

MINING ENGINEERS' REPORT



7th July, 1997

To: KGHM Polska Miedź S.A. (KGHM)
Barclays de Zoete Wedd Limited (BZW)
Union Bank of Switzerland (UBS)
Wielkopolski Bank Kredytowy S.A. (WBK)

In accordance with the instructions of BZW, UBS and WBK, Micon International Limited (Micon) has undertaken a thorough examination of KGHM's geology, reserves and mining operations in southwestern Poland. The results of this examination are set forth in Micon's report of March, 1997, entitled "Review of the Mining Operations of KGHM Polska Miedź S.A., Republic of Poland" (the "March Report").

This report, which summarizes Micon's review and the March Report, has been prepared by Micon for inclusion in the offering circular dated 7th July, 1997 (the "Offering Circular") relating to the International Offering.

In undertaking this assignment, Micon has visited the head office of KGHM in Lubin, Poland; has inspected underground workings at all of KGHM's active mines; has held discussions with responsible technical and financial personnel; and has reviewed with care the relevant data pertaining to geology, reserve estimation and mining.

Micon is an independent firm of geologists, mining engineers, metallurgists and environmental consultants, with headquarters in Toronto, Canada, and a permanent office in the United Kingdom. Micon offers a broad range of consulting services to clients involved in the mineral industry and maintains a substantial worldwide practice in the geological assessment of prospective properties, the independent estimation of resources and reserves, the compilation and review of feasibility studies, the economic evaluation of mineral properties, due diligence reviews, and the monitoring of mineral developments on behalf of financing agencies. Micon has considerable experience in the preparation of independent due diligence reports for submission to regulatory authorities.

The principal author of Micon's report is Christopher R. Lattanzi, P. Eng. President of Micon. Mr. Lattanzi is a mining engineer with more than 35 years of experience in the industry. He has a broad background in the evaluation of mineral deposits at all stages of development and in many parts of the world. He has appeared as an expert witness in mine valuation before courts in the United States and Canada. He is a member of the Canadian Institute of Mining, Metallurgy and Petroleum.

Patrick W. Gorman, C. Eng., Vice President of Micon, and Zygmunt Jakubiak, C. Eng., also participated in the preparation of Micon's report. Mr. Gorman is a senior mining engineer. Mr. Jakubiak is a senior geologist. Both are members of The Institution of Mining and Metallurgy.

Micon, and all of its individual employees and associates, are totally independent of KGHM and of all other parties involved in the privatization of KGHM.

Micon hereby gives its consent to the use of Micon's name and to the inclusion of this summary report in the Offering Circular in the form and context in which it appears and to the inclusion of reserve estimation statements in the Offering Circular in the form and context in which they appear.

Yours sincerely,

MICON INTERNATIONAL LIMITED

Christopher Lattanzi, P. Eng.
President

MINING ENGINEERS' REPORT

SUMMARY

The Company operates three underground mines: Lubin, Polkowice-Sieroszowice and Rudna. These mines, which are serviced by a total of 28 shafts, operate at depths below surface of between 600 and 1,150 metres and extend over a continuous strike length of about 40 kilometres, between the towns of Lubin and Głogów in southwestern Poland. Mining in this area has been on-going for some 35 years.

Reserves

At 1st January, 1996, the Company's Proved Mining Reserves (categories A+B) consisted of 423.9 million tonnes, of which 314.7 million tonnes were available and 109.2 million tonnes were unavailable in pillars. Proved and Probable Mining Reserves (categories A+B and C₁) amounted to 906.0 million tonnes, of which 737.6 million tonnes were available and 168.4 million tonnes were unavailable in pillars. The material presently reported as being unavailable in pillars is expected ultimately to become available for extraction. The distribution of these reserves among the three mining operations is shown in Table I. For a description of the Polish reserve classification system used by the Company, see the section of this report entitled "Company's classification system".

Table I
PROVED AND PROBABLE MINING RESERVES AT 1st JANUARY, 1996
(million tonnes)

Mine	Proved Reserves (A+B)		Proved and Probable Reserves (A+B and C ₁)	
	Available	Unavailable in Pillars	Available	Unavailable in Pillars
Lubin	24.8	59.9	97.1	119.0
Polkowice-Sieroszowice	93.6	1.7	381.9	1.9
Rudna	196.3	47.6	258.6	47.5
Total	314.7	109.2	737.6	168.4

The marked differences in the tonnages unavailable in pillars at each of the three mines is understood to relate, in large part, to the existence of substantial pillars beneath tailings impoundments at both Lubin and Rudna.

At 1st January, 1997, the Company's total Mining Reserves were estimated at approximately 922 million tonnes at an average grade of about 1.7 per cent. copper, allocated among the three mining operations as shown in Table II.

Table II
MINING RESERVES AT 1st JANUARY, 1997⁽¹⁾

Mine	Mining Reserves		Mining Capacity (million tonnes/year)	Mine Life ⁽²⁾ (years)
	Ore (million tonnes)	Grade (Cu %)		
Lubin	210.3	1.29	6.45	33
Polkowice-Sieroszowice	405.1	1.74	9.50	43
Rudna	306.9	1.91	12.00	26

(1) Without taking into account new areas the Company may mine after 2015.

(2) Estimated mine life assumes continued operation at full capacity.

At the date of this report, an analysis of Mining Reserves at 1st January, 1997, by category was not available.

MINING ENGINEERS' REPORT

In addition to the reserves shown in Tables I and II, the Company owns a part of the geological documentation to certain other resources in areas contiguous to its existing mining concessions. These additional resources may potentially be mined in the future.

It is Micon's opinion that the procedures used by the Company for the estimation of reserves are fully in accordance with accepted standards and that, with respect to classification:

- Industrial Reserves in the A+B categories equate, in whole or in large part, to Proved Reserves as defined under the classification system adopted by The Institution of Mining and Metallurgy.
- Industrial Reserves in the C₁ category and, possibly, a minor part of the Industrial Reserves in the A+B categories, equate to Probable Reserves.

Mining Reserves are a sub-set of Industrial Reserves, modified to incorporate technical recoverability parameters. In Micon's opinion, these parameters in general have been appropriately assessed. Thus, it is Micon's opinion that the Company's Mining Reserves can also be divided into Proved and Probable categories on the basis set forth above for Industrial Reserves.

It is Micon's opinion that the lack of precise equivalence between the Polish classification system and that used by The Institution of Mining and Metallurgy is not of material significance, given the very large tonnage of reserves currently reported.

It is to be emphasised, however, that the current estimates of Mining Reserves are based on cut-off criteria developed on the basis of 1993 costs. Mining costs have risen substantially since that time and, in Micon's opinion, a complete re-evaluation of these reserves is urgently required, using cut-off criteria based on 1996 costs, in order more accurately to define the limits of economic mineralisation at prevailing metal prices and operating costs. Micon anticipates that such a re-evaluation may well determine that some of the areas scheduled for near-term extraction, particularly at Lubin, are not economic under current conditions. Micon anticipates, also, that, in overall terms, the proposed re-evaluation will not reduce the total reserve tonnage by more than about 15 per cent., and that the material remaining in the reserve will be of higher average grade than that currently reported.

Current operations

The recent performance of each of the Company's mines, in terms of underground ore production and unit mine operating cost, is summarised in Table III. It can be seen that, in recent years, the mining operations have been characterised by a progressive increase in both ore production and ore grade, but also by a marked increase in unit mining cost.

Generally, unit mining costs, expressed in zlotys per tonne of ore, have increased more or less at the rate of domestic inflation in Poland from 1992 to 1996, or at a rate of approximately 30 per cent. per year. These costs, therefore, have remained relatively stable in terms of constant zlotys. The zloty, however, has been devaluing against the US dollar at a rate lower than the domestic inflation rate, so that unit mining costs, expressed in US dollars per tonne of ore, have increased appreciably in recent years. Since the Company's revenues are denominated in US dollars, this trend of increasing dollar costs has potentially serious implications for the future profitability of the Company's operations, particularly in light of the recent reduction in the price of copper.

As shown in Table III, the Company's unit mining cost, expressed in terms of equivalent copper recovered to concentrate, after allowing for silver credits, has risen from 34 cents per pound of copper equivalent in 1992, to 42 cents per pound in 1996. Of particular concern, in this regard, is the Lubin mine, where, in 1996, the unit mining cost was 47 cents per pound of equivalent copper recovered to concentrate. This cost relates solely to mining, and does not include the costs of processing, smelting, refining, administrative overhead and on-going capital expenditures.

MINING ENGINEERS' REPORT

Table III
HISTORICAL MINE PRODUCTION AND OPERATING COST

	1991	1992	1993	1994	1995	1996
Lubin						
<i>Mine Production</i>						
Ore mined (thousand tonnes)	5,602	5,682	6,209	6,226	6,264	6,364
Copper grade (% Cu)	1.25	1.27	1.31	1.32	1.34	1.36
Silver grade (grammes/tonne Ag)	63	67	70	68	71	73
<i>Unit Mining Cost</i>						
US\$/tonne ore.	N/A	11.25	11.59	12.95	16.46	17.03
US\$/pound Cu equivalent	N/A	0.34	0.33	0.37	0.47	0.47
Polkowice-Sieroszowice						
<i>Mine Production</i>						
Ore mined (thousand tonnes)	7,925	8,081	9,318	9,216	9,463	9,236
Copper grade (% Cu)	1.70	1.76	1.81	1.79	1.76	1.84
Silver grade (grammes/tonne Ag)	32	33	33	33	34	34
<i>Unit Mining Cost</i>						
US\$/tonne ore.	N/A	12.99	11.33	12.56	15.56	17.03
US\$/pound Cu equivalent	N/A	0.34	0.29	0.32	0.41	0.43
Rudna						
<i>Mine Production</i>						
Ore mined (thousand tonnes)	8,546	8,707	9,956	9,386	9,413	10,388
Copper grade (% Cu)	1.81	1.82	1.82	1.88	1.92	2.08
Silver grade (grammes/tonne Ag)	44	47	54	52	48	49
<i>Unit Mining Cost</i>						
US\$/tonne ore.	N/A	14.24	12.96	14.30	18.45	18.26
US\$/pound Cu equivalent	N/A	0.34	0.31	0.33	0.42	0.39
Total Company						
<i>Mine Production</i>						
Ore mined (thousand tonnes)	22,073	22,470	25,483	24,828	25,140	25,988
Copper grade (% Cu)	1.63	1.66	1.69	1.71	1.72	1.82
Silver grade (grammes/tonne Ag)	45	47	50	49	48	50
<i>Unit Mining Cost</i>						
US\$/tonne ore.	N/A	13.03	12.03	13.32	16.87	17.52
US\$/pound Cu equivalent	N/A	0.34	0.31	0.34	0.43	0.42

Future operations

In light of the trend towards increasing unit cost, the Company has embarked upon an aggressive programme of cost reduction under which it is anticipated that, by the year 2000, average mining costs, in constant 1996 US dollars, will decrease by about 20 per cent., from the 1995 level of about \$17 per tonne, to approximately \$14 per tonne. Clearly, the degree of success achieved in implementing these cost reduction goals will have a material impact on the medium-term profitability of the Company. During 1996, unit mining costs, expressed in dollars per tonne of ore, were reduced marginally at Rudna but continued to increase at both Polkowice-Sieroszowice and Lubin. The increase in unit mining cost at Polkowice-Sieroszowice had been anticipated. At Lubin, however, it had been projected that unit mining costs would decrease in 1996.

