MINING

SECTOR PROFILE

ZAMBIA DEVELOPMENT AGENCY

Table of Contents

1.0. OVERVIEW OF THE MINING SECTOR IN ZAMBIA 3

1.1. Background of the Mining Sector 3

1.2. Geology of Zambia 3

1.3. Exploration Potential 6

2.0. INVESTMENT OPPORTUNITIES IN THE MINING SECTOR IN ZAMBIA 7

2.1. Metallic Minerals 7

2.2. Gemstones 8

2.3. Industrial Minerals 9

2.4. Energy Minerals 10

3.0 ADMINISTRATION OF THE MINING SECTOR……..11

3.1 Types of Licences……..11

3.2 Mining Fiscal Regime……...14

3.3 Prescribed Fees/Charges…….……..14

4.0 USEFUL CONTACTS OF AGENCIES RESPONSIBLE FOR INVESTMENTS IN THE MINING SECTOR 15

1.0. OVERVIEW OF THE MINING SECTOR IN ZAMBIA

1.1. Background of the Mining Sector

Zambia has a mining history which spans over ninety years including the late 1960's, when Zambia was the world's third largest copper producer, after the US and the former Soviet Union. Mining was and remains central to the Zambian economy. It has played a key role in the social and economic development of the country.

Zambia has predominantly been a copper mining country being one of the top two largest copper producers in Africa and the world's seventh copper producer. In the 1970's, copper production in Zambia reached its peak (700,000 tons). Subsequently, falling copper metal prices caused annual production to drop to 200,000 tons in the late 1990's. Since the early 2000 following completion of the privatisation of the mining sector, Zambia's mining sector has recovered sharply.

With the rising prices of metals on the international commodity markets spurred by increased demand for metals from Asia, especially China, Zambia's copper production has surpassed its peak recorded in 1972 of 700,000 tons. Zambia has continued to attract foreign direct investment in the mining sector and this has supported the increase in copper other metal production. Copper production has increased from 572,793 tons in 2008 and raising to over 800,000 tons in 2013 with a projection that copper production will reach 1,500,000 tons by the year 2018 on account of new mining projects that are currently under development.

The mining sector has attracted investment in excess of USD 8 billion since the year 2000 creating over 80,000 jobs by the year 2013 up from 27,000 jobs in the year 2000. It is projected that investments in the mining sector will reach approximately USD 15 billion on account of new projects under implementation and/or exploration by the year 2017 if the international metal prices hold above current levels recorded in the first and second quarter of the year 2013.

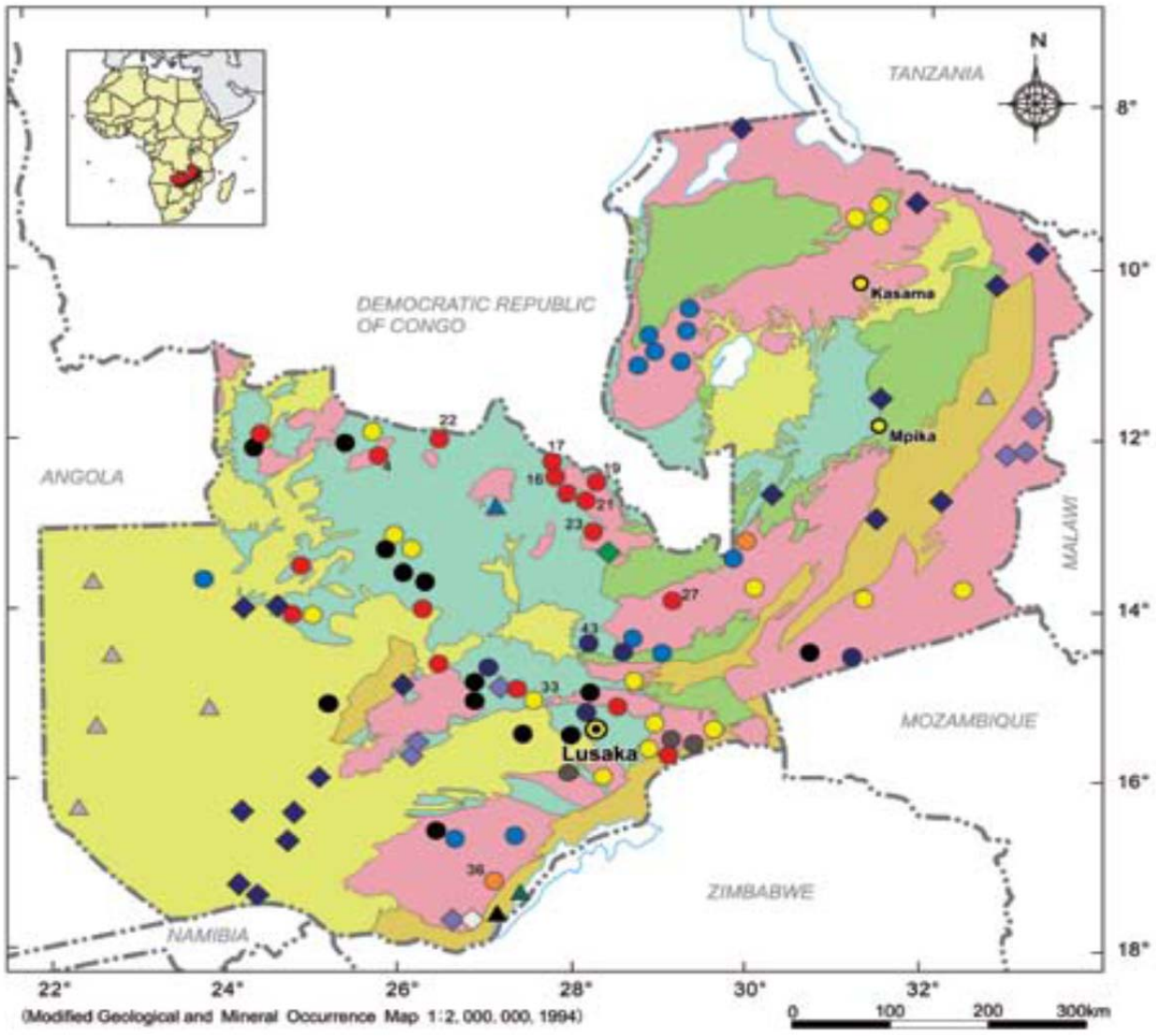
Zambia's endowment of mineral resources is substantial and the mineral wealth includes metals, gemstones, industrial minerals, agricultural, building and energy minerals. Production of metallic minerals dominates the mining sector. Nevertheless, the full potential of these and other known mineral deposits is yet to be realised creating greater exploration opportunities.

