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SUMMARY

OF THE

1980 - 1981 EXPLORATION AND REHABILITATION

PROGRAM

AND THE ONGOING

EXPLORATION PROGRAM

AT THE

NICKEL PLATE PROPERTY

OSOYOOS MINING DIVISION

BRITISH COLUMBIA

FOR

MASCOT GOLD MINES LIMITED Suite 310 - 800 Sixth Avenue S.W. Calgary, Alberta T2P 3G3

July 1, 1981 Calgary, Alberta

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W.G. Hainsworth, P. Eng. Consulting Geologist

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SUMMARY

This report summarizes the work completed to July 1, 1981, on the Nickel Plate property of Mascot Gold Mines Limited (Mascot) in the Osoyoos Mining Division, British Columbia and recommends the continued exploration of the property.

In 1980, Mascot undertook the work program as generally recommended by the writer in his 1980 report "The Nickel Plate Property" (the Report) prepared for Mascot Gold Mines Limited. The program was recommended in two stages. Stage I consisting of the establishment of a camp, the rehabilitation of the underground workings down to 6 level in order to undertake a diamond drilling, geologic and wall sampling program to evaluate the exploration potential of this former producing gold property is generally completed. Stage II consisting essentially of delineation diamond drilling and a limited amount of development including re-equipping certain of the mine levels and development drifting and crosscutting is recommended. Certain initial phases of this recommendation including underground diamond drilling is presently underway.

To the date of this report, 12,927 feet of surface and 5,354 feet of underground boring have been completed.

This drilling in conjunction with the wall sampling has been successful in adding 101,340 tons of diamond drill indicated reserves grading 0.248 ounces gold per ton to the previously established Kelowna reserves of 48,388 tons of 0.317 ounces gold per ton resulting in 149,728 tons grading 0.270 ounces gold per ton reserves above the 450 level. The silver values, which are generally in the order of 3 units of silver to two units of gold, are minor while the copper values in the areas tested are not considered commercially significant at this time.

On the basis of the exploration results to date it is recommended that Stage II of the exploration program be carried on. This stage includes some 35,000 feot of diamond drilling, some 1200 feet of development work and the re-equipping of some 1500 feet of the Bulldog haulageway. Also certain additions to the surface camp and equipment will be required for this program. The program is estimated to cost \$2,692,000 and, of course, in additon there will be certain corporate and overhead costs. The time frame for the program is estimated at some 12 to 18 months depending upon the availability of diamond drill stations, the continuance of the program over the winter months and other factors such as the availability of labour and equipment.

RECOMMENDATIONS

As stated in the Report the program to assess the potential tonnage and grade of mineralization accessible above the existing 450 level would involve at least two stages and extend over two to three years. Stage I consisting of three phases (Phase 1 to 3) designed to include the reopening of the mine down to the 450 level and deeper, where possible, the establishment of a surface camp and plant and the commencement of a drilloriented exploration program has been completed. Stage II which is a more extended and intense continuation of Stage I is recommended.

A.

The evaluation of the results of Stage I was the fulcrum point on which to make the decision to proceed with Stage II. Discouragement in Stage I would have negated or retarded Stage II but conversely favourable results of Stage I warrant proceeding to Stage II.

The 1980-1981 program has resulted in finding some 100,000 tons of new reserves of mineralization and the development of over 25 exploration targets including one which could represent large tonnage. The program did not (1) extend into any areas outside the main workings (2) test any new geologic concepts (3) extend below the 450 level. It has remained within the circumvallation of the concepts of the Report.

Therefore, in view of the encouraging results emerging from the first stage it is recommended that Mascot proceed to Stage II of the exploration program which effectively is a continuation of the last phase of Stage I but carries less emphasis on the rehabilitation of the workings and a stronger emphasis on exploring for reserves of commercial potential.

The writer recommends up to 35,000 feet of diamond drilling mainly underground, the re-equipping of the Bulldog haulageway for some 1500 feet and 1,000 feet of drifting, crosscutting and raising. The bulk of the development work is recommended to explore the apparent new Sunnyside zone with a lessor amount to provide drill setups in the Sunnyside and Nickel Plate ore systems.

The drilling would include the targets as laid out under the heading Exploration Targets of this report and the completion of the recommended program as per the 1980 report. The Sunnyside development as recommended is directly related to the promising geological structure disclosed in a drill hole close to the Bulldog haulageway. This drill intercept of 0.389 ounces gold per ton across 45 feet must be investigated by development at track level particularly if continuity is established by holes presently drilling. It is estimated that the development work requirement will consist of 200 feet of crosscutting, 300 feet of drifting and 100 feet of raising. To carry out this work will require the re-equipping the Bulldog level with some 1,500 feet of rail, air and water lines plus the establishment of a compressor plant, shop, etc. at the Bulldog portal. This re-equipping of the Bulldog level would also service the diamond drilling, the Sunnyside 3, 4 and 450 areas. Should the results in this new Sunnyside area warrant additional development work then it should be considered as a third stage. Drilling footage should not be sacrificed for development at this stage of exploration.

In addition to these major exploration recommendations a number of ancillary expenditures are required in order to carry them out. These include the expansion of the camp and surface plants, the purchase of mining equipment and increased compressed air capacity.

The present camp can only handle 23 people including supervisory personnel. Therefore, it must be expanded and upgraded. The water system, which some \$45,000 was spent, proved inadequate to guarantee a continuous water flow and as a result, during the 1980-1981 winter, water had to be transported, an expensive procedure. It is recommended that a water well be drilled. Additional accommodation and recreational facilities to improve the morale of the crew and staff because of remoteness is recommended. Also, consideration should be given to installing an electric compressor if it is decided to operate through the winter as was the case in 1980-1981 and if hydropower is available.