In Micon's view, it is likely that some degree of cost savings can be achieved, but it is not possible to predict with any reasonable level of assurance the extent to which the Company will be able to meet its specific cost reduction targets for each mine. On the basis of its review of the cost-cutting measures proposed by the Company, and of its general experience within the mining industry, however, Micon considers that sustained reductions in unit mining cost of the magnitude forecast by the Company will be difficult to achieve.

Micon's judgements with respect to the future levels of underground ore production at each of the Company's mines are summarised in Table IV. In light of recent historical performance, it is Micon's opinion that there is reasonable assurance of achieving the forecast levels of production and grade.

MINING ENGINEERS' REPORT

Table IV
ESTIMATED FUTURE MINE PRODUCTION AND OPERATING COST

	1996 (actual)	1997	1998	1999	2000	2001 (annual average to end of life)
Lubin						
<i>Mine Production</i>						
Ore mined (thousand tonnes) . . .	6,364	5,709	6,385	6,424	6,464	6,450
Copper grade (% Cu)	1.36	1.39	1.39	1.40	1.40	1.30
Silver grade (grammes/tonne Ag)	73	71	71	70	70	70
Polkowice-Sieroszowice						
<i>Mine Production</i>						
Ore mined (thousand tonnes) . . .	9,236	8,451	9,025	9,025	9,025	9,400
Copper grade (% Cu)	1.84	1.83	1.91	1.95	1.97	1.85
Silver grade (grammes/tonne Ag)	34	36	36	36	36	36
Rudna						
<i>Mine Production</i>						
Ore mined (thousand tonnes) . . .	10,388	9,882	11,566	11,965	11,965	12,000
Copper grade (% Cu)	2.08	2.06	2.01	2.04	2.10	1.90
Silver grade (grammes/tonne Ag)	49	49	48	49	50	50
Total Company						
<i>Mine Production</i>						
Ore mined (thousand tonnes) . . .	25,988	24,042	26,976	27,414	27,454	27,850
Copper grade (% Cu)	1.82	1.82	1.83	1.86	1.89	1.74
Silver grade (grammes/tonne Ag)	50	50	49	50	50	50

The continuation of the Company's mining operations will also involve the expenditure of substantial amounts of sustaining capital. Micon's judgements with respect to the magnitude of these capital investments are summarised in Table V, in which all expenditures are quoted in constant zlotys of December, 1996 value. The investments shown in Table V refer to the mines only, and do not include capital expenditures required for any other aspect of the Company's operations.

Table V
ESTIMATED FUTURE CAPITAL EXPENDITURES FOR MINING OPERATIONS
(million constant zlotys of December 1996 value)

Year	Lubin	Polkowice- Sieroszowice	Rudna	Total
1997	58.8	70.5	97.4	226.7
1998	77.2	104.3	148.5	330.0
1999	47.0	126.2	101.1	274.3
2000	38.7	97.9	94.3	230.9
2001	37.5	98.7	121.6	257.8
2002-2007	28.5	57.0	42.7	128.2
2008-2012	14.3	71.2	28.5	114.0
Thereafter.	14.3	28.5	28.5	71.3

Year-end exchange rate was US\$1 = 2.85 zlotys

Ultimately, it is clear that the Company controls extremely large resources of copper and silver. It is equally clear, however, that the profitability of the Company's operations will come under severe pressure unless the recent trend of progressively increasing unit costs, in dollar terms, is reversed. Micon fully supports the cost-saving initiatives being implemented by the Company, but also considers it imperative that the Company's Mining Reserves be completely re-evaluated, under the current regime of operating costs and metal prices, in order to ensure that only economic material is mined.

MINING ENGINEERS' REPORT

THE MINING PROPERTIES

The Company's mining area is located between longitude 15°52' and 16°22' east and between latitude 51°21' and 51°35' north, in the northwestern part of the Silesian Lowland. Within this area, the Ministry of Environmental Protection, Natural Resources and Forestry in Poland has granted to the Company the exclusive right to extract ore from seven contiguous concessions which extend northwestwards for approximately 40 kilometres (km), between the towns of Lubin and Głogów. Details of each concession are provided in Table VI. The total area held by the Company under these concessions is approximately 400 square kilometres (km²).

Table VI
MINING CONCESSIONS

<i>Concession</i>	<i>Concession Number</i>	<i>Expiry Date</i>	<i>Area (km²)</i>
Lubin I	231/93	31 Dec. 2013	82.6
Malomice I	232/93	31 Dec. 2013	75.7
Rudna I	233/93	31 Dec. 2013	75.6
Rudna II	24/96	30 June 2046	2.2
Polkowice II	234/93	31 Dec. 2013	75.3
Sieroszowice I	235/93	31 Dec. 2013	97.0
Radwanice Wschód	10/95	21 May 2015	3.3

The Company currently conducts active underground mining operations on four of its concessions: Lubin, Rudna, Polkowice and Sieroszowice. Administratively, the Polkowice and Sieroszowice mines are combined into a single operation, referred to as the Polkowice-Sieroszowice mine. Mining has also been undertaken on the Malomice concession, which has been developed from the Lubin mine workings, and on the Radwanice Wschód concession, to which access is provided from the Polkowice-Sieroszowice mine. The Company's underground mines are large by any standard, consistently producing approximately 100,000 tonnes of ore per day. The Company currently employs some 23,000 people, of whom about 12,000 work in the mining operations.

The Company is a major industrial enterprise, operating three mines, three processing plants, two smelting and refining complexes, a rolling mill and a precious metal recovery plant. In 1996, the Company mined and processed 26 million dry tonnes of ore and produced 424,708 tonnes of electrolytic copper. A portion of the electrolytic copper was used internally to manufacture 174,755 tonnes of copper wire rod and 26,290 tonnes of continuous cast billets. In 1996, also, in addition to its copper output, the Company produced a range of by-products, the most important of which was 933,044 kilograms (kg) of silver.

MINING ENGINEERS' REPORT

RESOURCE AND RESERVES

Nature of the ore occurrence

The copper deposits of southwestern Poland occur in the geological extension of the Kupferschiefer stratum in Germany, which has been mined for copper since 1150 AD. Copper mineralisation in the area currently being mined by the Company was discovered by deep drilling in 1957. Commercial mining commenced in 1968 and has continued uninterrupted since that time.

The Kupferschiefer stratum is a copper-bearing shale horizon, which is underlain by sandstone and overlain by dolomite or limestone. In the area being mined by the Company, the copper mineralisation is not confined to the Cupriferous Shale, but also extends downwards into the sandstone units and upwards into the carbonate rocks. The highest grades of ore, however, occur in the Cupriferous Shale.

Database

Exploration and Delineation Techniques

The Lubin-Głogów copper deposits were explored and preliminarily delineated by drilling from surface. During the initial programme on a 3 km by 3 km grid, core samples were taken over entire drilling intervals from all holes. Later, during drilling on a 1.5 km by 1.5 km grid and during the 1.1 km by 1.1 km infill drilling, only selected intervals were cored, including all mineralised intervals and stratigraphic contacts. Drilling results formed the basis for the estimate of geological reserves in the C₁ category.

More detailed delineation required for the classification of reserves in the B and A categories is done by mapping and sampling of underground development tunnels, supplemented as necessary by underground diamond drilling.

Core Sampling and Preparation for Analysis

After logging, 10 to 20 cm long sample intervals, or shorter intervals in the Cupriferous Shale, were marked on the core which was then split along the core axis with a corundum saw. One half was sent for preparation and analysis. Core samples were reduced according to procedures specified by the Minister of Heavy Industry.

Underground Sampling

Underground samples are taken from all development tunnels. Samples are taken from one wall, except in areas of complex structure and lithological variability, in which case samples are taken from both walls. Channel sampling is supplemented by underground diamond drilling when ore thickness exceeds the height of development tunnels or when analyses indicate that mineralisation may extend up or down from the sampled intervals.

In Micon's opinion, the underground sampling procedures and sampling intervals used by the Company are appropriate to the deposit. Accordingly, Micon endorses the Company's practices in this regard.

Channel Sample Preparation and Analysis

All channel and core samples are analysed for copper. One in three samples from development openings and working faces along stopes at the 200 m advance is analysed for silver. Copper analyses are performed by the photo-activation method. Each mine has its own equipment. The detection limit is 0.01% Cu and there are no interference problems. The method is non-destructive. Analytical control procedures include inserting standards, cross correlation between the three laboratories, frequent calibration of analytical equipment and electronic scales, and external control and check assays. Micon visited all three laboratories and is satisfied that preparation and analyses are carried out in a professional manner, fully in accordance with accepted engineering standards.

