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REPORT  
on

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MASTODON-HIGHLAND BELL MINES LTD.  
BEAVERDELL, BRITISH COLUMBIA

by: J.J. Crowhurst, B.A.Sc., P.Eng.  
J.W. Murton, B.Sc. Dec. 5/69

TELEPHONE:  
688-5485

102 - 1111 WEST GEORGIA STREET  
VANCOUVER 5, B.C.

**BACON & CROWHURST LTD.**  
CONSULTING ENGINEERS

December 5th, 1969.

Leitch Gold Mines Ltd., and  
Mastodon-Highland Bell Mines Ltd.,  
225 - 12 Richmond St. East,  
Toronto, 1, Ontario.

Attention: Mr. F.E. Hall, President

Dear Sir:

Pursuant to your recent request, we are pleased  
to submit herewith a report concerning an economic evaluation

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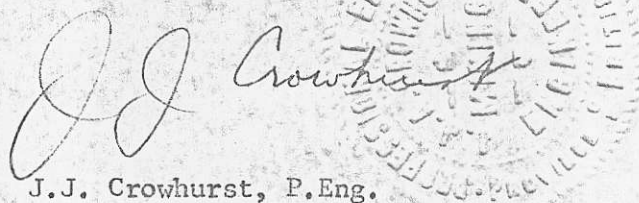
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Dear Sir:

Pursuant to your recent request, we are pleased  
to submit herewith a report concerning an economic evaluation  
of the Mastodon-Highland Bell mine at Beaverdell, B.C.

Respectfully submitted,

BACON & CROWHURST LTD.

  
J.J. Crowhurst, P.Eng.

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## TABLE OF CONTENTS

|  | <u>Page</u> |
|--|-------------|
| Covering Letter  |             |
| Terms of Reference and Acknowledgments                             | 1           |
| Scope of the Report  | 2           |
| Summary and Conclusions  | 5           |
| <br><u>CHAPTER I - FINANCIAL</u>                                   |             |
| Summary of Estimated Present Worth                                 | 1           |
| Estimated Operating Profit (Cash Flow)                             | 2           |
| Present Worth of Future Income                                     | 3           |
| Salvage Value - 1973 - Concentrator, Surface Plant & Camp          | 4           |
| Estimated Salvage Value Underground Equipment                      | 5           |
| Estimate of Net Smelter Returns - Future Production                | 6           |
| Operating Costs - 1961-1969  | 7           |
| Estimated Operating Cost - 1971-1973                               | 8           |
| Estimated Costs - Vancouver Office                                 | 9           |
| Estimated Economics re Tailings                                    | 10          |
| <br><u>CHAPTER II - LOCATION, PROPERTY, HISTORY AND PRODUCTION</u> |             |
| Location   | 1           |
| Property   | 1           |
| Crown Grant Claims   | 3           |
| Located Claims   | 4           |
| "Optioned" Claims  | 4           |
| Surface Rights   | 4           |
| History  | 5           |
| Production   | 6           |
| <br><u>CHAPTER III - GEOLOGY AND ORE RESERVES</u>                  |             |
| Geology  | 1           |
| Ore Reserves   | 2           |
| Reasonably Assured Ore   | 2           |
| Possible Ore   | 3           |
| Concentrator Tailings  | 3           |
| Ore Reserves - November 1, 1969                                    | 8           |
| <br><u>CHAPTER IV - MINE DEVELOPMENT AND EXPLORATION</u>           |             |
| Lower Mine East  | 1           |
| Lass Mine  | 1           |
| Bell Mine  | 2           |
| Rob Roy Claim  | 3           |
| Sally Claim  | 3           |

Certificate of Qualifications

TERMS OF REFERENCE AND ACKNOWLEDGMENTS

On October 21st, 1969, Bacon & Crowhurst Ltd. were requested by Mr. F.E. Hall, President of Leitch Gold Mines Ltd., to proceed with the preparation of an economic evaluation of the Mastodon-Highland Bell Mine at Beaverdell, B.C.

Mr. J.P. LaPrairie, P.Eng. and Mr. B. Goetting, Mine Manager of Mastodon-Highland Bell Mines Ltd., Dr. W.R. Bacon, P.Eng. and J.J. Crowhurst, P.Eng. of Bacon & Crowhurst Ltd. were present at this meeting.

A considerable amount of information in this evaluation has been supplied by Mr. J.D. Munroe, Director of Mastodon-Highland Bell Mines Ltd., and Mr. B. Goetting. Appreciation is expressed herewith for their suggestions and help.



### SCOPE OF THE REPORT

This report considers the following:

(1) RATE OF PRODUCTION

It is anticipated that the concentrator as presently installed and operating (including the ore-waste sorting section) will treat 3400 tons of ore per month, or 40,800 tons of ore per year until mid 1974. The silver content initially will be 15.16 ounces per ton of ore but this will gradually decline. No economics are submitted pertaining to the construction of a new or larger concentrator because it is considered by Bacon & Crowhurst Ltd. that insufficient ore is presently in sight.

(2) ORE SUPPLY

It is predicted that there is an excellent chance of discovering sufficient additional ore, of similar mineralogy and grade to that contained in the reasonably assured ore reserves, to support the rate of production mentioned above.

In the old stoping areas it is impossible to estimate accurately the amount of backfill material that can be removed at a profit, but reasonable allowances have been made for partial successful extraction from this source.

(3) EXPLORATION

It is assumed that the policy of the company will be to conduct enough exploration work on a continuous basis to maintain henceforth the current amount of estimated ore reserves (i.e. one to

one and a quarter year's supply) until the various possibilities have been exhausted; it does not envisage accelerating or expanding exploration to the point where a reasonable cash flow cannot be maintained.

(4) TREATMENT OF CONCENTRATOR TAILINGS

This report includes a preliminary investigation of the re-treatment of impounded concentrator tailings. Since the requisite information is incomplete at present, and since the estimated economics appear doubtful, i.e. whether or not this material can be classed as "ore", no allowance has been made for anticipated cash flow from re-treatment.

(5) METAL PRICES

In this report the estimated mine operating profit, or cash flow, is calculated by using average metal prices for lead, zinc, gold and cadmium realized by Mastodon-Highland Bell during the first half of the 1969 calendar year as well as \$1.80, \$2.00 and \$2.20 (U.S.) per troy ounce of silver.

(6) MARKETING

It is assumed that Mastodon will continue shipment of concentrates to the Cominco smelter at Trail, B.C., and that current or comparable marketing schedules re payment for metal content will apply.

(7) POWER SUPPLY

Power costs and methods considered are the same as those now prevailing, i.e. company owned and operated diesel-electric generators.



(8) TAXES

Computations in this report are based on present laws, with no consideration being given any basic change such as presently proposed by the Government of Canada.

(9) WAGE AND PRICE ESCALATION

No allowance has been made for cost increases which could result from a new labour contract after the expiration of the present one, November 30th, 1970. Neither has any consideration been given to an increase in the cost of supplies and other services.

In general, and particularly after studying the operating costs for the period January 1st, 1961, to June 30th, 1969, increased efficiency and advances in technology are expected to offset wage and supply increases. The assumption is made therefore that operating costs will remain stable.

(10) TIMBER RIGHTS

The title to some of the mineral claims carries the "right to the use and possession of the surface, including the use of all the timber thereon for mining". No value has been placed on this right in this report.

(11) APPRAISALS

In early November 1969 the Canadian General Appraisal Company completed an appraisal of the mine surface buildings and equipment, including the concentrator, power plant, mine compressor house, and camp. By permission, these figures are quoted herein.

SUMMARY AND CONCLUSIONS



## SUMMARY

### ORE RESERVES

As of November 1st, 1969, "reasonably assured" ore reserves are estimated at 51,755 tons assaying 15.16 ounces of silver per ton - after allowance for dilution.

It is conservatively estimated that an additional 100,000 tons of similar material will be found by future exploration; some of this amount could be obtained from the backfill in old stoping areas.

### PRESENT WORTH ESTIMATE

As of November 1st, 1969, the present worth of the future income, together with the salvage value of the mine equipment and supplies, surface plant buildings, equipment and supplies (using discount rates for compound interest at the factors shown) is estimated to be \$561,529 for a price of \$1.80 U.S. per ounce of silver,

\$739,369 for \$2.00 U.S. per ounce, and

\$967,833 for \$2.20 U.S. per ounce.

### APPRAISAL AND SALVAGE ESTIMATES

(Discount factor - end of 1973 to November 1, 1969 - 10% = 0.68301)

#### (1) Surface Plant, buildings, equipment & supplies

|                                     |             |
|-------------------------------------|-------------|
| New replacement cost (Nov. 6, 1969) | \$1,235,822 |
| Depreciated value (Nov. 6, 1969)    | 762,165     |
| Salvage value - end of 1973         | 293,000     |
| Present worth of 1973 salvage value | 200,100     |

#### (2) Mine equipment

|                                     |         |
|-------------------------------------|---------|
| New replacement cost                | 184,400 |
| Salvage value - end of 1973         | 53,500  |
| Present worth of 1973 salvage value | 36,500  |

(3) Rail and Pipe

|                                     |          |
|-------------------------------------|----------|
| New replacement cost                | \$66,000 |
| Salvage value - end of 1973         | 18,000   |
| Present worth of 1973 salvage value | 12,300   |

CAPITAL EXPENDITURES

No substantial capital expenditures are required at present. Routine replacement and additions to equipment, amounting to \$15,000 per year of operation, have been included in the estimates.

