



## Dick Wilkinson

<b>Qualifications</b>	BSc (Hons) Chemical Engineering, University of Edinburgh Chartered Engineer
<b>Affiliations</b>	Member, Institution of Mining and Metallurgy Associate Member, Institution of Chemical Engineers
<b>Date of Birth</b>	1934
<b>Nationality</b>	British

### Current Position at CWA

External Consultant, CWA Minerals Department, with wide international experience of planning, design and operation within the mining industry.

### Specific Expertise and Experience

#### Key Qualifications

- 33 years experience in the metal mining industry.
- Experience in project management, operations management, research, project evaluation, shipping of minerals and environmental management
- Developing country experience including Zambia, Ghana and Indonesia and others

Graduated from the University of Edinburgh in 1969 with BSc in chemical engineering and joined Roan Consolidated Mines as a metallurgist at Mufulira in Zambia. Over the next eleven years worked in a range of technical and managerial roles in hydrometallurgical and mineral processing plant, culminating in the management of a small remote open pit mine and concentrator.

In 1980 left RCM and took up a position as a senior metallurgist with Billiton International Metals in the Hague. Participated in the evaluation of investment opportunities and entry negotiations in non-ferrous mining in five continents.

From 1983, he was responsible for mineral processing research at Billiton Research where work encompassed industrial minerals, oil shale, and coal as well as non-ferrous metals. In 1988, he assumed responsibility for the feasibility study on a Ghanaian refractory gold deposit, following this project through construction and bringing it on stream as Mines Manager. He then transferred to Indonesia as Senior Technical Advisor controlling existing operations and developing new projects for the Billiton Companies in Indonesia.

In 1993, he left the Billiton group and established himself as an independent consultant, based in England and serving the international mining industry.

He is experienced in the economic evaluation of mineral deposits, the management of feasibility studies; technical audits; environmental audits; metallurgical accounting audits; project management and operations management. Also has experience in the assembly and presentation of data for the settlement of legal and contractual disputes.

He has extensive experience of assisting with mineral cargo problems including attendance sampling, analysis, testing and reporting.

### **Summary of Previous Employment**

1993-2000 **Self employed as a Minerals Consultancy**

Working with Mining companies, Government representatives, Investors and Engineering Companies on the development of new ventures. Activities have included:

- Initial appraisal, site selection and feasibility study planning for project to heap leach gold bearing quartzites in the Republic of Georgia, for Cracow Resources of Australia.
- Planning and supervision of sampling and metallurgical testwork and process development for re-commencement of gold mining operations at Konongo, Ghana for Obenemase Gold Mines Ltd.
- Due diligence at the Monarch Gold Mine, Mozambique, following their application for a loan to provide equipment for flotation and bacterial leaching of refractory ores, for the African Development Bank.
- Project manager for a feasibility study on the Bakhuis bauxite deposits in south-west Suriname, for Suralco (Alcoa) and Billiton.
- Assessment of the Legadembi Mine in southern Ethiopia for RTZ Corp.

- Technical review of the Haib Copper Project in Namibia for Namibian Copper Joint Venture, Merrill Lynch International and Rothschild Australia.
- Independent review of development plan for Saudi Arabian mining industry for IMC – Mackag and Schnellman.
- Preparation of business plan for nickel project to upgrade low grade concentrates in Russia and process by roast, leach and SX-EW in Italy for Osmium Holdings SA.
- Prepare technical evidence for Kennecott in dispute with Allianz Cornhill International.
- Due diligence review of the Kasese cobalt project in Uganda for Deutsche Morgan Grenfell.
- Review of future power demand by the Zambian copper mining industry for Kleinwort Benson.
- Due diligence review of the Swedish copper, lead and zinc mines of the Boliden group for Micon International Ltd.
- Independent technical experts report on the mineral processing and roasting operations of Asturiana de Zinc SA for IMC – Mackay and Schnellman.
- Preliminary Appraisal of the Kenticha tantalum project (Ethiopia) for A & M Minerals and Metals.
- Appraisal of the Vasilkovskoye gold project (Kazakhstan) for the Malaysia Mining Corporation.
- Due diligence appraisal of the Fairview, Agnes, Sheba and New Consort gold mines (Eastern Transvaal, South Africa) for Eldorado Gold Corporation.
- Evaluation of the Haib copper roast leach/bacterial leach/solvent extraction project (Namibia) for Behre Dolbear Australia.
- Preparation of a development schedule for the Irtysk Cu/Pb/Zn Mine, Bekesovsk Concentrator and IMX Smelter for Kaiser Engineers.
- Technical expert's report on the Tenke Fungurume copper/cobalt solvent extraction and electrowinning project for Investec.
- Preparation of project monitoring and progress reports on the Kasese Cobalt Bacterial Leach/Solvent Extraction project for Royal Bank of Scotland.
- Technical due diligence report on LG Metals' Onsan copper smelter and refinery complex for Glencore International AG.
- Review cobalt mining project data and prepare market and price forecasts for cobalt metal to prepare case for a legal dispute for an equipment manufacturer.
- Examine copper cathode consignment in Athens to assist the resolution of a contractual dispute over quality for Gerald Metals.
- Technical appraisal of concentrator, smelter and refinery at Mufulira Copper mine for Glencore International AG.
- Technical audit of bauxite mines and ferro-chrome smelter of KMRC, Kazakhstan, for JCI Projects (Pty) Ltd