Geological Documentation

Primary documentation of each mine, covering the period to 1st January, 1980, is compiled into documents called Geological Documentation. In each case, this document was prepared by Geological Enterprise in Kraków and included geological reserve estimates based on cut-off criteria of 1977. All subsequent revisions of reserve estimates are presented in supplements. The latest supplements were prepared in 1994 following the introduction of new cut-off criteria in June, 1993. Measurements and observations made during underground sampling are entered in geological notebooks and this information is then used to produce geological maps. Composite sampling plans are prepared. Supporting documentation includes certificates of analyses and a computerised database of sample composites in the "Geolog" programme developed by the Company.

MINING ENGINEERS' REPORT

The Company's classification system

The resource and reserve classification system used by the Company follows "Directives for Documenting Deposits of Solid Minerals in Categories D₁ to A" issued by the Commission for Mineral Reserves of the Ministry of Environmental Protection, Natural Resources and Forestry (the Ministry) in 1992. In accordance with that document and the Company's working practices, reserve statements show Balance Geological Reserves, Non-Industrial Reserves, Industrial Reserves, Operational Reserves and Mining Reserves. Definitions of each group are as follows:

Balance Geological Reserves: reserves in a deposit or its part whose natural characteristics satisfy defined cut-off criteria and permit extraction.

Industrial Reserves: that part of the Balance Geological Reserves which can be the subject of economically justified extraction under conditions determined in the Deposit Development Plan (DDP), the proposed extraction being optimal from the technical and economic point of view while fulfilling the requirements of environmental protection.

Non-Industrial Reserves: that part of the Balance Geological Reserves which cannot be extracted for technical or economic reasons under conditions determined in the DDP.

Operational Reserves: Industrial Reserves reduced by anticipated losses.

Mining Reserves: Operational Reserves adjusted to account for anticipated dilution.

Each reserve group is subdivided into reserves available for extraction and reserves in support pillars. All reserves are also subdivided into categories A+B and C₁ which reflect the degree of confidence of delineation.

The Company's copper deposits were drilled from surface on a 1.5 km grid, with infill drilling in more complex zones. This drilling formed the basis for estimating reserves in the C₁ category. Delineation in the A+B categories requires mining development. In overall terms, although there are marked differences for individual reserve blocks, the A+B reserves estimated on the basis of underground development are in reasonable agreement with the C₁ reserves originally estimated on the basis of the surface drilling. It is Micon's opinion, therefore, that the density of surface drilling has been adequate to support the reliable estimation of C₁ reserves.

Comparison with the IMM resource and reserve classification

The resource and reserve classification system adopted by The Institution of Mining and Metallurgy (IMM) in London distinguishes two principal groups of mineral assets: Mineral Resources and Mineral Reserves.

Mineral Resource is defined as a tonnage or volume of rock or mineralisation or other material of intrinsic interest whose grades, limits and other appropriate characteristics are known with a specified degree of knowledge.

Mineral Reserve is that portion of a Mineral Resource on which technical and economic studies have been carried out to demonstrate that it can justify extraction at the time of the determination and under specific economic conditions.

Thus, the IMM classification is based on two principles: first, a Mineral Resource has to have intrinsic interest; and, second, its transfer to a Mineral Reserve is conditional upon a positive outcome of a technical and economic feasibility study. Despite its relative complexity, the Polish classification system is based on similar principles. Material in-situ with parameters exceeding a defined set of criteria is classified as a Balance Geological Reserve. This material satisfies the cut-off criteria and therefore, like a Mineral Resource, has intrinsic interest. That part of a Balance Geological Reserve that can be economically extracted is classified as an Industrial Reserve. Except for a reference to environmental protection, the Polish definition of an Industrial Reserve does not differ in principle from the IMM definition of a Mineral Reserve.

Subdivisions within the Mineral Resource definition of the IMM classification reflect the degree of resource identification and the confidence level of resource estimates. In this respect, a Mineral Resource can be divided into Measured and Indicated. The respective definitions are as follows:

Measured Mineral Resource: That portion of a Mineral Resource for which tonnage or volume is calculated from dimensions revealed in outcrops, pits, trenches, drill-holes or mine workings, supported where

MINING ENGINEERS' REPORT

appropriate by other exploration techniques. The sites used for inspection, sampling and measurement are so spaced that the geological character, continuity, grades and nature of the material are so well defined that the physical character, size, shape, quality and mineral content are established with a high degree of certainty.

Indicated Mineral Resource: That portion of a Mineral Resource for which quantity and quality are estimated with a lower degree of certainty than for Measured Mineral Resource. The sites for inspection, sampling and measurement are too widely or inappropriately spaced to enable the material or its continuity to be defined or its grade throughout to be established.

Again, there are broad similarities to the Polish system of A, B, C₁, C₂ and D₁ categories. In Micon's view, Balance Geological Reserves of the A and B categories are equivalent to Measured Mineral Resources and Balance Geological Reserves of the C₁ category are equivalent to Indicated Mineral Resources.

Under the IMM classification, a portion of a Measured Mineral Resource can be re-classified as a Proved Mineral Reserve after a positive outcome of detailed technical and economic studies or on the basis of current operating experience. A Probable Mineral Reserve is defined as that portion of a Measured and/or Indicated Resource on which sufficient technical and economic studies (sufficient but with a shallower scope than detailed studies) have been carried out to demonstrate that it can justify extraction at the time of the determination and under specific economic conditions. At this point a difference can arise between the two systems. While, after a transfer to a Mineral Reserve, a Measured Mineral Resource can be classified as either Proved Mineral Reserve or Probable Mineral Reserve, the Polish divisions into A, B and C₁ categories are not affected by economic considerations during a transfer from a Balance Geological Reserve to an Industrial Reserve.

On the basis of a thorough review of the classification system used by the Company, it is Micon's opinion that:

- Balance Geological Reserves of the A+B categories equate to Measured Resources;
- Balance Geological Reserves of the C₁ category equate to Indicated Resources.

Subject to the qualification that some of the current Industrial Reserves may not meet revised cut-off criteria updated to reflect 1996 mining costs, it is also Micon's opinion that:

- Industrial Reserves in the A+B categories equate, wholly or in large part, to Proved Reserves;
- Industrial Reserves of the C₁ category and, possibly, a minor part of Industrial Reserves in the A+B category, equate to Probable Reserves.

It is Micon's opinion that the lack of precise equivalence between the Polish classification system and that used by The Institution of Mining and Metallurgy is not of material significance, given the very large tonnage of reserves currently reported.

Micon's judgement with respect to the subdivision of the Company's reported Mining Reserves, as at 1st January, 1996, into Proved and Probable categories, as defined by the IMM, is summarised in Tables VII and VIII.

Table VII
PROVED MINING RESERVES
Inventory as at 1st January, 1996

Mining Area	Reserves Available for Extraction						Reserves in Support Pillars					
	Tonnage (Mt)	Thickness (m)	Cu (%)	Ag (grammes /tonne)	Contained Cu ('000t)	Contained Ag (tonnes)	Tonnage (Mt)	Thickness (m)	Cu (%)	Ag (grammes /tonne)	Contained Cu ('000t)	Contained Ag (tonnes)
Lubin-Malomice	24,764	4.14	1.31	64	325	1,607	59,941	5.07	1.33	71	799	4,226
Polkowice	59,045	3.60	1.75	33	1,031	1,968	1,663	3.04	1.94	37	32	61
Radwanice Wschód . . .	—	—	—	—	—	—	—	—	—	—	—	—
Sierszowice	34,585	2.42	1.87	29	647	1,005	73	1.30	2.06	61	2	5
Rudna	196,264	6.55	1.85	43	3,624	8,439	47,543	7.12	1.97	40	935	1,902
Total	314,658	—	1.79	41	5,627	13,019	109,220	—	1.62	57	1,768	6,194

MINING ENGINEERS' REPORT

Table VIII
PROBABLE MINING RESERVES
Inventory as at 1st January, 1996

Mining Area	Reserves Available for Extraction						Reserves in Support Pillars					
	Tonnage (Mt)	Thickness (m)	Cu (%)	Ag (grammes /tonne)	Contained Cu ('000t)	Contained Ag (tonnes)	Tonnage (Mt)	Thickness (m)	Cu (%)	Ag (grammes /tonne)	Contained Cu ('000t)	Contained sAg (tonnes)
Lubin-Malomice	72,375	3.46	1.29	73	936	5,255	59,108	4.01	1.26	81	743	4,760
Polkowice	19,487	2.93	1.73	37	338	721	—	—	—	—	—	—
Radwanice Wschód	16,871	4.12	1.60	24	270	405	—	—	—	—	—	—
Sieroszowice	251,905	2.58	1.89	41	4,768	10,397	114	1.36	3.33	28	4	3
Rudna	62,270	3.32	2.04	52	1,270	3,238	—	—	—	—	—	—
Total	422,908	—	1.79	47	7,582	20,016	59,222	—	1.26	80	747	4,763

It is to be emphasised, however, that the current estimates of Mining Reserves are based on cut-off criteria developed in 1993. Mining costs have risen substantially since that time and, in Micon's opinion, a complete re-evaluation of these reserves is urgently required, using cut-off criteria based on 1996 costs, in order more accurately to define the limits of economic mineralisation at prevailing metal prices and operating costs. Micon anticipates that such a re-evaluation may well determine that some of the areas scheduled for near-term extraction, particularly at Lubin, are not economic under current conditions. Micon anticipates, also, that, in overall terms, the proposed re-evaluation will not reduce the total reserve tonnage by more than about 15 per cent, and that the material remaining in the reserve will be of higher average grade than that currently reported.

Estimating Procedures

The Company's reserve estimates are based on the primary data contained in the Geological Documentation of each mine, supplements to that documentation and results of on-going development sampling. The most recent supplements for each mine were prepared by Geological Enterprise in Kraków in 1994.

Estimates of Balance Geological Reserves in the C₁ category were based on drilling results augmented by results of development sampling in blocks adjoining the A+B reserves. The method of estimation was polygonal with polygons centred on drill intersections. Balance Geological Reserves in categories A+B are estimated by the method of geological blocks using the "SEZA" computer programme developed by the Company.

The procedures used by the Company for the estimation of A+B and C₁ reserves are similar to the methods used in other mineral deposits throughout the world, and are fully endorsed by Micon.

