PRELIMINARY MINING OVERVIEW

ESKAY CREEK PROPERTY

Prepared by

D.J. Barker, P.Eng.
KEEWATIN ENGINEERING INC.
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INTRODUCTION

At the request of Mr. Ron Netolitzky, I have done some initial interpretation and design work for the Eskay Creek property.

This report documents that work, records the conclusions and impressions and also makes suggestions for further work.

Given that the geological interpretation and the engineering are at a very early stage in this project, the conclusions must be taken in that context. However, I feel that more detailed work will confirm these original approximations.

SUMMARY AND CONCLUSIONS

1. The vast majority of the mineral inventory found to date is open pitable. This conclusion is based on an assessment of grade distribution and supporting stripping ratios.

   Almost all reserves are at a strip ratio less than 20:1 and consequently underground mining at these reserves would not be as economic as open pitting.

2. Although the ore body has a defined strike and dip, it is massive in nature and therefore this is a positive in open pit mining. It appears that an assay boundary will control cutoffs. Dilution should be no more than 8% and dilution material will be graded at about 0.015 Au equivalent/ton.

3. After calculating a rough pit design around the economic reserves, a grade of 0.28 oz/ton Au equivalent/ton (undiluted) was calculated. Applying a cutting factor and diluting by 8% the final ore reserve grade is estimated to be 0.26 oz/ton Au equivalent. The reserves are approximately 3,000,000 tons at 0.26 oz/ton Au equivalent.

4. A pit design estimate around the 3,000,000 tons of ore indicates that a stripping ratio of approximately 6:1 can be achieved.

5. Further exploration is continuing to the northeast of section 13. Good mineralization is being encountered.

6. Aside from the location of the property, pit development will be relatively easy and straight forward. Access and final ramping should always be from the hanging wall side of the ore. Waste disposal can occur in 360° around the ore zone, and elevations and dump locations can be optimized fairly easily.

7. A number of opportunities exist that have favourable economics, and should be pursued.

   i. Grade distribution appears to be consistent rather than erratic. Consequently the distribution of high grade and low grade could have a very important economic impact. It is likely that large tonnages of 0.35 - 0.40 oz/ton Au equivalent can be mined in the early years.

      The distribution of high grades is somewhat similar to Pine Point and Granisle in the early years. If exploited properly, the risks of location, metallurgy, and gold price can be minimized.

   ii. The geometric relationship of the ore zone and the pit design makes the mining sequence easily amenable to low ratio mining. Progressive cuts from the southeast to the northwest of the pit are feasible such that an increasing ratio occurs.

   iii. The geometry of the pit and ore zone is such that the pit can unfold in a 'porphyry copper type' manner. Selectivity, operating room and access is not a major concern. Consequently if the resource is opened up with ample room for development, very low operating costs should be realized. Regardless of which equipment is chosen, a very productive situation can be set up at all times.

      The above implies high grade, low ratio, and good unit costs in the early stages of the project. The combination can have a very powerful economic impact.

8. After reviewing grade distribution on the available sections, the following is suggested:

   i. Operating grade cutoff should be about 0.10 oz/ton Au equivalent.

ii. All material between 0.05 - 0.1 oz/ton equivalent should be stockpiled for future milling.

iii. Large blocks of material in the grade range 0.01 - 0.05 oz/ton exist within the pit. Consideration should be given to selective stockpiling of this material.

iv. Although selectivity is not a major concern, it should not be overlooked. Ore integrity is always important and particularly with high value ores. Selectivity will be more a function of stockpiling and pit development, rather than equipment selection.

9. The location of the property is a negative that will impact costs negatively. Mine planning, mine operating, and project development must be done on the terms of the weather environment. This is easily done, as the weather in general terms is predictable. Any attempt to resist the weather impact in open pit mining will result in failure. A suggested schedule is included later.