OPERATING COST ESTIMATES

Operating cost is estimated at \$22.97 per ton milled, which allows for 200 feet of exploration drifting and crosscutting or the equivalent per month in addition to normal mine development; it also includes estimated Vancouver Office costs, as they would be if a single mine were in operation.

ECONOMICS RE TAILINGS TREATMENT

If, after the mine is exhausted, concentrator tailings were processed, the profits would be marginal at best as shown below:

| <u>Price of Silver - \$U.S.</u> | <u>Operating Profit (Loss) per Month</u> |
|---------------------------------|--|
| \$1.80                          | (\$2,152)                                |
| 2.00                            | 448                                      |
| 2.20                            | 3,048                                    |

To date no appreciable quantity of tailings assaying 8 to 10 or more ounces of silver per ton has been outlined. This fact, coupled with the operating problems that could be anticipated in the concentrator and the doubtful metallurgy resulting therefrom, precludes treatment of tailings concurrently with mine ore. In other words, it is estimated to be less profitable where tailings replace mine ore, even partially, as feed to the concentrator.



### MANAGEMENT

The successful operation of the Mastodon-Highland Bell Mine depends on managerial know-how and a thorough appreciation of the following factors:

1. The intricate faulting pattern.
2. The methods that have proven successful in the search for ore.
3. "Small-mill" metallurgy.
4. Selective underground mining.

Time and experience are necessary to operate this mine to the best advantage. The present staff has had the requisite experience and can be relied upon to produce at the anticipated costs.

### CONCLUSIONS

The total present worth of the Mastodon-Highland Bell mine at Beaverdell, B.C., is estimated as follows:

| <u>Price of Silver - \$U.S./ounce</u> | <u>Present Worth - \$ Canadian</u> |
|---------------------------------------|------------------------------------|
| \$1.80                                | \$561,529                          |
| 2.00                                  | 739,369                            |
| 2.20                                  | 967,833                            |

It may well be argued that, since the mine has been either shipping ore (1936-1950) or milling ore and shipping concentrates (1950 to date), and has consistently shown an appreciable operating profit, even though more than two to three years ore reserves could never be foreseen, the predicted operation (1970-1973) is too conservative. On the other hand, it must be taken into consideration that the innermost workings in the lower mine are now about 2 miles from the adit portal and that the vein structure, although apparently still present, has been steadily weakening in silver content as mining progresses. Actually, unless better grade material is found, it would appear that operations could reach their economic limit by the end of 1971.

In the last three to four years rehabilitation of the upper mine workings has resulted, and will continue to result, in the extraction of ore (mostly from the Lass workings) containing silver values which were too low grade to permit profitable operations when the price of silver was \$1.25 per ounce or less. This source of ore is becoming increasingly difficult to maintain and new, intelligent exploration must be undertaken as soon as possible.



The records pertaining to the old Bell, Sally, Rob Roy and Beaver workings (amongst others) are very incomplete. The workings are caved for the most part and inaccessible at any reasonable cost. In the majority of cases, however, it would appear that mine operators previous to 1945 extracted anything of value (even at today's metal prices) and delimited the veins rather thoroughly.

Several geological possibilities which may or may not have been investigated previously by underground work do, however, exist and present chances for new ore. Optimistically, therefore, if the price of silver remains at or above the \$2.00 U.S. per ounce level, and mine exploration meets with some success, two more years of concentrator operation beyond 1973 can be foreseen.

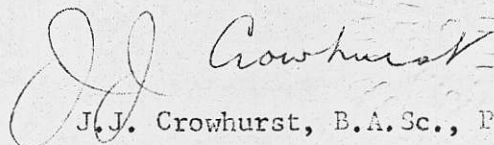
In our opinion, therefore, the present worth as outlined above should be increased approximately as follows:

| <u>Price of Silver</u><br><u>U.S./ounce</u> | <u>Calculated</u><br><u>Present Worth</u> | <u>Estimated</u><br><u>Present Worth</u><br><u>Additional</u><br><u>Operation</u> | <u>Total Estimated</u><br><u>Present Worth</u> |
|---|---|---|--|
| \$1.80                                      | 561,500                                   | 40,000  | 601,500  |
| \$2.00                                      | 739,400                                   | 96,000  | 835,400  |
| \$2.20                                      | 967,800                                   | 125,000   | 1,092,800                                      |

Therefore, a prospective purchaser could invest a sum in the order of \$835,000 and expect to earn approximately 9% on his investment as well as recovering that investment at the end of operations.

Respectfully submitted,

BACON & CROWHURST LTD.

  
J.J. Crowhurst, B.A.Sc., P.Eng.

CHAPTER I  
FINANCIAL

CHAPTER I  
FINANCIAL



SUMMARY OF ESTIMATED PRESENT WORTH

Price of Ag - \$1.80 U.S. per ounce

| <u>Year</u>            | <u>Future Income</u>     |                      | <u>Present Worth of Salvage Value</u> |                              |                        | <u>Totals</u> |
|------------------------|--------------------------|----------------------|---------------------------------------|------------------------------|------------------------|---------------|
|                        | <u>Discount Factor %</u> | <u>Present Worth</u> | <u>Surface Plant</u>                  | <u>Underground Equipment</u> | <u>Rail &amp; Pipe</u> |               |
| Nov. & Dec. 1969       | 0                        | \$17,160             |                                       |                              |                        |               |
| 1970                   | 8                        | 121,602              |                                       |                              |                        |               |
| 1971                   | 8                        | 86,017               |                                       |                              |                        |               |
| 1972                   | 10                       | 66,363               |                                       |                              |                        |               |
| 1973 ( $\frac{1}{2}$ ) | 10                       | 21,487               |                                       |                              |                        |               |
|                        |                          | \$312,529            | 200,100                               | 36,500                       | 12,300                 | 561,529       |

Price of Ag - \$2.00 U.S. per ounce

|                        |    |           |         |        |        |         |
|------------------------|----|-----------|---------|--------|--------|---------|
| Nov. & Dec. 1969       | 0  | \$34,960  |         |        |        |         |
| 1970                   | 8  | 182,158   |         |        |        |         |
| 1971                   | 8  | 142,087   |         |        |        |         |
| 1972                   | 10 | 114,748   |         |        |        |         |
| 1973 ( $\frac{1}{2}$ ) | 10 | 48,016    |         |        |        |         |
|                        |    | \$490,469 | 200,100 | 36,500 | 12,300 | 739,369 |

Price of Ag - \$2.20 U.S. per ounce

|                        |    |           |         |        |        |         |
|------------------------|----|-----------|---------|--------|--------|---------|
| Nov. & Dec. 1969       | 0  | \$52,760  |         |        |        |         |
| 1970                   | 8  | 241,696   |         |        |        |         |
| 1971                   | 8  | 198,071   |         |        |        |         |
| 1972                   | 10 | 163,808   |         |        |        |         |
| 1973 ( $\frac{1}{2}$ ) | 10 | 62,598    |         |        |        |         |
| Totals                 |    | \$718,933 | 200,100 | 36,500 | 12,300 | 967,833 |

ESTIMATED OPERATING PROFIT (CASH FLOW)

| <u>Mined</u>                                | <u>Nov. &amp; Dec.<br/>1969</u> | <u>1970</u> | <u>1971</u> | <u>1972</u> | <u>1973 (½ year)</u> |
|---|---------------------------------|-------------|-------------|-------------|----------------------|
| Dry tons/month - average                    | 3,200                           | 3,400       | 3,400       | 3,400       | 1,700                |
| Dry tons for period                         | 6,400                           | 40,800      | 40,800      | 40,800      | 20,400               |
| Ag - ounces/ton                             | 15.16                           | 15.16       | 15.16       | 15.16       | 14.00                |
| Ag - ounces total                           | 97,020                          | 618,530     | 618,530     | 618,530     | 285,600              |
| <u>Sorted</u>                               |                                 |             |             |             |                      |
| Dry tons/month - average                    | 175                             | 250         | 250         | 250         | 250                  |
| Dry tons for period                         | 350                             | 3,000       | 3,000       | 3,000       | 1,500                |
| Ag - ounces/ton                             | 0.75                            | 0.75        | 0.75        | 0.75        | 0.75                 |
| Ag - ounces total                           | 260                             | 2,250       | 2,250       | 2,250       | 1,125                |
| <u>Milled</u>                               |                                 |             |             |             |                      |
| Dry tons/month - average                    | 3,070                           | 3,150       | 3,150       | 3,150       | 3,150                |
| Dry tons for period                         | 6,140                           | 37,800      | 37,800      | 37,800      | 18,900               |
| Ag - ounces/ton                             | 15.76                           | 16.30       | 16.30       | 16.30       | 15.05                |
| Ag - ounces total                           | 96,760                          | 616,280     | 616,280     | 616,280     | 284,475              |
| <u>Recovered @ 92%</u>                      |                                 |             |             |             |                      |
| Ag - ounces total                           | 89,202                          | 566,978     | 566,978     | 566,978     | 261,717              |
| <u>Net Smelter Returns (\$ Canadian)</u>    |                                 |             |             |             |                      |
| Price of Ag - \$1.80 U.S./ounce             | \$160,200                       | \$1,020,600 | \$1,020,600 | \$1,020,600 | \$471,090            |
| - \$2.00 "                                  | 178,000                         | 1,134,000   | 1,134,000   | 1,134,000   | 523,430              |
| - \$2.20 "                                  | 195,800                         | 1,247,300   | 1,247,300   | 1,247,300   | 575,780              |
| <u>Operating Costs (\$ Can./ton milled)</u> | \$22.97                         | \$22.97     | \$22.97     | \$22.97     | \$22.97              |
| <u>Total for period</u>                     | \$141,040                       | \$868,270   | \$868,270   | \$868,270   | \$434,130            |
| <u>Operating Profit (\$ Canadian)</u>       |                                 |             |             |             |                      |
| Price of Ag - \$1.80 U.S./ounce             | \$19,160                        | \$152,330   | \$152,330   | \$152,330   | \$36,960             |
| - \$2.00 "                                  | 36,960                          | 265,730     | 265,730     | 265,730     | 89,300               |
| - \$2.20 "                                  | \$54,760                        | 379,030     | 379,030     | 379,030     | 141,650              |