- Technical due diligence report on Pasar Copper Smelter and Refinery for Glencore International AG.
- Preparation of development plans for Pasar Copper Refinery for Glencore International AG.
- Review of development plans for Nkana Copper Refinery, Nchanga Copper tailings leach plant and Nkana Cobalt plant for Anglo American Corporation.
- Preliminary economic appraisal of three Malaysian silica sand deposits for the Mines Research Institute, Ipoh.
- Preparation of case for arbitration between Trans World Group and Kazakh interests.
- Technical due diligence on refurbishment plans for Nkana copper smelter and refinery for UK government.
- Preparation of a post-commissioning technical expert's report on the Kasese Cobalt plant for Royal Bank of Scotland.
- Preparation of an expert witness statement on mineral processing equipment.
- Review of feasibility study for the refurbishment of the integrated steel plant of Delta Steel, Nigeria.
- Independent technical experts report in support of financing for fly ash processing plants, UK.
- Leader and mineral processing engineer of technical and management advisory team assisting the management of the Trepca lead, zinc and silver mines in Kosovo, Yugoslavia.
- Report on the potential for co-operative development of the Shaimerden zinc project, Kazakhstan, with the Chelyabinsk electrolytic zinc plant, Russia.
- Review of the Management of Capital Projects at Chelyabinsk electrolytic zinc plant, Russia.
- Review of the options for future development of the mineral processing laboratories and pilot plant of the Office de Recherche Geologique et Miniere, Boumerdes, Algeria.
- Review of available technology to deal with soluble copper in gold cyanidation for a Romanian gold plant.
- Evaluation of potential for profitable operation of Aguas Tenidas mine and Almagrera process plants in Spain for Atna Resources.
- Consultation on test work for the extraction of tantalum and niobium from Ghurayyah granite (Saudi Arabia) and preparation of a scoping study for Tertiary Minerals.
- Technical experts report for loss adjusters on failure of crusher liners and belt conveyor at Minera Los Pelambres, Chile.
- Introduction of project management software at Chelyabinsk Zinc Plant, Russia.
- Managed scoping study on the Ghurayyah Project (Saudi Arabia).



1991-1993 **Billiton Companies**, in Indonesia, Jakarta  
Senior Technical Advisor

Supervision of new project development and the management of feasibility studies etc. Technical advice to President Director on all aspects of mining operations. Focal point for environmental affairs and responsible for environmental audits. From time to time acting general manager of two remote gold/silver mining operations.

1990-1991 **Canadian Bogosu Resources Ltd**, Ghana  
Mines Manager

Responsible for operations at new open pit oxide/refractory gold mining operations. 900 ktpa operation working four open pits in the vicinity of Bogosu, 120 km north of the port of Takoradi.

1989-1990 **Canadian Bogosu Resources Ltd**, Ghana  
Technical Manager

Completion and refinement of studies including the development of the environmental management plan and monitoring programme, preparation of supplementary studies, liaison with JV partners, participating in the securing of shareholder and banking support for 900 ktpa gold project in Ghana. Development of contracting strategy and contractor selection. Supervision of detail design and procurement.

1988 **Billiton International Metals BV**  
Clients Representative

Manager of feasibility study including resource definition, mine planning and reserve development, process development, including supervision of testwork, design and specification, infrastructure, environmental baseline studies and impact assessment, human resources, cost estimation and economic evaluation for 750 ktpa, later 900 ktpa gold mine in Ghana. .

1983-1988 **Billiton International Metals BV**  
Head of Ore Dressing Dept

Development and management of mineral processing research programme including extra-mural studies. Work included direction of test work in support of operations and feasibility studies. Liaison with other research organisations. Consulting

1980-1983 **Billiton International Metals BV**  
Senior Metallurgist

Evaluation of business opportunities. Negotiations with vendors/partners.  
Consulting. Participation in business planning studies.

1979-1980 **Roan Consolidated Mines Ltd**  
General Superintendent (Chibuluma/Kalengwa)

Responsible for all activities at Kalengwa copper/gold open pit mine and mill and  
for Chibuluma concentrator.

1979 **Roan Consolidated Mines Ltd**  
Concentrator superintendent, Chambishi copper mine.

1977-1979 **Roan Consolidated Mines Ltd**  
Concentrator superintendent, Chibuluma copper cobalt mine.

1975-1976 **Roan Consolidated Mines Ltd**  
Assistant Leach Plant Superintendent (Chambishi)

Responsible for operations and maintenance at copper/cobalt roast, leach,  
electrowinning plant.

1973-1975 **Roan Consolidated Mines**  
Plant Metallurgist, Mufulira Copper Refinery

Responsible for tankhouse operations. Technical interest included periodic  
current reversal, resistance heating of electrolyte, infra-red short circuit detection  
etc. Extended periods as acting assistant superintendent.

1970-1973 **Roan Consolidated Mines Ltd**  
Mufulira Copper Refinery & Concentrator  
Assistant/Senior Metallurgist

1970 **RST Technical Services Ltd**  
Baluba Copper Cobalt pilot plant  
Assistant Metallurgist

1969-1970 **Roan Consolidated Mines Ltd**  
Mufulira Copper Refinery  
Assistant Metallurgist