I would suggest that a close study of Skyline, Cominco's Snip, Newhawk and Premier Gold would bear good dividends for the planning of the Eskay Creek property.

A good study of the development of the Granduc Mine would also be worthwhile. Twenty years of operating in a similar environment is a powerful ally for planning the Eskay Creek property.

A good understanding of the Echo Bay Lupin mine and how Echo Bay operates the property would provide a very good plan for the Eskay Creek property.

10. It is anticipated that the milling capacity will be 1,000 tonnes/day or about 350,000 tonnes/year. Although this only gives a mine life of 8 years, it is anticipated that more reserves will be found to extend the life.

In my view, the location factor in terms of both capital and operating costs, imply a short operating life (say 10 years).

As soon as a commitment is made to the project, every attempt should be made to shorten the life and maximize the precious metal outflow on an annual basis particularly in the early years.

11. The capital cost for the property will be about $60,000,000. This includes $10,000,000 for location allowance and a 20% contingency. Good project development could bring the capital close to $50,000,000.

12. Total operating cost per tonne of ore will be about $40/tonne.

Mining	$12.00/tonne
Milling	18.00/tonne
Overhead	6.00/tonne
Head Office	3.00/tonne
	$39.00/tonne = $40.00/tonne

13. The value/tonne of ore is $95.00 based on $430/ounce gold price. Assuming a capital write off cost of $35.00/tonne for the first five years, an operating profit of $20/tonne can be made. This represents an annual profit of $7,000,000 after the capital allowance.

14. The mill should be run on a year round basis. However, the mine should only be run from April 1 to December 15 of each year. The mill can be fed by a front end loader and a single truck from the stockpile during the winter period.

BACKGROUND

The property is located in northwest British Columbia, in an extremely isolated location. At this time access is by air. Weather conditions are adverse. The resource is open pitable and the variables of isolation, capital cost, operating cost, high grade open pit ore, and weather constraints provide a challenging set of variables in order to provide the maximum profitability.

INITIAL ECONOMICS

In order to develop a preliminary pit design, the following assumptions and parameters were utilized:

i. Ore Reserves ~ 4,000,000 tonnes
ii. Strip Ratio ~ 7:1
iii. Mill Capacity = 1,200 tonnes/day
iv. No mining from December 15 - March 31 each year.
v. Total material requirements = 12,800 tonnes/day
vi. Equipment requirements
   a. 7 31 tonne trucks
   b. 4 988 sized loaders
   c. 1 30 R sized drill
   d. 1 14 G grader

On this basis the following costs were estimated:

Drilling	.20/tonne
Blasting	.30/tonne
Loading	.40/tonne
Haul	.40/tonne
Lubrication	.10/tonne
Grading	.30/tonne
Supervision	.20/tonne
	$1.90/tonne

Total Mining Costs = $1.90/tonne x 8 = $15.20/tonne ore

Milling	$15.00/tonne
Overhead	7.00/tonne
Head Office	4.00/tonne
	$41.20/tonne ore
+ 10%	$ 4.12/tonne ore
	$45.32/tonne ore
SAY:	**$46.00/tonne ore**

vii. Capital Cost:

Mine	$ 5 x 10^6
Mill	25 x 10^6
Shops	5 x 10^6
Inventory	2 x 10^6
Preproduction	3 x 10^6
Yards/Services	5 x 10^6
Tailings	5 x 10^6
+ 20% Contingency	10 x 10^6
	$60 x 10^6

viii. For pit design economics the following assumptions were made:

Payable Recovery =	85%
Gold Price =	$425/ounce U.S.
Exchange Ratio =	1.20
Au equivalent =	Ag x 0.015
Average grade =	0.25 ounce/tonne Au equivalent

ix. The following formulation was utilized to develop a breakdown stripping ratio:

Ore Cost =	$28.00/tonne ore
Waste Cost =	$ 1.90/tonne waste

$$\text{Breakdown Stripping Ratio} = \frac{\text{Value - Ore Cost}}{\text{Waste Cost}}$$

x. Supporting stripping ratios were calculated utilizing the above parameters as and determined to be:

