DEPARTMENT OF INDIAN & NORTHERN AFFAIRS, MINERAL RESOURCES BRANCH

ELSA PROPERTY ASSESSMENT

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Elsa Property Assessment

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1. EXECUTIVE SUMMARY

Hatch has been commissioned by DIAND to carry out a desk-top study to assess the economic viability of reopening the Elsa Mine and the feasibility of reprocessing the existing tailings at the Elsa minesite. Hatch has reviewed two studies compiled by UKHM presenting the feasibility of reopening the Elsa mine and detailing the proposed changes to the mining methods for the two major orebodies, Bellekeno and Silver King.

The proposed changes in mining methods for the Bellekeno and Silver King orebodies, from track drifts using small equipment to mechanized cut-and-fill and shrinkage stoping respectively appear appropriate for the nature of these orebodies, and should result in significantly improved productivities over those attained previously. However, it is Hatch's opinion that additional allowances should be made for bad ground and dilution that will likely result in higher mining costs and lower ore head grades than indicated in the UKHM's studies. The mining costs developed by UKHM reflect only the costs for mining the Bellekeno and Silver King orebodies, and do not consider the different cost structures for mining the additional satellite mines which form part of the resource base. This inconsistency needs to be addressed to reduce the risks of higher than expected costs associated with mining these ore bodies.

A number of modifications to the process plant have been proposed, supported by limited bench scale metallurgical testwork, conducted mostly on Bellekeno ore. Additional testwork is required on Silver King ore to confirm the best process for treating the graphitic silver concentrate. The modifications proposed - the incorporation of a unit flotation cell, separate grinding and flotation circuits for the Bellekeno and Silver King ores and a pressure filter - are appropriate. No metallurgical test work has been reported on the ore from the proposed satellite mines or future extensions of the Bellekeno and Silver King orebodies, which constitute approximately 70% of the proposed mill feed.

Hatch has assessed the capital and operating costs for the proposed operation by examining the major cost drivers in terms of current costs, the reasonableness of the assumptions regarding consumption rates and manning levels and the adequacy of the estimates presented. It is our opinion that the estimates for capital and operating costs as presented are optimistic, and that these costs should realistically be approximately 46% and 20% higher respectively.

At current metal prices, the Elsa mine project shows a negative rate of return, based on the parameters in the 1996 UKHM Study. Utilizing Hatch's estimates for the capital and operating costs appropriate for this operation, the project only breaks even at a silver price of about U$7 per ounce. The project is significantly more sensitive to operating than capital costs, and it is in this respect that the robustness of this project has to be assessed, especially in view of the potential for substantial additional costs for ground support, lower ore feed grades due to higher ore dilution, higher costs than anticipated for reserve replacement, and the metallurgical recovery uncertainties.

Reprocessing Elsa tailings by cyanidation or gravity concentration require significantly higher silver prices before being considered economic. Additional testwork and engineering may be warranted to confirm the metallurgical and cost parameters, especially for the gravity recovery option which offers the potential for comparatively low capital and operating costs.

It is unlikely that the demand for silver will significantly increase until the major world economies recover from the present recession. Most of the global mined silver production is a by-product of base metal production, which is also likely to increase when world economic conditions improve. Current forecasts for silver prices in the short to medium term in the range of U$4.50/oz to U$5.00/oz seem realistic and we recommend that the viability of this project should be determined in this price range.

The UKHM Study minesite cash operating cost estimate of U$4.1/oz seems low when benchmarked against similar North American underground, high grade, narrow vein mines, which are more typically about U$4.50-U$5.0/oz (equivalent silver basis).

2. SCOPE OF WORK

The United Keno mining camp is an historically prolific producer of silver, lead, and zinc that has seen several periods of sporadic activity over almost a century since silver was first discovered in the creeks near what is now the Silver King property. Since 1947, it is estimated that the district has produced in excess of 148 million ounces of silver plus significant lead-zinc-cadmium by-products from numerous small deposits occurring over a 20-25 km belt of favourable quartzite host rocks.

With the downturn in silver prices in the late 1980s, the properties were put on care and maintenance pending better economic conditions and a re-appraisal of the operating parameters of some key resources, particularly at the Bellekeno and Silver King properties. Following a court decision in 2001, the original assets of United Keno Hill Mines Limited (UKHM) were acquired by AMT Canada Inc. (AMT) who are proposing to bring the Elsa operation back into production on the basis of additional resources defined in a 1994/95 exploration program, a revised mine plan, and possible re-processing of tailings deposits using ATM's proprietary Eagle Concentrator technology.

This report sets out Hatch's technical and financial assessment of the Elsa property commissioned by the Mineral Resources branch of the Department of Indian and Northern Affairs in a letter dated December 14th, 2001.

The principal objectives of this study have been to:

- complete a desktop evaluation of all the relevant technical data.
- update costing and provide a first-pass feasibility analysis of the project at current metal prices.
- determine the economic feasibility of re-processing the tailings.
- benchmark the estimated costs of production against similar operations.
- provide an update of current price projections for silver (including world supply and demand forecasts).
- produce a final report summarizing this information.

The study was completed in Hatch's Vancouver office during January and February of 2002 entirely on the basis of two reports (the UKHM Study) provided by DIAND, as follows:

- Draft Pre-feasibility Study of Resumption of Production, February 23, 1996 (UKHM).
- Mine Reopening – Operating Plan, August 15, 1996 (UKHM).

Additional material for the study was provided from our own experience with similar, narrow-vein precious metals deposits and from contacts in Industry who provided operating cost and benchmarking information for comparison against the pre-feasibility study estimates. Unless otherwise sated, the metric system is used throughout this report and all units are expressed in metric terms.

3. GEOLOGY, RESOURCES, AND RESERVE ASSESSMENT

3.1 Geological Setting

The lode deposits of the United Keno Hill mining camp are found associated with a favourable quartzitic horizon of Mississipian age in the northern Selwyn Basin of western Canada. The local stratigraphy is believed to be controlled by thrust fault structures interpreted at the upper and lower contact of the Central Quartzite unit where it is found in contact with thick sequences of schist and meta-sedimentary rocks. Various conformable sills and dykes have been mapped in the area and towards the eastern limit of the Central Quartzite unit a prominent granitic plug has been interpreted as a possible source of the mineralizing fluids.

Economic occurrences of mineralization are almost entirely confined to the Central Quartzite unit that has a thickness of some 700m. Over a east-west striking belt of ground, over 60 individual vein systems have been mined over the district's one hundred years of activity. The veins are found in several styles from sheeted lenses to cymoid loops or individual shoots dipping steeply to the southeast. Underground mapping has shown that favourable conditions for mineral deposition occur where vein systems changing strike and/or dip, at the junction of vein structures, or where the Central Quartzite meets the Upper Schist contact. Brittle deformation of the competent quartzites has been put forward as the controlling mechanism for dilation along fault structures and deposition of mineralizing fluids at high temperatures.

Payable zones or shoots typically occupy only a small percentage of the surrounding vein structures making for difficult exploration targets that can only be tackled by underground development in drifts, cross-cuts, and raises. Individual shoots are generally more continuous vertically than horizontally and are separated along strike by low-grade or waste vein material. Post-mineralization crosscutting faults and fractures add to the geological and structural complexity of the deposits and account for the difficult ground conditions in which the mining operations have to take place.

Principal ore minerals are ruby silver, silver-bearing galena, and various sulpho-salts in a gangue of siderite and quartz. Two stages of mineralization have been recognised within the vein systems with the second (later) stage providing the bulk of the economic quantities.

3.2 Recent Exploration

A complete review of past work at United Keno was undertaken by Watts, Griffiths, and McOuat (WGM) in 1994 through 1996 and included a C$10 million program of exploration and underground development directed principally at the Bellekeno and Silver King properties (also Husky SW). Some 18,000m of drilling and 730m of underground development were completed during this period leading to the definition of an additional 214,000t of resource in Measured, Indicated, and Inferred categories at the Bellekeno and Silver King properties.

On completion of their exploration program, WGM reached a favourable conclusion regarding the exploration potential around the United Keno camp, based principally on:

- the limited extent of past underground exploration compared to the depth potential depth of the favourable Central Quartzite unit
- comparison of the Bellekeno and Silver City geology to that of the prolific Calumet mine that produced in excess of 95 million ounces of silver, and

- the potential around several other abandoned sites as sub-parallel vein structures, and/or extensions to past ore blocks

Given the nature of the vein occurrences at Elsa and its long history of sporadic production, it is reasonable to expect that additional sources of vein mineralization can be defined either as extensions to existing structures or as separate veins in the vicinity of abandoned mines. The style of mineralization will however continue to be narrow-vein, erratic, and high-cost as it has been over the history of the district.

3.3 Resources & Reserves

Resources on the various properties making up the Elsa project are based on sample information from percussion drilling, diamond drilling, and development both in drifts and raises from which chip and channel samples have been collected. Estimation on longitudinal sectional using standard polygonal methods have been used to block out ore blocks, and is a method that has been applied for some time in the district.

Hatch has reviewed the description of the resource estimation procedures used by UKHM, and concludes that the basic methodology is sound based on the limited information available. Suitable interpretation methods and projection of grades seem to have allowed for in the company's estimation and can be accepted as being reasonable for this level of investigation.

In their 1994-96 work, WGM reviewed the resource statements issued at the time of the mines' closure in 1988 and re-classified them according to the Australian (JORC) system. Including 214,000t of resource resulting from their 1994 exploration programs (approximately 50% in Measured and Indicated), WGM provided the following resource statement as of December 31, 1995:

Elsa Property in situ Resources (WGM, 1995):

Category	Property	Tonnes (000's)	Ag, g/t	Pb %	Zn %
Measured & Indicated	Bellekeno, SK, & Husky SW	213.0	1,213	7.1	4.9
	Others	107.3	775	4.5	0
Inferred	Bellekeno, SK, & Husky SW	175.9	1,117	8.8	5.5
	Others	107.3	775	4.5	0
S/totals	Bellekeno, SK, & Husky SW	388.9	1,170	7.9	5.2
	Others	214.6	775	4.5	0
GRAND TOTAL	**All properties**	**603.5**	**1,030**	**6.7**	**3.3**

In the absence of detailed information on "Other" properties shown above, HATCH has assumed that the figures quoted by WGM are split evenly between Measured & Indicated (50%) and Inferred (50%) categories, on a *resource basis* only.

In projecting *mineable* quantities from this resource base, the UKHM Study does not consider adjustments to allow for common mining factors such as dilution and mine recovery, but instead relies on historical Mine Call Factors (used by the mine operators to convert resources to reserves). While this was a reasonable approach in the past when extensive production records were available, the proposed change to shrinkage and mechanized cut-and-fill mining methods with larger equipment means that these historical factors may now not be entirely valid. To allow for shrinkage stoping in particular, Hatch has therefore deducted 10% from the Silver King silver resource grades as shown in the reserve table below.

It is also noted that several comments are made in the UKHM Study regarding the lack of economic support for properties classified as "Other" in the table above (consisting of numerous small, satellite occurrences of mineralization). Therefore given this imprecision, Measured and Indicated *resources* for the "Other" properties have been re-classified as "Possible" in Hatch's reserve statement of Mineral Reserves, as follows:

Elsa Property Mineral Reserves (Hatch, 2002):

Category	**Property**	**Tonnes (000's)**	**Ag, g/t**	**Pb %**	**Zn %**
Proved & Probable	Bellekeno	136.3	1,179	10.5	7.6
	Silver King	32.0	1,302	1.4	-
	Husky SW	44.7	1,037	0.8	-
	s/total Proved & Probable	213.0	1,168	7.1	4.9
Possible	All properties	390.5	929	6.4	2.5
GRAND TOTAL		**603.5**	**1,013**	**6.7**	**3.3**

Note that Proved and Probable reserves represent only 35% of the total for the property as estimated by UKHM (but all categories are included in this 5-year cash flow analysis).

4. MINING

4.1 Past Mining Practices

Historically, mining at Elsa was typical of narrow vein underground mining. Track drifts, using small equipment, followed the mineralized structures, found in shear zones or highly fractured faults. Support in the drifts consisted primarily of timber sets. Battery locomotives were used to haul ore and waste from the stopes and development headings to ore and waste passes, for hoisting in mine shafts to surface.

Square-set stoping, usually without fill, was the principal mining method utilized in the past at Elsa. With this method, there was no drainage of the water encountered in the fractured and sheared zones prior to development and mining, contributing to the poor ground conditions. The overall effect was labour intensive with low productivity, resulting in extremely expensive mining.

4.2 Proposed Practices

Under the proposed operation, significant changes have been outlined in mining of these deposits.

Access to the mines would be obtained by adits driven into the hillside, with trackless equipment. The drifts and crosscuts would be located in the more competent footwall quartzite. Access to the mineralized zones is obtained by crosscuts driven off the main ramp, also with trackless equipment. With the better ground conditions encountered in the footwall quartzite, rock bolts and straps are adequate for support.

The use of trackless development ahead of mining allows the sheared and fractured veins to be drained prior to mining. Support in areas with poor ground conditions, usually encountered in and around the mineralized zones, is to be provided by steel reinforced shotcrete.

There are also major changes proposed in the mining methods. Mechanized cut-and-fill, with waste rock fill, has been proposed for Bellekeno. There has been one trial, which wasn't completely successful, but poor performance was blamed on untimely placement of shotcrete.

Shrinkage stoping has been proposed for the narrower zones, particularly at Silver King. There have not been any trials of shrinkage stoping. The success will depend largely on the effectiveness of the proposed ground support, in particular, of the hanging wall. If the ground conditions are good, or support is effective, dilution could be kept within reasonable limits. In any event, dilution with shrinkage stoping will be higher than with square-set. As a minimum, a 10% dilution factor for the shrinkage mining is recommended and has been is applied to the resource/reserve estimate.

Productivity would be substantially higher than in the previous mining method, which was based on mining from square-set stopes.

There is every reason to expect that the change to trackless mining would be successful in recovering the reserves as stated. The use of shrinkage stoping could, however, be questionable in some areas where caving is encountered.

4.3 Scenarios

The UKHM Study is based on the geological resource outlined in a WGM report. However, as indicated in Section 3, the Measured and Indicated Resources at Bellekeno and Silver King are limited.

4.4 Production Rate

The UKHM Study is based on an annual production of 115,920t, with 78,750t from Bellekeno and 37,170t from Silver King initially.

The proposed production rate from these two mines is reasonable and achievable.

4.5 Mine Call Factor

Historically, a factor was applied to the grade of reserve/resource blocks, but not the tonnage, to provide a correlation with mill heads. The factors can be expected to be entirely different with the change in mining methods. Historically at Elsa, a mine factor of 1.0 has been used which is not typical of other mining operations. We recommend that a dilution adjustment of 10% be incorporated for the shrinkage mining areas, as has been reported in Section 3.

4.6 Dilution

Historically, only a minimal percentage was included for dilution in the mining reserve. With the proposed mining methods, a higher percentage will have to be considered as discussed above.

4.7 Current Conditions

The UKHM Study was completed in 1996. The current state of the mines, in particular dewatering, is not known.

There will also be a need to re-build a mining crew with experience in narrow-vein operations.

4.8 Bellekeno

The Bellekeno mine is located some 16 km by road to the east from the mill at Elsa.

Access to the underground is via an adit collared on the hillside at the 1160 m elevation (600 level). There are, also, older adits at the 100 and 200 levels where some mining was undertaken during the late sixties.

The 600 level was originally developed for conventional track haulage. Trackless equipment was utilized to drive a decline from the 600 level, which currently extends down at 15% gradient to the 800 level.

Under the proposed mining plan, a new portal would be collared at the 1204 m elevation. A new decline would be driven down at 15% gradient to connect the existing workings at the 1136 m elevation.

Surface installations required at the portal would include, as a minimum, a layout area, electrical panel, air compressor, ventilation fan, settling sumps and a waste dump.

Mechanized cut-and-fill is proposed for the 48 and Southwest zones at Bellekeno. Access to the ore zone would be from short cross-cuts driven from the decline located in the footwall. A lift would be mined by breasting each way along strike from the cross-cut. After completion of a lift, waste rock would be used as fill. The waste rock would be levelled and compacted using a blow-pipe or packer. The back of the crosscut would be slashed to provide access to the next lift.

Shrinkage stoping is proposed for the 99 zone at Bellekeno.

Access to the veins is by crosscuts driven from the decline located in the footwall of the ore zone. A drift would be driven along the strike of the vein. Stope raises would be driven up to the next level. Drawpoints at 8 m centres would be established at the bottom of the stopes.

Ground support would be provided by shotcreting the back and walls as required every second breast.

4.9 Silver King

The Silver King mine is located some 5 km by road southwest from the mill at Elsa.

The adit at the 100 level was originally developed for conventional track haulage. Trackless equipment was utilized to drive a decline at 15% gradient from the 100 level at the 860 m elevation, which provides access to the mineralized zones on the 300 level and below.

Under the proposed mining plan, a new portal would be collared within the small open pit at the 860 m elevation. A new decline would be driven down at 15% gradient to connect the existing workings at the 838 m elevation.

Shrinkage stoping is proposed for the narrow veins at Silver King. Some remnants above the 300 level would also be mined by Shrinkage.

As at Bellekeno, access to the veins is by crosscuts driven from the decline located in the footwall of the ore zone. A drift would be driven along the strike of the vein. Stope raises would be driven up to the next level. Drawpoints at 8 m centres would be established at the bottom of the reserve blocks.

4.10 Other Mines

While the UKHM Study described the proposed mining operations at Bellekeno and Silver King in some detail, the other operations are not. For the most part, the mineral resource data and other information are obtained from historical records at United Keno Hill. There is no reason to doubt the validity of the information.

The operations for these mines are described but the technical and the capital and operating cost parameters are not developed which adds to the potential risk in projecting mining costs from Bellekeno and Silver King to these ore bodies.

4.11 Ore Haulage

In the study, it is proposed that broken ore would be hauled from the stope directly to the mill using 14 t underground haul trucks. This equipment is not generally adapted to the needs of a surface haul, particularly in freezing winter temperatures.