MINING ENGINEERS' REPORT

Geological Reserve Inventories

Balance Geological Reserves of each mine conform to cut-off criteria that were approved by the Chief Geologist of the Country in June, 1993. These criteria are:

Parameter	Cut-off Values	
	Balance Geological Reserves	Marginal Reserves
Sample cut-off grade	0.7% Cu	0.7% Cu
Minimum Cu equivalent in sample composite ⁽¹⁾	0.7% Cu	0.5% Cu
Maximum yield (copper metal per unit area) ⁽²⁾	50 kg/m ²	35 kg/m ²
Maximum depth to footwall	1,250 (1,500) m ⁽³⁾	

(1) Cu equivalent is calculated from the formula $Cu_e = \% Cu + 0.01 \text{ g/t Ag}$.

(2) This parameter refers to copper equivalent.

(3) The 1,500m depth is applicable only if reserves to that depth can be developed.

The inventory of Balance Geological Reserves of A+B and C₁ categories as at 1st January, 1996, based on the 1994 estimates by Geological Enterprise in Kraków and updated by the Company's mine geological departments, is given in Table IX.

Table IX
BALANCE GEOLOGICAL RESERVES
as at 1st January, 1996

Mining Area	Available for Extraction						In Support Pillars					
	Tonnage (Mt)	Thickness (m)	Cu (%)	Ag Contained (grammes /tonne)	Contained Cu ('000t)	Contained Ag (tonnes)	Tonnage (Mt)	Thickness (m)	Cu (%)	Ag Contained (grammes /tonne)	Contained Cu ('000t)	Contained Ag (tonnes)
A+B CATEGORY												
Lubin-Malomice	58,992	3.62	1.37	79	808	8,964	113,808	3.96	1.44	70	1,644	4,142
Polkowice	87,447	2.83	2.10	40	1,839	3,537	33,532	2.89	2.40	53	806	1,770
Sieroszowice	51,979	1.90	2.59	41	1,346	2,121	175	0.96	2.69	65	5	11
Radwanice Wschód	—	—	—	—	—	—	—	—	—	—	—	—
Rudna	317,979	6.59	1.97	42	6,275	13,355	178,426	7.07	1.95	36	3,474	6,423
Total	516,397	—	1.99	54	10,268	27,977	325,941	—	1.82	38	5,929	12,346
C₁ CATEGORY												
Lubin-Malomice	207,660	3.10	1.30	61	2,693	12,761	80,427	3.21	1.30	81	1,047	6,547
Polkowice	38,166	1.98	2.24	51	856	1,957	1,091	2.17	2.16	48	24	52
Sieroszowice	278,070	1.86	2.70	61	7,498	17,012	27,172	1.95	2.61	51	709	1,385
Radwanice Wschód	14,948	2.90	2.11	32	316	483	—	—	—	—	—	—
Rudna	161,511	3.78	1.70	45	2,753	7,268	107,557	4.96	1.32	34	1,415	3,657
Total	700,355	—	2.02	56	14,115	39,480	—	—	1.48	54	3,195	11,641
Grand total	1,216,752	—	2.00	55	24,383	67,457	542,188	—	1.68	44	9,124	23,987

Industrial Reserve Inventories

Lubin Mine

As at 1st January, 1996, Industrial Reserves within the Lubin and Malomice mining areas were 232.4 Mt grading 1.44 per cent. Cu. The average thickness of the Industrial Reserves at Lubin-Malomice is 3.47 m.

Operational Reserves were estimated assuming total losses of 23 per cent. of the available reserves and 17 per cent. of the reserves in support pillars, in terms of both tonnage and contained copper. The difference in estimated losses between available reserves and reserves in support pillars is understood to be based on experience and long-term extraction plans for individual mining areas. Actual mining losses in the period 1991 to 1995 varied from 10.1 to 23.4 per cent. in terms of tonnage and from 9.6 to 23.2 per cent. in terms of contained copper. The estimated reduction of 23 per cent. in both tonnage and contained copper, therefore, is regarded as reasonable.

Mining Reserves were derived from Operational Reserves by adding 16 per cent. dilution at an average grade of 0.39 per cent. Cu. This dilution is marginally higher than cumulative dilution calculated for the period

MINING ENGINEERS' REPORT

1978 to 1995 inclusive, which was 15.3 per cent., but lower than dilution recorded in the period 1991 to 1995, during which it ranged from 16.8 to 19.6 per cent.. Annual records show a sudden rise in dilution in 1991 and then a gradual drop from 19.6 per cent. in 1991 to 16.8 per cent. in 1995. The 16 per cent. dilution used by Lubin geologists therefore assumes that this downward trend will continue. Mining Reserves as at 1st January, 1996 were 216.2 Mt grading 1.30 per cent. Cu.

Polkowice-Sieroszowice Mine

Polkowice

As at 1st January, 1996, Industrial Reserves at Polkowice stood at 70.8 Mt grading 2.33 per cent. Cu. The average thickness of the Industrial Reserves at Polkowice is 2.55 m.

Operational Reserves were estimated assuming average total losses of 15 per cent., in terms of both tonnage and contained copper. This accounts generously for the level of actual losses recorded over the last ten years, which have varied from 6.6 to 13.3 per cent. in terms of tonnage, and from 6.1 to 12.9 per cent. in terms of contained copper.

Mining Reserves were estimated by reducing the average copper grade by 25 per cent.. This is equivalent to a dilution of 33 per cent. at zero grade. Given that dilution over the entire mine life to date has varied from 18.3 to 24.9 per cent., the estimating allowance of 33 per cent. is regarded as conservative. As at 1st January, 1996, Mining Reserves in the A+B and C1 categories were 80.195 Mt grading 1.75 per cent. Cu.

Radwanice Wschód

As at January 1, 1996, Industrial Reserves at Radwanice Wschód were 14.4 Mt grading 2.13 per cent. Cu, all being classified as C₁ and outside support pillars. Losses of 12 per cent. and dilution of 33 per cent. were used in estimating Operational and Mining Reserves. As at 1st January, 1996, Mining Reserves of the C₁ category were 16.871 Mt at 1.60 per cent. Cu.

Sieroszowice

As at 1st January, 1996, Industrial Reserves at Sieroszowice were 222.7 Mt grading 2.70 per cent. Cu. The average thickness of the Industrial Reserves at Sieroszowice is 1.97 m.

Operational Reserves were estimated assuming average total losses of 10 per cent., in terms of both tonnage and contained copper. Taking into consideration that average mining losses calculated on an annual basis for the years 1991 to 1995 varied from 4.9 to 10.0 per cent., and that non-mining losses (which are rock bursts and other occurrences which render ore unmineable) are generally low in comparison to annual production, the 10 per cent. allowance for losses is considered generous.

Mining Reserves were estimated by reducing the average copper grade by 30 per cent.. This is equivalent to a dilution of 43 per cent. at zero grade. Following the change in cut-off criteria in 1994, actual dilution at Sieroszowice was 37.8 per cent. in 1994 and 35.9 per cent. in 1995. The estimated dilution of 43 per cent., therefore, is regarded as appropriate, although modestly conservative. As at 1st January, 1996, Mining Reserves in the A+B and C₁ categories were 286.678 Mt at 1.89 per cent. Cu.

The total Mining Reserves for the Polkowice-Sieroszowice mine, including Radwanice Wschód, as at 1st January, 1996 were 383.744 Mt grading 1.85 per cent. Cu.

Rudna Mine

As at 1st January, 1996, Industrial Reserves at the Rudna mine were 313.1 Mt grading 2.19 per cent. Cu. The average thickness of the Industrial Reserves at Rudna is 5.08 m.

Operational Reserves were estimated assuming total losses of 15 per cent. in ore and contained copper. Mining Reserves were derived from Operational Reserves by adding 15 per cent. dilution. Actual mining losses for the period 1986 to 1995 inclusive varied from 12.1 to 17.4 per cent. in terms of tonnage and from 11.8 to 16 per cent. in terms of contained copper. Cumulative mining losses from the start of extraction to 1995 inclusive were 14.3 per cent. in terms of tonnage and 13.3 per cent. in terms of contained copper. The 15 per cent. losses used in conversion of Industrial Reserves to Operational Reserves therefore account reasonably for actual mining losses. However, the 15 per cent. allowance does not take into account non-mining losses, mainly due to high seismicity. In some years, these losses have exceeded 10 per cent. of Industrial Reserves under exploitation. In

MINING ENGINEERS' REPORT

1995, for instance, non-mining losses were estimated at over 1 Mt. General mine dilution over the period 1986 to 1995 inclusive varied from 14.2 to 19.2 per cent. and cumulative dilution from 1974 to 1995 inclusive was 19.6 per cent.. The 15 per cent. dilution allowance used by the Company to estimate Mining Reserves is therefore regarded as too optimistic.

Mining Reserves at Rudna in combined A+B and C₁ categories as at 1st January, 1996, were 306.1 Mt grading 1.90 per cent. Cu.

Estimated Reserves at 1st January, 1997

The foregoing discussion is based on the Company's reserve estimates as of 1st January, 1996. Subsequent to the compilation of this report, the Company has completed its reserve estimates as of 1st January, 1997, which have been prepared using the same procedures and the same cut-off criteria as the earlier estimates discussed above.

Table X compares the 1st January, 1996 estimates with those prepared as of 1st January, 1997. It is evident that there is close equivalence between the two estimates. Although some minor differences do exist, it is Micon's opinion that these differences are not material and are not sufficient to cause any change in the conclusions reached in this report.