TABLE 1

Au Grade Equivalent (ounces/tonne)	Value $	Supporting Strip Ratio
0.05	$21.68	loss
0.06	26.01	loss
0.07	30.35	1.23:1
0.08	35.00	3.7:1
0.09	39.00	5.8:1
0.10	43.00	7.9:1
0.11	48.00	10.5:1
0.12	52.00	12.6:1
0.13	56.00	14.7:1
0.14	61.00	17.4:1
0.15	65.00	19.5:1
0.16	69.00	21.6:1
0.17	74.00	24.0:1
0.18	78.00	26.0:1
0.19	82.00	28.0:1
0.20	87.00	31.0:1
0.21	91.00	33.0:1
0.22	95.00	35.0:1
0.23	100.00	38.0:1
0.24	104.00	40.0:1
0.25	108.00	42.0:1

Pit wall angles were assumed to be 45° for the following reasons:

a. Weather will be hard on the walls.
b. Rock types outside of the ore should be competent at greater than 45°.
c. Very little knowledge at this time on joints/faults.
d. Dip slope situation minimizes the wall exposure.
e. Geometry of the pit allows for intermediate pits and consequently minimum exposure beneath a long term highwall.
f. Ramps will be narrow with small equipment.

ORE OUTLINES

On 27 sections, on which gold and silver assays have been plotted, the ore and waste zones were colour coded as follows:

0.01- 0.05	ounces/tonne	Au equivalent	yellow
0.05 - 0.10	ounces/tonne	Au equivalent	blue
0.10 - 0.15	ounces/tonne	Au equivalent	orange
0.15 - 0.25	ounces/tonne	Au equivalent	pink
> 0.25	ounces/tonne	Au equivalent	red

Topography was plotted on sections 1-13 and R. Netolitzky interpreted the ore zone, and defined ore outlines on the sections as well as plotted limited geology. Ore outlines were defined generally to the 0.05 Au equivalent assay boundary. Composite assays over the ore intersections were plotted. Salient features of the ore zone are as follows:

i. The ore body strikes northeasterly and dips at about 45° to the northwest.

ii. Economics and sorting control will be determined by assay control rather than structural controls.

iii. The ore body can be very thick and massive. Dilution will not be a problem with respect to the mining technique. The ore zone is similar to porphyry copper or Mississippian Valley type deposits in that large high grade areas exist (as well as low grade areas) that can be extractable. The persistence of the high grade zones imply that they are not erratic but are rather continuous.

It is not likely that under these conditions, extensive cutting will be required.

The proportion of surface area to volume is low and consequently dilution should be quite low.

At sometime in the future, a geostatistical evaluation of the ore zone should be done, such that percentage of grade levels and confidence levels can be quantified.

iv. It is noticeable when evaluating the assay sections that large quantities of 0.02 - 0.03 Au equivalent material exists within the pit design. This material could be economic and should be stockpiled.

PIT OUTLINE

The pit outline was laid out on Sections 1 to 13 as shown in the green outline. The walls are generally at 45 degrees except when the footwall angle is less than 45 degrees.

The location of the pit walls were determined by the supporting stripping ratios, as shown in Table 1 and the ore outlines.

In general, the determination of the pit outline was fairly easy because:

i. Anticipated grades of the ore body boundary are sufficiently high to easily support the waste to the topographic surface.
ii. The vast majority of the ore at the ore body outline is less than the approximate limiting ratio of 15 to 20:1.

An aggressive approach was taken to the location of the pit design location. It is anticipated that exploration will find more ore which will be within the limits of open pit economics, rather than underground reserves.

The rationale for this is that grades, and the geometric relationship of the ore zone with respect to a favourable topographic setting indicates that further ore will be open pitable rather than in the underground classification.