Following the completion of Stage II an indepth analysis should be made of the then economic factors and the advisability of a production investigation.

It is also recommended that an early start be made to an environmental impact study. The initial phase of this study - development of a standard - should form part of the recommended Stage II program.

COST ESTIMATES, STAGE II

The following figures are the estimated costs on the property for a 12 month program and have been obtained from examination of past costs with escalation factors. The program would be to:

- 1) Carry out 35,000 feet of diamond drilling
- 2) Re-equip 1500 feet of haulageway
- 3) Drive 1000 feet of drifts, cross cuts and raises
- 4) Purchase and install the equipment necessary to carry out the program.

Property Operating Costs

Property Supervision	\$36,000
Consulting fees and travel	44,400
Other	27,600

Cookhouse and Bunkhouse (including power)

184,000

276,000

359,400

\$108,000

Surface Expense

Transportation - men and	
supplies	66,900
Road and winter maintenance	37,500
First Aid and safety	51,600
Water Supply	12,300
Employee benefits	36,000
Other	71,700

Mine Expenses

Supervision	54,000
Engineering	73,200
Geology	73,200
Compressed air	72,000
Employee benefits	42,000
Other	45,000

Exploration and Development

Diamond drilling	677,400
Re-equip levels	77,400
Development	219,600
Employee benefits	54,000
Other	117,600

1,146,000

\$2,074,000

Standards Environmental Study

<u>Capital Costs</u>

Equipment and Installation

Contingencies 10%

25,000

348,200

\$2,447,400

244,600

\$2,692,000



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INTRODUCTION

In early 1980 Mascot, formerly Mascot Nickel Plate Mines Limited, undertook the exploration program recommended by the writer in a report titled "Report on the Nickel Plate Property" dated January 10, 1980 and revised to May 1, 1980, and a report titled "Progress Report on the Nickel Plate Property" dated August 1, 1980 ('the Report').

The Report recommended the continuance of the 1979 rehabilitation and wall sampling program above the 450 level and its expansion below that level, where possible, plus diamond and/or percussion drilling. This recommendation was for a two stage program of which Stage I would consist mainly of expanding the camp facilities and plant; rehabilitation, for safe access, the Bulldog and A haulage levels, the Dickson shaft to 6 level or below and in the stoped areas. Also, the wall sampling and geologizing of these areas and drilling with the objective of assessing the potential of known exploration targets and the delineation of new targets. The second stage of the program which, on a very limited basis, has commenced and which it is recommended be continued would consist of reserve delineation drilling and the establishment of new exploration targets based on the extension of previously worked areas and further interpretation of the geologic structures. The ultimate objective of the combined program (Stage I and II) as stated in the writers January 1980 report under Recommendation was as follows: "The following exploration program is recommended to sample and test by diamond and/or percussion drilling the three main ore systems on the property with the objective of proving within a two or three year period sufficient reserves of gold mineralization to support a commercial operation."

With this report which summarizes the results of the work to July 1, 1981, Phases 1 to 3 of Stage I is completed except for the drilling in the Purple beds of the North Dyke area that was not as extensive as recommended.

GENERAL

Mascot's Nickel Plate property, on Nickel Plate Mountain, near Hedley in south central British Columbia, which was first located in 1894 was placed in commercial production in 1904 and continued in production until 1931 when the then known ore reserves were exhausted. In the next three years the predecessor of Kelowna Mines (Hedley) Limited ('Kelowna') carried out an intensive geological and related exploration program that established new ore reserves and from 1934 to 1955 operated the property at 250 tons per day until operations were again suspended as a result, in part, to the steady increase in the cost of labour and supplies in relation to the fixed price of gold. In 1955 all the equipment and buildings were removed and the mineral claims and surface rights were transferred by Kelowna to Burden Investors Services, ('Burden'), a related company. In 1967 the property was optioned by Burden to a subsidiary of G M Resources Limited ('GMR') and in 1971 it was acquired by a predecessor of Mascot. Burden and GMR retain a 8% and 61.7% interest respectively in Mascot. Burden has the right ro receive up to \$250,000 in the aggregate by way of a royalty on the net proceeds of production from the Nickel Plate property on a sliding scale based on the value of ore per ton but not exceeding 10% of the net proceeds of any shipment.

The Nickel Plate property consists of 83 Crown Granted claims, three claims held by location, two leases comprising 26 reverted Crown Granted mineral claims, surface rights on 14 Crown Granted claims and one land lot.

GEOLOGY

The Nickel Plate property lies within the Interior Plateau of British Columbia. However, the southern portion of the Plateau is unlike its table-like northern extension in that dissection has obscured the level surface. The Plateau in the general Hedley area presents high, undulating topography which rises to the southeast.

Area1

The oldest rocks in the Hedley area are sediments of Mezozoic age that correlate with the Nicola group of the Triassic period. The Nicola formations were derived from an epoch of wide spread volcanism that flowed into a marine basin of great extent and depth resulting in the formation of argillite and limestone with some local fine-grained quartzite.

Pressure produced an overturned fold striking N15-20°E. The western link, along which most of the ore structures are located developed a flat 15 to 40° dip to the west.

Early magmatic injections produced the granite core whereas later basic magmas located the extensive mine sills and dykes.

Formations

The stratigraphic column in the Hedley area depicts:

- <u>Aberdeen</u> The youngest and thickest sedimentary member with no apparent economic deposits.
- <u>Red Mountain</u> The next thickest member composed of volcanics and fragmentals.
- <u>Nickel Plate</u> This calcareous formation with intrusive sheets has three main beds:
 - 1) Kingston Limestone coarse crystalline limestone
 - 2) Middle Member highly metamorphosed limestone,
 - argillites and quartzites. The productive member of the group.
 - 3) Sunnyside Limestone massive, dark coloured limestone.