4.12 Pre-Production Development

The only development included in the UKHM Study is as described above. There does not appear to be any allowance in the declines for remuck bays, safety stations, etc., which would add some 10 % to the overall length.

It is not clear where the site preparation and surface installation required at the portals are included in the pre-production requirements. At least some of the site preparation work has been done already.

- **Bellekeno:**
  - A new access ramp, with 460 m of decline Bellekeno
  - Vent raise 36 m
- **Silver King:**
  - A new access ramp, with 202 m of decline
  - Vent raise 73 m
  - Rehabilitation of the 100 level.

4.13 On-Going Development

Given the lateral extent of the mines, and the relatively small size of the reserve blocks, the development requirements are relatively high.

A significant portion of the on-going development needs to be considered with the exploration requirements.

Waste Development

The annual access ramp requirement at Bellekeno is estimated in the UKHM Study to be 355 m. There is no allowance for remuck bays, etc. in this requirement. In addition, there does not appear to be any provision for stope access other than off the access ramp or for other development, a serious deficiency. The provision for stope access crosscuts is calculated as slash equivalent of access for three stope lifts or 475 m, which should be conservative. There is an additional 410m for exploration drift and ventilation raises in the estimates. This development is to be accomplished by one 3-person crew.

All of the annual Access ramp, level development and stope access at Silver King are estimated to amount to 1095 m. There is an additional 380 m for ventilation raises and exploration. This is more than would typically be accomplished by one 3- person crew.

4.14 Operating Requirements

The operating requirements for the proposed mining operations at Bellekeno and Silver King are presented in some detail. As a result, it is possible to assess the technical parameters and inputs with some confidence.

The productivities for most of the underground work, including both the Mechanized Cut-and-Fill and Shrinkage stoping, seem to be reasonable overall.

Stope Development

For the Mechanized Cut-and-Fill at Bellekeno, the provision for the annual stope block development in ore at Bellekeno is estimated in the study to amount to 1585 m of drift, based on three lifts per access crosscut. There is only 1240 m of drift in the estimates, presumably because it is expected that, at times, more than three lifts would be accessed from the crosscut.

All of the annual stope block development for the Shrinkage stoping at Silver King is estimated to amount to 427 m of drift and 533 m of raise. This is substantially more than can be reasonably accomplished by the one-person crew proposed in the UKHM Study.

Stoping

At Bellekeno, a 3-person crew is projected in the study to produce 16.8 tons per manshift. The productivity is reasonable.

Based on the 3-person crew for the shrinkage stoping at Silver King, the productivity appears to be 23 tons per manshift. With the narrow stope blocks and the shotcreting requirement, productivity is likely to be lower than that proposed in the UKHM Study.

Particularly with the Shrinkage stoping, there does not seem to be sufficient allowance for bad ground and dilution. If bad ground were encountered, as seems likely, a stope could be lost to production temporarily, perhaps even permanently. In order to mitigate the risk of loss of production temporarily or permanently for a particular stope, it would be necessary to have additional stopes prepared and ready for mining.

We recommend that a reasonable contingency be applied to the mining operating costs to cover the weaknesses identified.

5. METALLURGY AND PROCESSING

5.1 Metallurgy

The UKHM Study largely referenced a series of bench scale metallurgical testwork, and some historical production data to substantiate the projected basis for metal and basis recovery and plant performance. None of the detailed testwork data was available for review in the reports, except in the case of the tailings reprocessing investigation. The testwork carried out to support the UKHM Study has not been extensive - 5 and 15 bench scale flotation tests respectively for Bellekeno and Silver King ores, and it is not clear whether these are locked or open cycle tests. The UKHM Study recommends additional testwork to optimize chemistry, evaluate recoveries at varying head grades and operating conditions.

The key metallurgical points relevant to the processing of the primary sulphide orebodies at UKHM are as follows:

- Bellekeno ore is not complex and good separation between galena and sphalerite can be achieved by flotation, typical of Industry practice, by initially depressing the sphalerite to recover a predominantly galena product and subsequent reactivation of the sphalerite to recover a predominantly sphalerite product. Cyanide is not required as a depressant. The silver deportment appears to be largely as solid solution in galena. These criteria support the high silver and lead recoveries indicated in the UKHM Study, and appear reasonable in light of the recent historical production data.

- A comparatively coarse grind of 40% to 50% passing 75 micron is adequate to achieve good mineral separation for Bellekeno and Silver King ores.

- Silver King ore contains graphitic schist, which is readily floatable and results in a low-grade silver, lead and zinc concentrate, containing approximately 30% of the silver. Testwork to depress the flotation of graphite and slimes appear to have been unsuccessful to date. Galena and sphalerite flotation is straightforward after the removal of the initial graphitic concentrate. The graphitic concentrate can be upgraded by cleaning and could possibly be marketed separately, or possibly blended with the silver-lead concentrate.

- The UKHM Study states that laboratory testing has not yet advanced to the point where the Silver King flowsheet can be fixed.

- Silver King ore contains significantly lower zinc grades than the Bellekeno ore, and will probably not justify a separate zinc concentrate circuit.

- The UKHM Study states that no concentrate regrinding is required, based on optical mineralogical studies. We suggest that in practice, the concentrates (especially the silver-lead concentrate) will likely benefit from regrinding to further upgrade the concentrate and reduce the mass for transportation.

- No metallurgical testwork on material from other orebodies was reported. This is a serious deficiency as the proven reserves form only approximately 30% of the total, and consequently the metallurgy of a substantial portion of the proposed ore is not known with any great degree of confidence.

The thrust of the recent Silver King testwork was to investigate the feasibility of blending the Bellekeno and Silver King ores. However, the UKHM Study is based on separate silver-lead flotation circuits for each ore type, due to the presence of the graphitic schist in the Silver King ore. This approach will better guarantee the silver-lead concentrate grades and allow for better metallurgical and optimization of the individual circuits.

The expected metallurgical recoveries and concentrate grades shown in the UKHM Study for each orebody are summarised below.

		oz./t	Assay %		Distribution %		
Product	**Wt. %**	**Ag**	**Pb**	**Zn**	**Ag**	**Pb**	**Zn**
Bellekeno Ore							
Ag/Pb Concentrate	15.3	193.4	64.0	5.1	85	90	10
Zn Concentrate	13.9	20.0	3.9	48.0	8	5	85
Total Concentrate	29.2				93	95	95
Tailings	70.8	3.5	0.8	0.6	7	5	5
Feed	100.0	34.9	10.9	7.9	100	100	100
Silver King Ore							
Ag/Pb Concentrate	4.4	662.1	55	2.8	85	80	20
Zn Concentrate	0.5	339.7	12	48	5	2	40
Total Concentrate	4.9				90	82	60
Tailings	95.1	3.6	0.6	0.3	10	18	40
Feed	100.0	34.0	3.0	0.6	100	100	100

Prudent practice in scaling up laboratory recovery results in the plant scale is to derate the laboratory recoveries by 2% to 3%, and we generally recommend that the financial evaluation be carried out utilizing these derated recoveries. However, in this case the laboratory data are not presented, only the summary above.

5.2 Processing

The proposed concentrator essentially utilizes the existing equipment as much as possible, with relatively minor modifications. The plant will have the capacity to treat 450 tpd of ore, although the UKHM Study contemplates operating at 315 tph.

The proposed process route of maintaining separate grinding and primary flotation circuits for each ore type requires separate ROM storage bins, crushing the ores in campaigns, separate crushed ore bins, grinding and primary flotation circuits. In light of the metallurgical differences between the ores, this approach is logical. Due to the configuration of the existing plant, this is entirely feasible with relatively minor circuit modifications. We can make the following recommendations with respect to the proposed circuit:

- We concur with the inclusion of a unit “flash” flotation cell into the Bellekeno grinding circuit to remove the fast floating silver-lead minerals into a high grade concentrate to prevent overgrinding of these minerals. This should maximize the potential for silver-lead recovery with this ore.

- We recommended that a pressure filter be added to achieve a lower moisture content in the concentrate products, to reduce the mass for transportation will prove economical. The UKHM Study states that the proposed vacuum filter should achieve a product of less than 10% moisture, despite the statement that prior to shutdown moisture contents of +15% were typical. The pressure filter would also likely handle a finer concentrate, which in our opinion, is a likely consequence of future testwork to optimize the Silver King and Bellekeno concentration circuits. The UKHM Study suggests that the most attractive option for concentrate transportation would be to combine with Anvil Range's production and ship in bulk. However, it would be imprudent to assume that Anvil Range will be brought back into operation at the same time as UKHM. For the other proposed options for concentrate transportation – hauling to Skagway, barge to Vancouver and onward shipment by rail or ship, or bagging and trucking to Cominco's Trail smelter – a reduced mass and volume for transport would likely prove more economical attractive.

- We have not assessed the adequacy of the of the existing tailings containment areas, as there is insufficient information presented in the UKHM Study, to do so.

6. CAPITAL EXPENDITURES

6.1 Mine Equipment Costs

The UKHM Study includes an estimate of C$1.88 million for various pieces of underground mine equipment. The following major items represent 65% ($1.22 million) of the total:

- one drill jumbo
- 6 scooptrams varying from 1.25 to 3.5 cu yd bucket size
- 3, 15t underground trucks

If purchased new, these major items would collectively cost about $4.1 million, or over 3 times that included in the UKHM estimates. However given the short mine life of only 5 years, used equipment would be considered, and on this base Hatch's enquiries indicate that this same list of equipment could currently be acquired for about $1.5-$1.75 million, or 20-40% more than estimated in the 1995-96 UKHM Study.

Hatch's analysis of the costs for the underground mine equipment required for a re-start at Elsa is that these should be 20-40% higher than the $1.88 million estimated in 1995/96, or about $2.5 million for the purposes of our economic analysis.

6.2 Process Plant

The summary of our review of the details of the capital cost estimates to bring the proposed plant into production are discussed as follows:

- There is very little backup or detail presented in the UKHM Study as to how the costs were estimated.

- The proposed modifications to the circuit as described in the UKHM Study are appropriate

- The labour costs appear too low. These costs are a function of labour rates and the amount of time allocated to complete the task. A labour rate of $50/hr is appropriate for contract labour in the Yukon.

- To check the reasonableness of the estimate, we have estimated the labour and material costs for the major items identified in the UKHM Study, as shown below:

Item	Hrs.	Labour	Material	Equipment	Total	PFS	Diff.
		$	$	$	$	$	%
Jaw Crusher 20 x 30"	140	7,000	2,000	30,000	43,000	30,000	+43
Bob Cat				20,000	20,000	20,000	0
Pressure filter Larox 4m^2 incl. Compressor, etc.	300	15,000	5,000	430,000	450,000	325,000	+38

  On the basis of this evaluation, the UKHM Study estimate for the mill refurbishment appears approximately 36% too low.

- Another method for checking the cost estimate, appropriate to the level of estimate presented (±25%), is to factor the estimate on equipment costs using Industry typical factors. This estimate is presented below, based on the equipment costs presented in the UKHM Study.

Item	$k	Comments
Equipment	618	typically 35% of total direct costs
Total direct costs	1,766	
Total indirect costs	618	typically 35% of total direct costs
Total Project Estimate	2,384	

On the basis of the above two analyses, it is our opinion that the capital costs for the refurbishment of the mill as described should be in the range of $2 to $2.4 million.

6.3 Infrastructure

There are insufficient details presented in the UKHM Study to be able to estimate the work required. However, taking into account our assessment that the mine and plant cost estimates are low, we recommend that the infrastructure cost items be increased by 20%.

6.4 Summary

We recommend that a contingency be included in the estimate, and this should be assessed at 20% of direct and indirect costs for an estimate at this level of engineering detail. Our estimate of the pre-production capital costs required to bring Elsa Mine back into production are summarized below:

Description	$000's
Environmental and Permitting	80
Reclamation Bond	250
Mine Development	1,772
Mill Rehabilitation	2,200
Infrastructure Rehabilitation	1,645
Mining and Auxiliary Equipment and Services	2,500
Site Maintenance	886
Corporate Costs	475
Contingency	1,962
TOTAL ESTIMATE	**11,770**

7. OPERATING COSTS

We have assessed the operating costs in terms of current costs for labour and consumables and reviewed the reasonableness of the manning levels and consumption rates presented in the UKHM Study.

7.1 General and Administration Expenses

7.1.1 Administration Manpower

Generally, the salaries appear about 20% low compared to rates for similar functions in other recent studies, and overall the number of personnel seems light.

7.1.2 Administration Expenses

Overall the allowances appear reasonable, except for the exclusion of legal and accounting costs. We recommend that an allowance of $50,000 pa be made for these activities.

G & A Costs	Annual ($000's)
Manpower	668
Expenses	396
Total G & A	**1,064**
$/t ore	9.2

7.2 Mining

The mine operating costs from the 1995/96 UKHM Study have been examined and check prices requested from suppliers (or similar operations) for the significant input items, such as base labour rates, explosives, and fuel:

a) <u>*underground labour:*</u>

- stoping and development labour in the UKHM Study has been costed at the equivalent of $39 per hour, including burdens of 35%, and some allowance for bonus payments.
- by comparison, underground miners at the Con mine in Yellowknife are currently earning a base rate of $22.45 per hour plus bonus that typically adds 100% to this base, and including 50.52% burdens brings total wages to $67.50 per hour. This is acknowledged as high and reflects the current diamond mining activity in the NWT.
- in a recent pre-feasibility completed by Hatch on the Finlayson Pb-Zn project in the Yukon, average wages for underground labour totalled $42.75 per hour (stoping and development).
- current mining labour rates at the Cantung Operation are about $42/hour.
- therefore, the UKHM Study rates for underground miners appear low based on these comparisons, and should realistically be increased by approximately 25%.

b) <u>*surface labour*</u>

- electricians and tradesmen are costed at $17-19 per hour in the UKHM Studies, plus 35% burdens.
- a recent survey of skilled tradesmen rates paid in BC and Canadian Mines indicate that average rates of $23/hr are typical.

- surface labour in the UKHM Study therefore appears to be slightly low compared to current conditions by approximately 25%.

c) *fuel costs*

- the UKHM Study uses a fuel cost of $0.36 per litre.
- current quotes from the Yukon Territory indicate a cost of $0.42 per litre, an increase of 17%.

d) *explosives and steel*

- compared to the Finlayson study completed by Hatch in 2001, the UKHM costs for explosives are reasonable and may in fact be higher than current conditions

The effect on the major cost drivers associated with mining costs in summarized below, with the forecast overall costs.

Item	% of Total Costs		Update Factor
	Silver King	Bellekeno	
Labour (U/G and Surface)	46	60	+25%
Supplies/Materials	40	25	+10%
Power	8	5	+10%
Weighted Updated Factor	1.17	1.19	
Updated Cost $/t ore	130.1	95.5	
Production tpa	37,170	78,750	

Due to the uncertainties relating to productivity and the actual costs of mining the satellite orebodies, we recommend a contingency on the mining operating cost, of at least 10%.

7.3 Surface Costs

The salaries and personnel appear adequate for the staff manpower, but the wage rates for the skilled tradesmen appear too low. The working period includes for 5% scheduled overtime, but no other overtime allowance. We recommend a 25% increase in costs for the trades personnel.

The allowance rates for equipment usage appear adequate. The estimate for heat, light, and power is based on 66% of the power supplied at 7c/kWh, the balance at 3.3c/kWh, and an average hourly mining load of 858 kW. We suggest that it is likely that power rates will have increased from 1996 and that their costs should be increased by 10%.

Prevailing fuel costs are 42 c/litre, an increase of 17% over that used in the UKHM Study. The UKHM Study includes a contingency allowance of approximately 17% against this account. We recommend adding a contingency allowance to the entire operating cost estimate, rather than just to this specific item.

Item	$ pa (000's)
Manpower - staff	377
hourly	1,319
Equipment	819
Electrical power	464
Supplies, fuel	102
TOTAL	**3,081**
$/t ore	26.6

7.4 Catering and Transportation Costs

Recent costs were received for camp services were approximately $25 per manday, a 10% increase over the UKHM Study rates.

We do not think that the employee transportation subsidies presented in the UKHM Study are sufficient to attract the number of skilled personnel required. Approximately 47% and 14% of the Mine workforce is expected to be drawn from Vancouver and Winnipeg respectively and overall 76 of the total compliment of 160 are expected to be drawn from beyond the Yukon, which we regard as realistic. Airfares have significantly increased since the time of the UKHM Study and we recommend that substantial subsidies for local housing or airfares will have to be paid to attract the required personnel. We recommend subsidies equivalent to at least $300 per flight.

The other allowances for vehicle usage and bus transportation are reasonable.

Item	$ pa (000's)
Catering	1,003
Employee transportation subsidies	292
Car allowance	96
Gas allowance	31
Bus transportation	130
TOTAL	**1,552**
$/t ore	13.4

7.5 Process

We have assessed the estimated mill operating costs by examining the principal cost drivers – labour, consumables, power and concentrate handling, and these are discussed in the proceeding section.

- Labour – comparison of the rates used in the UKHM Study for skilled tradesmen against a recent survey of rates paid in Canadian and BC mines indicates that the former is approximately 25% low, and indeed the lowest of the 17 mines surveyed. The maintenance crew for the mill is inadequate and should be doubled at the minimum. We consider that the level of manning shown, plus the additional maintenance personnel, is a minimum requirement to operate the plant, and that operation at 66% of these levels as suggested in the UKHM Study, is not reasonable.
- Consumables:

- Grinding balls, consumption is realistic and current costs are similar.
- Liner, cost basis of 20% of media costs are typical.
- Lime, recent quote for Yukon supply is 15% higher.
- Reagents, recent quotes for Yukon supply are 15 to 100% higher, with overall increase of 30%.
- Filter fabric and assay supplies, allowance adequate.
- Maintenance supplies – presumably included in the UKHM Study estimate as miscellaneous. An allowance of approximately $1/t ore is reasonable for a plant of this size and age.