PRESENT WORTH OF FUTURE INCOME

|  | <u>Cash Flow</u> | <u>Capital<br/>Expenditure</u> | <u>Income Tax</u> | <u>Mining Tax</u> | <u>Balance<br/>Cash Retained</u> | <u>Discount Factor</u> | <u>Present<br/>Worth</u> |
|--|------------------|--------------------------------|-------------------|-------------------|----------------------------------|------------------------|--------------------------|
| <u>PRICE OF Ag - \$1.80 U.S./ounce</u>   |                  |                                |                   |                   |                                  |                        |                          |
| 1969 (2 mos.)                            | 19,160           | 2,000                          | -                 | -                 | 17,160                           | Nil                    | 17,160                   |
| 1970                                     | 152,330          | 15,000                         | -                 | 6,000             | 131,330                          | 8% = 0.92593           | 121,602                  |
| 1971                                     | 152,330          | 15,000                         | 24,000            | 13,000            | 100,330                          | 8% = 0.85734           | 86,017                   |
| 1972                                     | 152,330          | 15,000                         | 36,000            | 13,000            | 88,330                           | 10% = 0.75131          | 66,363                   |
| 1973 (½)                                 | 36,960           | -                              | 4,500             | 1,000             | <u>31,460</u>                    | 10% = 0.68301          | <u>21,487</u>            |
|  |                  |                                |                   |                   | \$368,610                        |                        | \$312,629                |
| <u>PRICE OF Ag - \$2.00/ounce (U.S.)</u> |                  |                                |                   |                   |                                  |                        |                          |
| 1969 (2 mos.)                            | 36,960           | 2,000                          | -                 | -                 | 34,960                           | Nil                    | 34,960                   |
| 1970                                     | 265,730          | 15,000                         | 34,000            | 20,000            | 196,730                          | 8% = 0.92593           | 182,158                  |
| 1971                                     | 265,730          | 15,000                         | 58,000            | 27,000            | 165,730                          | 8% = 0.85734           | 142,087                  |
| 1972                                     | 265,730          | 15,000                         | 70,000            | 28,000            | 152,730                          | 10% = 0.75131          | 114,748                  |
| 1973 (½)                                 | 89,300           | -                              | 14,000            | 5,000             | <u>70,300</u>                    | 10% = 0.68301          | <u>48,016</u>            |
|  |                  |                                |                   |                   | \$620,450                        |                        | \$490,469                |
| <u>PRICE OF Ag - \$2.20 U.S./ounce</u>   |                  |                                |                   |                   |                                  |                        |                          |
| 1969 (2 mos.)                            | 54,760           | 2,000                          | -                 | -                 | 52,760                           | Nil                    | 52,760                   |
| 1970                                     | 379,030          | 15,000                         | 68,000            | 35,000            | 261,030                          | 8% = 0.92593           | 241,696                  |
| 1971                                     | 379,030          | 15,000                         | 92,000            | 41,000            | 231,030                          | 8% = 0.85734           | 198,071                  |
| 1972                                     | 379,030          | 15,000                         | 103,000           | 43,000            | 218,030                          | 10% = 0.75131          | 163,808                  |
| 1973 (½)                                 | 141,650          | -                              | 36,000            | 14,000            | <u>91,650</u>                    | 10% = 0.68301          | <u>62,598</u>            |
|  |                  |                                |                   |                   | \$854,500                        |                        | \$718,933                |

SALVAGE VALUE - 1973 - CONCENTRATOR, SURFACE PLANT & CAMP

An approximate estimate of the amount that might be realized by the sale, after mining operations have been concluded, has been compiled. In summary, this is as follows:

|     |   |              |               |
|-----|---|--------------|---------------|
| (1) | <u>Concentrator</u> (incl. power plant)   |              | \$107,700     |
| (2) | <u>Assay Office</u> , pump house, water system,<br>and miscellaneous equipment                        |              | 12,300        |
| (3) | <u>2900 Level</u>   |              |               |
|     | Fan   | \$800        |               |
|     | Compressor house & equipment  | 27,800       |               |
|     | Portable compressors  | 18,000       |               |
|     | Blacksmith shop equipment   | 1,100        |               |
|     | Miscellaneous   | <u>5,200</u> | 52,900        |
| (4) | <u>3800 Level &amp; No. 4 Level</u>   |              |               |
|     | Compressed air supply equipment,<br>compressors, generator equipment,<br>fuel tanks and miscellaneous |              | 48,600        |
| (5) | <u>Camp &amp; Housing</u>   |              |               |
|     | 21 dwellings @ average of \$1300 each   | 27,300       |               |
|     | Office, warehouse & miscellaneous<br>equipment  | 8,500        |               |
|     | Trailers  | 11,000       |               |
|     | Wiring, transformers, etc.  | <u>1,700</u> | 48,500        |
| (6) | <u>Mobile Equipment</u>   |              |               |
|     | 12 trucks & other vehicles  | \$15,000     |               |
|     | Caterpillar D-7 tractor   | 7,000        |               |
|     | Front end loader  | <u>1,000</u> | <u>23,000</u> |
|     | Total   |              | \$293,000     |



ESTIMATED SALVAGE VALUE UNDERGROUND EQUIPMENT AS OF OCTOBER 28th, 1969

|  | Original<br>Cost | Approximate<br>Average Age<br>1973 - in years | Estimated Salvage Value - 1973 |            |
|--|------------------|---|--------------------------------|------------|
|  |                  |   | Factor - %                     | Amount     |
| 9 Double drum slusher hoists               | \$12,583         | 13  | 30                             | \$3,775    |
| 5 Single drum hoists                       | 5,564            | 6   | 40                             | 2,226      |
| 14 Feed leg rock drills                    | 13,046           | 9   | 20                             | 2,609      |
| 4 Stoper rock drills                       | 5,661            | 7   | 20                             | 1,132      |
| 8 Rocker shovels                           | 20,576           | 16  | 60                             | 12,346     |
| 6 Storage battery locomotives              | 22,050           | 17  | 25                             | 5,512      |
| 7 Storage batteries                        | 7,315            | -   | N/A                            | -          |
| 2 Diamond drills - Boyles Bros. "Samplers" | 4,294            | 5   | 60                             | 2,576      |
| 1 " " " " "JV"                             | 1,000            | 17  | 20                             | 200        |
| 3 Piston type diamond drill pumps          | 2,977            | 6   | 20                             | 595        |
| 28 Mine cars - 2 ton capacity              | 29,400           | 6   | 60                             | 17,640     |
| 6 Mine cars - 1 " "                        | 1,842            | 12  | 60                             | 1,105      |
| 1 Diesel locomotive                        | 6,959            | 6   | 50                             | 3,480      |
| 6 Drill steel grinders                     | <u>1,522</u>     | 5   | 20                             | <u>304</u> |
|  | \$134,789        |   |                                | \$53,500   |

ESTIMATE OF NET SMELTER RETURNS - FUTURE PRODUCTION

Net smelter returns in Canadian dollars can be estimated quite accurately for Mastodon-Highland Bell concentrates under the present Cominco purchase schedule by multiplying the ounces of silver produced by the price of silver expressed as U.S. dollars. This system avoids an involved calculation which would include, amongst other factors, additions for the lead, zinc, cadmium and precious metal content, and deductions for smelter losses, treatment and freight charges.

Applying this system to the first half of 1969, the estimated net smelter returns would amount to 292,114 ounces of silver x \$1.763 (representing the average U.S. price of silver realized during the period) or \$514,997 (Canadian). This can be compared with the actual figure of \$523,034 (Canadian).



OPERATING COSTS - 1961-1969

The following statement shows the actual operating costs during the past nine years:

| <u>Year</u>          | <u>Amount</u> | <u>Dry Tons<br/>Milled</u> | <u>Cost per Dry<br/>Ton Milled</u> |
|----------------------|---------------|----------------------------|------------------------------------|
| 1961                 | \$398,283     | 18,954                     | \$21.01                            |
| 1962                 | 426,458       | 19,480                     | 21.89                              |
| 1963                 | 459,240       | 21,689                     | 21.17                              |
| 1964                 | 571,852       | 25,090                     | 22.79                              |
| 1965                 | 693,668       | 23,213                     | 29.88                              |
| 1966                 | 733,943       | 24,138                     | 30.41                              |
| 1967                 | 866,428       | 34,020                     | 25.47                              |
| 1968                 | 912,487       | 36,413                     | 25.06                              |
| 1969<br>(first half) | 403,194       | 18,838                     | 21.41                              |

It should be noted that the higher operating costs shown for the years 1965 to 1968 inclusive were caused by a much larger than normal exploration program during those years.