Red Top - The oldest bed consisting in the main of quartzites.

The above formations have seen the emplacement of intrusive rocks such as granodiorite, diorite gabbro, lamprophyre and andesite dykes.

Alteration

Alteration of the Nickel Plate formation has produced a "skarn effect". It is considered that the skarn was produced as a primary product during the emplacement of the basic porphyry dykes and sills. Development of the skarn produced variably altered sedimentary strata with different degrees of alteration. The demarcation point is referred to as the "Marble Line". Controls

Past operations have recognized five ore controls within the Middle Member bed:

- Favourable Beds Little or no commercial mineralization has been found in other than the Middle Member of the Nickel Plate formation.
- 2) Marble Line Economic gold values are usually located within the skarn formations.
- 3) Presence of Sills and Dykes These are acknowledged to have served as the channelways for the mineralizing solutions.
- 4) Folds and Fractures It is generally accepted that these structures have localized orebodies. The degree of folding has been instrumental in accounting for the geometry of the ore body.
- 5) Mineralization The presence of arsenopyrite is necessary for gold values to be present.

It has been found that the majority of the above conditions must be present in either a primary or secondary manner for economic operations.

Ore bodies

These are three general systems of gold bearing orebodies in the Nickel Plate area.

1. Nickel Plate Orebodies -This system is composed of a series of tabular gold bearing lenses that may be described as a set of overlapping shingles following the dip of the strata for a distance of some 3,000 feet (900 meters) on a bearing of N 70° W. There are seven lenses from the surface each in a different skarn bed. For convenience, the previous operators identified the ore shoots or beds by a color code and other appropriate symbols. In order of descending elevation they are the violet, upper purple, lower purple, red, orange, yellow blister and yellow. This system is associated with porphyry sills called "the mine sills" which are intrusive structures that lie slightly discordant to the bedding

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planes and rake gently across them while maintaining the same dip attitude. Best known of these sills is the Midway Sill. This sill is more persistent than the others and has been traced intermittently down dip into the Mascot Fraction claim where it is known as the Hot Sill. As with the other sills, it steepens sharply in the Mascot Fraction to 70° west.

Of the numerous dykes in the system, which crosscut the ore bearing lenses and sills, the strongest and best identified is the Flange Dyke. This 35 to 50 foot (10 to 15 meter) dyke that strikes N 80° W and dips 70° N to 75° S separates the ore beds. The dyke is weakly mineralized but has never been mined.

Another dyke, the South Dyke, lies 525 feet (160 meters) to the south of the Flange dyke and roughly parallels it. The orebodies in their downward convergence pass from close proximity to the South Dyke at surface, across the Flange Dyke and approach the North Dyke, in the deepest portion of the Mine, where they abut the Climax Breccia.

The ore beds have been mined from the surface through to the 17th Level at elevation 4,750 feet (1,450 meters).

2. Morning Orebodies

- This system of orebodies which are unlike the Nickel Plate orebodies in both structure and grade derives its name from the claim on which it was first identified, the Morning claim.

As the Midway Sill descends towards the Mascot Fraction claim it steepens and cuts across the underlying Middle Formation thus taking on the identity of a dyke. Its presence was recognised by Hedley Gold Mines Limited in the Mascot Fraction where it was named the Hot Sill.

At the junction of the Hot Sill (Midway Sill) and the Flange Dyke orebodies were formed. The grade and persistence of the mineralization was related in most instances to the tight folding at these "crotches". The juncture of other porphyry sills with the Flange Dyke also gave rise to concentrations of gold although the larger and richer orebodies were generally associated with the Midway Sill. The Morning ore structures, because of their rich grades were thoroughly stoped above the 4,050 level and possibly below. Good drill intersections were made below the Mascot Fraction 3,700 level, but the extent of exploration and development in this area is not clear.

3. <u>Sunnyside Orebodies</u> - The surface expression of the Sunnyside orebodies was discovered early in the history of the Mine. The Sunnyside 1 through 4 orebodies were stoped early in the operation of the Mine with the 2 being mined out prior to 1930. The Sunnyside 4¹/₂ which is not exposed on the surface was not discovered until 1945 and was the richest of the five Sunnyside deposits.

> The Sunnyside ore beds lie deep in the Middle formation and are closely related to indentations or keels in the Marble Line. They are moderately folded with the mineralization being confined to the apex and/or one limb of the fold. Their down dip expression is shallow.

The Sunnyside 4½, like the others, is associated with mine sills, the principal one being the Flipper Sill. In addition, two dykes converging to the east form a loci with the sill where ore grade mineralization is generally formed.

The Bulldog ore zones are similar to the Sunnysides in stratigraphy, but lie further to the south and down the rake of the strata.

Sills here are prominent and have an important relationship to the distribution of the gold values. Only one of the zones, the Bulldog #1-820 Stope, was mined and this work was discontinued in 1953 due to heavy concentrations of chalcopyrite that caused metallurgical recovery problems in the mill.

The Morning orebodies which are at lower elevations in the Middle Formations are similar in design and ore tenor to the Sunnyside orebodies. Both Billingsley and Dolmage postulated they might be the depth image of the Sunnysides

THE 1980/1981 PROGRAM

Commencing in early 1980, Phases 1 to 3 of Stage I of the two stage exploration program recommended by the writer in his Report has now been completed. The work consisted initially of researching and correlating available technical data of previous operators and revising and preparing the necessary working plans and sections. This was followed in the early summer of 1980 with the reopening and retimbering of the main A haulageway and re-equiping it with rail and air and water lines to the Dickson shaft (some 850 feet). This work was carried on in conjunction with gaining safe access to the workings above the 450 level. Later in the year the Dickson shaft was reopened, retimbered and equipped with the necessary rail and pipe to service the geologic and drilling crews between the main haulageway and 6 level. Also the Bulldog haulageway was reopened and retimbered to interconnect with the A adit and service the drills in the Sunnyside area some 2,500 feet from the Bulldog portal. In early 1981, surface and underground diamond drilling was commenced and to July 1, 1981 a total of 142 holes aggregating 17,498 feet have been drilled.