- Power – the specific power consumption of 21 kWh/t ore for the concentrator seems reasonable for this circuit. As discussed previously, it is not unreasonable to assume that the power cost of 7 c/kWh has increased by 10% since 1996.
- Concentrate handling – 3 t capacity, woven fabric bags will add approximately $3/t ore to the operating costs. However, it is reasonable to assume that the concentrate can be more economically transported in bulk to Skagway by road and either shipped to foreign smelters or barged to Vancouver and railed to Cominco's Trail smelter, so that the bagging cost can reasonably be discounted.

There appears to be no allowance in the UKHM Study for the costs for tailings disposal, which are typically included in process cost centres. We recommend that an allowance of $0.5/t ore be added for the costs attributable to piping, equipment and labour component for the maintenance of the tailings containment dam.

The revised total process operating cost estimate is summarized below:

Item		$/t ore
Labour		17.29
Supplies:	Grinding media, liners	0.84
	Lime	0.28
	Reagents	1.58
	Filter fabric, assay	0.32
	Maintenance	1.0
Subtotal Supplies		**4.02**
Power		1.95
Tailings Disposal		0.5
Total Process Costs		**24.3**

7.6 Summary

The total minesite cash operating cost estimate is summarized in the following table:

Cost Description	$/t ore	
	Hatch Q1, 2002	**UKHM Q2, 1996**
General and administration	9.2	7.7
Surface facilities	26.6	27.5
Catering and personnel transport	13.4	15.4
Mining, Silver King	130.1	111.2
Mining, Bellekeno	95.5	80.3
Mining, weighed avg.	106.6	90.5
Processing	24.3	24.2
Subtotal	**180.1**	**165.3**
Exploration	22	22
Contingency, 10%	18.0	Incl.
Reclaimation fund	5.5	5.5
Total Estimate $/t ore	**225.6**	**192.8**
U$/oz silver	**4.9**	**4.1**

Basis: Plant throughput = 115,920 tpa
Annual Silver production = 4.03 Moz/yr

8. BENCHMARKING

Benchmark statistics have been compiled for three underground mining operations with comparable characteristics to those of Elsa:

- narrow-vein mineralization
- selective underground mining methods using shrinkage and/or cut-and-fill and/o longhole stoping
- access by adit, ramp, or shaft
- comparable production rates (except for Greens Creek with a much higher annual production)
- similar products and annual silver production

Imperial Units	**ELSA (UKHM Study)**	**Silver Valley (Coeur)**	**Lucky Friday (Hecla)**	**Greens Creek (Kennecott)**
Year	1996	2000	2000	2000
Ore processed K t/yr	128.8	204.6	321.7	619.5
Average Ore grade (oz/t)	34.6	20.4	18.4	15.7
Silver Production oz/yr (M)	4.03	4.0	5.0	9.3
By-Product Contribution*	35% Pb/Zn	None	40% Pb/Zn/Au	70% Pb/Zn/Au
Access Method	Adit/ramp	shaft	shaft	Ramp
Manpower	160	227	225	268
Productivity t/manyear	805	901	1,430	2,312
US$/oz Ag.Eq:-				
Cash Cost	**$4.1**	**$4.6**	**$5.0**	**$2.2**
Total Cost	**$4.4**	**$5.3**	**$5.8**	**$4.9**

* on gross revenue basis

This data indicates that comparable low-rate underground mining operations currently have cash costs in the range of US$4.5-U$5.0 per equivalent ounce of silver. Furthermore, if the examples shown above were pro-rated for lower production rates similar to those proposed for Elsa, it is likely that the costs would indeed be higher. Therefore the UKHM Study estimates of US$4.1 per ounce appear to be low compared to typical underground operations employing similar underground mining methods.

Direct mine productivity estimates from the UKHM Study can also be benchmarked against similar stoping methods at the Con mine in the Northwest Territories where both shrinkage, cut-and-fill, and longhole methods contribute to an annual ore production of 308,000t per year compared to the proposed 117,000t per year at Elsa. Excluding the higher rate and higher efficiency longhole methods at Con produces the following comparisons:

		Con	***Elsa Study***
Total miners (stoping & development)		47	38
Mine production	t/yr	151,000	117,000
Productivity	t/man/yr	3,213	3,079
Productivity	t/manshift	13.4	9.7

The lower productivity at Elsa therefore appears reasonable given the location, difficult ground conditions, and narrower ore widths compared to the Con which is an established mine with a long history of operating experience.

8.1 Silver Survey - Production Costs

The Silver Survey highlights for production cost data (on an equivalent basis) were reviewed to provide a global picture and are summarized as follows, and provide another measure for benchmarking world silver production costs. However, these are weighted towards large scale, low cost operations.

- Weighted average production costs were $3.19/oz, in 2000.
- Only one primary silver producer reported cash costs, which were higher than the average spot price of $4.95 in 2000.
- Weighted average total production costs in 2000 were $4.23/oz.

Date from eleven operations was used to calculate the weighted average cash cost for the 2001 Survey. In total, the sample group produced 94.5 Moz (2,939 t) of silver, or 16% of global output. The small sample size can largely be explained by the fact that only 25% of silver in 2000 was generated from primary mines.

2000 and 2001 were particularly tough for primary silver operators, as the average spot price declined 5% and cash costs increased moderately, with the result that cash margins declined by 14% (margins had declined by 20% in 1999). The lowest reported cash costs in 2000 (and the only mines producing at less than $3/oz) were Greens Creek silver-gold-lead-zinc mine in Alaska (owned by Rio Tinto subsidiary Kennecott Minerals 70.3% and Hecla Mining 29.7%) and Mina Proano silver mine in Mexico (Peñoles 100%).

The highest costs were recorded by Hecla's Lucky Friday mine, with both cash costs and total production costs higher than the average spot price. The high costs were in part due to lower revenues from lead production (an important by-product at Lucky Friday).

In 2000, total production costs were also monitored, albeit for a slightly smaller sample size of 82 Moz (2,555 t); and total nine mines.

Weighted average total production costs (including depreciation, amortization and reclamation costs) for the sample size in 2000 was $4.23/oz, and 21% of sampled production was produced at total costs that exceeded the average spot price.

Silver Mine Production Costs (U$/equivalent oz. Ag)

		1998	1999	2000
Cash costs:	Highest	$5.34	$5.09	$5.02
	Lowest	$1.90	$1.99	$2.20
	Weighted average	$3.03	$3.18	$3.19
Average spot price		$5.54	$5.22	$4.95
% output with costs > spot price		0.0%	0.0%	5.0%
Sample size (Moz)		81.3	87.7	94.5

9. TAILINGS REPROCESSING

9.1 Resource/Reserve

A drill program in 1987/88 reportedly delineated 1.5 Mt grading 4.9 oz/t, as presented in the UKHM report "Investigation into the Reprocessing of Elsa Tailings" (the UKHM Report) dated March 1996, in which there is a statement that an initial estimate of selective mining potential indicates a potential resource of 900 kt grading 5.9 oz/t. There is insufficient data to be able to independently verify these numbers.

9.2 Metallurgy

A limited metallurgical testwork program was conducted on Elsa mine tailings material that focused on maximizing silver recovery from the defined high-grade areas. Few details were presented on how their samples were taken and from where to be able to assess their representatives. The testwork results are summarized below:

- gravity concentration, which demonstrated recoveries in the order of 30% for a 4% mass concentrate grading only 27oz/t, which is lower than can be marketed. The concentrate can be upgraded by regrinding and flotation cleaning, but at the expense of reduced recovery (18%)
- flotation , which demonstrated recoveries in the order of 30% for a cleaner concentrate grading 25 oz/t, a lower than marketable grade. The poor recoveries attained by flotation testwork indicate that a large portion of the lead and zinc minerals have oxidized significantly, reportedly in the order of 60% to 100% and 30 to 60% respectively.

No cyanidation testwork was carried out on Elsa tailings material during this recent evaluation, but apparently historically, recoveries of approx 50% were achieved by cyanidation of flotation tailings. It seems reasonable to assume that recoveries somewhat higher than 50% should be achieved from the reprocessing of non-cyanide treated tailings materials, considering the degree of oxidation of this material.

9.3 Processing

A number of options exist for treating the tailings material, although none would seem attractive for the recovery of lead or zinc. The incremental silver recoveries by gravity and flotation are marginal, and it would not likely prove economically attractive to treat this material in the existing plant. However, a number of treatment options are worthy of discussion, as follows:

- Agitated tank leach . This option was discounted by UKHM due to perceived high cost. Generally, the leach extraction in agitated tanks is both higher and more rapidly attained than by percolation leaching. We suggest that a recovery of 55-60% is appropriate. The silver could be recovered either by adsorption onto carbon or by precipitation onto zinc powder using the Merille Crowe process .The leach residue would have to be detoxified, after cyanidation prior to deposition in a lined containment area. The feed material would have to be fed as a slurry to the tanks, which would favour mining by hydraulic monitoring, generally less expensive than excavation methods.
- Heap leaching . The material would likely have to be agglomerated with cement and with the addition of fines in a drum agglomerator and conveyor stacked onto a lined leach pad.

Silver could be recovered either by carbon adsorption or by Merille Crowe. The feed material would likely be wet and sticky and it would be difficult to effectively mix in the cement and fines to form stable agglomerates. Reportedly, heap leaching of Elsa tailings material was tested by Candora Ltd, who determined that fines had to be added to the feed material in a ratio of 3:2 tailing/fines to achieve acceptable agglomerates at an economic cement addition rate. However, no recovery numbers are presented. Typically, heap leach recoveries achieved in the field are lower than those achieved in the laboratory, and lower than those achieved in agitated tanks. We suggest that a recovery of 50-55% is appropriate for heap leach recovery.

- Vat leaching is another possibility, although this would require extensive testing. An alternative to heap leaching, vat leaching is carried out in vats on a batch-continuous basis. The advantage of this process is the greater ore and solution contact to effect rapid and high recoveries, the smaller plant footprint (compared to a leach pad) and the ability to largely detoxify the spent ore in a vat at the end of each discrete leach cycle. This option was not considered previously and is a comparatively uncommon process. A similar operation was run successfully at Hope Brook mine in Newfoundland. We suggest that a recovery similar to heap leaching is appropriate.

- Gravity concentration. Conceptually, tailings could by hydraulically mined and pumped to an agitated surge tank, from which the slurry could be fed to a single large or two smaller concentrators. The residue would be pumped to a containment area. Primary concentrate could be reground and fed to another smaller concentrator or a column flotation cell for upgrading. Concentrate could be marketed directly. We have assumed the laboratory recovery conditions in this assessment to examine the potential, but additional confirmatory testwork is required to substantiate the recoveries.

It is assumed that adequate services required for these processes are available from the existing Elsa minesite.

The assessment of the relative economics for a heap leach and gravity concentration plant are presented in Section 2.

9.4 Capital Costs

Preliminary sizing and costing of equipment and facilities for a heap leach, agitated leach, and gravity concentrator plant are presented in Appendix B. The costs were estimated using Hatch's historical database, particularly the following projects:

- Brewery Creek mine, heap leach, Yukon
- Mantua mine, 2000 tpd heap leach, used crushing, agglomeration and Merille Crowe equipment from Canada.
- Eskay Creek, 350 tpd mill, Northern BC
- Gold Corp, 1000 tpd mill, Ontario

The cost estimates were factored from equipment costs and are summarized below U$000's:

Description	Heap Leach	Agitated Leach	Gravity
Dump hopper, conveyors	250		
Agglomerator drum	175		

Description	Heap Leach	Agitated Leach	Gravity
Stacking conveyors	250		
Pumps	60		
Merill Crowe Plant/Concentrators	450		450
Hydraulic Mining Equipment		120	120
Tanks and Concentrator		1152	140
Agitators		300	50
Strip/regneration/Merille Crowe		850	
Tailings pumps, screens		120	100
Process Equipment Costs	1185	2542	860
Total Installed Equipment	**3950**	**7703**	**2606**
Pad and Ponds	1384		
Tailings Containment		938	938
Total Direct Costs	5334	8640	3544
Total Indirect Costs	1867	3024	1240
Contingency	1080	1750	718
Total Capital Cost Estimate, Plant	8280	13414	5502

The estimate for the refurbishment of the requisite infrastructure to support either of these plants on a stand-alone basis is estimated according to that presented in the UKHM Study, modified as follows to reflect the smaller scale of operations:

Description	$000's
Environmental and permitting	80
Reclaimation Bond	250
Mine Prestripping, clean-up	80
Infrastructure:	
• Laboratory	40
• Shop/Warehouse	27
• Cafeteria	40
• Bunkhouse	30
• Fire Pump Station	40
• 8 Houses	90
Site Maintenance	300
Corporate Costs	350
S/Total Infrastructure, Corporate	**1327**
Contingency, 15%	200
Total Infrastructure estimate	**1627**

The estimate for the heap leach plant includes for used equipment for conveyors, the drum agglomerator and the Merille Crowe plant as there are a significant number of these units on the market.

The estimate for the agitated leach plant is based on largely new equipment and does not take into account any equipment in the existing cyanidation plant, as the UKHM Study suggests that the plant is not suitable. This circuit is also based on zinc precitation of the silver after stripping from loaded carbon, as the likely most economical process route.

The working capital requirements are different for the process options. There is a significantly longer time lag between start up and metal production for heap leaching than for the agitated leaching. Furthermore, production typically ramps up to design levels over 2 to 3 months as the operators are trained in the process. Consequently, working capital requirements for heap and agitated leaching and gravity concentration have been estimated at 3, 2, and 2 months of total operating costs respectively.

The total capital costs are summarized below:

Description	Heap Leach	Agitated Leach	Gravity Concentration
Plant	8280	13414	5502
Infrastructure corporate	1627	1627	1627
Working capital	2876	1901	360
Total preproduction capital estimate	**12783**	**16942**	**7489**

9.5 Operating Cost

Operating costs were estimated using current consumable and labour prices. Reagent consumption rates were estimated from experience of similar operations.

The mining costs are inclusive of all operations and maintenance personnel. For tailings excavation for the heap leaching option, we have used a unit cost of $1.25/t moved, which calculates to $2.1/t ore with the inclusion of 0.66t of fines per tonne of tailings, assumed to be reasonably available locally . For hydraulic mining, we have used a unit cost of $0.75/t tailings.

The operating cost estimates are summarized below:

Description		Heap Leach $/t ore	Agitated Leach $/t ore	Gravity Concentration
Cyanide		1.05	1.50	0
Cement/lime		0.63	0.50	0
Zinc powder		8.17	8.91	0
Maintenance supplies		0.28	0.46	0.20
Power		0.30	0.75	0.35
Mining		2.08	0.75	0.75
G & A Expenses		1.00	0.97	0.86
Total Operating Cost Estimate	**$t/ ore**	**23.1**	**22.9**	**8.63**
	$/oz	**7.9**	**7.1**	**5.8**
	U$/oz	**5.1**	**4.6**	**3.7**

Environmental costs are accounted for separately in the cashflow analysis, and for this exercise is assumed as $1/t treated.

Manpower requirements are estimated on the basis of 3 operating crews and maintenance personnel making up approximately 30% of the total complement.

10. MARKET CONDITIONS

Survey of the most recent published data on the Silver Market status was conducted and is summarized in this section. The most recent comprehensive published data, the Silver Institutes' "World Silver Survey 2001" contains demand and supply official data up to 2000.

10.1 Demand

The major highlights in silver consumption trends are summarized below:

- World silver fabrication continued to grow strongly in 2000, rising over 5 percent to a record 921 Moz (28,642 t).
- Regionally, fabrication growth was strongest in East Asia and the Indian Sub-Continent while, sectorally, it was strongest in electrical and electronics uses.
- Photographic demand slipped a modest 1% to 231 Moz (7,173 t).
- Demand from coins and medals increased by almost 14 percent.
- Net producer hedge positions declined by 23 percent, creating an estimated 25 Moz (791t) of demand.

World silver fabrication demand grew be more than 5 percent in 2000, with silver's use in industrial applications recording an impressive 11-percent gain. Buoyant consumer spending and business investment resulted in much higher raw material demand for use in a huge variety of products incorporating silver. The growth in fabrication demand for silver accelerated in 2000, up from 4.9 percent in 1999 to 5.3 percent in 2000. Fabrication demand expanded by 47 million troy ounces (Moz) from 1999 figures to absorb a record 921 Moz in 2000. Regionally, fabrication growth was strongest in East Asia and the Indian Subcontinent. Worldwide fabrication demand has grown by 32 percent over the past decade.

Overall, industrial applications remained the prime driver of the rise in total demand for silver, accounting for 41 percent of fabrication demand, totalling 378 Moz in 2000. This rise was spearheaded by the electrical and electronics sector, which increased 12.2 percent to 167 Moz in 2000. Much of this sector's growth was in products such as CD-Rs, semiconductors and cell phones.

Jewellery and silverware fabrication rose a solid 3 percent in 2000 to 282 Moz. The increase was strongest in East Asia with demand rising nearly 13 percent to 44 Moz. Europe saw a fifth year of growth, up 3 percent to 44 Moz. Europe saw a fifth year of growth, up 3 percent to 87.5 Moz, due primarily to buoyant demand in Italy where offtake rose 6 percent to 54.2 Moz. Fabrication demand for this sector in the United Sates was nearly 5 percent higher at 13.7 Moz.

Silver's use in photography, the third major component of silver demand, dipped slightly in 2000 by 1.2 percent to 231 Moz, posting its second-best performance of the past decade. Japanese photographic demand was up 7 percent to 64.1 Moz. In 2000, while the United Sates experienced a 1 percent growth in silver demand for photographic uses.

World silver use in coins and medals posted strong gains in 2000, growing by nearly 14 percent to 30.5 Moz, its highest level since 1994. Sharply higher demand in Germany and the United

States accounted for this increase, and together represented almost 68 percent of world demand last year in this sector.

In 2000, the structural deficit between fabrication demand and conventional supply (Mine production and recycled scrap) grew to 151.2 Moz, further reducing above-ground stocks to meet silver demand. This is part of a decade-long trend that has reduced private sector bullion stocks by one billion ounces.