ESTIMATED OPERATING COST - 1970-1973

|  | <u>Per Dry Ton Milled</u> |             |
|--|---------------------------|-------------|
| (a) Ore Haulage - mine to concentrator | \$0.96                    |             |
| (b) Stoping                            | 6.02                      |             |
| (c) Development                        |                           |             |
| Drifting & Crosscutting                | 2.09                      |             |
| Raising                                | 0.56                      |             |
| (d) Diamond Drilling                   | 1.91                      |             |
| (e) Mine Exploration                   | 1.19                      |             |
| (f) Milling                            | <u>5.56</u>               |             |
| Total                                  |                           | \$18.29     |
| Mine Overhead                          |                           | <u>3.67</u> |
| Total                                  |                           | \$21.96     |
| Vancouver Office                       |                           | <u>1.01</u> |
| Total                                  |                           | \$22.97     |

Notes

- (1) Items a, b, c, d, and f are as per actual costs first half of 1969.
- (2) Item (e) (Mine Exploration) represents the cost of completing 200' of drifting and crosscutting per month (or the equivalent in diamond drilling, etc.) for long range exploration projects as detailed elsewhere in this report.
- (3) Vancouver Office overhead has been estimated as that amount necessary to support the mine operation alone without any consideration being given to outside exploration, or supervision related to the company's other assets.



ESTIMATED COSTS - VANCOUVER OFFICE

(assuming Beaverdell operation only)

|                       | <u>Per Month</u> |
|-----------------------|------------------|
| Salaries              | \$1,500          |
| Rent, light & heat    | 750              |
| Insurance             | 70               |
| Legal                 | 50               |
| Audit                 | 150              |
| Annual meeting        | 25               |
| Office supplies       | 50               |
| Travel                | 50               |
| Telephone & telegraph | 200              |
| Miscellaneous         | <u>350</u>       |

\$3,195 or  $\frac{3195}{3150} = \$1.01/\text{ton}$

ESTIMATED ECONOMICS - RE TAILINGS

ASSUMPTIONS

- (1) Average metal content - 3.12 ozs. Ag/ton  
(Note - no figures are available for Pb, Zn, Cd, & Au content).
- (2) Mill recovery - 80%.
- (3) Mill operating days/year = 250 (i.e. 5-day week).
- (4) Tons available - 132,000.  
Tons removed & treated/day = 250 or 62,500/year.  
" " " " /month = 5,208.

COST ESTIMATES

(1) Manpower & Labour Cost

|                                      | No. of     | Average Cost<br>/month/man<br>incl. 20%<br>Fringe Benefits | Total Cost<br>per month |         |
|--------------------------------------|------------|--|-------------------------|---------|
| (a) <u>Concentrator</u>              | <u>Men</u> |  |                         |         |
| Mill operators                       | 6          | 700  | 4,200                   |         |
| Labourer                             | 1          | 575  | <u>575</u>              | \$4,775 |
| (b) <u>Supervision &amp; General</u> |            |  |                         |         |
| Superintendent                       | 1          | 1,200  | 1,200                   |         |
| Assayer                              | 1          | 1,000  | 1,000                   |         |
| Accountant                           | 1          | 1,000  | <u>1,000</u>            |         |
|                                      |            |  | <u>3,200</u>            |         |
|                                      |            |  | <u>Total</u>            | \$7,975 |

(2) Supplies

Estimated cost of supplies per month 7,512

(3) Tailings Reclamation

5,208

(4) Mine Overhead (exclusive of (1) (b))

Estimated cost per month 1,660

(5) Vancouver Office

Estimated cost per month 3,195

Total \$25,550

NET SMELTER RETURNS (\$ Canadian)

Per Month

5,208 tons x 3.12 ozs./ton x 80% recovery = 12,999 ounces/month

|                                 |   |                  |                |
|---------------------------------|---|------------------|----------------|
| Price of Ag - \$1.80 U.S./ounce | - | Revenue          | \$23,398       |
|                                 |   | Operating Costs  | <u>25,550</u>  |
|                                 |   | Operating Loss   | \$2,152        |
| Price of Ag - \$2.00 U.S./ounce | - | Revenue          | \$25,998       |
|                                 |   | Operating Costs  | <u>25,550</u>  |
|                                 |   | Operating Profit | \$448          |
| Price of Ag - \$2.20 U.S./ounce | - | Revenue          | \$28,598       |
|                                 |   | Operating Costs  | <u>25,550</u>  |
|                                 |   | Operating Profit | <u>\$3,048</u> |



CHAPTER II  
LOCATION, PROPERTY, HISTORY AND PRODUCTION

CHAPTER II  
LOCATION, PROPERTY, HISTORY AND PRODUCTION

LOCATION

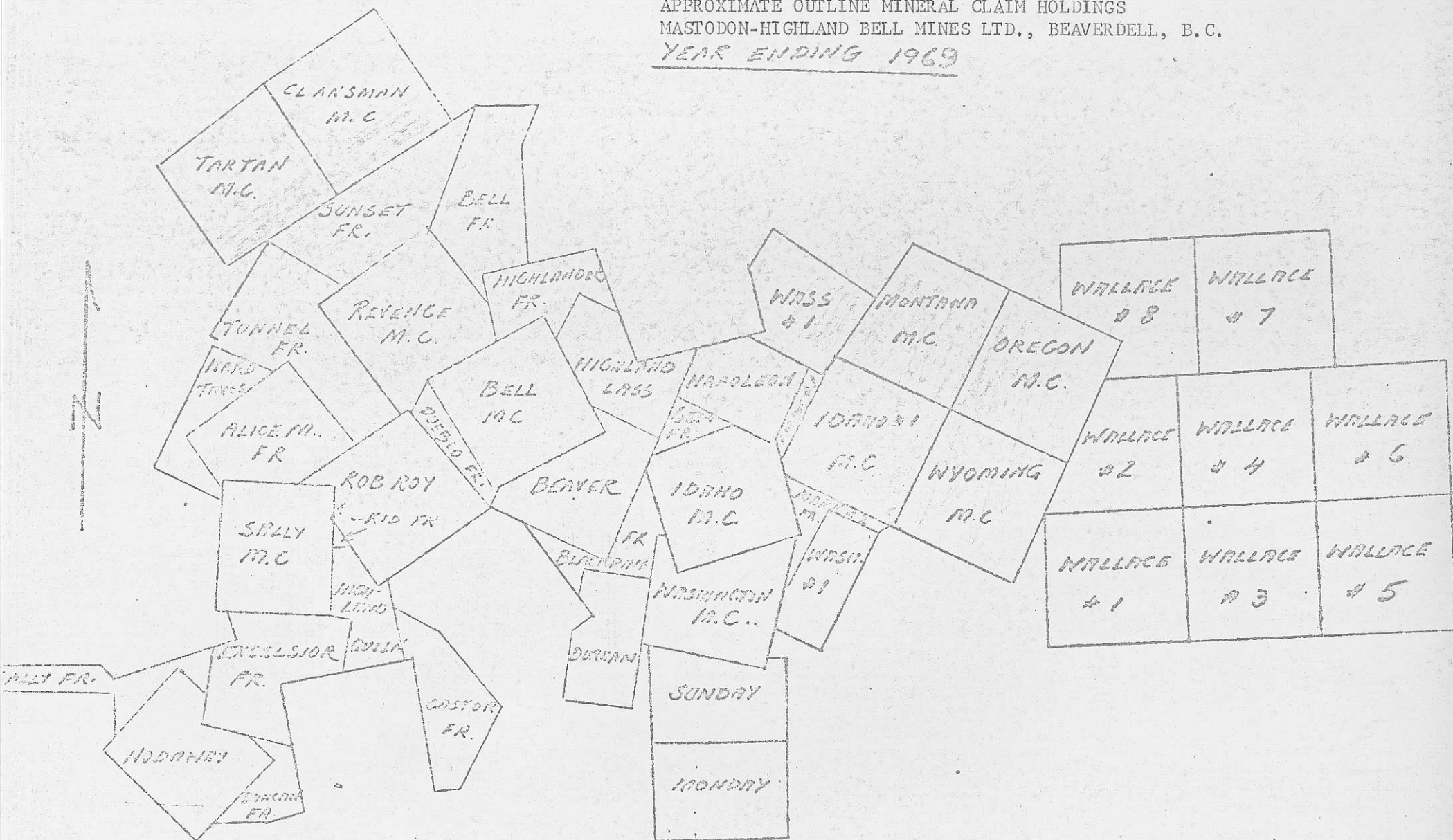
The mine workings and plant are situated at Beaverdell, British Columbia, a small settlement almost wholly dependent on the mine's operation. The Kettle Valley line of the Canadian Pacific Railway runs past the concentrator and is used to transport concentrates to Trail, B.C.

Beaverdell is 30 miles north of and linked to Rock Creek, B.C., by a paved, all-weather road. Rock Creek is on the southern Trans-Provincial Highway. A road, which is mostly paved, leads northward from Beaverdell to Kelowna in the Okanagan Valley.

PROPERTY

The Beaverdell property of Mastodon-Highland Bell Mines Ltd. consists of (a) 31 full sized Crown granted mineral claims and fractions, (b) 14 full sized mineral claims and fractions held by location, and (c) 1 claim held under an option agreement, dated September 5th, 1968, between the company and Joseph Harris of R.R. #1, Naramata Road, Penticton, British Columbia. All these claims are in one group in the Kettle River Assessment District, Similkameen Division, Yale District, British Columbia. Various surface rights are also held.