1980-1981 OPERATING EXPENDITURES

The expenditures on the 1980/1981 exploration program from January 1, 1980 to May 31, 1981 totalled \$1,876,580. Of this some \$576,615 was spent prior to September 30, 1980 and was largely financed by G M Resources Limited prior to Mascot arranging a public financing.

Property Administration	\$	106,785
Cookhouses and Bunkhouse Operation		158,680
Hydropower		4,766
Surface Operation (including road		
and water maintenance of some		
\$77,721 and water supply and camp		
installation and maintenance of		
\$79,365)		293,932
Underground Operation (including		
geologic staff of \$65,049 and		
compressed air operation of		
\$87,509)		187,938
Exploration and Rehabilitation		
(including direct costs for		
diamond drilling, assaying and		
rehabilitation of \$382,120,		
\$66,458 and \$154,847)		618,173
	\$1	,370,274

A total of \$309,942 was expended on the purchase of capital plant equipment, and \$196,364 on corporate costs including administration, accounting and senior management.

Since October 1, 1980 to May 31, 1981 the total expenditures by the company including repayment of loans was \$1,353,960.

MINING CONCEPTS

As in the past the writer has approached the exploration of the Nickel Plate property with the concept of finding commercial tonnages and grade that would warrant a 200 to 300 ton per day plant as was the case in the past. However, on the basis of the limited work done by Mascot, there are indications that tonnages in excess of 5 million tons grading in the order of 0.07 ounces gold per ton can possibly be developed on the property and an open pit operation operating at 1200 or more tons might be the ultimate criteria rather than 200 to 300 tons per day.

Therefore, it was considered well to comment on the mining aspects at this time as it relates to the future operation of the property.

As stated above the concept of the open pit operation at the Nickel Plate arose from the possibility that there might be sufficient amounts of gold distributed through the host formations to overcome the costs of mining productive and non-productive areas of rock. Normally, in open pits, other than for cap rock or overburden and unusually large bulk areas of waste, the pit is mined as a total mill feed. The dilution factor is overcome by the larger mill throughput and lower operating costs.

Initially, it was envisioned that large sections of the surface drilling lent themselves to an open pit situation. If this possibility exists then as a natural sequence:

A) A large concentrator with a capacity exceeding 1200 tons/day would be required.

B) A water supply of 8000 gallons per minute would be required, assuming no reusage.

C) A tailings disposal area 8 feet high by 1000 by 2000 feet would be required for the first four years of operation. There is also the possibility that the tailings could be piped to the lower levels and some of the old stopes filled if the concentrator were located near the open pit areas. Incidentally, these tailings would amount to 45% of the total ore taken from the mine during it's initial 50 years of operation.

From the above it follows that it would be difficult to locate a plant of this size plus its ancillaries at a high elevation. Nickel Plate Lake, the largest source of water in the area would be hard pressed to supply the mill, townsite and auxiliary operations. Furthermore, the topography mitigates against the choice. As a consequence, the mill would have to be relocated in the valley where level ground is available and a possible source of water might be the Similkameen River or its larger tributaries. Environmental problems would possibly be greater here than in the mountains. In addition, the transfer of 1200 tons of muck daily down the mountainside would be another problem. Internal ore passes to lower level haulage ways could solve this problem. However, the main criteria of an open pit is sufficient ore for a large daily throughput to produce a substantial per ton profit to return the initial capital investment in a short period of time.

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In 1979, Lornex milling at a 48,700 ton a day rate had operating and general expenses per ton of ore mined at \$3.20. Average gross value of a ton of ore (copper and molybdenum) was \$12.60. Brenda Mines in the same year milled 27,400 tons per day with an operating cost of \$2.82 per ton. Brenda's gross value of a ton of ore (molybdenum and copper) was \$11.72.

For Mascot to have open pit potential the approximate requirements would be:

- 1) Mill of not less than 1,200 tons per day.
- Tonnage and grade sufficient to sustain a production life to return original capital investment and then show an annual net profit for the remainder of the ore reserves.
 - 3) Mill, pit equipment, ancillary operations and housing requirements = \$70 million.

Therefore, to return the capital investment on material containing 0.10 ounces gold per ton and gold at \$450 U.S. per ounce plus 18% exchange less estimated operating costs of \$40 ton = 5.4 million tons at 1200 tons per day this would take $12\frac{1}{2}$ years.

The time factor before pay back is too long for any investment project. In addition, based solely on the Sunnyside drilling, the writer calculates the tonnage and grade to be 5.3 million tons at a grade of 0.068 ounces per ton gold with no allowance for an ore to waste factor.

Possibly a pit approach could be adopted which would

- 1) Increase the grade
- 2) Lower tonnage
- 3) Decrease the costs

In contrast, underground mining by means of subdrifts, inclines, dog holes and glory holes can effectively mine economic grade sections for a 200 to 300 ton per day plant.

Underground reserve calculations are based on sections with a cut-off grade of 0.10 ounces of gold per ton. It was expected that due to the banded nature of the mineralization lateral and vertical expansion of the mining excavation will likely occur. To continue to verify this prior to mining will entail additonal underground drilling. Also, certain areas will require advance underground development in order to assess the tonnage and grade to be expected. Other areas have sufficient information to allow immediate mine development.

