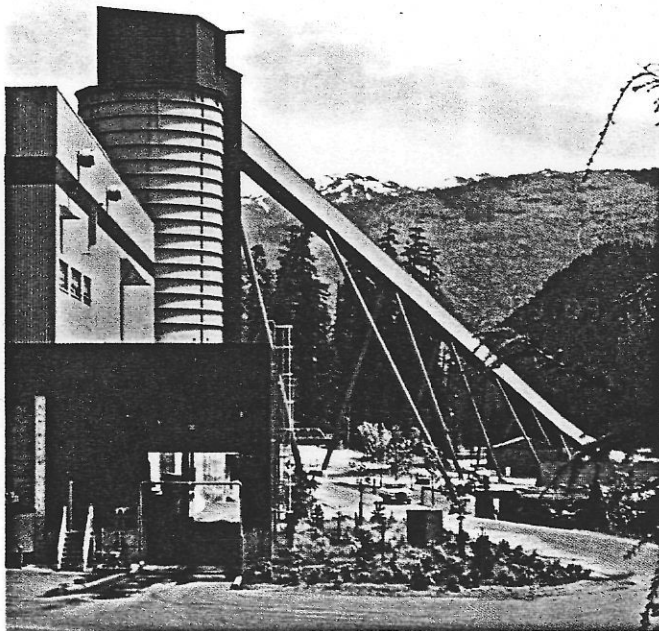
■ Areas of Activity

### Production

	1987	1986	1985
<b>Ore Milled</b>			
— tons	1,201,294	1,175,794	645,590
— (tonnes)	(1,089,800)	(1,066,700)	(585,670)
<b>Average/Operating Day*</b>			
— tons	3,327	3,257	1,783
— (tonnes)	(3,019)	(2,955)	(1,618)
<b>Percent Operating Time*</b>	89.8	93.5	90.4
<b>Source of Ore (%)</b>			
— H-W	82	78	56
— Lynx	18	22	40
— Myra	—	—	4
<b>Head Grades</b>			
— Gold: oz/ton	0.06	0.07	0.06
— (g/tonne)	(2.20)	(2.47)	(2.09)
— Silver: oz/ton	1.17	1.44	1.73
— (g/tonne)	(40.1)	(49.30)	(59.40)
— Copper (%)	2.46	2.33	1.64
— Zinc (%)	4.91	5.85	6.18
— Lead (%)	0.36	0.47	0.55
<b>Concentrate Production</b>			
— Copper: tons	110,200	99,300	36,423
— (tonnes)	(100,200)	(90,100)	(33,042)
— Copper Grade (%)	23.3	23.9	24.3
— Copper Recovery (%)	87.1	86.6	83.5
— Zinc: tons	95,300	110,500	59,502
— (tonnes)	(86,500)	(100,300)	(53,979)
— Zinc Grade (%)	50.3	51.7	53.2
— Zinc Recovery (%)	81.2	83.0	79.4
— Lead: tons	—	—	3,301
— (tonnes)	—	—	(2,995)

\*Percent operating time is based on operating days.





Mill building, storage silo and truck loading bay, with conveyor bringing ore from the H-W mine about one mile distant.

and sublevel retreat stopes in the west "G" and "S" zones continued throughout the year.

Drifting and diamond drilling at an accelerated rate was commenced in April in conjunction with the expansion program. Areas of exploration included the westerly extensions of the west "G" and "S" zones and the H-W Rhyolite and South Flank horizons. Exploration of these areas will continue throughout 1988.

#### Ore Reserves

Total ore reserves as of January 1, 1988 show a net loss of 1,500,000 tons (1,357,000 tonnes) in comparison to January 1, 1987 figures. This is due to tonnage depletions by production and a tonnage loss in the possible category through a structural re-interpretation of the north edge of the north ore zones.

Diamond drilling throughout the year focused, as planned, on ore definition in preparation for mining resulting in the transfer of some possible ore to the probable category. The need for ore definition will decrease during 1988 and it is planned to increase exploration type drilling.

#### Power

The Thelwood Lake Reservoir project was completed in September. The project, which raises the high water elevation by 11 feet (3.3m) consisted of constructing two small rockfill dams and control works to increase water storage capacity in the Thelwood Power system.

Three diesel, 1,000 KW generators were installed at the power house in October to handle additional standby power requirements.

#### Environmental

Westmin places a high priority on protecting the environment, with state-of-the-art control systems and installations. The Company's policy is to maintain standards which greatly exceed regulatory requirements.

The on-land tailings deposition system operated as planned throughout the year. Construction of a separation berm between Areas I and II and the raising of the perimeter berm on Area II have been completed.

The expansion was completed on the water treatment system in 1987. These includes: the excavation of a fifth settling pond; the enlargement of the surge basin and the upgrading of the water conveyance system to handle increased flow rates.

Routine monitoring indicates that water quality entering Myra Creek is well within permit restrictions.