(a) CROWN GRANT CLAIMS - Current taxes are paid in full for these claims.

| <u>Lot No.</u>   | <u>Name of Claim</u> |
|------------------|----------------------|
| 2347             | Gem Fraction         |
| 2341             | Highland Lass        |
| 2344             | Highlander Fr.       |
| 2343             | Bell                 |
| 2342             | Beaver               |
| 2615 (1)         | Nodaway              |
| 2616 (1)         | Hard Times           |
| 2617 (1)         | Sally Fr.            |
| 2618 (1)         | Alice M. Fr.         |
| 2619 (1)         | Tunnel Fr.           |
| 2620 (1)         | Duncan Fr.           |
| 2092 (1)         | Sally                |
| 2093 (1)         | Rob Roy              |
| 2095 (1)         | Highland Queen       |
| 2096 (1)         | Kid Fr.              |
| 2278 (1)         | Castor Fr.           |
| 2792             | Durham               |
| D.L. 3334        | Sunday               |
| D.L. 3335 (1)    | Monday               |
| D.L. 2362        | Idaho                |
| D.L. 2363        | Washington           |
| 3294 "S" (3)     | Revenge              |
| 3296 "S" (2) (3) | Sunset Fr.           |
| 3295 "S" (2) (3) | Bell Fr.             |
| 1472 "S"         | Black Pine Fr.       |
| 1204 "S"         | Excelsior Fr.        |
| 1205 "S"         | Pueblo Fr.           |
| D.L. 3960 "S"    | Idaho No. 1          |
| D.L. 3961 "S"    | Washington No. 1     |
| 3962 "S"         | Mark No. 1 Fr.       |
| 3963 "S"         | Mark No. 2 Fr.       |

Notes - (1) Surface rights.

(2) Partial surface rights.

(3) The Revenge, Sunset Fr. & Bell Fr. are held under a royalty agreement amounting to 10% of the net smelter returns of any ore shipped from these claims. The claims have not been worked and no royalties paid.



(b) "LOCATED" CLAIMS

| <u>Name of Claim</u>  | <u>Record No.</u>    | <u>Expiry Date</u> |
|-----------------------|----------------------|--------------------|
| Wallace No. 1-8 incl. | 20505 to 20512 incl. | Sept. 18, 1970     |
| Wass No. 1 Fr.        | 13029                | June 28, 1970      |
| Wyoming               | 13028                | June 28, 1970      |
| Montana               | 13027                | June 28, 1970      |
| Oregon                | 13026                | June 28, 1970      |
| Tartan                | 12991                | April 28, 1970     |
| Clansman              | 12992                | April 28, 1970     |

(c) "OPTIONED" CLAIMS

The Highland Chief mineral claim is held under an option agreement with the vendor which specifies an initial payment of \$500 cash, plus a yearly payment due on the 1st of September in each year, with a total purchase price of \$60,000.

10% of the "net proceeds" received by the company from all ore removed is to be paid, in addition, to the vendor. "Net proceeds" are defined essentially as net smelter returns (after concentrate freight and marketing charges) less \$30 per ton.

All payments to the vendor are deducted from the total purchase price.

(d) SURFACE RIGHTS

The company is the registered owner of various parcels of land in the Kettle River Assessment District, Province of British Columbia, which are not detailed in this report. Essentially, these cover and protect the surface plant and the mine camp area generally.

### HISTORY

Claims were staked in the area in 1889 but were allowed to lapse; restaking occurred in 1896. The first mining dates back to 1900 and, up to 1936, was conducted by several separate companies. Highland Bell was formed in 1936 by amalgamation of Bell Mines Ltd. and Highland Lass Ltd., with control transferring to K.J. Springer and the Leitch Gold Mines group in 1946. The name changed to Mastodon-Highland Bell in 1960 following a reorganization of capital stock resulting from a merger with Mastodon Zinc Mines Ltd.

With the construction of a concentrator in 1950, sorting of high grade (75 to 150 ounces of silver per ton) ore and direct shipments were discontinued. As the upper mine workings gradually became worked out in the late 1950's, mining increased in the lower mine until, in the early 1960's, virtually all ore came from the lower mine. With the increases in the price of silver in the last few years, operations were recommenced in the upper workings, and the daily tonnage was increased to the economic capacity of the concentrator. These moves were effected to offset the slowly but steadily decreasing silver content of the ore.



PRODUCTION AND OPERATING PROFIT - Since concentrator start-up

|          | <u>Dry Tons<br/>Milled</u> | <u>Grade -<br/>Ounces of<br/>Silver</u> | <u>Silver<br/>Produced<br/>- Ounces</u> | <u>Revenue</u> | <u>Operating Costs</u> |                           | <u>Operating<br/>Profit</u> |
|----------|----------------------------|---|---|----------------|------------------------|---------------------------|-----------------------------|
|          |                            |   |   |                | <u>Amount</u>          | <u>Per Ton<br/>Milled</u> |                             |
| 1950 (1) | 3,990                      | -                                       | 696,561                                 | 603,606        | 314,625                | n/a                       | 288,981                     |
| 1951     | 13,828                     | 51.93                                   | 718,207                                 | 758,573        | 325,380                | 23.53                     | 433,193                     |
| 1952     | 8,811                      | 43.96                                   | 387,379                                 | 349,019        | 241,703                | 27.43                     | 107,316                     |
| 1953     | 14,765                     | 46.62                                   | 688,344                                 | 596,723        | 321,327                | 21.76                     | 275,396                     |
| 1954     | 12,785                     | 44.68                                   | 571,295                                 | 485,955        | 363,233                | 28.41                     | 122,722                     |
| 1955     | 13,229                     | 39.81                                   | 526,682                                 | 484,994        | 427,971                | 32.35                     | 57,023                      |
| 1956     | 14,322                     | 44.86                                   | 642,474                                 | 589,949        | 337,222                | 23.55                     | 252,727                     |
| 1957     | 15,779                     | 45.41                                   | 716,546                                 | 663,630        | 407,333                | 25.81                     | 256,297                     |
| 1958     | 18,729                     | 48.09                                   | 900,669                                 | 819,359        | 431,133                | 23.02                     | 388,226                     |
| 1959     | 18,029                     | 39.73                                   | 716,325                                 | 842,065        | 437,394                | 24.26                     | 404,671                     |
| 1960     | 18,204                     | 49.64                                   | 903,614                                 | 891,086        | 439,430                | 24.14                     | 451,656                     |
| 1961     | 18,954                     | 46.47                                   | 880,892                                 | 896,336        | 398,283                | 21.01                     | 498,053                     |
| 1962     | 19,480                     | 42.77                                   | 833,153                                 | 1,040,712      | 426,458                | 24.89                     | 614,254                     |
| 1963     | 21,689                     | 40.47                                   | 877,861                                 | 1,267,826      | 459,240                | 21.17                     | 808,586                     |
| 1964     | 25,090                     | 32.28                                   | 809,819                                 | 1,189,227      | 571,852                | 22.79                     | 617,375                     |
| 1965     | 23,213                     | 27.91                                   | 647,993                                 | 983,722        | 693,668                | 29.88                     | 290,054                     |
| 1966     | 24,138                     | 30.88                                   | 745,278                                 | 1,177,532      | 733,943                | 30.41                     | 443,589                     |
| 1967     | 34,020                     | 20.98                                   | 713,911                                 | 1,354,550      | 866,428                | 25.47                     | 488,122                     |
| 1968     | 36,413                     | 15.45                                   | 562,560                                 | 1,318,394      | 912,487                | 25.06                     | 405,907                     |
| 1969 (2) | 28,139                     | 14.42                                   | 405,700                                 | 810,854        | 698,396                | 24.82                     | 112,458                     |

Notes - (1) Mill start-up September 9th, 1950.

(2) Nine months to end of September 1969.

CHAPTER III  
GEOLOGY AND ORE RESERVES

CHAPTER III  
GEOLOGY AND ORE RESERVES



### GEOLOGY

Three significant rock types occur on Wallace Mountain:

(a) barren quartz monzonite comprising the Beaverdell stock, (b) quartz diorite (mineralized) designated as the West Kettle batholith, and (c) the overlying volcanic tuffs and sediments known as the Wallace formation. It should be noted that in some areas, the mineralization extends from the quartz diorite 150' into the Wallace formation.

Mineralization, consisting of pyrite, galena, sphalerite, native silver, argentite, pyrargyrite and other silver minerals occupy narrow (0.5' to 10') quartz veins and shear zones in the quartz diorite. The general strike of the veins is NE-SW to E-W, with an average southward dip of 45°. They are restricted to the east by the quartz diorite-Wallace contact, which dips flatly to the east. Westward the mineralization weakens and pinches out 600' to 800' from the contact.

Extensive and complex, closely spaced faulting involves the whole mine area and makes location and continuity of the veins and shears extremely difficult to establish; it has resulted in a general elongation of the mineralization easterly and downwards, with up-thrusted and down-faulted blocks occurring quite frequently. One large normal fault, known as the "East Terminal" fault, dips about 65° southeasterly and has an approximate 600' movement downwards; it separates the upper mine workings (Lass mine) from the lower mine.

In the lower mine, as the mineralized zone proceeds easterly and downwards, the silver content has gradually changed in

tenor from 15-500 ounces per ton to 1-5 ounces per ton. Since 8 ounces of silver per ton across a 5.0 width is considered to represent the cut-off figure, it would appear that either an extensive lean zone has been encountered or the end of economic mining is approaching. Further exploration now in progress should answer this question.