Underground operations are relatively expensive. It is expected that a combination of slashing, drifting and stoping will average between \$80 and \$85 per ton mined and milled. However, the selectivity of the operation will be the key to commercial success. Predicated on the operation of a number of small stoping operations a 250 to 300 ton mill would be suitable. It is predicated that the mill would be located in the immediate area of the mine operation which would minimize ore and water transportation, lessen the environmental impact, and, result in good tailings control. Consideration, in respect to the mill location will, of course, be given to possible deeper level extraction. This future operation might be best served by another incline working in conjunction with the Dickson adit.

The writer has calculated diamond drill reserves for underground operation at 99,850 tons of 0.252. This figure does not include Kelowna's reserves as stated in the report of January 10th, 1980. Nor does it include reserves resulting from recent surface drilling in the Lower Purple Ore bed area. These figures are presently unavailable due to late return of assay figures.

MINERAL RESERVES

Unless stated otherwise the mineral reserves are classified as diamond drill indicated. Development necessary to place them in the proven category has not been undertaken.

The reserves have been calculated on a weighted basis using the assay grades times the length sampled times the distance between sections all divided by 10.5 cubic feet to the ton. A dilution or extraction factor will not be applied until the reserves are reclassified as drill proven or proven. Following the established practice of the previous operators there has been no cutting of high grade sections. A cut-off figure of 0.10 ounces per ton gold has been used in the calculations.

Silver and copper values have not been included in the reserve calculations due to their relative lack of importance at present.

The volume of minable rock has been estimated from the sections and plans on a judgement basis following accepted engineering standards. It is considered to be on the conservative side. At most mines, production tonnages normally exceed initial estimates.

Continuity of mineralization and geologic structure between reserve sections is important in calculating reserve estimation as it makes it evident that regular stoping methods subject only to geometric dimensions can be used in extracting the reserves. For the most part the writer found good consistency, however, in a few sections this was not the case. Therefore, in these areas it was assumed on the basis of experience, barring substantiation drilling that the mineralized intersections worthy of exploitation, would be mined by means of subdrifting, raising, wall slashing or dog holing rather than following regular methods. As several of the surface holes broke into openings (stopes, raises and tunnels) not plotted on the plans and sections, it was difficult to calculate the reserves in those specific cases. It would appear that in the latter years of the operation surveying of the underground operations did not keep pace with mining. Consequently, although all measures have been taken to ensure that the reserves as calculated do not include mined areas the possibility remains.

On the basis of the assay results received to July 1,1981, that do not include the surface drilling in the area of the Nickel Plate Glory Hole, certain underground drilling in the Sunnyside 450 area and the possible new zone between the Sunnyside 2 and 3, a total of 99,840 tons grading 0.252 ounces per ton has been added to the reserves above the 450 level. These are in addition to the 48,388 tons grading 0.317 ounces gold per ton established by Kelowna above this horizon and the 47,471 tons grading 0.275 ounces per ton established by Kelowna below the 450 horizon. In total the known reserves on the property which the writer classifies as drill indicated are in the order of 200,000 tons grading 0.274 ounces of gold per ton. In addition to these reserves of tonnage mineable from underground, there is, on the basis of a very rough calculation, the possibilities of some $5\frac{1}{2}$ million tons of open pit mineralization grading 0.07 ounces gold per ton disregarding the physical and environmental matters related to a processing plant_dilution and ore to waste factors.

1. Sunnyside Ore System

a. Surface

In the Sunnyside 3 and 4 areas, surface diamond drilling shows good continuity existing for some 300 feet (from section 2350N to 2650N) above the former stope backs. Therefore, the mining of these reserves can be done by regular methods. However, to extract the reserves assigned to the area of holes S81-28, S81-29 and S81-35, to the north will require sub drifting from the Sunnyside 4 East stope. These three holes extend the Kelowna reserves. Drilling to north of the Sunnyside 4 East stope produced no significant results. Another promising feature of the surface drilling was the intersections of a high grade section (0.389 ounces gold per ton across 45 feet) in hole S81-44 at a location between the Sunnyside 2 and 3 and considerably down dip from the other Sunnysides. This mineralized area is now the target for three underground and one surface diamond drill hole. On the basis of assays to date and the logs of the additional holes in this area underground, drifting and crosscutting from the Bulldog haulage level to explore this area is recommended.

Surface diamond drilling carried out with up to three machines in the Sunnysides totalled 9086.5 feet in 67 holes to July 1981.

This drilling in addition to delineating several targets requiring further drilling, established drill indicated reserves of 58,720 tons grading 0.211 ounces gold per ton.

b. Underground

The underground drilling concentrated in the 450 to delineate the Sunnyside area. Drilling in the vicinity of the 450 stope has clarified the association of mineralization with the Flipper Sill. Above the Flipper Sill and between the North and South dykes a total of 7,100 tons of 0.187 ounces per ton gold grade has been identified. This is considered to be a southern extension of the N450B stope towards the S450 stope. This extension is further verified by the 1979 and 1980 Mascot sampling in both stopes. A total of 48 samples over 120 feet of the south wall of the N450 B stope gave a weighted grade of 0.390 ounces gold per ton. Seven samples from 85 feet of the north wall of the S450 stope returned 0.271 ounces per ton gold.

On the <u>under</u> side of the Flipper Sill (sub Flipper ore) there is a concentration of economic grade mineralization lying along both walls of the South Dyke. Early Kelowna production encountered numerous high grade patches of this nature along the junction of the sills-dykes. On the north side of this dyke reserves totalling 5,750 tons of 0.549 ounces gold per ton have been outlined in 12 drill intercepts. Underground drilling to expand the dimensions of this zone is continuing. On the south side of the dyke, one drill hole indicates the extension possibilities of a Kelowna mineral reserve.

The North Dyke area has been closely drilled and stoped by previous operators. However, at the Sunnyside Stadit level a geological crumple indicates ore of limited tonnage but good grade. Three drill hole intersections indicate 1,500 tons of 0.406 grade. Further drill holes are planned to expand this drill reserve.