Table X
COMPARISON OF THE COMPANY'S RESERVE ESTIMATES AT 1ST JANUARY, 1996
AND 1ST JANUARY, 1997

	January, 1996 Reserve		January, 1997 Reserve	
	Ore (million tonnes)	Grade (% Cu)	Ore (million tonnes)	Grade (% Cu)
Balance Geological Reserves				
Lubin	460.9	1.34	454.4	1.34
Polkowice	160.2	2.20	161.1	2.20
Sieroszowice	357.4	2.68	354.7	2.68
Radwanice Wchód	14.9	2.11	15.4	2.08
Rudna	765.5	1.82	745.5	1.83
Industrial Reserves				
Lubin	232.4	1.44	226.1	1.43
Polkowice	70.8	2.33	70.2	2.32
Sieroszowice	222.7	2.70	220.6	2.70
Radwanice Wchód	14.4	2.13	14.7	2.12
Rudna	313.1	2.19	313.9	2.20
Mining Reserves				
Lubin	216.2	1.30	210.3	1.29
Polkowice	80.2	1.75	82.1	1.74
Sieroszowice	286.7	1.89	305.8	1.75
Radwanice Wchód	16.9	1.60	17.2	1.59
Rudna	306.1	1.90	306.9	1.91

PRINCIPAL TECHNICAL AND ECONOMIC CONSIDERATIONS AFFECTING THE FUTURE OF THE COMPANY'S MINING OPERATIONS

Technical Considerations

In Micon's judgement, the principal technical factors which will influence the future performance of the Company's mining operations are:

- Seismicity
- Rock temperature
- Hoisting capacity

MINING ENGINEERS' REPORT

Seismicity

The Company's mines operate at depths of 600 to 1,150 m below surface and experience rock burst phenomena. In essence, the rock bursts are of two types: pillar failure in an area after the completion of primary extraction, and failure of the roof in active mining areas. The Company regards the occurrence of rock bursts as serious, since they result in occasional fatalities, equipment damage and lost production.

The historical frequency of major rock bursts at each of the active mines is summarized in Table XI.

Table XI
FREQUENCY OF MAJOR ROCK BURSTS

Year	Number of Rock Bursts per year		
	Lubin	Polkowice-Sieroszowice	Rudna
1991	—	1	1
1992	—	—	—
1993	1	—	2
1994	—	—	2
1995	1	—	2
1996	1	1	2

At the present time, the principal means of minimising rock burst hazards is careful mine planning. Through its experience, the Company has developed a number of empirical standards governing the size and shape of rooms and pillars, the favoured direction of advance, and the optimum sequence of extraction required to minimise local concentrations of stress. The historical data provided in Table XI, however, suggest that the frequency of rock bursts has been increasing somewhat over recent years, possibly as a reflection of the general trend towards increasing mining depth.

Rock Temperature

The Company's mines operate in an area of severe geothermal gradient. On average, virgin rock temperatures increase with depth at a rate of 1°C per 40 m, or about 2.5°C per 100 m. The virgin rock temperature at a depth of 25 m below surface is 8°C. At an average gradient of 1°C per 40 m, virgin rock temperatures reach 30°C at a depth of about 900 m, and 35°C at a depth of about 1,100 m.

The mining industry in Poland is heavily regulated, and these regulations are understood to require that underground working times for personnel be reduced as ambient temperature increases, in accordance with the following schedule:

Temperature Range	Maximum Working Time
Less than 28°C	8 hours
28°C to 33°C	6 hours
Greater than 33°C	Nil

The Company is currently controlling the underground ambient air temperature solely by ventilation. Very large volumes of air, totalling 375,000 cubic metres per minute (m³/min), are circulated through the underground workings. Ventilation is by ambient air, with no refrigeration.

The Company considers that the existing ventilation system is adequate for present purposes but that a new ventilation shaft will need to be completed at Rudna in about the year 2003. This shaft, which will be 7.5 m in diameter and 1,200 m deep, is estimated to cost approximately US\$85 million.

As mining proceeds to greater depths, it is highly unlikely that ventilation with ambient air will be sufficient to maintain underground working temperatures within the regulatory limits. With respect to the future operation of the Company's mines, then, and particularly at Rudna, increasing rock temperatures at depth will require additional measures of underground temperature control, beyond the current system of ventilation with ambient air. While the available systems of temperature control are used in other parts of the world and, thus, are technologically proven, their use will inevitably result in some increase in mining cost.

MINING ENGINEERS' REPORT

The Company's current reserve estimates are restricted to a maximum mining depth of 1,250 m below surface. The incremental cost of additional temperature control measures to this depth is not expected to be material in comparison to total production costs, and it is understood that the cut-off grade used for reserve estimation has not been adjusted to account for any marginal increase in cost with increasing depth. The potential increase in the frequency of rockbursts has a greater impact on extraction ratios than it does on direct mining costs and hence does not materially effect the cut off grade.

Hoisting Capacity

Hoisting is currently undertaken through a single shaft at the Lubin mine, three shafts at the Polkowice-Sieroszowice mine, and three shafts at the Rudna mine. The Company states that all hoisting shafts are operating at capacity, and this imposes the basic limit on underground mine production. It is understood, however, that regulations require that certain maintenance be performed on a daily basis, this maintenance requirement effectively limits hoisting time in each shaft to approximately 112 hours per week.

Economic Considerations

Inflation and Exchange Rate

It is a fundamental attribute of the Company's business that, for all practical purposes, its revenues are denominated in US dollars, while its costs are incurred in zlotys.

Generally speaking, the Company's unit mining costs have been increasing more or less in line with the rate of domestic inflation, so that unit costs have remained relatively stable in terms of constant zlotys. In recent years, however, the domestic inflation rate in Poland has far exceeded the rate of devaluation of the zloty against the US dollar. As a result, unit mining costs, expressed in dollar terms, have risen sharply. Between 1992 and 1996, average mining cost per tonne of ore, expressed in dollar terms, has increased by about 35 per cent., from US\$13 per tonne to US\$17.50 per tonne.

Recently, also, the price of copper, expressed in dollars, has fallen materially. These developments have caused the Company to institute an aggressive programme of cost reduction.

Cost Reduction Programme

The Company is now embarked upon a formal programme of cost reduction. Under this programme, it is anticipated that, by the year 2000, average mining costs, in constant 1996 US dollars, will decrease by some 20 per cent., from the 1995 level of about \$17 per tonne to approximately \$14 per tonne. Clearly, the degree of success achieved in implementing these cost reduction goals will have a material impact on the profitability of the Company.

In Micon's view, the initiatives being implemented by the Company should result in some decrease in mining cost, but it is clearly impossible to predict, with any reasonable level of assurance, the extent to which the Company will be successful in meeting the ambitious cost reduction goals which it has set for the year 2000.

Technical Factors Common to All Mines

The Company's underground mining operations are fully mechanised and, generally, employ sufficient units of equipment of appropriate size. Surface facilities at all shafts visited were extensive and entirely adequate. Housekeeping, both on surface and underground, is of a uniformly high standard.

The impression gained upon inspection is that the face operations are efficient, with productivities similar to those achieved at large mines in other countries.

The geological, engineering and supervisory staff interviewed by Micon demonstrated an appropriate and detailed level of knowledge with respect to the operations, and are regarded as competent.

The Company's mines were initially developed using longwall mining methods, but the room-and-pillar method of mining is now used exclusively. The method employs both primary and secondary mining, with total extraction understood to be 75 to 85 per cent. of the in-situ ore.

Operating Schedule

All mines operate on a regular schedule of three, 7½-hour shifts per day, for five days per week, with either one or two additional shifts typically worked on Saturdays. There is no underground production on

MINING ENGINEERS' REPORT

Sundays. This schedule provides an effective underground working time equivalent to about 280 full days per year.

Under the current operating schedule, and given the regulatory restriction on hoisting time discussed earlier, the hoists in the major production shafts at the Company's mines typically operate for about 112 hours per week.

The working period for underground employees both begins and ends at surface, so that all travel time to the working place is part of the 7½-hour shift. Given the extensive and widespread nature of the operations, travel time can amount to as much as one hour, each way.

Labour Costs

The Company's total mining cost has increased substantially in recent years and, more particularly, the labour component of this cost has increased more rapidly than other components. This trend is illustrated in Table XII.

Table XII
LABOUR COMPONENT OF TOTAL MINING COST

	1992	1993	1994	1995	1996
Total mining cost (million zlotys) . . .	397.9	552.7	748.3	1,027.9	1,226.2
Labour component (million zlotys) . . .	103.7	160.6	258.1	343.2	404.8
Labour component (% of total)	26	29	34	33	33
Unit mining cost (zlotys/tonne)	17.71	21.81	30.14	40.89	47.18
Labour component (zlotys/tonne)	4.61	6.30	10.40	13.65	15.58
Unit mining cost (US\$/tonne)	12.99	12.03	13.32	16.87	17.52
Labour component (US\$/tonne)	3.38	3.48	4.60	5.63	5.79

Mine planning

The Company's mine planning process follows the normal cycle of life-of-mine plans, medium term plans, and shorter term operating plans and budgets. In Micon's opinion, all of these plans are prepared in accordance with accepted engineering practices.

The principal feature of the Company's longer term plans is that future mining operations at both Rudna and Sieroszowice must move in a general northerly direction and, hence, to greater depth. Under these circumstances, the costs associated with ventilation and cooling can be expected to increase, and there is a risk that the frequency of rock bursts will increase also.

With respect to short term planning, the Company prepares quite detailed physical mining plans, which typically cover the next three years of operation. These plans are updated regularly and form the basis for the development of detailed one-year production schedules and budgets. The basic philosophy underlying the short term plans, at the present time, is that all mines should continue to operate at full capacity.

It is Micon's judgement that, at current copper prices, some of the underground sections which are presently being mined, and which are scheduled for mining in the near term, are probably not economic. Accordingly, it is Micon's opinion that the policy of continuing to operate all mines at full capacity should be re-examined, in conjunction with the re-evaluation of reserves discussed previously.

The Lubin Mine

Characteristics of the deposit

The Lubin mine extracts both sandstone and shale-carbonate ore, with the bulk of production coming from the sandstone. Ore thickness typically ranges from 3 to 4.5 m, with an average of about 3.5 m, but there are

MINING ENGINEERS' REPORT

places in which thicknesses exceed 18 m. Hydraulic backfill is used to facilitate the mining of the thicker ore zones.

In terms of copper content, Lubin has the lowest grade of all of the Company's mines, with run-of-mine ore typically averaging about 1.4 per cent. Cu. On the other hand, the silver content is higher than at the other mines and typically averages about 70 grammes/tonne Ag. As a rough approximation, using current metal prices and metallurgical recoveries, 7 grams of silver in ore contribute the same revenue as one pound of copper in ore. Thus, including silver credits, the effective copper-equivalent grade of the Lubin ore is about 1.85 per cent. Cu. As will be shown subsequently, the copper-equivalent grade at Polkowice-Sieroszowice is approximately 2.0 per cent. Cu and, at Rudna, approximately 2.3 per cent. Cu.