The stripping ratio includes a higher estimate of waste at the northeast and southwest corners of the pit as well as extra waste for ramping.

AVERAGE ORE GRADE

The average grade was calculated by weight averaging the intersections on a cross sectional method. The uncut weighted average of all intersections is 0.28 oz/ton Au equivalent. This figure has been cut to 95% of that value, or 0.258 ounces/tonne Au equivalent.

Dilution has been calculated to be 6.7%. This estimate was based on an anticipated dilution thickness of 0.61 metres on all boundaries. Dilution grade is estimated to be 0.015 oz/ton Au equivalent. The dilution estimate is selected to be 8% at 0.015 oz/ton Au equivalent.

A sectional calculation indicates reserves of 2,800,000 tons at 0.28 oz/ton Au equivalent. Based on limited measurements, a specific gravity of 2.8 was used.

	2,800,000 @ 0.28 oz/ton
[8%] Dilution	224,000 @ 0.015 oz/ton
Total Ore:	3,000,000 @ 0.26 oz/ton Au equivalent

CAPITAL COST

Assumptions:

i. Mill Capacity = 1,000 tonnes/day
ii. Stripping Ratio = 6:1
iii. Mine Operating Day/Year = 252 (April 1 - December 15)

31 tonne trucks	5 x $200,000	=	$ 1,000,000
988 sized loaders	2 x $456,000	=	900,000
grader (146)	1 x $300,000	=	300,000
1 30R Drill	1 x $600,000	=	600,000
2 D-8's	2 x $400,000	=	800,000
Fuel/Lube	1 x $200,000	=	200,000
Pumps/Pipe		=	100,000
Blasting		=	100,000
Pick-ups/Lights		=	100,000
Total Mine Equipment		=	**$ 4,100,000**

Mill	=	20,000,000
Shops	=	3,000,000
Tailings	=	3,000,000
Yards/Services	=	4,000,000
Inventory	=	2,000,000
Preproduction Development	=	3,000,000
Total Surface	=	**$35,000,000**
Total Mine	=	**$39,100,000**
+ 20% Contingency	=	7,820,000
Total	=	**$46,920,000**
Road Development, Power Lines, Location Factor	=	10,000,000
GRAND TOTAL	=	**$56,920,000**
SAY	=	**$60,000,000**
		for 1,000 tonnes/day mill

The capital cost is very high and is a strong indication of the location factor. This is one of the reasons that precious metal content must be maximized on an annual basis and particularly in the early years. Because of the location factor this is more important than the 'long life at mine factor'. The trick is to 'get in, do a job, and get out' and take the high salvage value on the equipment.

OPERATING COSTS

After reviewing the mining situation, the following costs are estimated. The simplicity of mining, short haul anticipation, large waste blocks, simple ore mining and single pit situation has led to a downward revision of the open pit mining costs.

Mining	$/Tonne
Drilling	$0.20
Blasting	.20
Loading	.35
Hauling	.30
Lubrication	.05
Grading	.25
Supervision	.20
	1.55
+ 10% Contingency	.16
	$1.71

Total Mining Cost =	$1.71 x 7 =	11.97
		= 12.00/tonne ore
Milling		= 18.00/tonne ore
(revised upward because of anticipated metallurgical problems)		
Overhead		= 6.00/tonne ore
Head Office		= 3.00/tonne ore
TOTAL		**=$39.00/tonne ore**
SAY		**=$40.00/tonne ore**

This is a reasonable cost given the location and the highly productive mining situation. Manpower complement should be approximate as follows:

Mine	44
Mill	16
Maintenance	15
Surface	6
Staff	20
	101 Employees

GENERAL COMMENTS AND SUGGESTIONS

1. It is anticipated that weather will be very adverse in the Eskay Creek area. A thorough understanding of the weather and location should lead to the best operating mode. The following is a suggested strategy:

- single status for all employees
- two crews in and two crews out at all times for the mill (Lupin style) and surface
- mine only from April 1 - December 15
- initial stockpile to be developed by preproduction development is 150,000 tonnes (i.e. 5 months)
- stockpile to be maintained by accelerated mining from April 1 - December 15
- one 988 sized loader plus one truck to feed mill on single shift basis during the winter
- accelerated open pit equipment maintenance during the winter.