#### ORE RESERVES

The ore reserve tabulation shows tonnages and grade of silver designated as "reasonably assured" (after allowances have been made for mining dilution) of 15.16 ounces of silver per ton, and possible ore amounting to 50,000 tons assaying 10.0 ounces of silver per ton.

A cut-off grade of 8 ounces of silver per ton has been used except where a small tonnage of 5 to 6 ounce material has been included; it is considered a good possibility that this latter tonnage will respond to further exploration.

##### (1) REASONABLY ASSURED ORE

Blocks containing "reasonably assured" ore are established in plan between previously mined zones or around diamond drill hole intersections. The length and width of a block is related to experience gained in the nearby mined areas, proximity to each other of diamond drill holes, geological considerations such as the presence or absence of native silver, fault patterns, or the proximity of the quartz diorite-Wallace formation contact. With isolated diamond drill holes, however, the length and the width are both generally restricted to a maximum of 50 feet.



The thickness of the block is arbitrarily assumed to be a minimum of 5.0 feet; experience has shown this will allow for mining dilution.

A factor of silver assigned to the block is based on previous mining results in nearby areas, diamond drill hole intersection results, and geological considerations.

(2) POSSIBLE ORE

"Possible" ore consists of backfill material in old stopes situated between Lass #4 and #7 levels (40,000 tons) and above Bell #3 level (10,000 tons).

Due to inaccessibility, proper sampling of "possible" ore has not been completed. A grade of 10 ozs./ton is assumed to be reasonable, based on the results of assays obtained in the extraction of approximately 1000 tons of material from the stopes above Lass #4 level.

(3) CONCENTRATOR TAILINGS

Using a factor of 22 cu. ft./ton, as determined by field measurements, and using the areas outlined on the attached plans, (both submitted by the mine staff) the three tailings ponds are estimated to contain 132,477 tons assaying 3.12 ounces of silver per ton. This could be extracted by front end loader methods. Approximately 30,000 tons per year, containing an estimated 1.0 to 1.5 ounces of silver per ton, are currently being placed in a fourth pond. Some part of this latter tonnage would consolidate during the next three to four years.

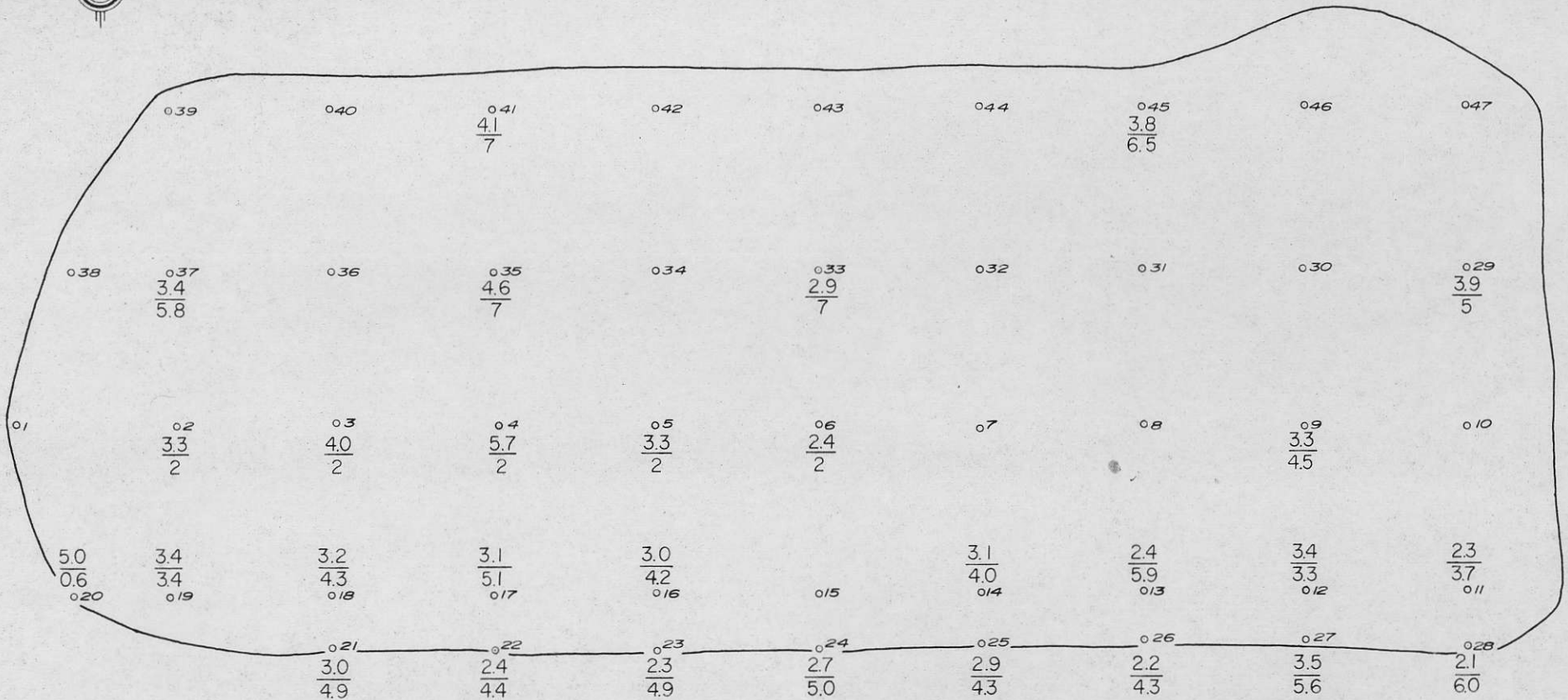
The attached plans show the three surveyed pond areas, sample locations, and assay results where applicable. In Pond "A" and in Pond "C", below about seven feet in depth, the material is reportedly still sufficiently unconsolidated to prevent the use of a front-end loader for removal. No information is available at present concerning Pond "E" but it is considered probable that similar conditions are present here.

Within the largest or "C" Pond, about 2,000 tons, estimated to contain 6 ounces of silver per ton, is situated along the edges of the area where some experimental extraction has been carried out earlier this year.

Within the range of the price of silver considered in this report (\$1.80-\$2.20 per ounce), and considering the sampling and assaying information now available, the estimated operating profit in the treatment of 250 tons of tailings per day is considered too small (if not negative) to warrant the inclusion of this material in the present ore reserve calculation.

No estimates have been made with regard to the construction of a separate concentrator section to treat tailings material concurrently with mine ore. A future investigation might result in the inclusion of part or all of the tailings material in an ore reserve category, should sampling and assaying results so warrant.





LEGEND

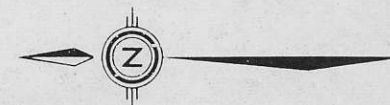
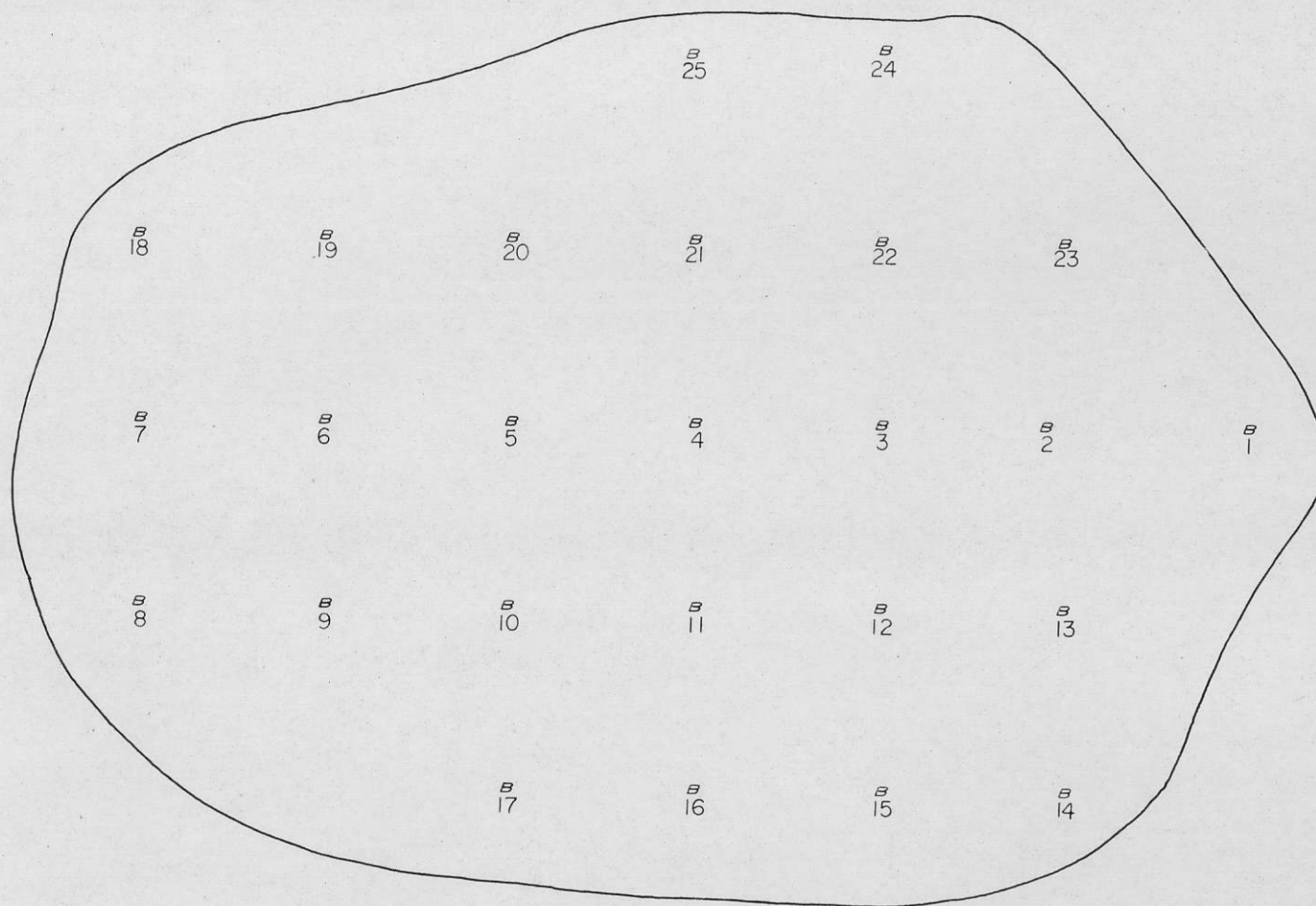
$\frac{4.1}{7}$  = ASSAY  
 DEPTH  
 $\frac{180 \times 450 \times 5}{22}$  = 18,409 TONS