10.2 Supply

The major highlights in the supply of silver metal are summarized below:

- Total supply in 2000 was 7 percent higher year-on-year at 946.3 Moz (29,433 t).
- Mine production increased strongly, by almost 7 percent due to a recovery in Mexico and another surge in Australian production.
- Official sector sales declined almost 20 percent to 74.7 Moz (2,323 t) as flows from China subsided somewhat.
- Scrap was marginally higher due primarily to increased secondary flows in the United States.
- Disinvestment increased 53 percent year-on-year to 102 Moz (3,167 t).

World silver mine production rose almost 7 percent in 2000, with global output reaching 589.4 Moz, primarily due to a recovery in Mexico and another surge in Australia. North American output increased by 8 percent last year to 189.3 Moz. Most of the global gain was due to higher output from the world's biggest producer, Mexico, which produced 88.2 Moz, 17 percent more than 1999 figures. This increased output was primarily due to the lifting in February 2000 of lead emissions restrictions placed on the Peñoles processing facility at Torreon in 1999. Additional increased at other mines in Mexico assisted in the 2000 figures. Silver mine production contributed just over 62 percent of all silver that entered the market last year, almost 10 percent less than a decade ago.

Central and South American production was down 1 percent, at 135.5 Moz, which represents nearly 23 percent of global production. Peru, the world's second-largest silver producer, produced 78.4 Moz of silver in 2000, up from 71.7 Moz in 1999.

In 2000, Australia's silver output increased 20 percent to 66.2 Moz, compared to 55.3 Moz in 1999, eclipsing the United Sates a the third largest producer. The growth in production can mostly be accounted for by gains at the mammoth Cannington silver-lead-zinc mine.

In the United Sates, which slipped to fourth in terms of world silver production, losses at primary silver, copper and lead-zinc operations were cancelled out by increases at gold mines, to leave last year's silver output up 1 percent at 63.3 Moz Canada reported silver production levels at 37.7 Moz, an increase of under 1 percent.

There was a decline in net official sector sales, which had leapt to 92.9 Moz in 1999, but dropped to 74.7 Moz in 2000. This unusual market influence stands in stark contrast with the years 1991-1998, when sales only averaged 13.4 Moz. It is estimated that in 2000, Chinese government sales exceeded 57 Moz down from 68 Moz in 1999.

Scrap supply to the market posted a modest increase of 3.1 percent to 180.3 Moz in 2000. Photographic scrap accounted for over 40 percent of total scrap last year. Over 80 percent of silver scrap is generated in industrialized countries.

Implied net disinvestments was over 102 Moz in 2000, but was below the levels recorded in 1993, 1994 and 1996. An indication of this increase is data from Comex, which pointed to investors liquidating long positions and building up short ones.

Historical silver production and price data is presented in the Table below, together with forecast prices for 2002.

World Silver Supply and Demand
(in millions of ounces)

	1994	1995	1996	1997	1998	1999	2000	2001	Forecast 2002
Supply									
Mine Production	452.0	479.7	487.7	525.3	547.9	552.6	589.4		
Net Official Sector Sales	17.6	25.3	18.9	--	39.3	92.9	74.7		
Old Silver Scrap	151.9	162.9	158.4	169.3	193.7	174.9	180.3		
Hedging	--	9.2	--	69.1	5.5	--	--		
Implied Net Disinvestment	143.2	90.7	147.1	81.0	47.0	102.0	102.0		
Total Supply	**764.7**	**767.9**	**812.2**	**844.7**	**833.4**	**946.3**	**946.3**		
Demand									
Fabrication…									
• Industrial	281.4	295.3	297.3	320.4	316.2	340.6	378.0		
• Photography	202.5	210.9	212.9	220.2	231.6	233.4	230.6		
• Jewellery & Silverware	227.9	236.9	263.9	274.9	259.5	273.5	281.7		
• Official Coins	43.8	24.7	23.3	28.5	26.1	26.8	30.5		
Total Fabrication	755.6	767.9	797.4	844.0	833.4	874.3	920.9		
Net Official Sector Purchases	--	--	--	0.7	--	--	--		
Hedging	9.1	--	14.8	--	--	12.9	25.4		
Total Supply	**764.7**	**767.9**	**812.2**	**844.7**	**833.4**	**887.2**	**946.3**		
Silver Price U$/oz	**5.29**	**6.20**	**5.20**	**4.90**	**5.54**	**5.22**	**4.95**	**4.36**	**4.50**

10.3 Mine Supply

- World silver mine production increased strongly last year, rising almost 7 percent to a new record of 589.4 Moz (18,334 t).
- Primary silver mines contributed 25 percent of the total 145.9 Moz (4,538 t). Primary silver output was down marginally year-on-year, but gold by-product increased strongly.
- Weighted average cash production costs increased by a marginal 1 c/oz to $3.19/oz.
- Lack of activity in the forward market saw outstanding positions decline by over 25 Moz (791t).

Only 25 percent of silver produced in 2000 was derived from primary sources. This is, in part, a consequence of the scarcity of large silver deposits, which can be economically exploited at prevailing silver prices. Silver is typically found in the oxidized zones of ore deposits, or in the hydrothermal veins associated with sulfide ores. This natural association with lead and zinc (which often occur together), gold and copper, results in significant quantities of silver being produced at operations where it is not the primary target nor the principal earner of revenue – in fact, in many cases silver is regarded as a “bonus” of base metal or gold mining.

Silver Output by Source Metal
(million ounces)

	1999 Output	% of total	2000 Output	% of total	Change y-o-y
Primary	148.2	27%	145.9	25%	-1.6%
Lead/Zinc	193.3	35%	205.7	35%	6.4%
Copper	130.9	24%	140.2	24%	7.1%
Gold	73.2	13%	91.0	15%	24.3%
Other	7.0	1%	6.6	1%	-5.7%

Whether as a primary product or a by-product, silver is also mined in many parts of the world. In 2000 Mexico, Australia, Peru and the United States were the top four silver producing countries. North America produced roughly one-third of the world's silver last year. Peru remained the largest silver produced in South America with more than half of its silver generated from lead-zinc mines. Primary mines contributed to over half of the total silver mined in the United Sates. Australia is home to the world's largest silver mine, Cannington, which alone produced nearly half of all of Australia's 2000 production.

Top 20 Silver Producing Countries in 2000

Ranking			Output (Moz)	
2000	1999	Country	1999	2000
1	1	Mexico	75.2	88.2
2	2	Peru	71.7	78.4
3	4	Australia	55.3	66.2
4	3	United States	62.7	63.3
5	5	CIS	46.2	51.3
6	7	China	44.2	48.2
7	8	Canada	37.5	37.7
8	6	Chile	44.8	37.6
9	9	Poland	35.8	36.7
10	10	Bolivia	13.6	14.1
11	11	Indonesia	9.8	9.9
12	12	Sweden	8.9	9.5
13	13	Morocco	8.9	9.3
14	14	South Africa	4.9	4.6
15	17	Spain	3.1	3.8
16	15	Turkey	3.5	3.5
17	18	Japan	3.0	3.3
18	16	Argentina	3.3	3.2
19	19	Papua New Guinea	1.9	2.4
20	20	India	1.9	1.8

Top 20 Silver Producing Companies in 2000

Ranking				Output (Moz)	
2000	**1999**	**Company**	**Country**	**1999**	**2000**
1	1	Industrias Peñoles	Mexico	42.1	44.7
2	2	KGHM Polska Miedz	Poland	35.1	36.0
3	3	BHP Minerals	Australia	25.4	32.5
4	4	Grupo Mexico	Mexico	20.1	23.2
5	6	Homestake Mining	USA	13.1	14.7
6	5	Rio Tinto plc	UK	16.0	14.4
7	7	Cominco Ltd.	Canada	12.0	13.3
8	8	MIM Holdings Ltd.	Australia	11.9	12.7
9	15	Echo Bay Mines Ltd.	USA	8.4	12.3
10	12	Coeur d'Alene Mines Corp	USA	9.6	11.7
11	10	Cia. De Minas Buenaventura	Peru	11.6	10.2
12	14	Boliden AB	Sweden	8.5	9.9
13	9	Noranda Inc.	Canada	11.7	9.7
14	18	Codelco	Chile	7.3	9.3
15	26	Volcan Cia. Minera SA	Peru	4.8	8.5
16	16	Hecla Mining Co	USA	7.6	8.0
17	19	Societe Metallurgique d'Imiter	Morocco	7.3	7.9
18	27	Comsur	Bolivia	4.8	7.5
19	11	Placer Dome Inc.	Canada	10.8	6.3
20	21	Pasminco Ltd.	Australia	6.2	6.0

Having barely changed in 1999, world silver mine production leapt almost 7 percent last year, the second biggest jump in output recorded this decade (mine production increased 8 percent in 1997). Global production reached a new record level of 589.4 Moz (18,334 t), bringing the total growth since the beginning of the 1990s to 15 percent.

Mexico's Industries Peñoles confirmed its position as leading producer, with a 6 percent increase in output. In fact, there were no changes among the top four producers.

Leading Primary Silver Mines

Rank	Mine	Country	Operator	1999 Moz	2000 Moz
1	Cannington	Australia	BHP Minerals	26.2	32.5
2	Proaño	Mexico	Industrias Peñoles SA de CV	21.2	23.9
3	Greens Creek	United States	Kennecott Minerals/ Hecla Mining Co	10.3	9.3
4	Uchucchacua	Peru	Compañia de Minas Buenaventura SA	7.1	8.5
5	Imiter	Morocco	Societe Metallurgique d'Imiter	7.3	7.9
6	Tizapa	Mexico	Industrias Peñoles SA de CV	5.3	6.8
7	Rochester	United States	Coeur d'Alene Mines Corp	6.2	6.7
8	Arcata	Peru	Minas de Arcata SA	6.2	5.1
9	Lucky Friday	United States	Hecla Ming Co	4.4	5.0
10	Quiruvilca	Peru	Pan American Silver Corp	3.3	4.1
11	Galena	United States	Coeur d'Alene Mines Corp	3.7	4.0
12	Sunshine	United States	Sunshine Mining & Refining Co	5.2	3.9
13	San Martin	Mexico	First Silver Reserves Inc.	2.3	2.3
14	La Encantada	Mexico	Industries Peñoles SA de CV	2.5	2.1
15	Caylloma	Peru	Hochschild Group	1.2	1.9

Silver Mine Production by Source Metal
(Million ounces)

	1997	1998	1999	2000
Primary				
• Mexico	43.2	45.6	34.2	42.2
• Australia	3.5	19.8	26.2	32.5
• United States	36.2	36.6	33.5	31.5
• Other	39.3	54.1	54.3	39.7
• Total	122.2	156.1	148.2	145.9
Gold				
• Chile	18.3	10.2	9.6	20.2
• Canada	13.3	12.0	15.2	17.2
• United States	17.1	13.6	13.5	17.2
• Other	31.2	31.9	34.9	36.4
• Total	79.9	67.7	73.2	91.0
Copper				
• Poland	33.1	35.3	35.1	36.0
• CIS	18.7	19.8	20.8	25.3
• Chile	16.6	16.7	18.0	17.2
• Other	59.1	59.8	57.0	61.7
• Total	127.5	131.6	130.9	140.2
Lead/Zinc				
• Peru	38.4	36.1	40.0	43.4
• Mexico	31.1	32.9	29.3	32.4
• Australia	31.1	26.5	28.1	32.2
• Other	87.4	89.0	95.9	97.7
• Total	188.0	184.5	193.3	205.7
OTHER	**7.7**	**8.0**	7.0	**6.6**
TOTAL	**525.3**	**547.9**	**552.6**	**589.4**

10.3.1 Outlook

Three projects were previously expected to have a significant impact on the future silver market. Barrick's Pascua-Lama (Argentina-Chile border), Apex Silver Mines' San Cristobal (Bolivia) and Serebro Magadana's Dukat (Russia) were expected to add roughly 78 Moz (2,420 t) of silver per year to world silver production - equivalent to around 13% of current global output. However, the situation has changed over the past year or so. Development of Pascua-Lama is on hold, pending improvements in the gold and silver prices. Project funding for San Cristobal cannot be advanced until a problem with the provision of electricity to the project is resolved; the construction start-update has thus been pushed back. And in Russia, the redevelopment of the Dukat silver field was on hold for most of last year while the legal struggle for ownership of the project was being settled. The license is now held by Serebro Magadana (Magadan Silver) in which a subsidiary of MNPO Polimetall owns 80% of the equity and former owners of the mining license, Pan American Silver, 20%. Recent reports suggest that the mine will still be put into production, though only in 2002 at the earliest.

Some smaller new mines, however, did come on stream during 2000. The new batch of silver producers included Rey de Plata (zinc-silver) in Mexico, El Person (gold-silver) in Chile and George Fisher (zinc-lead-silver) in Australia. In addition, 2000 already witnessed the start-up of two primary silver mines, both in South America: Pan American Silver's Huaron (Peru) and Yamana Resources' Martha mine (Argentina). And additional output from Antamina (copper-zinc) and Francisco I Madero (zinc-lead), both of which started production in late 2001, is expected to bring the total "new" output for 2001 to around 16 Moz (504t). This could be boosted further by expansions completed in 2000 at Peñoles' Mina Proano, La Cienega and Sabinas.

On the other hand, there were also a number of closures in 2000 and 2001 (Sunshine, Julcani and Andacaba); delays in development decisions (Amayapampa, Cerro San Pedro and Lucky Friday) and long-time major producers approaching ore depletion (McCoy/Cove). This could negate much of the output gains from "new" silver. Based on the above, it would seem highly unlikely that there will be any major increase in silver production in 2001 but a nominal increase in likely. However, production levels are likely to remain static until the demand for bare metals in particular increase.

10.3.2 By-Product Analysis

Three-quarters of mined silver is not generated at silver mines, but instead is a by-product of mining of another metal. Generally speaking, the economics affecting the primary metal(s) being mined at an operation will determine levels of output and this could result in fluctuations in silver production which may be completely unrelated to developments in the silver market itself. The implication is that silver mine production is much less sensitive to developments in the silver market than most of the other components of supply and demand.

For this reason, any analysis of the silver mining sector would be not be complete without some consideration of developments in the markets for copper, gold, lead and zinc. What follows is intended to give a brief overview of major developments and how they may affect future silver production from these sources.

It is worth clarifying the basis on which this classification is done. As a general rule, mines are classified based on the dominant source of revenue. Thus, "primary silver mine" does not imply that only silver is mined at an operation; rather, it indicates that silver generates most of the revenue. Where revenue is split fairly equally between different metals, say silver and zinc, movements in metals prices can result in swings in the primary revenue earner, so that it may be silver one year and zinc the next. Excessive reclassification based on price swings which may be temporary in nature could unnecessarily distort data and complicate analysis, and efforts are made to avoid this. It is usually clear when a mine commences production which metal will generate most of the revenue over its life, and the classification is made on this basis.

Occasionally, however, re-classification is required. This was the case in 1999 with the Cannington mine in Australia. Originally classified as a lead-zinc mine, it became clear during the course of the past two years that silver would generate most of Cannington's revenue, and that a re-classification to a primary silver mine was justified.

The contribution of primary silver mines to total output contracted somewhat to just under 25%, and total primary silver output fell by 2%, the second consecutive annual decline. The decline was recorded despite a 24% increase in Cannington's output last year, to a massive 32.5 Moz (1,009 t). Primary silver production in Mexico also expanded substantially (up 23% to 42.2 Moz (1,311 t)), largely as a result of strong performances at Peñoles Proano and Tizapa divisions. But in the United States, the third largest primary silver-producing region, growth at Coeur d'Alene's Rochester and Galena mines and Hecla's Lucky Friday operation was cancelled out by the declines at the Sunshine mine, as well as Hecla/ Kennecott's Greens Creek operation. And in Latin America, primary production collapsed to less than two-thirds of 1999 levels as the Chimberos deposit in Chile was mined out and operators Mantos de Oro switched their focus back to mining gold at La Coipa.

Silver Output by Source Metal
(million ounces)

	1999 Output	% of total	2000 Output	% of total	Change y-o-y
Primary	148.2	27%	145.9	25%	-1.6%
Lead/Zinc	193.3	35%	205.7	35%	6.4%
Copper	130.9	24%	140.2	24%	7.1%
Gold	73.2	13%	91.0	15%	24.3%
Other	7.0	1%	6.6	1%	-5.7%

This switch back to gold mining at La Coipa contributed to the 24% surge globally in silver-from gold. La Coipa has always had high silver grades, and last year generated over 11 Moz (344 t) of silver. The table above shows how silver production from gold mines increased to 15% of total silver output, up from 13°/a in 1999. Gold by-product from Chile more than doubled, as the output from La Coipa was enhanced by 4 Moz (125 t) of silver from Meridian's new gold mine, El Person. As a region, Latin America saw its silver as gold by-product surge by 62% last year. Canadian and US gold mines also increased their silver output (up 13% and 27% respectively), with Agnico Eagle's LaRonde and Echo Bay's McCoy/Cove mines being particularly prominent. Homestake's Eskay Creek also increased silver production substantially.

This robust increase in silver from gold mines belies the fact that there was virtually no growth in global gold mine production last year. Gold output increased by less than half a percent, to 82.7 Moz (2,573 t) as prices remained depressed for most of the year. The market continued to be under pressure: total fabrication demand fell marginally and investment swung from a positive 5.5 Moz (170 t) in 1999 to a negative 9.4 Moz (291 t) in 2000. This year there are fears that a global economic slowdown could impact negatively on gold demand, which contributed to the continuing low prices, together with ongoing Central Bank Sales. While gold prices remain depressed, there is not much scope for new gold projects to be brought onstream; the potential for silver from this source is therefore also muted. The deferral of Barrick's Pascua-Lama project due to poor metals prices is one prominent case where future silver production was removed (albeit perhaps only temporarily) from the production pipeline – Pascua was expected to generate an average of 36 Moz (1,120 t) of silver per year as gold by-product. The forecast for Gold prices in 2002 however, is more optimistic at prices closer to U$300/oz, which will likely encourage some projects into production.