#### Total Reserves

As of January 1, 1988

	Proven and Probable Reserves	GRADE				
		Gold	Silver	Copper	Zinc	Lead
	Tons (Tonnes)	oz/ton (g/tonnes)	oz/ton (g/tonnes)	%	%	%
H-W Mine	11,871,400 (10,772,600)	0.07 (2.45)	1.11 (38.08)	2.57	5.22	0.35
Lynx Mine	320,500 (290,900)	0.08 (2.75)	2.15 (73.69)	1.14	7.48	0.86
Price Mine	230,900 (209,500)	0.04 (1.23)	1.55 (53.14)	1.10	8.31	1.07
<b>Total Proven and Probable</b>	<b>12,422,800</b> <b>(11,273,000)</b>	<b>0.07</b> <b>(2.44)</b>	<b>1.14</b> <b>(39.27)</b>	<b>2.50</b>	<b>5.33</b>	<b>0.38</b>
	<b>Possible Reserves</b>					
H-W Mine	1,344,900 (1,220,500)	0.06 (2.08)	0.64 (22.00)	1.51	4.80	0.17
Lynx Mine	30,900 (28,000)	0.07 (2.45)	2.24 (80.00)	1.00	7.70	1.00
<b>Total Possible</b>	<b>1,375,800</b> <b>(1,248,500)</b>	<b>0.06</b> <b>(2.09)</b>	<b>0.68</b> <b>(23.30)</b>	<b>1.49</b>	<b>4.86</b>	<b>0.19</b>
<b>Combined Total</b>						
<b>Proven, Probable and Possible</b>						
January 1, 1988	13,798,600 (12,521,500)	0.07 (2.40)	1.10 (37.68)	2.40	5.28	0.36
January 1, 1987	15,298,300 (13,878,400)	0.07 (2.36)	1.13 (39.70)	2.35	5.35	0.35

## Metals Marketing

A fifth straight year of growth in the world economy was recorded in 1987, resulting in improved demand and prices for most commodities. However, concerns over U.S. trade and budget deficits and the potential for lower consumer spending, obscure the economic outlook for 1988.

In 1987, production of copper and zinc concentrates from the Myra Falls operation was shipped primarily to smelters in the Far East.

## Copper

Prices on the London Metal Exchange for copper ended the year at US\$1.45 per pound, having started at 60 cents. This dramatic improvement resulted from better than expected metal demand over the past two years, combined with supply problems. World-wide inventories have been depleted and are currently at their lowest levels in many years. However, primary production increases forecast for 1988 should begin to replenish stocks by mid-year.

## Zinc

Labour disputes, in combination with the weakness of the U.S. dollar, were supporting factors for zinc markets in 1987. Zinc prices began the year with the European Producer Price (EPP) at \$870 (39.5 cents) but soon weakened. However, in response to a strike at a major Canadian integrated producer, North American supplies tightened through the second and third quarters and prices firmed. In Europe, the weakness of the U.S. dollar, combined with significant smelting over-capacity, led to a

round of talks aimed at rationalization by European producers. Nothing came of these talks but the year ended with prices firming and the EPP finished the year at US\$860 per metric tonne or 39 cents U.S. per pound.

## Gold and Silver

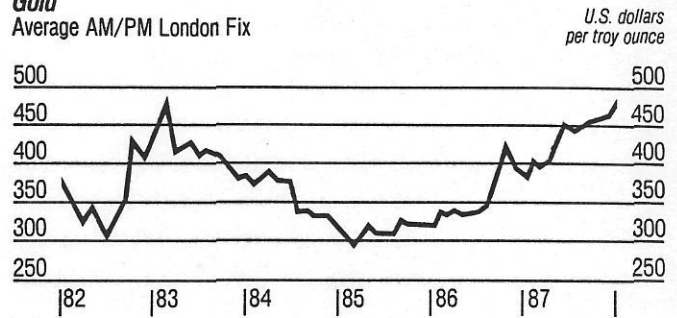
The steady decline in the value of the U.S. dollar, together with tension in the Middle East, volatility in equity markets and renewed inflationary concerns, all combined to support a rise in the price of gold during 1987. The average price for an ounce of gold bullion in London was US\$447 in 1987 compared with \$368 in 1986. Silver was also stronger, averaging US\$7.01 per ounce versus \$5.47 in 1986. There was a substantial improvement in the silver supply/demand situation due to better industrial consumption, a revival in investor demand and production cutbacks.

## Payable Metals

	(000)	1987	1986
Gold — oz		37	44
Silver — oz		772	966
Zinc — lb		80,393	96,238
Copper — lb		49,185	45,492
Lead — lb		340	770

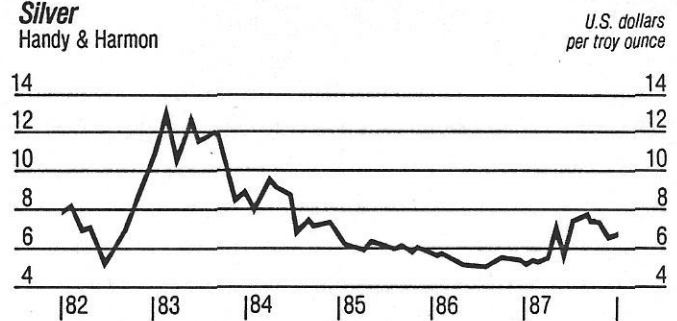
## Gold

Average AM/PM London Fix



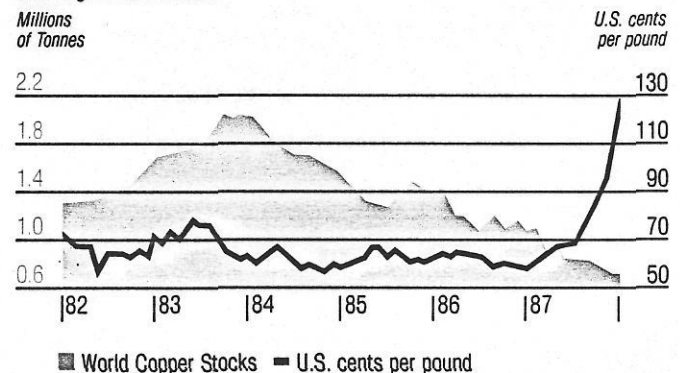
## Silver

Handy & Harmon



## Copper

LME High Grade Settlement



## Zinc

Thousands of Metric Tonnes