BACON & CROWHURST LTD.  
VANCOUVER, B.C.

MASTODON-HIGHLAND BELL MINES LTD.  
BEAVERDELL, B.C.

**TAILINGS POND 'A'**  
SOUTH OF RIVER PIPE

SCALE: 1" = 50'



WATER LINE

$$\frac{210 \times 300 \times 5}{22} = 14,318 \text{ TONS}$$

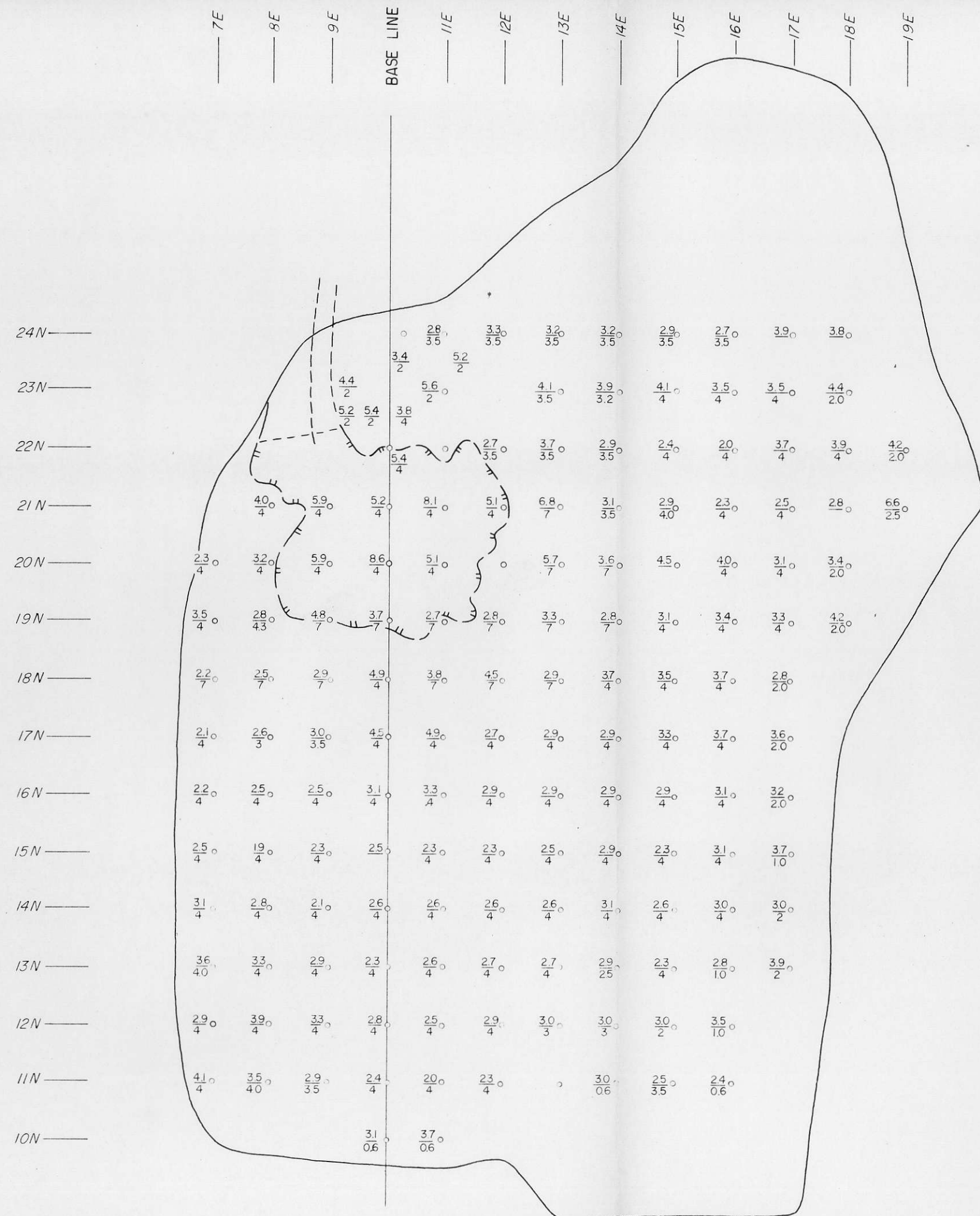
BACON & CROWHURST LTD.  
VANCOUVER, B.C.

MASTODON-HIGHLAND BELL MINES LTD.  
BEAVERDELL, B.C.

**TAILINGS POND 'B'**  
NORTH OF RIVER PIPE

SCALE : 1" = 50'





**LEGEND**

$\frac{3.1}{4}$  = ASSAY  
DEPTH

$\frac{570 \times 770 \times 7}{22}$  = 99,750 TONS

114 ASSAYS AVERAGE 3.122 oz./Ton

BACON & CROWHURST LTD.  
VANCOUVER, B.C.

MASTODON-HIGHLAND BELL MINES LTD.  
BEAVERDELL, B.C.

**TAILINGS POND 'C'**

SCALE: 1" = 100'

ORE RESERVES - November 1, 1969

REASONABLY ASSURED - AFTER ALLOWANCE FOR MINING DILUTION

WEST AREA LOWER MINE

| <u>Area</u>      | <u>Co-ords</u> |             | <u>Dimensions</u> | <u>Tons</u> | <u>Grade</u> | <u>Ozs.</u> |
|------------------|----------------|-------------|-------------------|-------------|--------------|-------------|
|                  | <u>North</u>   | <u>East</u> |                   |             |              |             |
| 2850             | 1150           | 4400        | 70x20x5;11        | 636         | 10           | 6,360       |
| 2850             | 1370           | 4540        | 40 x 10           | 181         | 20           | 3,620       |
| 2852             | 1420           | 4500        | 20 x 10           | 90          | 10           | 900         |
| 2854             | 1420           | 4630        | 35 x 35           | 556         | 10           | 5,560       |
| 2854-2955        | 1510           | 4710        | 150 x 30          | 2045        | 12           | 24,540      |
| 2855E            | 1500           | 4830        | 140 x 20          | 1272        | 18           | 22,896      |
| 2900 Pillars     | 1600           | 4300        | 20 x 20           | 181         | 15           | 2,715       |
| 2900 Pillars     | 1800           | 4360        |                   | 50          | 30           | 1,500       |
| 2900L Remnants   |                |             |                   | 350         | 15           | 5,250       |
| 2902 Broken      | 1450           | 4550        |                   | 500         | 10           | 5,000       |
| 2902             | 1300           | 4320        | 40 x 10           | 181         | 10           | 1,810       |
| 2904             | 1300           | 4570        | 20 x 10           | 90          | 20           | 1,800       |
| 2905             | 1650           | 4650        | 50 x 10           | 227         | 35           | 7,945       |
| 2918-2902        | 1530           | 4615        | 60 x 15           | 409         | 15           | 6,135       |
| 3000L Remnants   |                |             |                   | 500         | 15           | 7,500       |
| 3001             | 1740           | 4400        | 30 x 25           | 340         | 12           | 4,080       |
| 3014 Dr. above   | 1700           | 4450        | 25 x 10           | 113         | 20           | 2,260       |
| 3009 Pillars     | 1900           | 4390        | 50 x 30           | 680         | 15           | 10,200      |
| 3011 Broken      | 1790           | 4800        |                   | 200         | 10           | 2,000       |
| 3016N            | 2040           | 4880        | 20 x 20           | 181         | 10           | 1,810       |
| <u>Sub-Total</u> |                |             |                   | 8782        | 14.10        | 123,881     |

Low Grade

|           |      |      |         |     |   |       |
|-----------|------|------|---------|-----|---|-------|
| 2850 (ET) | 1240 | 4330 | 80 x 20 | 726 | 6 | 4,356 |
|-----------|------|------|---------|-----|---|-------|