Average Prices of Source Metals

	1997	1998	1999	2000	2001	Forecast for 2002
Lead ($/t)	624	528	503	454	500	550
Zinc ($/t)	1,313	1,023	1,077	1,128	1,000	873-1000
Copper ($/t)	2,276	1,653	1,575	1,814	1,628	1,551
Gold ($/oz)	331	294	279	279	270	300
Sources: LME, GFMS, AME Mineral Economics						

Most of the world's silver is still generated at lead-zinc mines. Silver by-product from this source increased by just over 6% last year, thus maintaining its 35% share of total output. Growth in the category was recorded in every region of the world, except for Africa, with countries in Latin America once again accounting for the majority (almost 30%) of silver from this source. In Peru, where there are 13 lead-zinc mines that produce more than 1 Moz (31 t) of silver a year, impressive increases were reported at several operations, including Yauliyacu, El Brocal and Andaychagua. Mexico's lead-zinc by-product also increased strongly (up over 11 %) as mines such as Naica, La Cienega and San Martin upped production and Sabinas more than doubled its output. And in Australia, lead-zinc by-product jumped almost 15%, due to the commencement of production at the Century zinc mine and strong results from the Rosebery and McArthur River mines.

This result was recorded against the background of a 9% increase in worldwide zinc mine output (according to ILZSG, the International Lead and Zinc Study Group) and a 1% decline in lead production in 2000, and essentially static output in 2001 and 2002.

World Mine Production of Source Metals
(Thousand tons)

	1997	1998	1999	2000	2001	Forecast for 2002
Lead	3,026	2,988	2,981	2,938	2,959	2,886
Zinc	7,336	7,566	7,739	8,418	8,621	8,825
Copper	11,483	12,288	12,716	13,227		
Gold (t)	2,479	2,538	2,567	2,573		
Sources: ILZSG, WBMS, GFMS, AME Mineral Economics						

Having performed well in 2000 and 2001, zinc prices are expected to ease in 2002 due to increased supply of new metal and an expected surplus in the market for a second consecutive year. The zinc market has been identified as being particularly exposed to the effects of an economic slowdown due the metals' particular end uses. The lead market, equally, is expected to be under continued pressure from excess supply, and growing demand is generally expected to be insufficient to absorb high stocks and rising supply levels. It is likely that further idling of production capacity and delaying of new projects will continue in 2002, until such time as world economics start to revive.

Copper mines are the source of just under one quarter of all silver. Many of the large silver-containing copper mines are located in Europe and Central Asia, with Poland and Kazakhstan contributing the lion's share of this type of silver. It was the latter, which recorded explosive growth in its silver by-product. Kazakhmys, the country's mammoth copper producer, reported a 33% surge in silver output on the back of a strong increase in copper production. Kazakhmys has benefited enormously from substantial capital investment over the past number of years by 42%-owners and operators Samsung, and indications are that production could increase even further.

Copper prices weakened by 11% in 2001 and expectations are for a further increase in 2002, despite modestly higher mine production and a possible lowdown in consumption. It has become apparent in recent years that higher copper output does not necessarily translate into increased silver output as some of the cheap new processing technology does not favour extraction of silver.

The forecast mine silver production is shown in the following Table, with data from two sources, which indicate that production levels will remain fairly static, with a decline in 2002. This is in line with foregoing discussion.

World Mine Production Forecast for Silver

	Actual		Projected							
	1999		2000		2001		2002		2003	
	Moz.	% of World Total	Moz.	% of World Total	Moz.	% of World Total	Moz.	% of World Total	Moz.	% of World Total
Mexico	75.2	13.9	80.3	14.7	85.7	15.6	87.8	16.4	88.3	16.0
Peru	71.3	13.2	73.8	13.5	74.5	13.6	79.5	14.9	79.5	14.4
United States	62.9	11.7	62.8	11.5	57.7	10.5	41.3	7.7	53.0	9.6
Australia	53.3	9.9	51.2	11.1	61.1	11.1	61.1	11.4	61.1	11.1
Chile	44.8	8.3	39.7	7.3	39.1	7.1	35.2	6.6	35.2	6.4
China	44.2	8.2	44.2	8.1	44.2	8.1	44.2	8.3	44.2	8.0
Canada	37.5	6.9	35.8	6.5	36.1	6.6	36.0	6.7	35.5	6.4
Poland	35.1	6.5	34.4	6.3	34.0	6.2	33.1	6.2	33.7	6.1
Kazakhstan	20.6	3.8	20.6	3.8	20.6	3.8	20.6	3.9	20.6	3.7
Russia	19.9	3.7	19.9	3.6	19.9	3.6	19.9	3.7	19.9	3.6
All Other Countries	74.8	13.9	74.4	13.6	75.2	13.7	76.2	14.2	80.1	14.5
TOTALS (1)	**539.6**	**100%**	**546.6**	**100%**	**548.1**	**100%**	**534.8**	**100%**	**551.1**	**100%**
TOTALS (2)	**552.6**		**589.4**							

10.4 Silver Prices

It is likely that silver prices in the present range of U$4.40 to U$4.75 will prevail through 2002, due to the continuing depressed world economic status, consequent low base metal prices and the high U$ exchange rate, especially with respect to Asian economics. It is also more likely that world economic recovery will be slow and that silver prices will also rise slowly. We suggest that a price of U$4.50 to U$5.00/oz is reasonable for 2003 and that the project should demonstrate economic robustness at a price level of U$5/oz to be considered viable over the project 4 to 5 year life of the project.

11. FINANCIAL ANALYSIS

11.1 Basis

As requested by DIAND, we have carried out the following analysis:

1. Assess the Elsa project economics using the capital and operating cost and mine production parameters presented in the UKHM Studies, at prevailing metal prices, exchange rate and smelter terms [File Elsa 4.5].
2. Assess the Elsa project economics using Hatch's assessment of capital and operating costs and reserve grades and at prevailing metal prices, exchange rate and smelter terms [File Elsa-Hatch].
3. Assess the Elsa tailings project economics using Hatch's assessment of capital and operating costs for heap leach and gravity concentration plants [Files Elsa tailings – HL01 & Elsa tailings – grav01]..

The project cashflow projections are presented in Appendix C (UKHM Base Case and the Hatch revisions).

The following assumptions constitute the current conditions and parameters used in the Hatch economic analysis:

• Exchange rate	U$/CD$	0.62
• Silver price	U$/oz	4.50
• Zinc price	U$/lb	0.36
• Lead price	U$/lb	0.23
• Inflation rate	%pa	0
• Royalties payable	%	0

- Net Smelter Return (NSR) is the gross value of metals produced and recovered to concentrates, less all smelter charges and penalties. Net Mine Return (NMR) is the NSR less concentrate transport, insurance, port handling and selling costs. The gross value of metals produced is determined as the aggregate of the tonnage of ore processed multiplied by the metal grades, process recovery percentages and forecast metals price for each metal.

  The smelter charges are detailed below, typical of recent smelter term sheets. Generally, smelter charges included a deduction of payable metal, treatment charges, refining charges (for some types of metals) and penalties for excess deleterious substances and moisture. Concentrate transportation, port handling and enroute concentrate losses (if applicable) are also deducted to yield NSR at the mine-gate.

  a) Lead Concentrate:

Lead deduction	%	3
Smelter charge	U$/DMT	195
Refining charge	U$/DMT	0
Lead payable	%	95
Transportation charge	U$/WMT	106
Silver payable	%	96.5
Refining charge	U$/oz	0.45

b) Zinc Concentrate:

Zinc deduction	%	8
Smelter charge	U$/DMT	175
Refining charge	U$/DMT	0
Transportation charge	U$/WMT	106
Silver payable	%	60
Refining charge	U$/oz	0.50

- Concentrate Transport

  Metal concentrates are transported by truck from the minesite to the port of Skagway in Alaska. The estimated cost of trucking from mine-site to Skagway is $42.50 per wet metric tonne (wmt). Port handling is an additional $8/wmt. Ocean transport costs were assumed at $35.29/wmt for the zinc concentrates, and $55.88 for the lead and copper concentrates.

- Concentrate Selling Cost

  An allowance for the costs of selling concentrates has been made. It is calculated as 0.5% of NSR before concentrate transport deductions. This includes insurance, agent's fees and dusting losses.

- Ore Production Rate, Grade and Process Recovery

  The ore production rate schedules from the Bellekeno and Silver King, average ore head grades and metal recoveries are detailed in earlier sections of the report.

- Working Capital

  Working capital consists of increases in accounts receivable, concentrate inventories, supplies and prepaid expenses; less increases in accounts payable. When a mining operation first commences, initial working capital amounts can be significant; as the concentrates are produced and shipments are made to the port and to the smelter, levels of accounts receivable and inventories rise. Sufficient funding must be available to cover week-to-week cash requirements until the first cash payments from the smelters are received. Initial working capital is assessed at approximately 2.5 months of operating expenses, part of the initial project capital costs.

  During the period of normal mine operations, net working capital levels will fluctuate up and down month to month. All working capital is recovered at the end of mine life including the allowance for spares and supplies inventory.

- Sustaining Capital

  Sustaining capital requirements are based on the figures presented in the UKHM Studies.

- Income Taxes

  The economic analysis has been done on an after-tax basis. Income taxes as applied to Canadian mining operations are generally levied at three levels: Federal and Provincial income taxes and Provincial or Territorial mining taxes. Each level of tax requires different calculations and separate tax depreciation pools (Called Capital Cost Allowances in Canada). In the Yukon Territory, the territorial income tax rate is applied to the taxable income as calculated for Federal purposes. However, for these projects, the net income taxes paid over the 4-year life is $0 as it can reasonably be assumed that there will be a sufficient tax loss pool to negate income taxes over the life of the mine.

11.2 Elsa Mine Reopening

The detailed cashflow spreadsheets are included in Appendix C, and are summarized as follows:

		UKHM Study	Hatch Assessment				
Silver price	U$/oz	Base	Base	6.45	7.0	7.0	7.0
Capital cost	$M	8.0	Base	Base	Base	+10%	Base
Operating Cost	$M	149.6	Base	Base	Base	Base	+10%
Cashflow cum.	$M	(3.2)	(48.3)	0.6	14.3	13.2	2.9
IRR	%	--	--	1.7	35.0	29.8	8.1
Cash cost	U$/oz	3.5	4.9	4.9	4.9	4.9	5.3
Total cash cost	**U$/oz**	**3.6**	**5.1**	**5.1**	**5.1**	**5.1**	**5.5**

Note: "Base" refers to conditions shown in Section 11.1 and capital and operating costs defined in Sections 6.0 & 7.0 respectively.

- Using the UKHM Study capital and operating costs and ore production schedule, but at current metal prices, the project is marginally cash negative.
- Using Hatch's capital and operating costs and ore production schedule at current prices, the project is uneconomic. The project only breaks even at a silver price of U$6.45/oz.
- The project is very sensitive to operating costs and silver price and relatively insensitive to capital costs. 10% increases in capital and operating costs results in a reduction of 6% and 27% respectively in the rate of return.

11.3 Elsa Tailings Reprocessing

The results of the economic analyses are summarized as follows:

		Heap Leach				Gravity Concentration			
Silver price	U$/oz	Base	8.5	Base	Base	Base	8.5	Base	Base
Operating Cost	$M	Base	Base	-50%	Base	Base	Base	-20%	Base
Capital Cost	$M	Base	Base	Base	-50%	Base	Base	Base	-20%
Pre-tax Cashflow cum	$M	(18.7)	0.3	(7.1)	(12.3)	(9.2)	0.6	(7.5)	(7.7)
IRR	%	--	1.0	--	--	--	3.3	--	--
Cash Cost	U$/oz	5.1	5.1	2.6	5.1	3.7	3.7	3.1	3.7
Total Cash Cost	**U$/oz**	**5.6**	**5.6**	**3.2**	**5.6**	**4.7**	**4.7**	**4.0**	**4.7**

Note: "Base" refers to conditions shown in Section 11.1 and capital and operating costs defined in Section 9.0.

- At base conditions, neither of the process options are economic, although the gravity concentration option returns the least negative cashflow over the mine life. Both options require a silver price of about U$8.5/oz to become attractive at base case capital and operating cost conditions.
- The heap leach option is significantly more sensitive to operating than capital costs, whereas the gravity concentration option is apparently equally sensitive to capital and operating costs.

12. RECOMMENDATIONS

There is a lack of information in a number of project areas which merit further investigation to reduce the project risk potential. Some of this data may exist, but is not included in the Studies reviewed by hatch. The areas suggested for further investigation are summarized as follows:

- Ore Reserves – since only approximately 35% of the reserves can be classified as proven and probable, further work is needed to confirm the assumptions that the additional ore can be found and mined economically.

- Metallurgy – metallurgical testwork has only been carried out on Bellekeno and Silver King ore. Further testwork is required on Silver King and the additional ore bodies to confirm the adequacy of the proposed plan and recovery parameters.

- Mine operating costs have only been developed for the Bellekeno and Silver King operations that only represent a portion of the total 5-year plan. Therefore costing of the other, satellite veins will be required for more accurate economic analysis.

APPENDIX A

Notes on Elsa Property Geology and Resource/Reserve Assessment

Geological Setting & Exploration Potential

- 700m thick Central Quartzite unit is the favourable horizon for vein systems
- two stages of mineralization involved with the second stage being the dominant silver-lead-zinc bearing period
- vein systems are complex, occurring as the result of brittle fracture in the quartzite zone resulting in dilatational zones for sulphide deposition, disrupted by post-mineralization faulting
- veins are generally narrow, swelling to +10m in some places, within which erratic "shoots" of payable mineralization occur (represent low percentage of host vein structures)
- vertical continuity generally better than the horizontal (variable along strike, 30-335m)
- exploration and definition of Proven blocks largely dependent on lateral and vertical development since diamond drilling costly and ineffective (poor recovery)
- ground conditions poor to extremely poor in the vein systems and immediate footwall and hanging wall
- down-dip and down-plunge extensions believed to exist in several vein systems across the Keno belt
- 1994-96 exploration added ~213,000 tons of resource, but is based on percussion drilling
- favourable conditions for development of payable shoots of mineralization are:
  - vein junctions
  - cymoid loops
  - related to footwall cross-faulting
  - changes in vein dip/strike
  - directly beneath contact of the Quartzite with the Upper Schist Unit
- specific exploration targets:
  - Bellekeno: down dip/plunge extension of SW zone
  - various small (?) vein systems at Silver King
  -

Conclusions

- region is favourable for the occurrence of additional silver-rich vein systems
- style of mineralization will be similar to that already known (narrow, erratic, high-grade)
- exploration will be expensive, particularly in areas outside established mining centres where rehabilitation of abandoned workings will be required

Property Descriptions

Bellekeno:

- hosts largest resource of property; principal resource blocks are in two zones (SW and 99)
- well-established access to 99 zone, but new adit and ramp will be required for SW zone
- 99 zone has been mined in the past, SW zone is virgin

Silver King:

- oldest mine in district
- well-established haulage level (100) already exists, but surface access via decline required
- several veins and resource blocks, some in remnant (pillars?)
- payable zones tend to be narrower than at Bellekeno

- together with Bellekeno, forms the principal targets for future production

Onek:
- abandoned for several years
- remnant open pit and underground potential
- more work required to define mineralization, including a decline ramp
- longhole stoping proposed, plus one bench remaining in pit

Husky SW:
- only shaft access available, and mine is flooded (de-watering to 530 level required)
- new plan assumes driving a decline to avoid using old shaft
- mineral resources remain in old mine

Flame & Moth:
- small tonnage (16,000 tons) remaining that could be extracted by open pit at an 11/1 strip ratio

Husky:
- one of the historically highest grade vein systems in the district, now abandoned
- old workings consist of 4 levels at 100ft intervals accessed by shaft, now flooded
- potential for extensions to mined-out zones, but only on an exploration basis

Keno 18:
- remaining resource in crown pillar above filled stopes could be extracted by open pit at high strip ratios (27/1 estimated)
- 15,000 tons of resource delineated (40-50opt?)