The Sunnyside 450 east stope, known as the "Red Mud" stope connage possibilities lying just below the track level provide complete but a Mascot hole combined with the rrow north-south structure combined with the also has tonnage possibilities lying just below the track level Drilling here is incomplete but a Mascot hole combined with three Kelowna holes shows a narrow north-south structure carrying 2,150 tons of 0.633 ounces gold per ton.

A total of 42 holes aggregating 3690.5 feet were drilled in the Sunnysides.

2. Nickel Plate Ore System

a. Surface

Twenty-one holes totalling 3,295.5 feet were drilled with two machines in the area of the Nickel Plate Glory Hole. This area which is also referred to as the "Piece of Pie" section, lies between the Central Fault and the Flange Dyke and has a wedge shape outline. Drilling in this area by Kelowna was limited. The assay results on the current drilling by Mascot have not been received but examination of the core shows a sporatically mineralized Lower Purple ore bed extending through to the surface with this bed being separated from the underlying Red Bed by the Midway sill which acts as the footwall of the Purple beds and the hanging wall of the Red Bed. The mineralization in the Red Bed appears to weaken with distance from the sill. The Red Bed is separated from the underlying Orange Bed which shows intermittent mineralization, by a mine sill of variable thickness.

b. Underground

As of the date of this report 12 holes have been drilled with a combined footage of 1425.5 feet. Up to 3 machines were employed on this phase of drilling.

Underground it was recommended that the north rib of the Purple ore beds be drilled on 50 foot centers. However, to date only 8 holes have been drilled and then only in two specific areas. In the result the potential of this area remains unassessed. Of the drilling, which was concentrated in the Lower Purple 5-8 stope, a combination of three drill holes and rib sampling established some 2,750 tons of 0.148 ounces per ton gold grade. Farther up the dip of the bed ring drilling in the 150 Stub drift coupled with 200 feet of rib sampling indicated some 20,000 tons of 0.253 ounces per ton gold lying beyond the present walls of the Purple stope within a confined section. Sampling of stope wall projections added another 3370 tons of 0.250 ounces per ton gold to the tonnage in this area. The total new Sunnyside and Nickel Plate reserves indicated by the first stage of the program are shown below.

Sunnyside System	Tons	Oz/ton Gold
450 Interdyke	7100	0.187
Sub Flipper-Dyke	5750	0.549
North Dyke Crumple	1500	0.406
450 East Extension	2150	0.633

Nickel Plate System

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	Tons	Oz/ton Gold
5-8 Purple Stope Extension 150 Stub Purple Purple Stope Wall	2750 20000 3 3 70	0.148 0.253 <u>0.250</u>
	42620	0.299
Sunnyside 3 and 4 surface		
	58,720	0.211
Total Tonnage	101,340	0.248
Kelowna Reserves	48,388	0.317
Total	149,728	0.270

EXPLORATION TARGETS

1. Nickel Plate Ore System

General - North Dyke

The North dyke to the north of the main Nickel Plate beds is an intriguing exploration target for all the beds as dykes particularily in combination with mine sills, have shown increased gold mineralization close to the dyke walls. The North dyke, although believed to be beyond the marble line requires investigation for remnant skarn bands from the A06 drift, 150 Stub drift and the 628 crosscut.

- Flange Dyke

This is a model for mineralization adhesive to and/or close to its dyke walls. The fact that there are no stopes adjacent to or even close to the Flange Dyke above the 5550 foot elevation (other than for the Purple beds) or approaching from the south side of the dyke must be examined. Possibly the proximity of the Central Fault to the Flange Dyke may have made mining difficult.

- South Dyke

This dyke is not as readily identifiable as the Flange Dyke. None of the Nickel Plate mineralized beds have stopes, other than for the 45-2 stope in the Yellow bed, that approach this dyke. Geological identification of the dyke was made in drifting from the 3 Adit Level and the 450 Level.

Purple Beds - A8N Area

There is the potential for commercial grade mineralization in the footwall of this upper Purple stope and from the South wall of the stope to the Flange Dyke.

- A-7 Stope

The south wall of this stope which is some 25 to 40 feet from the South Dyke is being tested from the A-11 and A02 drifts. A Kelowna hole cut modest results (0.13 ounces per ton gold over 16 feet) in this South Dyke area. It is postulated that the potential of this south dyke area is good. However, the extent of the drilling in this area will depend to some extent on the availability of drill sites and/or whether the potential warrants the development of drillsites to evaluate them.

- 1-4N Stope

A reserve block not included in Kelowna's reserves but which is evident from the maps and lies to the west end of this stope should be drilled from the A-13 drift in order to expand the reserves.

- B7-1 Stope

A block of Kelowna reserves in this area may possibly be further expanded or delineated by underground drilling from the 3 Adit. The recent surface drilling directed several holes towards this target but results are not presently available. The current underground drilling is seeking to establish an up-dip projection of the purple and underlying red, orange and yellow beds.

Red Beds - A-5 Stope

Two Kelowna reserve blocks in this stope area which were incorporated in my Report have extension possibilities in several directions. Drilling can be carried out from several drifts of the 3 Adit. Also the gap existing between these reserve blocks requires investigation with several judicially located drill holes.

- D-5 Stope

In the latter days of the Kelowna operation a portion of the Glory Hole ore was long hole blasted. However a section up dip from this stope is included in the Kelowna reserves and there exists a good possibility of expanding it. The potential for expansion is considered excellent as it is a multiple geological fold structure striking S 45 E. Due to location and lack of underground workings in the area it may prove to be more of a surface diamond drill target.

- A 5 W Stope

This stope around which there are Kelowna reserves has expansion possibilities both down dip and to the southwest. Sampling of this stope's walls is also recommended.