EAST AREA LOWER MINE

| <u>Area</u>       | <u>Co-ords</u> |             | <u>Dimensions</u> | <u>Tons</u> | <u>Grade</u> | <u>Ozs.</u> |
|-------------------|----------------|-------------|-------------------|-------------|--------------|-------------|
|                   | <u>North</u>   | <u>East</u> |                   |             |              |             |
| 2800E             |                |             |                   | 6000        | 20           | 120,000     |
| 2905E             | 1880           | 5150        | 70 x 40           | 1272        | 8            | 10,176      |
| 2905E             | 1730           | 5040        | 70 x 50           | 1591        | 8            | 12,728      |
| 2905E             | 1780           | 5140        | 70 x 25           | 795         | 20           | 15,900      |
| 2906              | 1830           | 5250        | 70 x 20           | 636         | 18           | 11,448      |
| 2910XC            | 1820           | 5345        | 20 x 20           | 181         | 20           | 3,620       |
| 2910E             | 1960           | 5450        | 20 x 20           | 181         | 15           | 2,715       |
| 2911E             | 1720           | 5950        | 100 x 10          | 1091        | 15           | 16,365      |
| 2911E             | 1750           | 5910        | 50 x 60           | 1363        | 12           | 16,356      |
| 2911E             | 1800           | 6150        | 100 x 30          | 1363        | 8            | 10,904      |
| 2914              | 1660           | 5600        | 130 x 20          | 1182        | 8            | 9,456       |
| 3017 Pillars      |                |             |                   | 300         | 20           | 6,000       |
| 3017              | 1830           | 5780        | 20 x 40           | 363         | 30           | 10,890      |
| 3017              | 1850           | 5650        | 50 x 20           | 454         | 12           | 5,448       |
| 3017XC Black Zone | 1850           | 5980        | 50 x 20           | 454         | 15           | 6,810       |
| 3021              | 1750           | 6300        |                   | 200         | 8            | 1,600       |

Sub-Total

17,426      14.94      260,416

Low Grade

|       |      |      |         |     |   |       |
|-------|------|------|---------|-----|---|-------|
| 2910S | 1620 | 4900 | 30 x 30 | 409 | 5 | 2,045 |
| 3021  | 1950 | 6360 | 25 x 25 | 284 | 5 | 1,420 |

Sub-Total

693      5      3,465

LASS MINE

| Area               | Co-ords |      | Dimensions | Tons   | Grade | Ozs.    |
|--------------------|---------|------|------------|--------|-------|---------|
|                    | North   | East |            |        |       |         |
| 201-A              | 2720    | 2800 | 100 x 20   | 909    | 25    | 22,725  |
| 201 Pillars        | 2520    | 2750 |            | 500    | 25    | 12,500  |
| 4 Level            | 2740    | 3300 | 100 x 15   | 681    | 25    | 17,025  |
| 4 L. Remnants      | 2750    | 3200 |            | 200    | 20    | 4,000   |
| Backfill above 4L. |         |      |            | 9,000  | 10    | 90,000  |
| 7 Level            | 2200    | 3000 | 150 x 15   | 1,022  | 25    | 25,550  |
| 7 Level            | 2300    | 4000 |            | 1,000  | 30    | 30,000  |
| 5 Level            | 2300    | 2850 | 80 x 20    | 727    | 40    | 29,080  |
| 3800 Level         |         |      |            | 1,000  | 30    | 30,000  |
| <u>Sub-Total</u>   |         |      |            | 15,039 | 17.34 | 260,880 |

BELL MINE

|                  |      |      |           |       |       |         |
|------------------|------|------|-----------|-------|-------|---------|
| 3L-4L Area       | 1600 | 2400 | 160 x 30  | 2,181 | 9     | 19,629  |
| 3L-4L Area       | 1580 | 2100 | 50 x 20   | 454   | 11    | 4,994   |
| Pueblo Area      | 1500 | 1960 | 120 x 100 | 5,454 | 18    | 98,172  |
| <u>Sub-Total</u> |      |      |           | 8,089 | 15.18 | 122,795 |

4L. LASS DUMP

1,000 9 9,000

SUMMARY

|                                   |        |       |         |
|-----------------------------------|--------|-------|---------|
| Lower Mine - West                 | 8,782  | 14.10 | 123,881 |
| Lower Mine - East                 | 17,426 | 14.94 | 260,416 |
| Low Grade                         | 1,419  | 5.51  | 7,821   |
| <u>Total - Lower Mine</u>         |        |       |         |
|                                   | 27,627 | 14.19 | 392,118 |
| Lass Mine                         | 15,039 | 17.34 | 260,880 |
| Bell Mine                         | 8,089  | 15.18 | 122,795 |
| Dumps                             | 1,000  | 9     | 9,000   |
| <u>Total - REASONABLY ASSURED</u> |        |       |         |
|                                   | 51,755 | 15.16 | 784,793 |
| Possible - Lass Mine - Fill       | 40,000 | 10    | 400,000 |
| Possible - Bell Mine - Fill       | 10,000 | 10    | 100,000 |
| <u>Total - POSSIBLE</u>           |        |       |         |
|                                   | 50,000 | 10    | 500,000 |



CHAPTER IV  
MINE DEVELOPMENT AND EXPLORATION

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### MINE DEVELOPMENT AND EXPLORATION

Normal mine development consists currently of 400 feet per month of drifting, crosscutting and/or raising plus 2500 feet per month of diamond drilling.

The estimated operating costs and general projections regarding ore reserves and resulting cash flow in this report contemplate the regular completion every month of an additional 200 feet of drifting, crosscutting and/or raising (or an amount of diamond drilling equivalent in cost) in order to attain the necessary exploration objectives (suggested by Mr. B. Goetting, Mine Manager) tabulated below.

(1) LOWER MINE EAST

A drift 600 feet in length is proposed to go due east from 2912 drift at coordinates 1800N and 6400E in order to explore by diamond drilling the eastward possibilities of the main mineralized zone.

(2) LASS MINE

(a) No. 4 Level

Recent development work on No. 4 level in the Lass Mine has resulted in extraction from the old stopes of an appreciable quantity of backfill averaging about 10 ounces of silver per ton. . Further drifting from these openings would provide diamond drill stations from which possible strike extensions of the vein system on No. 2 and No. 3 levels could be investigated.



(b) No. 7 Level

It is proposed to connect the new 3800 adit level (which was driven to open up stoping areas on the "Switch back" vein) with the eastern extremity of Lass No. 7 level. This connection, 1100 feet in length, would serve several purposes. It would provide an opportunity to examine and test a potential 40,000 tons of old backfill in the stopes above 7 level, which is either inaccessible or very difficult of access at present. It would also provide suitable locations from which possible extensions eastward on the Lass vein structure, between No. 4 and No. 7 level, could be probed by diamond drilling; and additional locations from which diamond drilling could test the possibilities below two soil anomalies. Furthermore, this working would permit much more efficient mining and removal of blocks of ore already exposed on Lass No. 7 level at the east end. This ore would now have to be trammed along No. 7 level, hoisted up an inclined winze (in need of rehabilitation) and trammed again on No. 4 level to the surface.

(3) BELL MINE

Present access to the Bell workings is difficult, costly and time-consuming, with operations restricted to a portion of the Bell 4 level. Initial exploration by diamond drilling has been disappointing so that, other than the backfill possibilities, the potential for this section of the property is not great.

A proposed drift from the Rob Roy No. 150 level would connect with the west end of Bell No. 3 level, giving reasonable access to the stopes containing potential backfill. At the same time, a crosscut should be driven north from this new drift to open the recently discovered Pueblo vein. The drift will also provide potential drill sites to explore the vein over a strike length of 400'.

(4) ROB ROY CLAIM

A diamond drilling program is proposed from the recently opened #2 level on #7 vein. This program would cover an area east from a point 1400N and 1000E and investigate the possible faulted continuation of the up-dip section of #6 vein, as well as a possible eastward extension of the Rob Roy 2 and 3 levels. An intersection of 51 ounces of silver over 1.0' in width lends merit to this proposal.

(5) SALLY CLAIM

It is proposed that indications of mineralization in drifts at coordinates 75N & 1050E and 00N & 500W be investigated by diamond drilling from 400 level. The possibility exists of obtaining small tonnages, both above and below the present level, from narrow veins in this relatively unexplored area.



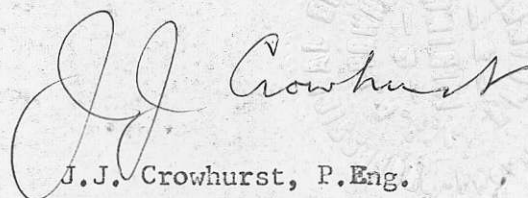
CERTIFICATE OF QUALIFICATIONS

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I, John James Crowhurst, DO HEREBY CERTIFY THAT:

- (1) I am a practising mining engineer with Bacon & Crowhurst Ltd., Ste. 102, 1111 West Georgia Street, Vancouver, 5, B.C.
- (2) I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Applied Science.
- (3) I have been practising my profession as a mining engineer for 26 years.
- (4) I am a member of the Association of Professional Engineers of British Columbia, Registration No. 2120.
- (5) I was employed as General Manager by Highland Bell Mines Ltd. during the period 1960-1967 inclusive and as such was responsible for the operation of the mine at Beaverdell, B.C.
- (6) I visited the property at Beaverdell, B.C., on October 30th and 31st, 1969.
- (7) I have no interest, direct or indirect, in the property or securities of Mastodon-Highland Bell Mines Ltd. or Highland Bell Mines Ltd., nor do I expect to acquire any such interest.

  
J.J. Crowhurst, P.Eng.

Vancouver, B.C.  
December 5th, 1969.