Shamrock K:
- possible pit extraction of remaining resource below existing pit limits
- very tentative potential

Ruby:
- a 1,600ft decline ramp would be required to access potential resources lying below and down-dip from the present workings (or as structural offsets, etc)
- geological confidence that extensions do exist

Resource Parameters

- Measured, Indicated, & Inferred categories according to Australian Code (JORC)
- calculated by Watts, Griffiths & McOuat (WGM) in 1995/96 based on earlier work plus additional drilling to depth on Bellekeno and Silver King vein systems
- current resources are based on a combination of older (1988) and newer (1994/95) data from various drilling campaigns (AQ to HQ diamond core and percussion) and chip/channel sampling in drifts (and raises?)
- database of information is believed to be extensive with several thousands of metres of drilling and individual underground samples available for resource estimation
- manual, polygonal methods on longitudinal section used for resource estimation
- cutting factors for erratic silver values applied to earlier data, but not to latest WGM data (1994-96)
- mineralization less than 5.5 feet diluted out to 5.5 feet
- silver cutoff grade of 15 ounces per ton (opt) used to select resource blocks
- historically, Mine Call Factors (MCF) applied to resources to account for dilution and other grade losses, however have **not** been applied to Bellekeno or Silver King veins (containing the bulk of the Elsa property resources)
- largest ore zones are the Bellekeno #48, and Silver City Vein #5, with the balance in isolated (remnant) blocks (pillars?), and outside properties

- all of the resources added by WGM in 1994-96 are based on percussion holes and will require confirmation by diamond drilling and/or development
- total resources in 1996 were put at 665,300 tons grading 30opt Ag, 6.7% Pb, and 3.3% Zn in
- distribution on a tonnage basis is approximately:
  - **Bellekeno/Silver King:** Measured & Indicated: 28%
    Inferred: 27%
  - **Various Other:** Measured & Indicated: 7%
    Inferred: 38%
- Measured & Indicated is therefore only ~ 35% of total property resource, with large quantities of Inferred (or potential) tied up in abandoned and/or small occurrences (Husky, Husky SW, Onek, Flame & Moth, Keno 18, Shamrock, Ruby), plus old dumps
- these Inferred resources could well be reasonable targets but will require exploration and development expenditures to fully evaluate them
- the main targets for initial mining are therefore the Bellekeno & Silver King occurrences and account for 28% of the property's total Measured & Indicated Resource (55% including Inferred)
- historically, MCF factors have been used to convert in situ geological resources to mineable quantities for mine scheduling based on operating experience and comparisons
- MCF factors were used to account for external dilution and other grade losses, but no adjustment to tonnages made
- existing mine plan is based on accessing the two principal resource blocks at Bellekeno #48 and Silver City #5 Vein. These are accessible, but not clear as to status of other remnant blocks
- 15opt cutoff used at resource stage implies a recovered value of ~C$90 per tonne of ore, that is ~60% of the quoted operating cost of C$150/ton (excluding exploration)
- on an equivalent gold basis, 15opt silver cutoff is ~8g/tonne on a gold equivalent basis, and probably is low given current economic conditions for a high-cost underground operation, however on an incremental cost basis may be reasonable
- although several properties are listed on the resource statement, only the Bellekeno and Silver King operations are costed and scheduled
- the total 665,300 tons of resources are scheduled out to the end-of-mine life at a rate of 328tpd using only Bellekeno and Silver King cost and NSR parameters
- sensitivities to varying reserve situations are suggested as follows:
  - Upper Limit: Resource as stated (665,300 tons)
  - Lower Limit: Measured & Indicated for Bellekeno/Silver King only (2P)
  - Median Case: All Bellekeno & Silver King (3P)

APPENDIX B

Preliminary Sizing and Costing of Equipment and Facilities

APPENDIX C

Project Cashflow Analyses

ELSA TAILINGS REPROCESSING

Proj # 32872
Date 11/2/02

		HL	
Tonnage	Mt	1	
grade	opt	5.35	
	g/t	166.4139	
recovery,HL	%	55%	
Ag production	oz/mth	122604.2	
plant availability, operating	%	80%	
life of mine	yrs	4	
mining,stacking operating period	mths/yr	6	
processing rate	tpa	250000	
	tpm	41667	
	tpd	1389	
design	tpd	1736	
	tph	72	
Ag price	U$/oz	4.75	
C$/U$ exchange rate		1.55	
	C$/oz	7.36	
max rainfall event,24 hrs	mm	60	
cyanide consumption	kg/t	0.7	
cement consumption	kg/t	4	
zinc consumption	kg/kg Ag	1.5	
soln application to achieve recovery	ts/to	2.5	
agglom bulk density	t/cm	1.5	
lift height	m	4	
# lifts		3	
agglom moisture content	%	10	
heap active leach moisture content	%	11	
heap draindown moisture content,24hrs	%	4	
heap retained moisture content	%	6	
Pad and ponds:			
heap area,nom	cm	55556	
heap dims,nom	mxm	236	
heap dims,design	mxm	306	to account for 1:2.5 side slope
heap area,design	sm	93889	
ore under leach	t	104167	
area under leach per lift	sm	17361	
max ore under leach, top lifts	t	406250	incl 30% factor for wetted front
max draindown	t	16250	

max runoff	t	5633	
leach solution application rate,nom	cm/d	1389	primary and same for secondary leaching
	cm/h	58	
draindown,24 hrs, design	t	2778	
# process ponds		2	
process pond capacity,ea - design	cm	3000	
events pond capacity	cm	8411	
events pond capacity - design	cm	10000	
Merille Crowe plant			
capacity	cm/hr	72	
	gpm	322	
Capex estimate :			
Pad	$/sm	25	Brewery Creek + for smaller
	$	1173611	construct in 2 phases
ponds	$/cm	35	BC
	$	210000	
equipment factor		30%	
indirects cost factor		35%	
contingency factor		15%	
dump hopper,conveyors	$	225000	used,new
agglomerator drum	$	150000	used refurbished
grasshoppers,stacker	$	250000	used refurbished
pumps	$	60000	new
Merille Crowe plant	$	500000	used refurbished
est process equipment	$	1185000	
est total equipt installed	$	3950000	incl electrics,piping valves etc
pad and ponds	$	1383611	
total direct costs,est	$	5333611	
total indirects cost ,est	$	1866764	
contingency	$	1080056	
Total costs,est	***$***	***8280431***	

Operating costs			cost $/kg	usage kg/t ore	usage kg/mth	cost $/mth	cost $/t ore	
cyanide cost			1.5	0.7		43750	1.05	
cement cost			0.25	2.5		26042	0.63	
zinc powder			1.85			340227	8.17	
maintenance, @ % equipt capital		1.0%				11850	0.28	
Labour , rate avg	$/pa		60000					28.8

# of, processing incl maintenance		#	30		150000	3.60			
# of G&A		#	4		20000	0.48			
cost w 35% burden		$/pm			229500	5.51			
power	300 kW	$/kWh	0.077	162000	12474	0.30			
mining contract		$/t ore	2.075		86458	2.08		incl ore:sand ratio 3:2	
G&A :									
insurance					10000	0.24			
personel transportation and camp					28125	0.68			
legal,accounting etc					2000	0.05			
communications etc					1500	0.04			
					$/mth	***$/t ore***	***$/oz Ag***	***U$/oz***	
total	process,power,maintenance				833842	20.01	6.8	4.4	
	G&A				41625	1.00	0.3	0.2	
	mining				86458	2.08	0.7	0.5	
	environmental,closure				0	0.00	0.0	0.0	
	total				961926	23.09	7.85	5.06	

Elsa Properties -
Cashflow Summary
UKHM Study - current metal prices

Silver	Zinc	Lead	CDN$
$4.50	$0.36	$0.23	$0.62

27-Mar-02

	Year	-1	1	2	3	4	5	TOTAL
Ore Production								
Bellekeno	tpa		87,500	87,500	87,500	87,500	87,500	
Silver King	tpa		41,300	41,300	41,300	41,300	41,300	
Total	tpa		128,800	128,800	128,800	128,800	128,800	
Operating Cost								
g&a	$CDN/t		$46.00	$46.00	$46.00	$46.00	$46.00	
milling	$CDN/t		$22.00	$22.00	$22.00	$22.00	$22.00	
mining	$CDN/t		$81.61	$81.61	$81.61	$81.61	$81.61	
Total	$CDN/t		$149.61	$149.61	$149.61	$149.61	$149.61	
Metal Production								
Payable Silver recovered	oz		4,031,584	4,031,584	4,031,584	4,031,584	4,031,584	20,157,920
Payable Lead recovered	lbs		20,056,688	20,056,688	20,056,688	20,056,688	20,056,688	100,283,441
Payable Zinc recovered	lbs		11,858,942	11,858,942	11,858,942	11,858,942	11,858,942	59,294,710
Revenue								
Silver	k$CDN		$29,261	$29,261	$29,261	$29,261	$29,261	146,307
Lead	k$CDN		$7,439	$7,439	$7,439	$7,439	$7,439	37,196
Zinc	k$CDN		$6,885	$6,885	$6,885	$6,885	$6,885	34,423
Smelter Refining, Transportation	k$CDN		($18,787)	($18,787)	($18,787)	($18,787)	($18,787)	(93,937)
Net Smelter Return	k$CDN		$24,798	$24,798	$24,798	$24,798	$24,798	123,990
Project Cash Flow								
Net Smelter Return	k$CDN		$24,798	$24,798	$24,798	$24,798	$24,798	123,990
Operating Cost	k$CDN		$19,270	$19,270	$19,270	$19,270	$19,270	96,349
								-
Profit Before Royalty	k$CDN		$5,528	$5,528	$5,528	$5,528	$5,528	27,641
Royalty	k$CDN		0	0	0	0	0	-
Management OH	k$CDN		$1,200	$1,200	$1,200	$1,200	$1,200	6,000
								-
Profit After Royalty	k$CDN		$4,328	$4,328	$4,328	$4,328	$4,328	21,641
Purchase Costs	k$CDN	$0						-
Construction Capital Cost	k$CDN	$8,000						8,000
Ongoing Capital Cost	k$CDN		$150	$150	$150	$150	$150	750
Closure Cost	k$CDN						3,220	3,220
Closure Bond ($5/t)	k$CDN		$644	$644	$644	$644	$644	3,220
Exploration Expense ($20/t)	k$CDN		$2,576	$2,576	$2,576	$2,576	$2,576	12,880
Change in Working Capital	k$CDN		$3,512	$0	$0	$0	($3,512)	-
								-
Cashflow before Tax	k$CDN	($8,000)	($2,554)	$958	$958	$958	$4,470	(3,209)
Income Tax	k$CDN	$0	$0	$0	$0	$0	$1,359	1,359
Yukon Resource Tax	k$CDN	$0	$0	$0	$0	$0	$0	-
								-
Project Cash Flow	k$CDN	($8,000)	($2,554)	$958	$958	$958	$5,829	(1,850)
								-
Accumulated Cash	k$CDN	($8,000)	($10,554)	($9,595)	($8,637)	($7,679)	($1,850)	(1,850)
IRR (before tax)	%							-8.62%
IRR (after tax)	%							-4.57%
		0	0	0	0	0	-	0.00
Payback Period (after tax)	Years							0.00
Net Present Value								
0%	k$CDN							$ (1,850)
6%	k$CDN							$ (3,054)
8%	k$CDN							$ (3,263)
10%	k$CDN							$ (3,408)
20%	k$CDN							$ (3,532)

Production	Year	1	2	3	4	5	TOTAL
	Unit						
Mined							
Bellekeno Ore	t	87,500	87,500	87,500	87,500	87,500	437,500
Silver King Ore	t	41,300	41,300	41,300	41,300	41,300	206,500
Other							-
Total	t	128,800	128,800	128,800	128,800	128,800	644,000
Bellekeno Ore Grades							
Gold	g/t	0.000	0.000	0.000	0.000	0.000	
Silver	g/t	1084.890	1084.890	1084.890	1084.890	1084.890	
Zinc	%	7.860	7.860	7.860	7.860	7.860	
Lead	%	10.870	10.870	10.870	10.870	10.870	
Copper	%	0.000	0.000	0.000	0.000	0.000	
Silver King Ore Grades							
Gold	g/t	0.000	0.000	0.000	0.000	0.000	
Silver	g/t	1057.210	1057.210	1057.210	1057.210	1057.210	
Zinc	%	0.600	0.600	0.600	0.600	0.600	
Lead	%	3.000	3.000	3.000	3.000	3.000	
Copper	%	0.000	0.000	0.000	0.000	0.000	
Blended Ore Grades							
Gold	g/t	0.000	0.000	0.000	0.000	0.000	
Silver	g/t	1076.014	1076.014	1076.014	1076.014	1076.014	
Zinc	%	5.532	5.532	5.532	5.532	5.532	
Lead	%	8.346	8.346	8.346	8.346	8.346	
Copper	%	0.000	0.000	0.000	0.000	0.000	
Contained Metals							
Gold	oz	-	-	-	-	-	
Silver	oz	4,455,793	4,455,793	4,455,793	4,455,793	4,455,793	
Zinc	lbs	15,708,598	15,708,598	15,708,598	15,708,598	15,708,598	
Lead	lbs	23,700,244	23,700,244	23,700,244	23,700,244	23,700,244	
Copper	lbs	-	-	-	-	-	
Recovery							
Bellekeno lead to lead con	%	90.00	90.00	90.00	90.00	90.00	
Bellekeno silver to lead con	%	85.00	85.00	85.00	85.00	85.00	
Bellekeno zinc to zinc con	%	85.00	85.00	85.00	85.00	85.00	
Bellekeno silver to zinc con	%	8.00	8.00	8.00	8.00	8.00	
Silver King lead to lead con	%	80.00	80.00	80.00	80.00	80.00	
Silver King silver to lead con	%	85.00	85.00	85.00	85.00	85.00	
Payable Metal Recovered							
Silver	oz	4,031,584	4,031,584	4,031,584	4,031,584	4,031,584	20,157,920
Zinc	lbs	12,890,154	12,890,154	12,890,154	12,890,154	12,890,154	64,450,772
Lead	lbs	21,060,672	21,060,672	21,060,672	21,060,672	21,060,672	105,303,358
Silver Distribution in Products							
To Bellekeno Zn Con	oz	244,160	244,160	244,160	244,160	244,160	1,220,801
To Bellekeno Pb Con	oz	2,594,202	2,594,202	2,594,202	2,594,202	2,594,202	12,971,009
To Silver King Pb Con	oz	1,193,222	1,193,222	1,193,222	1,193,222	1,193,222	5,966,111
To Bellekeno Zn Con	kg	7,594	7,594	7,594	7,594	7,594	37,971
To Bellekeno Pb Con	kg	80,689	80,689	80,689	80,689	80,689	403,443
To Silver King Pb Con	kg	37,113	37,113	37,113	37,113	37,113	185,567
Total Silver Recovered	**kg**	125,396	125,396	125,396	125,396	125,396	626,981
	oz	**4,031,584**	**4,031,584**	**4,031,584**	**4,031,584**	**4,031,584**	20157920

Production	Year	1	2	3	4	5	TOTAL
	Unit						
Zinc Distribution in Products							
To Bellekeno Zn Con	lbs	12,890,154	12,890,154	12,890,154	12,890,154	12,890,154	64,450,772
To Bellekeno Pb Con	lbs	-	-	-	-	-	-
To Silver King Pb Con	lbs	-	-	-	-	-	-
To Bellekeno Zn Con	tonnes	5,846	5,846	5,846	5,846	5,846	29,229
To Bellekeno Pb Con	tonnes	-	-	-	-	-	-
To Silver King Pb Con	tonnes	-	-	-	-	-	-
Total Zinc Recovered	**tonnes**	5,846	5,846	5,846	5,846	5,846	29,229
	lbs	**12,890,154**	**12,890,154**	**12,890,154**	**12,890,154**	**12,890,154**	64450771.875
Lead Distribution in Products							
To Bellekeno Zn Con	lbs	0	0	0	0	0	
To Bellekeno Pb Con	lbs	18,875,076	18,875,076	18,875,076	18,875,076	18,875,076	94,375,378
To Silver King Pb Con	lbs	2,185,596	2,185,596	2,185,596	2,185,596	2,185,596	10,927,980
To Bellekeno Zn Con	tonnes	-	-	-	-	-	-
To Bellekeno Pb Con	tonnes	8,560	8,560	8,560	8,560	8,560	42,801
To Silver King Pb Con	tonnes	991	991	991	991	991	4,956
Total Lead Recovered	**tonnes**	9,551	9,551	9,551	9,551	9,551	47,757
	lbs	**21,060,672**	**21,060,672**	**21,060,672**	**21,060,672**	**21,060,672**	105303358.125
Bellekeno Zinc Concentrate Constituents							
Silver To Conc.	kg	7,594	7,594	7,594	7,594	7,594	37,971
Zinc To Conc.	kg	5,845,875	5,845,875	5,845,875	5,845,875	5,845,875	29,229,375
Lead To Conc.	kg	-	-	-	-	-	-
Total Metals In Conc.	kg	5,853,469	5,853,469	5,853,469	5,853,469	5,853,469	29,267,346
Total Dry Conc. @ 48.0% Zinc	tonnes	12,179	12,179	12,179	12,179	12,179	60,895
Total Conc. @ 10% Water	tonnes	13,532	13,532	13,532	13,532	13,532	67,661

Production	Year	1	2	3	4	5	TOTAL
	Unit						
Bellekeno Lead Concentrate Constituents							
Silver To Conc.	kg	80,689	80,689	80,689	80,689	80,689	403,443
Zinc To Conc.	kg	-	-	-	-	-	-
Lead To Conc.	kg	8,560,125	8,560,125	8,560,125	8,560,125	8,560,125	42,800,625
Total Metals In Conc.	kg	8,640,814	8,640,814	8,640,814	8,640,814	8,640,814	43,204,068
Total Dry Conc. @ 64.0% Lead	tonnes	13,375	13,375	13,375	13,375	13,375	66,876
Total Conc. @ 10% Water	tonnes	14,861	14,861	14,861	14,861	14,861	74306.641
Silver King Lead Concentrate Constituents							
Silver To Conc.	kg	37,113	37,113	37,113	37,113	37,113	185,567
Zinc To Conc.	kg	-	-	-	-	-	-
Lead To Conc.	kg	991,200	991,200	991,200	991,200	991,200	4,956,000
Total Metals In Conc.	kg	1,028,313	1,028,313	1,028,313	1,028,313	1,028,313	5,141,567
Total Dry Conc. @ 55.0% Lead	tonnes	1,802	1,802	1,802	1,802	1,802	9,011
Total Conc. @ 10% Water	tonnes	2,002	2,002	2,002	2,002	2,002	10012.121
Bellekeno Zinc Concentrate Constituents							
Ag	ppm	624	624	624	624	624	
Zn	%	48.0	48.0	48.0	48.0	48.0	
Pb	%	1.50	1.50	1.50	1.50	1.50	
Cd	%	0.47	0.47	0.47	0.47	0.47	
As	%	0.26	0.26	0.26	0.26	0.26	
Fe	%	10.00	10.00	10.00	10.00	10.00	
Se	ppm	-	-	-	-	-	
Sb	%	-	-	-	-	-	
Bellekeno Lead Concentrate Constituents							
Ag	ppm	6,033	6,033	6,033	6,033	6,033	
Zn	%	7.00	7.00	7.00	7.00	7.00	
Pb	%	64.0	64.0	64.0	64.0	64.0	
Cu	%	-	-	-	-	-	
As	%	0.04	0.04	0.04	0.04	0.04	
Se	ppm	-	-	-	-	-	
Sb	%	0.53	0.53	0.53	0.53	0.53	
Silver King Lead Concentrate Constituents							
Ag	ppm	20,594	20,594	20,594	20,594	20,594	
Zn	%	10.0	10.0	10.0	10.0	10.0	
Pb	%	55.00	55.00	55.00	55.00	55.00	
Cu	%	-	-	-	-	-	
As	%	0.16	0.16	0.16	0.16	0.16	
Se	ppm	-	-	-	-	-	
Sb	%	0.75	0.75	0.75	0.75	0.75	