1.2. Geology of Zambia

Zambia comprises a number of very diverse geological terrains ranging from a stable early Proterozoic craton to structurally complex "mobile belts" and younger cover rocks. This diversity hosts the considerable exploration potential of the country. The geological complexities and multiple tectono-thermal events evident in Zambia are due, in large part, to the country's unique geographic location between the massive Kasai Craton to the west and the Zimbabwe-Kaapvaal ('Kalahari') and Tanzania cratons to the south and north respectively. Inter-cratonic dislocations and the buttressing effects of these stable blocks have exerted considerable control on the geological evolution of the country.

Some 80% of the country has been mapped, although a significant amount of this work is unpublished, including the reconnaissance mapping of the western and north-eastern parts of the country. Regional mapping is carried out at 1:50,000 scale and published at 1:100,000 scale as quarter degree sheets accompanied by a report. There are approximately 260-quarter degree sheets, of which around 60 cover the Kalahari of Western Zambia. Over 100 sheets have already been published and just over

60% of the solid geology has been mapped at 1:100,000 scale. Some reconnaissance maps at 1:250,000 are also available. A unique geological map at 1:1,000,000 is available as four separate sheets for easy handling. Prospective investors can view the tenements map showing the locations of exploration and mining licences at the Geological Survey Department in the Ministry of Mines, Energy and Water Development.