Current operations

The Lubin mine is serviced by a total of seven shafts. Hoisting capacity is 23,000 to 24,000 tonnes per day. Total ventilation capacity is about 80,000 m³/min.

Rate of Production

All ore produced from the Lubin mine is treated at the Lubin processing plant, which is located close to the production shaft. Historical production data for both the mine and the processing plant are summarised in Table XIII.

Table XIII
LUBIN MINE – HISTORICAL PRODUCTION DATA

	1991	1992	1993	1994	1995	1996
Mine Production						
Ore mined (thousand tonnes)	5,602	5,682	6,209	6,226	6,264	6,364
Copper grade (% Cu)	1.25	1.27	1.31	1.32	1.34	1.36
Silver grade (grammes/tonne Ag)	63	67	70	68	71	73
Process Plant Production						
Concentrate (thousand tonnes)	346	353	379	381	397	417
Copper recovery (%)	89.5	89.9	90.0	89.8	89.9	90.0
Silver recovery (%)	85.7	86.1	86.7	86.7	86.8	87.5
Concentrate grade (% Cu)	18.1	18.4	19.3	19.4	19.0	18.7
Concentrate grade (grammes/tonne Ag)	881	931	1,001	961	965	976

Underground production at Lubin has increased more or less progressively since 1991 and, in 1996, production essentially achieved the current rated capacity of approximately 6.4 million tonnes of ore per year. It can be seen from Table XIII, also, that, since 1991, there has been a progressive increase in the grade of ore mined at Lubin. This trend of increasing grade is common to all of the Company's mines and is thought to relate, in large part, to improved control of dilution.

Cost of Production

Historical cash mine operating costs at Lubin are summarised in Table XIV, in terms of both zlotys and US dollars.

MINING ENGINEERS' REPORT

Table XIV
LUBIN MINE – HISTORICAL CASH OPERATING COST

	1992	1993	1994	1995	1996
Total Cost (million zlotys)					
Labour	23.36	36.26	64.92	74.37	95.8
Material and fuel	19.49	28.76	60.56	85.50	94.4
Energy	10.87	14.23	18.21	20.49	27.4
Repairs	16.36	32.52	14.34	12.29	13.7
Special costs	5.35	8.00	9.58	14.64	19.5
Other costs	11.70	10.69	14.91	42.62	41.0
Total	87.13	130.46	182.52	249.91	291.8
Exchange rate (zlotys/US\$)	1.3630	1.8128	2.2635	2.4244	2.693
Total cost (million US\$)	63.93	71.97	80.64	103.08	108.4
Production (million tonnes)	5.682	6.209	6.226	6.264	6.364
Unit Cost (zlotys/tonne)					
Labour	4.11	5.84	10.43	11.87	15.05
Material and fuel	3.43	4.63	9.73	13.65	14.83
Energy	1.91	2.29	2.92	3.27	4.31
Repairs	2.88	5.24	2.30	1.96	2.15
Special costs	0.94	1.29	1.54	2.34	3.06
Other costs	2.06	1.72	2.39	6.80	6.44
Total	15.33	21.01	29.32	39.90	45.85
Unit cost (US\$/tonne)	11.25	11.59	12.95	16.46	17.03
Recovered grade (% Cu equiv.)	1.52	1.58	1.57	1.60	1.64
Unit mining cost (US\$/lb Cu equiv.)	0.34	0.33	0.37	0.47	0.47

Over the four year period from 1992 to 1996, annual mine operating costs at Lubin, expressed in zlotys, increased by a factor of 3.35, while unit mining costs, in zlotys per tonne of ore, increased by a factor of 2.99, or at an average rate of about 31 per cent. per year. The reported rate of inflation in Poland, over the same period, is understood to have averaged approximately 30 per cent. per year.

In US dollar terms, unit mine operating cost at Lubin increased from \$11.25 per tonne in 1992 to \$17.03 per tonne in 1996, or at an average rate of about 11 per cent. per year.

Over the same period, the grade of ore mined increased somewhat, so that, expressed in terms of equivalent copper recovered to concentrate (including allowance for silver credits), unit mining cost at Lubin has risen from 34 cents per pound of copper equivalent in 1992, to 47 cents in 1996. This cost is for mining only and does not include the costs of processing, smelting, refining, administrative overhead and on-going capital expenditures.

In 1996, with a unit mining cost of 47 cents per pound of equivalent copper recovered to concentrate, Lubin exhibited the highest cost of any of the Company's mines. The substantial increase in unit mining cost over the past few years, not only at Lubin but also at the Company's other mines, is clearly a matter of concern, particularly when these costs are translated into dollar terms.

Future Operations

Outlook for Production

At 1st January, 1997, the Mining Reserves at Lubin-Malomice were estimated at 210 million tonnes at an average grade of 1.29 per cent. Cu. These reserves would be theoretically capable of sustaining the current production rate for a period of about 33 years.

MINING ENGINEERS' REPORT

The Company's general plan for production from the Lubin mine and processing plant to the year 2000 is summarised in Table XV.

Table XV
LUBIN MINE — GENERAL PRODUCTION PLAN

	1997	1998	1999	2000
Mine Production				
Ore mined (thousand tonnes)	5,709	6,385	6,424	6,464
Copper grade (% Cu)	1.39	1.39	1.40	1.40
Silver grade (grammes/tonne Ag)	71	71	70	70
Process Plant Production				
Concentrate (thousand tonnes)	384	434	440	443
Copper recovery (%)	91.0	92.0	92.0	92.0
Silver recovery (%)	87.1	87.1	88.0	88.0
Concentrate grade (% Cu)	18.8	18.8	18.8	18.8
Concentrate grade (grammes/tonne Ag)	920	910	900	900

It is Micon's opinion that the general production schedule summarized in Table XV represents a reasonable planning objective for the Lubin mine.

Within this general plan, production from the Lubin mine for the years 1997 and 1998 has been scheduled in detail. The most significant feature of the detailed production schedule is the wide disparity in the grades of ore to be mined from the individual working areas. In particular, it is to be noted that 39 per cent. of scheduled ore tonnage for 1997, and 45 per cent. for 1998, will be at a grade of less than 1.20 per cent. Cu. In 1996, when mining at an average grade of 1.36 per cent. Cu, the unit mining cost at Lubin was 47 cents per pound of equivalent copper recovered to concentrate. Given this cost structure, there is serious doubt that material grading less than 1.20 per cent. Cu can be mined and processed economically at current copper prices. This observation again calls into question the validity of basing short term mine planning on the principle of maintaining the maximum level of underground ore production.

In this context, it is Micon's intuitive judgement that, in the strict economic sense and at current production costs and metal prices, the Mining Reserves at Lubin-Malomice are probably overstated. Updating of the cut-off criteria to reflect 1996 costs would probably result in a reduction in the Mining Reserve base and the elimination therefrom of certain areas which are currently scheduled for mining. This, in turn, would lead to a total re-evaluation of mining plans and schedules, with the possible result that ore production would be reduced, but grade enhanced. In Micon's opinion, studies along these lines should be instituted immediately.

Operating Cost Outlook

As noted previously, operating costs at all of the Company's mines have increased substantially in recent years. At Lubin, mining costs increased from \$11.25 per tonne of ore in 1992 to \$16.46 per tonne in 1995. In order to reverse this trend, the Company instituted an aggressive programme of cost reduction, under which it had been the Company's objective that, by the year 2000, unit mining costs at Lubin, expressed in dollar terms, would be reduced by about 20 per cent., from the 1995 level of \$16.46 per tonne to \$13.00 per tonne. During 1996, however, unit mining costs increased to \$17.03 per tonne, rather than decreasing to the projected level of \$15.50 per tonne. This actual mining cost experienced during 1996 provides a new factual base from which to assess the potential for future cost reductions.

In Micon's view, it is likely that some degree of cost reduction can be achieved at the Lubin mine, particularly through the progressive modernization of the equipment fleet. On the other hand it is impossible, at the present time, to predict with any reasonable level of assurance the degree to which the Company will be able to meet its cost reduction targets at the Lubin mine. On the basis of its review of the Company's cost-cutting programme, and of its general experience within the mining industry, however, Micon considers that sustained reductions in unit mining cost of the magnitude proposed by the Company will be difficult to achieve.

MINING ENGINEERS' REPORT

Outlook for Capital Expenditure

The Company's forecast of future capital expenditures at the Lubin mine is summarized in Table XVI, in which all data are expressed in constant zlotys of December, 1996 value. The 1996 year-end exchange rate between the US dollar and the zloty was US\$1 = 2.85 zlotys.

Table XVI
LUBIN MINE – FORECAST CAPITAL EXPENDITURES

Year	Forecast Capital Expenditure (million zlotys)
1997	58.8
1998	77.2
1999	47.0
2000	38.7
2001	37.5

It is Micon's opinion that the levels of capital expenditure shown in Table XVI are appropriate for the Lubin mine for the years 1997 to 2001. Between 2002 and 2007, significant additional development is scheduled for the Malomice area and, in Micon's judgement, it is likely that capital expenditures of approximately 28.5 million zlotys per year will be incurred throughout this period. Beyond 2007, the entire Lubin-Malomice area will have reached a mature stage of development, and on-going capital expenditures are thought likely to decrease to a level of about 14.3 million zlotys per year. The expenditures quoted in this paragraph are expressed in constant zlotys of December, 1996 value.

THE POLKOWICE-SIEROSZOWICE MINE

Characteristics of the Deposit

The Polkowice-Sieroszowice mine extracts both sandstone and shale-carbonate ore but, in contrast to the Lubin mine, the bulk of production is obtained from shale-carbonate ore. Ore thickness at Polkowice typically ranges from 2 to 4.5 m, with an average of about 2.5 m, while, at Sieroszowice, the typical range of thickness is from 1.5 to 4.5 m, with an average of about 2.0 m. Thicknesses in excess of 6 m are rarely encountered and hydraulic backfill is not used at the Polkowice-Sieroszowice mine.