- 1-5 and 2-9 Stopes

These two Red Bed stopes lie against the Flange dyke up to 2 level where mining was suspended. As previously stated the area along the Flange Dyke has good possibilities for establishing reserves. This postulation is supported by a number of Kelowna holes from the A-13 drift which cut through the dyke to intersect modest values along the south wall of the dyke well in advance of the face of the two stopes. As a result the Red Bed may possibly be extended up dip along the dyke by drilling from A-09, A-13 and A-14 drifts. The 2-9 stope on the north side of the Flange Dyke which only had two Kelowna check holes in advance of its up dip operation provides another drilling target.

Stoping of the Red Bed in the "Piece of Pie" area appears to have been stopped before the 4 Adit level was reached. Therefore exploration for the extension of the Red beds on this level and above is a priority target. Red beds further to the south are exposed in the floor of the Glory Hole.

Orange Bed

As with the Red ore bed, the Orange stopes were not carried through to the 4 Adit Level and are therefore a prime target. These beds have been sporadically indicated by the Glory Hole surface drilling but as the assay results are not available it is presently not possible to assess the potential of the beds. However, a further opportunity to investigate this bed is available from the underground. Holes from the B-05 drift can be directed to fil in gaps left untested by surface drilling which was somewhat restricted due to depth limitations of the machines.

- A-6 Proposed Stope

Drilling is required to expand the Kelowna reserves in this stope area. The expansion of these reserves both down dip and laterally can be readily done by drilling from underground.

- 4-6 Stope

Surrounding the 4-6 stope is a Kelowna reserve block which was presumably mined out. However it should be checked with stope sampling and short hole drilling from underlying headings. This stope is close to the South dyke but apparently its extension to it was not tested.

- 4-1 Upper Stope

In the upper chamber of the 4-1 stope limited sampling by Mascot indicated a grade of 1.131 ounces gold per ton over 130 feet of the perimeter of the stope. Average stope height of the samples was 2.4 feet. A study of the sections indicates that there is a possibility of expanding this zone of mineralization up the structural dip.

- 4-1 South Stope

This offshoot stope lies to the south and at a lower elevation than the 4-1 stope. Sampling along the southeast wall indicated a grade of 0.162 ounces per ton gold for 50 feet thereby indicating expansion possibilities in this direction. Sampling along the north wall (pillar area) ran a respectable 0.386 ounces per ton gold.

Yellow Bed - A-2N Stope

One of the deepest beds in the mine the Yellow is considered to have possibilities in the "Piece of Pie" area and has been tested by surface holes 81-62 (assays not presently available), 81-63 (assays not presently available), 81-68 (0.167 ounces gold per ton across 14 feet) and 81-74 (assays not presently available). These holes were positioned to test for the upward extension of the A-2N stope. Underground drilling is in progress from the A-11 drift to further test teh A-2 stope extension and other yellow bed extensions.

- 45-2 Stope

Within the Yellow Bed, this stope most closely approaches the South dyke. This dyke has been identified in 4556 drift but is totally unexplored in respect to find concentrations of mineralization in the Yellow beds. The A-11 and 4555 drifts are ideal locations for exploration drilling.

2. Sunnyside Ore System

a. Sunnysid<u>e 450</u> - <u>S450</u> Stope

As stated elsewhere, two Kelowna reserve blocks are being probed for westward extensions in the vicinity of the Sunnyside South Dyke. These extensions in reality would be prolongations of the S450 stope. Hole U2461, indicates a connection between the two Kelowna reserve blocks. However, drilling verification of this possibility can be done from the 4584 crosscut. These blocks may well tie into the interdyke reserves (the South and North 450 stopes) indicated by the recent Mascot drilling.

- N450 Stope

Several old Kelowna holes suggest that this stope has possibilities of expansion along its western rib. Testing of this wall by drilling can be done readily from the 4566 drift. In addition the west wall of the stope should be sampled. On the south side of the Sunnyside North dyke several Kelowna holes show interesting values close to the dyke wall. The possibility of extending the stope further to the west will be investigated by drilling. The extension of the N450 below this level has been demonstrated by three recent Mascot holes. Further drilling is forseen from the 4589 drift area to further delineate this depth extension.

The 450 area has been the target for a substantial amount of the Mascot drilling over the past months, however, there still remains several areas worthy of further investigation.

b. Sunnysides 3 & 4 - 4 Incline Stope

It is proposed to carry out drilling in the vicinity of this stope to test for expansion of a reserve block lying to the west and at a lower elevation than the ore section outlined in the recent SS375 surface drilling. Another small block of reserves outlined by recent Mascot underground drilling in the area east of the 4 Incline stope will have delineation drilling carried out from the 4 Sub-level drift/

- 4 Glory Hole Stope

In sampling the Sunnyside 4 Glory Hole Mascot cut ten samples that graded 0.298 ounces per ton gold across 45 feet of the south wall. In addition, Kelowna drill holes indicate expansion of this stope wall to the south. Further drilling is therefore required in this area as the surface drilling coverage was relatively thin.

- 3 Incline Stope

Recent surface drilling by Mascot has indicated mineralization lying close to the south west wall of the stope. Kelowna drilling also shows mineralization lying just outside the walls. These indications will require further substantiation drilling probably from the surface.

3. General

It is expected that with further geological research more targets will identify themselves for the underground program. All of the above target areas are above the 450 level horizon (5600 foot elevation) except for the North Dyke area of the Nickel Plate System. At this time no recommendation now can be made in respect to exploration in the South Rim, Windfall Canyon areas or between elevations 5300 feet and the bottom level of the workings at elevation 3750 feet. Furthermore, no recommendations have been made in respect to exploring the known targets of the Morning ore System. The writer feels there are sufficient drill targets above the 450 level to effectively carry out a program (Stage II) whose ultimate purpose will be the accumulation of sufficient mineral reserves to make consideration of production a necessity.