Smelter Terms & Metal Payments	Year	1	2	3	4	5	6
	Unit						
BELLEKENO LEAD CONCENTRATE REVENUE		-					
Revenue Due to Lead							
Wet Conc. Production	tonnes	14,861	14,861	14,861	14,861	14,861	#REF!
Dry Conc. Production	tonnes	13,375	13,375	13,375	13,375	13,375	#REF!
Lead Content	kg	########	8,560,125	8,560,125	8,560,125	8,560,125	#REF!
Lead Deduction (3%)	kg	401,256	401,256	401,256	401,256	401,256	#REF!
Lead Content After Deduction	kg	########	8,158,869	8,158,869	8,158,869	8,158,869	#REF!
Lead Revenue	**k$US**	**$4,137**	**$4,137**	**$4,137**	**$4,137**	**$4,137**	**#REF!**
95% Payment	k$US	207	207	207	207	207	#REF!
Price Participation	k$US	$0	$0	$0	$0	$0	$0
Smelter Charge ($195/DMT)	k$US	$2,608	$2,608	$2,608	$2,608	$2,608	#REF!
Refining Charge ($0)	k$US	$0	$0	$0	$0	$0	$0
As+Sb Penalty ($3.00/DMT for each 0.1% over 0.1%)	k$US	$189	$189	$189	$189	$189	#REF!
Se Penalty ($4/DMT for every 200ppm over 200ppm)	k$US	$0	$0	$0	$0	$0	#REF!
Moisture Penalty	k$US	$0	$0	$0	$0	$0	#REF!
Transportation ($106/WMT)	k$US	$1,575	$1,575	$1,575	$1,575	$1,575	#REF!
Revenue Generated By Lead	k$US	($442)	($442)	($442)	($442)	($442)	#REF!
Revenue Due to Silver							
Silver Content	kg	80,689	80,689	80,689	80,689	80,689	#REF!
Silver Revenue	**k$US**	**$11,674**	**$11,674**	**$11,674**	**$11,674**	**$11,674**	**#REF!**
96.5% Payment	k$US	11,265.32	11,265.32	11,265.32	11,265.32	11,265.32	#REF!
Payable Ounces	oz	########	2,503,405	2,503,405	2,503,405	2,503,405	#REF!
Refining Charge ($0.45/oz)	k$US	$1,127	$1,127	$1,127	$1,127	$1,127	#REF!
Revenue Generated By Silver	k$US	$10,139	$10,139	$10,139	$10,139	$10,139	#REF!
Total Revenue From Bellekeno Lead Conc.	**k$US**	**$9,697**	**$9,697**	**$9,697**	**$9,697**	**$9,697**	**#REF!**
	Unit						
SILVER KING LEAD CONCENTRATE REVENUE							
Revenue Due to Lead							
Wet Conc. Production	tonnes	2,002	2,002	2,002	2,002	2,002	#REF!
Dry Conc. Production	tonnes	1,802	1,802	1,802	1,802	1,802	#REF!
Lead Content	kg	991,200	991,200	991,200	991,200	991,200	#REF!
Lead Deduction (3%)	kg	54,065	54,065	54,065	54,065	54,065	#REF!
Lead Content After Deduction	kg	937,135	937,135	937,135	937,135	937,135	#REF!
Lead Revenue	**k$US**	**$475**	**$475**	**$475**	**$475**	**$475**	**#REF!**
95% Payment	k$US	24	24	24	24	24	#REF!
Price Participation	k$US	$0	$0	$0	$0	$0	$0
Smelter Charge ($195/DMT)	k$US	$351	$351	$351	$351	$351	#REF!
Refining Charge ($0)	k$US	$0	$0	$0	$0	$0	$0
As+Sb Penalty ($3.00/DMT for each 0.1% over 0.1%)	k$US	$44	$44	$44	$44	$44	#REF!
Se Penalty ($4/DMT for every 200ppm over 200ppm)	k$US	$0	$0	$0	$0	$0	#REF!
Moisture Penalty	k$US	$0	$0	$0	$0	$0	#REF!
Transportation ($106/WMT)	k$US	$212	$212	$212	$212	$212	#REF!
Revenue Generated By Lead	k$US	($156)	($156)	($156)	($156)	($156)	#REF!
Revenue Due to Silver							
Silver Content	kg	37,113	37,113	37,113	37,113	37,113	#REF!
Silver Revenue	**k$US**	**$5,369**	**$5,369**	**$5,369**	**$5,369**	**$5,369**	**#REF!**
95% Payment	k$US	5,101.02	5,101.02	5,101.02	5,101.02	5,101.02	#REF!
Payable Ounces	oz	########	1,133,561	1,133,561	1,133,561	1,133,561	#REF!
Refining Charge ($0.50/oz)	k$US	$567	$567	$567	$567	$567	#REF!
Revenue Generated By Silver	k$US	$4,534	$4,534	$4,534	$4,534	$4,534	#REF!
Total Revenue From Silver King Lead Conc.	**k$US**	**$4,378**	**$4,378**	**$4,378**	**$4,378**	**$4,378**	**#REF!**

Smelter Terms & Metal Payments	Year	1	2	3	4	5	6
	Unit						
	Unit						
BELLEKENO ZINC CONCENTRATE REVENUE							
Revenue Due to Zinc							
Wet Conc. Production	tonnes	13,532	13,532	13,532	13,532	13,532	#REF!
Dry Conc. Production	tonnes	12,179	12,179	12,179	12,179	12,179	#REF!
Zinc Content	kg	########	5,845,875	5,845,875	5,845,875	5,845,875	#REF!
Zinc Deduction (8%)	kg	467,670	467,670	467,670	467,670	467,670	#REF!
Zinc Content After Deduction	kg	########	5,378,205	5,378,205	5,378,205	5,378,205	#REF!
Zinc Revenue	**k$US**	**$4,268**	**$4,268**	**$4,268**	**$4,268**	**$4,268**	**#REF!**
Price Participation	k$US	$0	$0	$0	$0	$0	$0
Smelter Charge ($175/DMT)	k$US	$2,131	$2,131	$2,131	$2,131	$2,131	#REF!
Refining Charge ($0)	k$US	$0	$0	$0	$0	$0	$0
Cd Penalty ($2.00/DMT for each 0.1% over 0.1%)	k$US	$90	$90	$90	$90	$90	#REF!
Fe Penalty ($1.75/DMT for each 1% over 8%)	k$US	$43	$43	$43	$43	$43	#REF!
Transportation ($106/DMT)	k$US	$1,291	$1,291	$1,291	$1,291	$1,291	#REF!
Revenue Generated By Zinc	k$US	$713	$713	$713	$713	$713	#REF!
Revenue Due to Silver							
Silver Content	kg	7,594	7,594	7,594	7,594	7,594	#REF!
Silver Revenue	**k$US**	**$1,099**	**$1,099**	**$1,099**	**$1,099**	**$1,099**	**#REF!**
60% Payment	k$US	659.23	659.23	659.23	659.23	659.23	#REF!
Payable Ounces	oz	146,496	146,496	146,496	146,496	146,496	#REF!
Refining Charge ($0.50/oz)	k$US	$73	$73	$73	$73	$73	#REF!
Revenue Generated By Silver	k$US	$586	$586	$586	$586	$586	#REF!
Total Revenue From Bellekeno Zinc Conc.	**k$US**	**$1,299**	**$1,299**	**$1,299**	**$1,299**	**$1,299**	**#REF!**
Net Smelter Return K$US	**k$US**	**$15,375**	**$15,375**	**$15,375**	**$15,375**	**$15,375**	**#REF!**
Gross Silver Revenue	k$US	$18,142	$18,142	$18,142	$18,142	$18,142	#REF!
Gross Lead Revenue	k$US	$4,612	$4,612	$4,612	$4,612	$4,612	#REF!
Gross Zinc Revenue	k$US	$4,268	$4,268	$4,268	$4,268	$4,268	#REF!
Smelter Refining, Transportation Costs	k$US	($11,648)	($11,648)	($11,648)	($11,648)	($11,648)	#REF!
Net Smelter Return KUS$		**$15,375**	**$15,375**	**$15,375**	**$15,375**	**$15,375**	**#REF!**

PROJECTED TAXES

INCOME TAX	2000	2001	2002	2003	2004	2005	2006	2007	2008
Income Before Taxes	0	0	0	(2,554)	958	958	958	4,470	#REF!
Depreciation	0	0	0	798	798	798	798	798	#REF!
Prior Year Federal Capital Tax	0	0	0	0	0	0	0	0	0
CCA	0	0	0	0	(56)	(80)	(97)	(110)	#REF!
Class 41	0	0	0	1,755	(9,755)	0	0	0	#REF!
Income from Mine	**0**	**0**	**0**	**0**	**(8,055)**	**1,677**	**1,659**	**5,158**	**#REF!**
Add: Interest Expense	0	0	0	0	0	0	0	0	0
Expenses capitalized	0	0	0	0	0	0	0	0	0
Resource Profits	**0**	**0**	**0**	**0**	**(8,055)**	**1,677**	**1,659**	**5,158**	**#REF!**
Resource Allowance (25%)	0	0	0	0	2,014	(419)	(415)	(1,289)	#REF!
Deduct: Interest Expense	0	0	0	0	0	0	0	0	0
CDE	0	0	0	0	0	0	0	0	#REF!
Income Prior to Prior Losses and CEE	**0**	**0**	**0**	**0**	**(6,041)**	**1,258**	**1,244**	**3,868**	**#REF!**
Tax Write-Off	0	0	0	0	0	0	0	0	0
Income for Tax Calculation	0	0	0	0	(6,041)	1,258	1,244	3,868	#REF!
Losses Carried Forward	0	0	0	0	6,041	0	0	0	#REF!
Applied Losses	0	0	0	0	0	(1,258)	(1,244)	(3,539)	0
Income Prior to CEE	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**329**	**#REF!**
CEE	0	0	0	0	0	0	0	(3,429)	#REF!
Taxable Income	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**(3,100)**	**#REF!**
Standard Tax Payable	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,359**	**#REF!**
Tax Holiday	0	0	0	0	0	0	0	0	0
Deferred Income Taxes	0	0	0	1,119	(420)	(420)	(420)	(3,319)	#REF!
Total Taxes - Accounting	**0**	**0**	**0**	**1,119**	**(420)**	**(420)**	**(420)**	**(1,960)**	**#REF!**
Net Income After Taxes	**0**	**0**	**0**	**(1,434)**	**538**	**538**	**538**	**2,510**	**#REF!**
Income Tax Rate - Federal & Provincial	43.84%								

MINING TAX	2000	2001	2002	2003	2004	2005	2006	2007	2008
Income Before Taxes	0	0	0	(2,554)	958	958	958	4,470	#REF!
Interest Expense	0	0	0	0	0	0	0	0	0
Expenses Capitalized - Finance	0	0	0	0	0	0	0	0	0
Expenses Capitalized - Non Finance	0	0	0	0	0	0	0	0	0
Tax Depreciation	0	0	0	1,755	(9,811)	(80)	(97)	(3,539)	#REF!
Total Income Prior to Pre-Production Allowance	0	0	0	(798)	(8,853)	878	861	930	#REF!
Pre-Production Cost Allowance	0	0	0	0	0	0	0	0	0
Total Income Prior to Processing Allowance	0	0	0	(798)	(8,853)	878	861	930	#REF!
Processing Allowance (8% of process assets)	0	0	0	(4,480)	(4,480)	(4,480)	(4,480)	(4,480)	(4,480)
Taxable Income for Mining Tax	0	0	0	(5,278)	(13,333)	(3,602)	(3,619)	(3,550)	#REF!
Total Mining Tax	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**#REF!**
Mining Tax Rate	See Below								

Tax Brackets	Tax rates	2000	2001	2002	2003	2004	2005	2006	2007
Taxable income (in '000)		0	0	0	(5,278)	(13,333)	(3,602)	(3,619)	(3,550)
10 - 5 000	3%	0	0	0	0	0	0	0	0
5 000 - 10 000	5%	0	0	0	0	0	0	0	0
10 000 - 15 000	6%	0	0	0	0	0	0	0	0
15 000 - 20 000	7%	0	0	0	0	0	0	0	0
20 000 - 25 000	8%	0	0	0	0	0	0	0	0
25 000 - 30 000	9%	0	0	0	0	0	0	0	0
30 000 - 35 000	10%	0	0	0	0	0	0	0	0
35 000 - 40 000	11%	0	0	0	0	0	0	0	0
40 000 - 45 000	12%	0	0	0	0	0	0	0	0
45 000 +	12%	0	0	0	0	0	0	0	0
Total Income Taxes		0	0	0	0	0	0	0	0

Losses Carried Forward	0	0	0	0	6,041	4,784	3,539	0	#REF!
Deferred Income Tax Dt(Ct)	0	0	0	1,119	699	279	(141)	(3,459)	#REF!
Compteur annee de profit	0	0	0	1	2	3	4	4	6

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	Dep Rate	2000	2001	2002	2003	2004	2005	2006	2006
Opening	100%	0	0	0	0	2,576	5,152	7,728	10,304
Additions		0	0	0	2,576	2,576	2,576	2,576	0
CCA		0	0	0	0	0			3,429
Ending		0	0	0	2,576	5,152	7,728	10,304	6,875
Opening	100%	0	0	0	8,000	9,755	0	0	0
Additions		0	0	8,000	0	0	0	0	0
CCA		0	0	0	(1,755)	9,755	0	0	0
Ending		0	0	8,000	9,755	0	0	0	0
Opening	30%	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
CCA		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	25%	0	0	0	0	150	244	314	367
Additions		0	0	0	150	150	150	150	150
CCA		0	0	0	0	56	80	97	110
Ending		0	0	0	150	244	314	367	406
Opening	25%	0	0	0	0				
Additions		0	0	0	0	0	0	0	0
CCA		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	25%	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
CCA		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	25%	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
CCA		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	25%	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
CCA		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening		0	0	0	8,000	12,481	5,396	8,042	10,671
Additions		0	0	8,000	2,726	2,726	2,726	2,726	150
CCA		0	0	0	(1,755)	9,811	80	97	3,539
Ending		0	0	8,000	12,481	5,396	8,042	10,671	7,281

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	# Years	2000	2001	2002	2003	2004	2005	2006	2006
Opening	14	0	0	0	0	2,392	4,784	7,176	9,568
Additions		0	0	0	2,576	2,576	2,576	2,576	0
Depreciation		0	0	0	184	184	184	184	184
Ending		0	0	0	2,392	4,784	7,176	9,568	9,384
Opening	14	0	0	0	8,000	7,429	6,857	6,286	5,714
Additions		0	0	8,000	0	0	0	0	0
Depreciation		0	0	0	571	571	571	571	571
Ending		0	0	8,000	7,429	6,857	6,286	5,714	5,143
Opening	14	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
Depreciation		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	14	0	0	0	0	107	214	321	429
Additions		0	0	0	150	150	150	150	150
Depreciation		0	0	0	43	43	43	43	43
Ending		0	0	0	107	214	321	429	536
Opening	20	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
Depreciation		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	20	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
Depreciation		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	5	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
Depreciation		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening	5	0	0	0	0	0	0	0	0
Additions		0	0	0	0	0	0	0	0
Depreciation		0	0	0	0	0	0	0	0
Ending		0	0	0	0	0	0	0	0
Opening		0	0	0	8,000	9,928	11,855	13,783	15,711
Additions		0	0	8,000	2,726	2,726	2,726	2,726	150
Depreciation		0	0	0	798	798	798	798	798
Ending		0	0	8,000	9,928	11,855	13,783	15,711	15,063

Elsa Properties -
Cashflow Summary
Hatch assessment

Silver	Zinc	Lead	CDN$	
$4.50	$0.35	$0.23	$0.62	27-Mar-02

	Year	-1	1	2	3	4	5	TOTAL
Ore Production								
Bellekeno Proved and Probable	tpa		78,750	57,550	0	0	0	136,300
Silver King Proved and Probable	tpa		32,000	0	0	0	0	32,000
Other Possible			5,170	58,370	115,920	115,920	115,920	411,300
Total	tpa		115,920	115,920	115,920	115,920	115,920	579,600
Operating Cost								
g&a	$CDN/t		$54.1	$54.12	$54.12	$54.12	$54.12	
milling	$CDN/t		$26.7	$26.73	$26.73	$26.73	$26.73	
mining	$CDN/t		$117.3	$117.26	$117.26	$117.26	$117.26	
Total	$CDN/t		$198.1	$198.1	$198.1	$198.1	$198.1	
Metal Production								
Total Silver recovered	oz		3,837,585	3,574,773	3,070,284	3,070,284	3,070,284	16,623,212
Total Lead recovered	lbs		17,785,021	17,569,336	12,192,981	12,192,981	12,192,981	71,933,302
Total Zinc recovered	lbs		10,504,520	9,625,093	4,137,346	4,137,346	4,137,346	32,541,650
Revenue								
Silver	k$CDN		$27,853	$25,946	$22,284	$22,284	$22,284	$120,652
Lead	k$CDN		$6,597	$6,517	$4,522	$4,522	$4,522	$26,680
Zinc	k$CDN		$5,929	$5,433	$2,335	$2,335	$2,335	$18,367
Smelter Refining, Transportation	k$CDN		($16,945)	($16,026)	($10,579)	($10,579)	($10,579)	($64,708)
Net Smelter Return	k$CDN		$23,434	$21,869	$18,563	$18,563	$18,563	100,992
Project Cash Flow								
Net Smelter Return	k$CDN		$23,434	$21,869	$18,563	$18,563	$18,563	$100,992
Operating Cost	k$CDN		$22,965	$22,965	$22,965	$22,965	$22,965	$114,825
Profit Before Royalty	k$CDN		$469	($1,096)	($4,402)	($4,402)	($4,402)	($13,833)
Royalty	k$CDN		0	0	0	0	0	$0
Management OH	k$CDN		$1,200	$1,200	$1,200	$1,200	$1,200	$6,000
Profit After Royalty	k$CDN		($731)	($2,296)	($5,602)	($5,602)	($5,602)	($19,833)
Purchase Costs	k$CDN	$0						$0
Construction Capital Cost	k$CDN	$11,770						$11,770
Ongoing Capital Cost	k$CDN		$150	$150	$150	$150	$150	$750
Closure Cost	k$CDN						3,188	$3,188
Closure Bond ($5.5/t)	k$CDN		$638	$638	$638	$638	$638	$3,188
Exploration Expense ($22/t)	k$CDN		$2,550	$2,550	$2,550	$2,550	$2,550	$12,751
Change in Working Capital	k$CDN		$2,928	($322)	($679)	$0	($1,927)	$0
Cashflow before Tax	k$CDN	($11,770)	($6,997)	($5,312)	($8,260)	($8,940)	($7,013)	($48,292)
Income Tax	k$CDN	$0	$0	$0	$0	$0	$0	$0
Yukon Resource Tax	k$CDN	$0	$0	$0	$0	$0	$0	$0
Project Cash Flow	k$CDN	($11,770)	($6,997)	($5,312)	($8,260)	($8,940)	($7,013)	($48,292)
								$0
Accumulated Cash	k$CDN	($11,770)	($18,767)	($24,079)	($32,339)	($41,279)	($48,292)	($48,292)
IRR (before tax)	%							#NUM!
IRR (after tax)	%							#NUM!
Payback Period (after tax)	Years							0.00
Net Present Value								
0%	k$CDN							$ (48,292)
6%	k$CDN							$ (35,562)
8%	k$CDN							$ (32,312)
10%	k$CDN							$ (29,442)
20%	k$CDN							$ (19,213)