The current ore grade at Polkowice-Sieroszowice is about 1.8 per cent. Cu and 35 grammes/tonne Ag. Including silver credits at a ratio of 7 grams of silver equals one pound of copper, the effective copper-equivalent grade of Polkowice-Sieroszowice is about 2.0 per cent. Cu.

Current Operations

The Polkowice-Sieroszowice mine is serviced by a total of eleven shafts, of which seven are on the Polkowice concession and four are on the Sieroszowice concession. The combined capacity of the three production shafts is about 33,000 to 34,000 tonnes per day. Total ventilation capacity is approximately 120,000 m³/min. Actual air flow is also reported to be about 120,000 m³/min.

Rate of Production

The Polkowice-Sieroszowice mine produces about 33,000 tonnes of ore per day. Of this total, approximately 30,000 tonnes per day are treated at the Polkowice processing plant, while the remaining 3,000 tonnes per day are transported for treatment at the Rudna processing plant. There is no processing plant at Sieroszowice. Historical production data for both the Polkowice-Sieroszowice mine and the Polkowice processing plant are summarised in Table XVII.

MINING ENGINEERS' REPORT

Table XVII
POLKOWICE-SIEROSZOWICE MINE - HISTORICAL PRODUCTION DATA

	1991	1992	1993	1994	1995	1996
Mine Production						
Ore mined (thousand tonnes)	7,925	8,081	9,318	9,216	9,463	9,236
Copper grade (% Cu)	1.70	1.76	1.81	1.79	1.76	1.84
Silver grade (grammes/tonne Ag)	32	33	33	33	34	34
Process Plant Production						
Concentrate (thousand tonnes)	397	422	473	436	428	487
Copper recovery (%)	88.4	88.6	89.3	88.7	88.6	88.7
Silver recovery (%)	81.3	83.1	83.7	83.9	82.9	82.9
Concentrate grade (% Cu)	23.6	23.3	24.2	26.8	26.9	26.7
Concentrate grade (grammes/tonne Ag)	426	424	421	478	480	465

As was the case at Lubin, underground production at Polkowice-Sieroszowice has increased more or less progressively since 1991, and there has also been a general increase in the grade of ore mined. During 1996, mine production achieved about 97 per cent. of the current rated capacity of approximately 9.5 million tonnes of ore per year.

Cost of Production

Historical cash mine operating costs at Polkowice-Sieroszowice are summarised in Table XVIII, in terms of both zlotys and US dollars.

MINING ENGINEERS' REPORT

Table XVIII

POLKOWICE-SIEROSZOWICE MINE – HISTORICAL CASH OPERATING COST

	1992	1993	1994	1995	1996
Total Cost (million zlotys)					
Labour	41.47	64.26	99.46	135.78	153.4
Material and fuel	27.83	40.85	55.03	76.92	97.8
Energy	14.64	19.87	25.36	31.44	41.4
Repairs	16.45	19.84	31.42	39.13	19.5
Special costs	19.08	17.47	16.36	29.80	48.3
Other costs	23.68	29.12	34.32	43.92	63.1
Total	143.15	191.41	261.95	356.99	423.5
Exchange rate (zlotys/US\$)	1.3630	1.8128	2.2635	2.4244	2.693
Total cost (million US\$)	105.03	105.59	115.73	147.25	157.3
Production (million tonnes)	8.081	9.318	9.216	9.463	9.236
Unit Cost (zlotys/tonne)					
Labour	5.13	6.90	10.79	14.35	16.61
Material and fuel	3.44	4.38	5.97	8.13	10.59
Energy	1.81	2.13	2.75	3.32	4.48
Repairs	2.04	2.13	3.41	4.14	2.11
Special costs	2.36	1.87	1.78	3.15	5.23
Other costs	2.93	3.13	3.72	4.64	6.83
Total	17.71	20.54	28.42	37.72	45.85
Unit cost (US\$/tonne)	12.99	11.33	12.56	15.56	17.03
Recovered grade (% Cu equiv.)	1.74	1.79	1.77	1.74	1.81
Unit mining cost (US\$/lb Cu equiv.)	0.34	0.29	0.32	0.41	0.43

Over the four year period from 1992 to 1996, annual mine operating costs at Polkowice-Sieroszowice, expressed in zlotys, increased by a factor of 2.96, while unit operating costs, in zlotys per tonne of ore, increased by a factor of 2.59, or at an average rate of about 27 per cent. per year.

In US dollar terms, unit mine operating costs at Polkowice-Sieroszowice increased from \$12.99 per tonne in 1992 to \$17.03 per tonne in 1996, or at an average rate of about 7 per cent. per year.

Over the same period, the unit mining cost, expressed in terms of equivalent copper recovered to concentrate at Polkowice-Sieroszowice, after allowing for silver credits, has risen from 34 cents per pound of copper equivalent in 1992, to 43 cents in 1996.

Future operations

Outlook for Production

At 1st January, 1997, the Mining Reserves at Polkowice-Sieroszowice were estimated at 405 million tonnes at an average grade of 1.74 per cent. Cu. These reserves would be theoretically capable of sustaining a production rate of 9.5 million tonnes per year for a period of about 43 years.

The Company's general plan for production from the Polkowice-Sieroszowice mine and the Polkowice processing plant to the year 2000 is summarised in Table XIX.

MINING ENGINEERS' REPORT

Table XIX
POLKOWICE-SIEROSZOWICE MINE – GENERAL PRODUCTION PLAN

	1997	1998	1999	2000
Mine Production				
Ore mined (thousand tonnes)	8,451	9,025	9,025	9,025
Copper grade (% Cu)	1.83	1.91	1.95	1.97
Silver grade (grammes/tonne Ag)	36	36	36	36
Process Plant Production				
Concentrate (thousand tonnes)	497	509	524	525
Copper recovery (%)	88.5	88.5	88.5	88.5
Silver recovery (%)	76.4	82.3	84.8	84.9
Concentrate grade (% Cu)	27.0	27.0	27.0	27.0
Concentrate grade (grammes/tonne Ag)	462	470	470	470

With respect to mine production, this plan envisages a significant reduction in underground output, from the level of 9.2 million tonnes mined in 1996, to 8.5 million tonnes in 1997. Thereafter, tonnage is scheduled to return to a level of 9.0 million tonnes per year, which is still below the performance achieved in 1995 and 1996. The reduced levels of mine production, however, are scheduled to be accompanied by a progressive increase in grade from 1.83 per cent. Cu in 1997 to 1.97 per cent. Cu in 2000.

The projected increase in grade is to be achieved principally by reducing dilution, through the introduction of lower profile mining equipment. It is Micon's opinion that, with the use of the lower profile equipment, the general production schedule shown in Table XIX presents a reasonable planning objective for the Polkowice-Sieroszowice mine.

Within this general plan, production from Polkowice-Sieroszowice for the years 1997 and 1998 has been scheduled in detail. Generally speaking, it is Micon's judgement that the economics of mining material grading less than 1.3 per cent. Cu from Polkowice-Sieroszowice may be open to question. Approximately 11 per cent. of the ore scheduled for mining in 1997, and 10 per cent. in 1998, will be at a grade of less than 1.3 per cent. Cu. In Micon's view, the economic viability of continuing to mine this material should be subjected to detailed analysis, in conjunction with a thorough re-evaluation of the Mining Reserves at Polkowice-Sieroszowice on the basis of updated cut-off criteria which reflect 1996 costs.

Operating Cost Outlook

Mining costs at Polkowice-Sieroszowice increased from \$12.99 per tonne of ore in 1992 to \$15.56 per tonne in 1995. Under the current cost reduction programme, the Company had anticipated that unit mining costs at Polkowice-Sieroszowice would increase in 1996, before reducing, by the year 2000, to approximately \$14 per tonne. During 1996, unit mining cost at Polkowice-Sieroszowice achieved the projected level of \$17 per tonne of ore.

When viewed from the present time, and particularly in light of the recent increases in cost which have occurred at all of the Company's mines, it is impossible to predict accurately the extent to which the cost reduction targets for Polkowice-Sieroszowice will be met. It is Micon's opinion that some degree of cost saving can be realised, but that the forecast reduction in cost from \$17 per tonne of ore in 1996 to \$14 per tonne in 2000 will be difficult to achieve.

Outlook for Capital Expenditure

The Company's forecast of future capital expenditures at the Polkowice-Sieroszowice mine is summarised in Table XX, in which all data are expressed in constant zlotys of December 1996 value.

MINING ENGINEERS' REPORT

Table XX
POLKOWICE-SIEROSZOWICE MINE – FORECAST CAPITAL EXPENDITURES

Year	Forecast Capital Expenditure (million zlotys)
	70.5
1997	104.3
1998	126.2
1999	97.9
2000	98.7
2001	

It is Micon's opinion that the levels of capital expenditure shown in Table XX are appropriate for the Polkowice-Sieroszowice mine for the years 1997 to 2001. Between 2002 and 2007, extensive additional development will still be required in the northern portions of the Sieroszowice concession, and it is Micon's judgement that capital expenditures of the order of 57 million zlotys per year will be incurred at Polkowice-Sieroszowice during this period. In addition, a new ventilation shaft will be required by about 2012, at a probable cost of roughly 120 million zlotys. Allowing also for further routine items, capital expenditures between 2008 and 2012 are likely to amount, in Micon's view, to about 71.2 million zlotys per year. Beyond 2012, Polkowice-Sieroszowice will have reached a mature stage of development, and on-going capital expenditures of the order of 28.5 million zlotys per year are to be anticipated. The expenditures quoted in this paragraph are expressed in constant zlotys of December, 1996 value.

The Rudna mine

Characteristics of the Deposit

The Rudna mine extracts both sandstone and shale-carbonate ore, with sandstone being the more predominant ore type. The ore at the Rudna mine occurs both in flats (valleys) and in elevations (hills). Ore in the flats typically ranges in thickness between 2 and 6.5 m, with an average of about 4.5 m. In the elevations, on the other hand, ore thickness typically exceeds 7 m and locally exceeds 20 m. Hydraulic backfill is used to facilitate mining of the thicker ore zones. The overall average ore thickness at Rudna, at about 5 m, is significantly greater than at either Lubin or Polkowice-Sieroszowice.