Respectfully submitted,

19/ Jains

W.G. Hainsworth, P. Eng. Consulting Geologist

Calgary, Alberta July 1, 1981

A.A.

CERTIFICATE

- I, W.G. Hainsworth, P. Eng., of Calgary, Alberta do hereby certify:
 - That I am a Consulting Geologist residing at 2310 Carleton Street S.W., Calgary, Alberta.
 - (2) That I am a graduate of the University of Western Ontario, London, Ontario, Bachelor of Science Degree, Honours Geology.
 - (3) That I have practiced my profession for some 30 years.
 - (4) That I have been a continuous member of the Association of Professional Engineers of British Columbia since 1965 and am a Professional Geologist registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
 - (5) That I have no financial interest, direct or indirect, in the Mascot Gold Mines Limited, and do not expect to obtain any such interest.
 - (6) That the information contained in this report is based on repeated visits to the Nickel Plate property of Mascot Gold Mines Limited and familiarity with the operations, past and present.
 - (7) That consent is herewith given to Mascot Gold Mines Limited to use any or all material from this report in information circulars, offerings or shareholders brochures.

W.G. Hainsworth, P. Eng. (B.C.) P. Geol. (Alta.) and the second

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APPENDIX "A"

SURFACE DRILLING

OPEN PIT POTENTIAL IN THE SUNNYSIDE 350 AREA

SECTION	SQUARE FOOTAGE	OUNCES GOLD PER TON	HOLE NOS.
2275	NONE		
2325	NONE		
2350	2587	. 196	D2110, S80-2, S81-57
2375	7158	.090	\$54, \$56, D2110, D2118, \$81-13, \$81-39
2400	11241	.026	S81-93, S54, S74, S81-12, S81-15
2425	18796	.147	S81-95, S76, S74, D2191, S80-1, S81-11, S81-38
2450	9268	.053	S81-8, S81-9, D2162, No. 74
2475	27875	.046	S81-10, S81-36, S81-48, S81-86
2500	10486	.066	S 81 - 58
2525	13141	.033	S81-8, S81-90, S81-33, S81-59, S81-91
2575	9 627	.036	S81-6, S81-7, S81-87
25-5	10050	.106	S80-4
2650	13018	.079	\$81-27, \$81-14
2675	6447	.037	S81-29, S81-26, S81-31
2700	2950	.048	\$81-25, \$81-28
2725	3687	.052	\$81-35, \$81-37A & B

5,575,000 tons .068

*NOTE: 1) West walls on many sections taken vertically to surface near most westerly holes.

- 2) The section square footage multiplied by the section inverval of 25 feet and divided by 10.5 cubic feet per ton gives the tonnage per section as totalled at the bottom of the column.
- 3) No calculations have been made for ore to waste ratio as the walls have been taken as vertical nor has a dilution factor been considered.

- 28 -APPENDIX B

SURFACE DRILLING UNDERGROUND MINING RESERVES IN THE SUNNYSIDE 350 AREA

	CUBIC	OUNCES GOI	_D	
SECTION	FEET	PER TON	HOLES NO.	NO. OF INTERSECTIONS Section
2725	1500 2	725.192	581-35 Dava 2 ((1 intersection)
2700	1500 2	200.168	S81-28 Blouma Repurse	(1 intersection)
2675	3780 2	675.123	581-29, 581-26 650 Long @ 148	(2 intersections)
26 50	#7500	.239	D2147, S81-14	(2 intersections) 2650
2625	#2640	.962	S80-4	(1 intersection) 2625
(2600	13645	.195)	(extrapolation) (2000)	
2575	246 50	.113	S81-6, S81-7	(2 intersections)
	24750-	.200	S81-87, S-52(?)	(2 intersections)) ²⁵⁷⁵ (S-52 may be stoped)
(2550	23575	.128)	(extrapolation) (2550) -	2500
2525	×22500	.146	\$81-90, \$81-33	(2 intersections) 2525
2500	24000	.210	D2168, S81-58	(2 intersections) 2500
2475	100000	.245	\$81-10, \$81-36	(2 intersections) 2475
2450	1 8000	.247	\$81-9, D2162	(2 intersections) 2450
2.25	172500	.253	D2191, S81-95, S80-1, S81-11, S-76, S-74	(6 intersections) 2425
2400	52200	.151	\$81-12, \$81-15	(2' intersections) 2400
	- Coll	.213	S-54(?) 2	(3 intersections)
	×7050	.184	\$81-15	(1 intersection) 7.400
2375	412100	.188	\$81-13, D2110	(2 intersections))
	1050	1.24	D2118	(1 intersection) $\int^{23/3}$
2350	116000	.232	\$80-2, D2110	(2 intersections) 2350
2325	30000	.159	\$81-40	(1 intersection) 2325
(2300	15875	.156)	extrapolation) (2300)	
2275	47750	.102	S81-41 Subduft	(1 intersection) 2275

609410 23 58050 tom @ 217 616875

(591785@.223) 56,350

2655

= 58,720 tons .211

"TE: Based on a tonnage factor of 10.5 cubic feet per ton.





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H 70° W. (APPROX.)	
	1829 M.
	6000F1.
PLATE FORM	
ATIONS	
1	A A A A A A A A A A A A A A A A A A A
	IG76M
554/2	5500FT.
1-7/	
1 1 27/	
A. J. MAV	
1/1/1/10	
/ A'	
	1524 M.
	5000F1.
	1376M
	4500FT.
FIGURE 3	1280 M. 4200 FT.
COMPOSITE SE	CTION
OF	
NICKEL PLATE PRODU	JCTIVE AREA
5 SCALE : I : 2000	И.
bar the will rate e it	0 150
To accompany Report by W.G. Hain	sworth Dec. 1979