Production	Year	1	2	3	4	5	TOTAL
	Unit						
Mined							
Bellekeno Ore	t	78,750	57,550	-	-	-	136,300
Silver King Ore	t	32,000	-	-	-	-	32,000
Other Ore	t	5,170	58,370	115,920	115,920	115,920	411,300
Total	t	115,920	115,920	115,920	115,920	115,920	579,600
Bellekeno Ore Grades							
Gold	g/t	0.000	0.000	0.000	0.000	0.000	
Silver	g/t	1179.000	1179.000	1179.000	1179.000	1179.000	
Zinc	%	7.600	7.600	7.600	7.600	7.600	
Lead	%	10.500	10.500	10.500	10.500	10.500	
Copper	%	0.000	0.000	0.000	0.000	0.000	
Silver King Ore Grades							
Gold	g/t	0.000	0.000	0.000	0.000	0.000	
Silver	g/t	1057.210	1057.210	1057.210	1057.210	1057.210	
Zinc	%	0.600	0.600	0.600	0.600	0.600	
Lead	%	3.000	3.000	3.000	3.000	3.000	
Copper	%	0.000	0.000	0.000	0.000	0.000	
Other Ore Grades							
Gold	g/t	0.000	0.000	0.000	0.000	0.000	
Silver	g/t	885.822	885.822	885.822	885.822	885.822	
Zinc	%	2.070	2.070	2.070	2.070	2.070	
Lead	%	5.561	5.561	5.561	5.561	5.561	
Copper	%	0.000	0.000	0.000	0.000	0.000	
Blended Ore Grades							
Gold	g/t	0.000	0.000	0.000	0.000	0.000	
Silver	g/t	1132.304	1031.374	885.822	885.822	885.822	
Zinc	%	5.421	4.815	2.070	2.070	2.070	
Lead	%	8.209	8.013	5.561	5.561	5.561	
Copper	%	0.000	0.000	0.000	0.000	0.000	
Contained Metals							
Gold	oz	-	-	-	-	-	
Silver	oz	4,220,000	3,843,842	3,301,381	3,301,381	3,301,381	17,967,985
Zinc	lbs	13,853,878	12,306,197	5,289,818	5,289,818	5,289,818	42,029,529
Lead	lbs	20,979,745	20,478,053	14,211,608	14,211,608	14,211,608	84,092,620
Copper	lbs	-	-	-	-	-	
Recovery							
Bellekeno/Other lead to lead con	%	90.00	90.00	90.00	90.00	90.00	
Bellekeno/Other silver to lead con	%	85.00	85.00	85.00	85.00	85.00	
Bellekeno/Other zinc to zinc con	%	85.00	85.00	85.00	85.00	85.00	
Bellekeno/Other silver to zinc con	%	8.00	8.00	8.00	8.00	8.00	
Silver King lead to lead con	%	80.00	80.00	80.00	80.00	80.00	
Silver King silver to lead con	%	85.00	85.00	85.00	85.00	85.00	
Payable Metal Recovered							
Silver	oz	3,837,585	3,574,773	3,070,284	3,070,284	3,070,284	16,623,212
Zinc	lbs	11,417,956	10,462,058	4,497,115	4,497,115	4,497,115	35,371,359
Lead	lbs	18,673,322	18,433,402	12,792,636	12,792,636	12,792,636	75,484,633
Silver Distribution in Products							
To Bellekeno Zn Con	oz	238,806	174,518	-	-	-	413,324
To Bellekeno Pb Con	oz	2,537,315	1,854,254	-	-	-	4,391,568
To Silver King Pb Con	oz	924,530	-	-	-	-	924,530
To Other Zn Con	oz	11,779	132,989	264,110	264,110	264,110	937,100
To Other Pb Con	oz	125,155	1,413,012	2,806,174	2,806,174	2,806,174	9,956,689
To Bellekeno Zn Con	kg	7,428	5,428	-	-	-	12,856
To Bellekeno Pb Con	kg	78,919	57,674	-	-	-	136,593
To Silver King Pb Con	kg	28,756	-	-	-	-	28,756
To Other Zn Con	kg	366	4,136	8,215	8,215	8,215	
To Other Pb Con	kg	3,893	43,950	87,282	87,282	87,282	
Total Silver Recovered	**kg**	119,362	111,188	95,497	95,497	95,497	517,040
	oz	**3,837,585**	**3,574,773**	**3,070,284**	**3,070,284**	**3,070,284**	16623212
Zinc Distribution in Products							
To Bellekeno Zn Con	lbs	11,217,386	8,197,595	-	-	-	19,414,981
To Other Zn Con	lbs	200,570	2,264,463	4,497,115	4,497,115	4,497,115	15,956,378
To Bellekeno Zn Con	tonnes	5,087	3,718	-	-	-	8,805
To Other Zn Con	tonnes	91	1,027	2,040	2,040	2,040	7,236
Total Zinc Recovered	**tonnes**	5,178	4,745	2,040	2,040	2,040	16,041
	lbs	**########**	**########**	**4,497,115**	**4,497,115**	**4,497,115**	35371358.587
Lead Distribution in Products							
To Bellekeno Pb Con	lbs	16,409,334	11,991,837	-	-	-	28,401,172
To Silver King Pb Con	lbs	1,693,440	-	-	-	-	1,693,440
To Other Pb Con	lbs	570,548	6,441,565	12,792,636	12,792,636	12,792,636	
To Bellekeno Pb Con	tonnes	7,442	5,438	-	-	-	12,880
To Silver King Pb Con	tonnes	768	-	-	-	-	768
To Other Pb Con	tonnes	259	2,921	5,802	5,802	5,802	
Total Lead Recovered	**tonnes**	8,469	8,360	5,802	5,802	5,802	34,233
	lbs	**########**	**########**	**########**	**########**	**########**	75484633.461
Bellekeno/Other Zinc Concentrate Constituents							
Silver To Conc.	kg	7,794	9,565	8,215	8,215	8,215	42,003
Zinc To Conc.	kg	5,178,211	4,744,697	2,039,508	2,039,508	2,039,508	16,041,432
Lead To Conc.	kg	-	-	-	-	-	-
Total Metals In Conc.	kg	5,186,006	4,754,262	2,047,723	2,047,723	2,047,723	16,083,435
Total Dry Conc. @ 48.0% Zinc	tonnes	10,788	9,885	4,249	4,249	4,249	33,420
Total Conc. @ 10% Water	tonnes	11,987	10,983	4,721	4,721	4,721	37,133

Production	Year	1	2	3	4	5	TOTAL
	Unit						
Bellekeno/Other Lead Concentrate Constituents							
Silver To Conc.	kg	82,812	101,623	87,282	87,282	87,282	446,281
Zinc To Conc.	kg	5,178,211	4,744,697	2,039,508	2,039,508	2,039,508	16,041,432
Lead To Conc.	kg	7,700,627	8,359,820	5,801,649	5,801,649	5,801,649	33,465,394
Total Metals In Conc.	kg	12,961,650	13,206,140	7,928,439	7,928,439	7,928,439	49,953,107
Total Dry Conc. @ 64.0% Lead	tonnes	12,032	13,062	9,065	9,065	9,065	52,290
Total Conc. @ 10% Water	tonnes	13,369	14,514	10,072	10,072	10,072	58099.642
Silver King Lead Concentrate Constituents							
Silver To Conc.	kg	28,756	-	-	-	-	28,756
Zinc To Conc.	kg	-	-	-	-	-	-
Lead To Conc.	kg	768,000	-	-	-	-	768,000
Total Metals In Conc.	kg	796,756	-	-	-	-	796,756
Total Dry Conc. @ 55.0% Lead	tonnes	1,396	-	-	-	-	1,396
Total Conc. @ 10% Water	tonnes	1,552	0	0	0	0	1551.515
Bellekeno Zinc Concentrate Constituents							
Ag	ppm	722	887	761	761	761	
Zn	%	48.0	48.0	48.0	48.0	48.0	
Pb	%	1.50	1.50	1.50	1.50	1.50	
Cd	%	0.47	0.47	0.47	0.47	0.47	
As	%	0.26	0.26	0.26	0.26	0.26	
Fe	%	10.00	10.00	10.00	10.00	10.00	
Se	ppm	-	-	-	-	-	
Sb	%	-	-	-	-	-	
Bellekeno Lead Concentrate Constituents							
Ag	ppm	6,883	7,780	9,628	9,628	9,628	
Zn	%	7.00	7.00	7.00	7.00	7.00	
Pb	%	64.0	64.0	64.0	64.0	64.0	
Cu	%	-	-	-	-	-	
As	%	0.04	0.04	0.04	0.04	0.04	
Se	ppm	-	-	-	-	-	
Sb	%	0.53	0.53	0.53	0.53	0.53	
Silver King Lead Concentrate Constituents							
Ag	ppm	20,594	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Zn	%	10.0	10.0	10.0	10.0	10.0	
Pb	%	55.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Cu	%	-	-	-	-	-	
As	%	0.16	0.16	0.16	0.16	0.16	
Se	ppm	-	-	-	-	-	
Sb	%	0.75	0.75	0.75	0.75	0.75	

Smelter Terms & Metal Payments	Year	1	2	3	4	5	TOTAL
	Unit						
BELLEKENO/OTHER LEAD CONCENTRATE REVENUE		-					
Revenue Due to Lead							
Wet Conc. Production	tonnes	13,369	14,514	10,072	10,072	10,072	58,100
Dry Conc. Production	tonnes	12,032	13,062	9,065	9,065	9,065	52,290
Lead Content	kg	########	8,359,820	5,801,649	5,801,649	5,801,649	33,465,394
Lead Deduction (3%)	kg	360,967	391,867	271,952	271,952	271,952	1,568,690
Lead Content After Deduction	kg	########	7,967,953	5,529,697	5,529,697	5,529,697	31,896,704
Lead Revenue	**k$US**	**$3,722**	**$4,040**	**$2,804**	**$2,804**	**$2,804**	16,174
95% Payment	k$US	186	202	140	140	140	809
Price Participation	k$US	$0	$0	$0	$0	$0	-
Smelter Charge ($195/DMT)	k$US	$2,346	$2,547	$1,768	$1,768	$1,768	10,196
Refining Charge ($0)	k$US	$0	$0	$0	$0	$0	-
As+Sb Penalty ($3.00/DMT for each 0.1% over 0.1%)	k$US	$170	$184	$128	$128	$128	737
Se Penalty ($4/DMT for every 200ppm over 200ppm)	k$US	$0	$0	$0	$0	$0	-
Moisture Penalty	k$US	$0	$0	$0	$0	$0	-
Transportation ($106/WMT)	k$US	$1,417	$1,538	$1,068	$1,068	$1,068	6,159
Revenue Generated By Lead	k$US	($397)	($432)	($299)	($299)	($299)	(1,727)
Revenue Due to Silver							
Silver Content	kg	82,812	101,623	87,282	87,282	87,282	446,281
Silver Revenue	**k$US**	**$11,981**	**$14,703**	**$12,628**	**$12,628**	**$12,628**	64,567
96.5% Payment	k$US	11,561.77	14,188.10	12,185.81	12,185.81	12,185.81	62,307
Payable Ounces	oz	########	3,152,911	2,707,958	2,707,958	2,707,958	13,846,068
Refining Charge ($0.45/oz)	k$US	$1,156	$1,419	$1,219	$1,219	$1,219	6,231
Revenue Generated By Silver	k$US	$10,406	$12,769	$10,967	$10,967	$10,967	56,077
Total Revenue From Bellekeno Lead Conc.	**k$US**	**$10,008**	**$12,338**	**$10,668**	**$10,668**	**$10,668**	**$54,349**
	Unit						
SILVER KING LEAD CONCENTRATE REVENUE							
Revenue Due to Lead							
Wet Conc. Production	tonnes	1,552	-	-	-	-	1,552
Dry Conc. Production	tonnes	1,396	-	-	-	-	1,396
Lead Content	kg	768,000	-	-	-	-	768,000
Lead Deduction (3%)	kg	41,891	-	-	-	-	41,891
Lead Content After Deduction	kg	726,109	-	-	-	-	726,109
Lead Revenue	**k$US**	**$368**	**$0**	**$0**	**$0**	**$0**	368
95% Payment	k$US	18	0	0	0	0	18
Price Participation	k$US	$0	$0	$0	$0	$0	-
Smelter Charge ($195/DMT)	k$US	$272	$0	$0	$0	$0	272
Refining Charge ($0)	k$US	$0	$0	$0	$0	$0	-
As+Sb Penalty ($3.00/DMT for each 0.1% over 0.1%)	k$US	$34	$0	$0	$0	$0	34
Se Penalty ($4/DMT for every 200ppm over 200ppm)	k$US	$0	$0	$0	$0	$0	-
Moisture Penalty	k$US	$0	$0	$0	$0	$0	-
Transportation ($106/WMT)	k$US	$164	$0	$0	$0	$0	164
Revenue Generated By Lead	k$US	($121)	$0	$0	$0	$0	(121)
							-
Revenue Due to Silver							-
Silver Content	kg	28,756	-	-	-	-	28,756
Silver Revenue	**k$US**	**$4,160**	**$0**	**$0**	**$0**	**$0**	4,160
95% Payment	k$US	3,952.37	0.00	0.00	0.00	0.00	3,952
Payable Ounces	oz	878,304	-	-	-	-	878,304
Refining Charge ($0.50/oz)	k$US	$439	$0	$0	$0	$0	439
Revenue Generated By Silver	k$US	$3,513	$0	$0	$0	$0	3,513
Total Revenue From Silver King Lead Conc.	**k$US**	**$3,392**	**$0**	**$0**	**$0**	**$0**	**$3,392**

Smelter Terms & Metal Payments	Year	1	2	3	4	5	TOTAL
	Unit						
	Unit						
BELLEKENO/OTHER ZINC CONCENTRATE REVENUE							
Revenue Due to Zinc							
Wet Conc. Production	tonnes	11,987	10,983	4,721	4,721	4,721	37,133
Dry Conc. Production	tonnes	10,788	9,885	4,249	4,249	4,249	33,420
Zinc Content	kg	########	4,744,697	2,039,508	2,039,508	2,039,508	16,041,432
Zinc Deduction (8%)	kg	414,257	379,576	163,161	163,161	163,161	1,283,315
Zinc Content After Deduction	kg	########	4,365,122	1,876,347	1,876,347	1,876,347	14,758,118
Zinc Revenue	**k$US**	**$3,676**	**$3,368**	**$1,448**	**$1,448**	**$1,448**	11,388
Price Participation	k$US	$0	$0	$0	$0	$0	-
Smelter Charge ($175/DMT)	k$US	$1,888	$1,730	$744	$744	$744	5,848
Refining Charge ($0)	k$US	$0	$0	$0	$0	$0	-
Cd Penalty ($2.00/DMT for each 0.1% over 0.1%)	k$US	$80	$73	$31	$31	$31	247
Fe Penalty ($1.75/DMT for each 1% over 8%)	k$US	$38	$35	$15	$15	$15	117
Transportation ($106/DMT)	k$US	$1,144	$1,048	$450	$450	$450	3,542
Revenue Generated By Zinc	k$US	$527	$483	$208	$208	$208	1,632
Revenue Due to Silver							
Silver Content	kg	7,794	9,565	8,215	8,215	8,215	42,003
Silver Revenue	**k$US**	**$1,128**	**$1,384**	**$1,188**	**$1,188**	**$1,188**	6,077
60% Payment	k$US	676.58	830.27	713.10	713.10	713.10	3,646
Payable Ounces	oz	150,351	184,504	158,466	158,466	158,466	810,255
Refining Charge ($0.50/oz)	k$US	$75	$92	$79	$79	$79	405
Revenue Generated By Silver	k$US	$601	$738	$634	$634	$634	3,241
Total Revenue From Bellekeno/Other Zinc Conc.	**k$US**	**$1,128**	**$1,221**	**$841**	**$841**	**$841**	**$4,873**
Net Smelter Return K$US	**k$US**	**$14,529**	**$13,559**	**$11,509**	**$11,509**	**$11,509**	**$62,615**
Gross Silver Revenue	k$US	$17,269	$16,086	$13,816	$13,816	$13,816	$74,804
Gross Lead Revenue	k$US	$4,090	$4,040	$2,804	$2,804	$2,804	$16,542
Gross Zinc Revenue	k$US	$3,676	$3,368	$1,448	$1,448	$1,448	$11,388
Smelter Refining, Transportation Costs	k$US	($10,506)	($9,936)	($6,559)	($6,559)	($6,559)	($40,119)
Net Smelter Return KUS$		**$14,529**	**$13,559**	**$11,509**	**$11,509**	**$11,509**	**$62,615**