Rudna is the deepest of the Company's mines, with the underground workings extending between depths of about 850 and 1,100 m. Rock temperatures at the deeper elevations are higher than at the Company's other mines and it is likely that, in the relatively near future, measures other than solely ventilation with ambient air will be required to maintain acceptable working temperatures.

Rudna has the highest grade of any of the Company's mines, currently operating at an average grade of approximately 2.0 per cent. Cu and 50 grammes/tonne Ag. At a ratio of 7 grams of silver equals one pound of copper, the effective copper-equivalent grade of the Rudna ore is about 2.3 per cent. Cu.

MINING ENGINEERS' REPORT

Current Operations

The Rudna mine is serviced by a total of ten shafts. The total capacity of the three production shafts is about 42,000 tonnes per day, and it is this hoisting capacity which imposes the limit on underground production. Total ventilation capacity is of the order of 200,000 m³/min, and actual air flow is reported to be about 185,000 m³/min.

Rate of Production

At full capacity, the Rudna mine produces about 42,000 tonnes of ore per day, all of which is treated at the Rudna processing plant. The Rudna processing plant also treats approximately 3,000 tonnes of ore per day which is transported from the Polkowice-Sieroszowice mine. Historical production data for the Rudna mine and processing plant are summarised in Table XXI.

Table XXI
RUDNA MINE – HISTORICAL PRODUCTION DATA

	1991	1992	1993	1994	1995	1996
Mine Production						
Ore mined (thousand tonnes)	8,546	8,707	9,956	9,386	9,413	10,388
Copper grade (% Cu)	1.81	1.82	1.82	1.88	1.92	2.08
Silver grade (grammes/tonne Ag)	44	47	54	52	48	49
Process Plant Production						
Concentrate (thousand tonnes)	692	678	706	677	680	749
Copper recovery (%)	89.3	89.3	88.4	89.0	89.0	89.3
Silver recovery (%)	84.2	86.9	85.3	86.0	83.6	84.4
Concentrate grade (% Cu)	23.7	24.9	27.6	27.7	28.4	28.6
Concentrate grade (grammes/tonne Ag)	512	591	735	694	645	629

In common with the Company's other mines, underground production at Rudna has increased more or less progressively since 1991, and this increase in production has been accompanied also by a progressive increase in grade. During 1996, production achieved approximately 87 per cent. of the current rated capacity of approximately 12.0 million tonnes of ore per year, and maintained an average grade in excess of 2 per cent. Cu.

Cost of Production

Historical cash mine operating costs at Rudna are summarised in Table XXII, in terms of both zlotys and US dollars.

MINING ENGINEERS' REPORT

Table XXII

RUDNA MINE – HISTORICAL CASH OPERATING COST

	1992	1993	1994	1995	1996
Total Cost (million zlotys)					
Labour	38.82	60.05	93.71	133.02	155.6
Material and fuel	38.75	62.42	81.06	114.30	115.4
Energy	15.63	20.06	24.64	32.26	43.3
Repairs	13.27	23.40	27.72	28.30	50.4
Special costs	39.84	41.91	41.68	66.59	75.0
Other costs	22.68	26.01	35.06	46.57	71.2
Total	168.99	233.85	303.87	421.04	510.9
Exchange rate (zlotys/US\$)	1.3630	1.8128	2.2635	2.4244	2.693
Total cost (million US\$).	123.98	129.00	134.25	173.67	189.7
Production (million tonnes)	8.707	9.956	9.386	9.412	10.388
Unit Cost (zlotys/tonne)					
Labour	4.46	6.03	9.98	14.13	14.98
Material and fuel	4.45	6.27	8.64	12.14	11.11
Energy	1.80	2.01	2.63	3.43	4.17
Repairs	1.52	2.35	2.95	3.01	4.85
Special costs	4.58	4.21	4.44	7.08	7.22
Other costs	2.60	2.61	3.74	4.95	6.85
Total	19.41	23.48	32.37	44.74	49.18
Unit cost (US\$/tonne)	14.24	12.96	14.30	18.45	18.26
Recovered grade (% Cu equiv.)	1.89	1.91	1.96	1.97	2.13
Unit mining cost (US\$/lb Cu equiv.)	0.34	0.31	0.33	0.42	0.39

Over the four year period from 1992 to 1996, annual mine operating costs at Rudna, expressed in zlotys, increased by a factor of 3.02, while unit mining costs, in zlotys per tonne of ore, increased by a factor of 2.53, or at an average rate of about 26 per cent. per year.

In US dollar terms, unit mine operating costs increased from \$14.24 per tonne in 1992 to \$18.26 per tonne in 1996, or at an average rate of about 6 per cent. per year.

The unit mining cost, expressed in terms of equivalent copper recovered to concentrate at Rudna, after allowing for silver credits, has risen from 34 cents per pound of copper equivalent in 1992, to 39 cents in 1996. Thus, at the present time, Rudna exhibits the lowest unit mining cost, per pound of copper equivalent, of all of the Company's mining operations.

Future Operations

Outlook for Production

At January 1, 1997, the Mining Reserves at Rudna were estimated at 307 million tonnes at an average grade of 1.91 per cent. Cu. These reserves would be theoretically capable of sustaining the maximum production rate of the mine for a period of about 26 years.

The Company's general plan for production from the Rudna mine and processing plant to the year 2000 is summarised in Table XXIII.

MINING ENGINEERS' REPORT

Table XXIII

RUDNA MINE – GENERAL PRODUCTION PLAN

	1997	1998	1999	2000
Mine Production				
Ore mined (thousand tonnes)	9,882	11,566	11,965	11,965
Copper grade (% Cu)	2.06	2.01	2.04	2.10
Silver grade (grammes/tonne Ag)	49	48	49	50
Process Plant Production				
Concentrate (thousand tonnes)	663	795	829	857
Copper recovery (%)	89.7	89.2	89.2	89.3
Silver recovery (%)	85.0	85.0	85.0	85.0
Concentrate grade (% Cu)	28.0	28.0	28.0	28.0
Concentrate grade (grammes/tonne Ag)	630	630	630	630

Except for the year 1997, for which deliberate attempts have been made to maximise grade, this plan envisages a progressive increase in tonnage from the current level of about 10.5 million tonnes per year, to 12.0 million tonnes per year by 1999. The increase in tonnage is accompanied also by an overall increase in grade, from 2.06 per cent. Cu in 1997 to 2.10 per cent. Cu by the year 2000. Generally speaking, the production schedule shown in Table XXIII calls for a continuation of the recent tonnage and grade trends experienced at the Rudna mine and, in Micon's opinion, it represents a reasonable planning objective.

Within this general plan, production from Rudna for the years 1997 and 1998 has been scheduled in detail. Generally speaking, the grades of ore scheduled to be mined from the individual working areas at Rudna exceed 1.5 per cent. Cu and, in Micon's judgement, such grades are likely to be economic under the current regime of production costs and metal prices. In the economic sense, then, Rudna appears to be the most robust of the Company's mines. In Micon's view, however, it is still necessary to undertake a complete re-evaluation of the Mining Reserves at Rudna, using updated cut-off criteria based on 1996 costs.

Operating Cost Outlook

Mining costs at Rudna increased from \$14.24 per tonne of ore in 1992 to \$18.45 per tonne in 1995. Under the current cost reduction programme, the Company had anticipated that unit mining costs at Rudna, in 1996, would be maintained at the 1995 level of about \$18.50 per tonne of ore, before reducing progressively to \$15.00 per tonne in the year 2000. In fact, however, mining costs at Rudna in 1996 decreased marginally to \$18.26 per tonne.

Again, while it is impossible to make accurate predictions in this area, it is Micon's judgement that some additional cost savings remain to be realised at Rudna. It is also Micon's judgement, however, that the projected reduction in cost from \$18.26 per tonne of ore in 1996 to \$15 per tonne in 2000 will be difficult to achieve.

Outlook for Capital Expenditure

The Company's forecast of future capital expenditures at the Rudna mine is summarised in Table XXIV in which all data are expressed in constant zlotys of December, 1996 value.

Table XXIV

RUDNA MINE – FORECAST CAPITAL EXPENDITURES

Year	Forecast Capital Expenditure (million zlotys)
1997	97.4
1998	148.5
1999	101.1
2000	94.3
2001	121.6

MINING ENGINEERS' REPORT

It is Micon's opinion that the levels of capital expenditure shown in Table XXIV are appropriate for the Rudna mine for the years 1997 to 2001. Between 2002 and 2007, additional primary development is scheduled in the northern portion of the Rudna concession, and it is Micon's judgement that capital expenditures of the order of 42.7 million zlotys per year will be incurred during this period. Beyond the year 2007, Rudna will have reached a mature stage of development, and on-going capital expenditures of the order of 28.5 million zlotys per year are to be anticipated. The expenditures quoted in this paragraph are expressed in constant zlotys of December, 1996 value.

THE SELLING SHAREHOLDER

Control of the Company

The Selling Shareholder is the State Treasury of Poland represented by and acting through the Minister of State Treasury.

Prior to the Global Offering, all the Shares of the Company were owned by the Selling Shareholder. Upon completion of the Global Offering the Selling Shareholder will own at least 52.5 per cent. (at least 49 per cent. if the over-allotment option is exercised in full) of the outstanding Shares of the Company. As a result, the Selling Shareholder will, by virtue of its shareholding in the Company, continue to have a significant influence over the selection of members of the Supervisory Board and the determination of the outcome of all matters to be decided by a vote of the shareholders of the Company, including whether to approve the payment of dividends. See "Dividends" and "Description of Shares — Block Voting".

The Selling Shareholder has no specific plans for the Shares it will retain and intends to be a passive investor. The Selling Shareholder has agreed that, for the period of 12 months after the Global Offering, it will not offer, sell or otherwise dispose of any GDRs or Shares or cause the Company to issue any Shares (or issue any securities convertible or exchangeable into Shares), other than in connection with the Global Offering, unless the prior approval of the Joint Lead Managers is received. See "The Global Offering — Lock-Up Agreements".