March 15 - April 1
- snow removal from roads
- road from pit to mill opened up
- short waste haul roads open up
- areas in pit to broken ore and waste reserves open up
- tram to the mill from the stockpile
- staff continue office duties

April 1 - June 1
- simple short haul of broken waste and ore
- open up benches for drilling
- continue to open up longer hauls
- mill is fed from both the stockpile and the pit
- drilling maximized by May
- all staff are field oriented

June 1 - September 30
- longer and most complicated hauls
- highly productive period for all mining equipment
- some development work done during this period

- stockpile to be rebuilt to 150,000 - 200,000 tonnes
- mill fed predominantly from the pit
- very little maintenance other than preventative maintenance and servicing
- all staff are field oriented

October 1 - December 15

- simple short haul situation
- development intensive period
- drills pushed to maximum so that maximum blasted inventory exists by December 15
- road lengths to be minimized
- mill fed from the pit predominantly
- maintenance maximized
- all staff are field oriented

December 15 - March 15

- mill fed from the stockpile
- christmas holidays and other holidays taken by mine crew
- training program period
- maximize mine maintenance
- all mine equipment to be worked on at the shop area
- period of time for budgeting, planning, reconciliation, reserves, and mine planning
- all staff are office oriented
- 'tired equipment' to be brought up to top notch form by extensive maintenance
- mill fed from stockpile
- limited equipment used on stockpile and mill and office site snow removed.

The above suggested schedule conforms to the location and weather conditions. It is a schedule that requires:

i. First class planning
ii. Thorough understanding of the weather
iii. Commitment to certain styles of mining and development, up to 9 months ahead of the benefit of the activity. This has a capital cost.

iv. Personnel that are willing to adapt their activities to the location problem and the weather conditions. [This is easier said than done. In my experience personnel would rather adapt the project to their past experience rather than adapt their experience to the uniqueness of the project.]

However, the benefits are well worth the extra up front capital cost and planning:

a. Minimum mine operating cost
b. guaranteed ore delivery to the mill
c. mine operations under the best conditions available
d. minimum abuse to equipment
e. least stress situation for employees.

2. 'Go to school' on Premier Gold, Newhawk, Skyline, Snip and Lupin, and adapt the best parts to the uniqueness of the Eskay Creek property.

3. A very good opportunity exists to:

i. responsibly high grade
ii. responsibly low ratio
iii. mine like a porphyry copper

in the early years. This is very practical on the Eskay Creek property, and the economic impact could be very powerful. It can be done without compromising ore resources or costs.

4. My gut feel is that additional ore to be found will be open pitable rather than underground. Consequently, I don't see much of an underground opportunity at this time.

However, if this is incorrect, and a significant percentage of the overall resource falls into the underground category (i.e. greater than 20:1 stripping ratio), then consideration should be given to underground mining at the same time as open pit mining.

An opportunity might exist to mine underground during the winter and utilize the open pit equipment. If this is the case, then this should be known prior to the purchase of the open pit equipment.

5. Much of the above concepts are speculative and perhaps premature. However, it gives a framework and confidence level for exploration and project development.

   It also gives a model and style to the property, which will undoubtedly change with more sophisticated geology and engineering.

6. On the balance of grades, reserves, potential reserves, capital costs, operating costs and location, the project can be economic at very low gold prices.

   I see very little risk in this project.

7. For the purpose of this study, payable recoveries are assumed to be 85%. It has been assumed that the metallurgy will allow this.

D.J. Barker
May 31, 1988