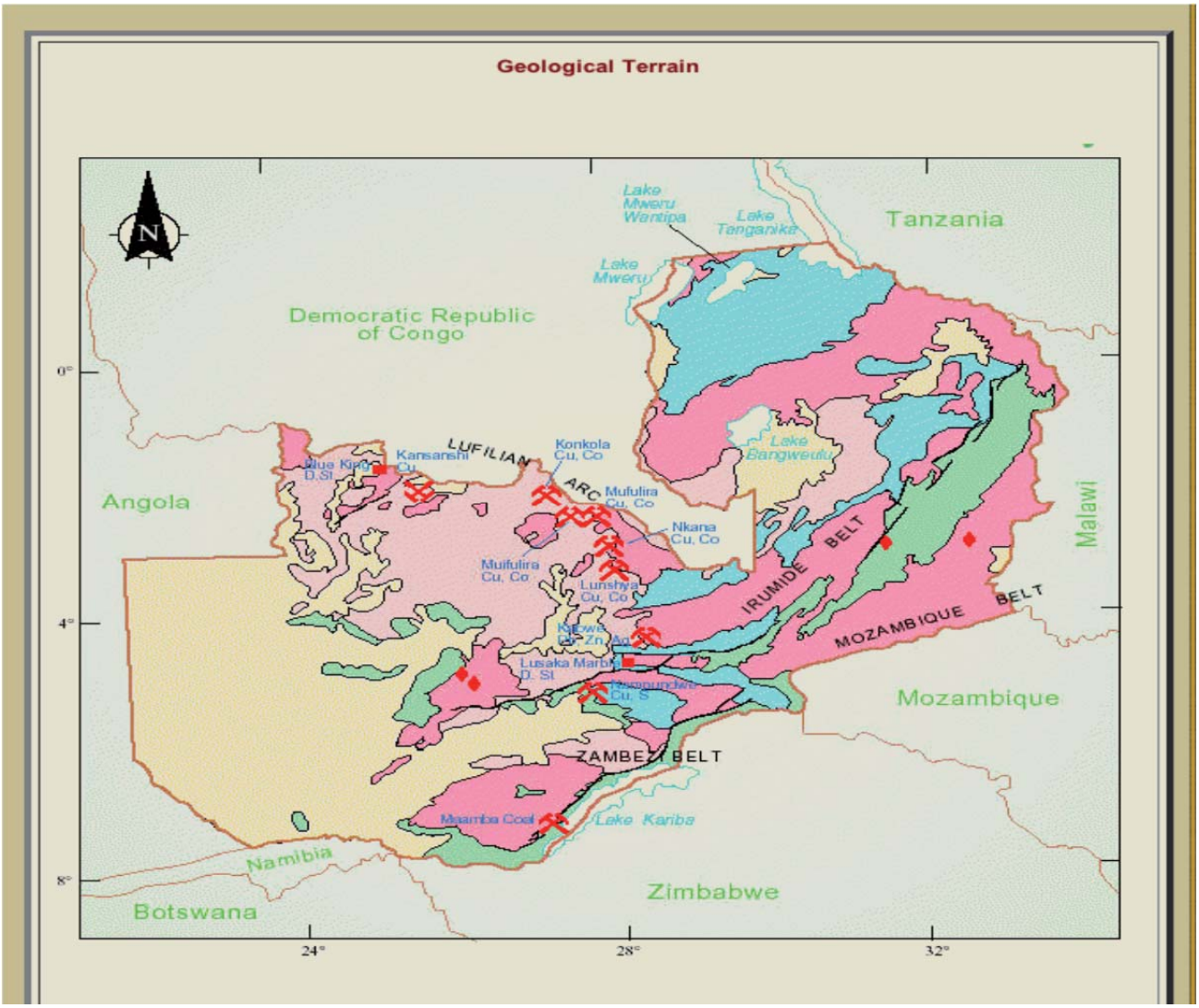


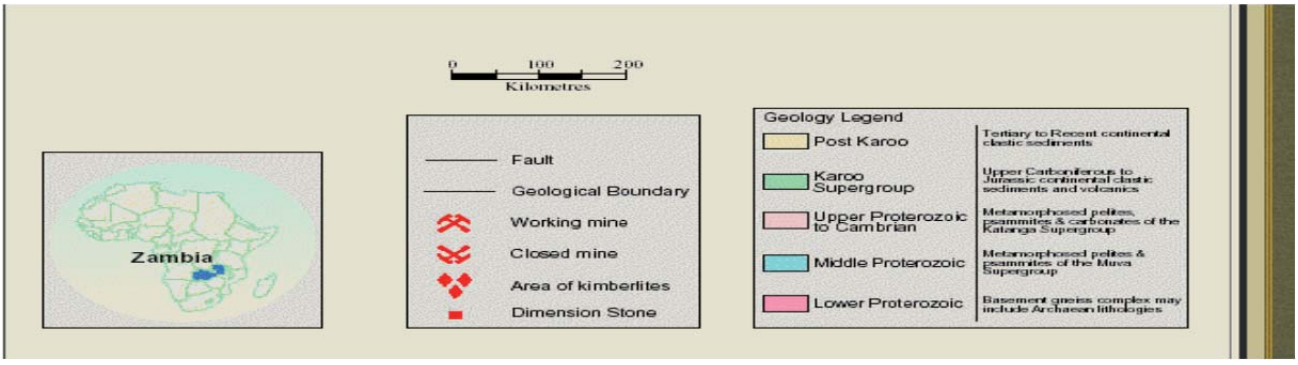
LEGEND

Post Karoo	Tertiary to Recent continental clastic sediments
Karoo Supergroup	Upper Carboniferous to Jurassic continental clastic sediments and volcanics
Upper Proterozoic to Cambrian	Metamorphosed pelites, psammites and carbonates of the Katanga Surpergroup
Middle Proterozoic	Metamorphosed pelites and psammites of the Muva Surpergroup
Lower Proterozoic	Basement gneiss complex including Archean lithologies
Lake	

Copper/Cobalt	Aquamarine
Gold	Emerald
Lead Zinc	Diamond
Nickel	Coal
Tin	Oil, Gas
Manganese	Uranium
Iron	Amethyst

Distribution of Mineral Deposits and Occurrences in Zambia





1.3. Exploration Potential

The complex geological evolution of Zambia together with its abundance and diversity of mineral and other natural resource deposits confirm the considerable potential for discovery of new economic resource occurrences through further exploration. Promising locations are being identified based on empirical models of known deposits and exploration targets are being formulated from other conceptual models. This potential is confirmed by the impressive number of new exploration companies working throughout the country.

The existing mining companies also have short and long term exploration programs to delineate additional resources in the deposits being mined and to discover new ones.

The Bangweulu Block, Kafue Anticline, Irumide Belt, Mozambique Belt, Zambezi Belt, Katanga Terrain, Choma- Kalomo Block, Mwembeshi Shear Zone and the Hook Granite Complex constitute areas with exploration potential for gold, copper-cobalt, uranium, base metals mineralisation and for industrial minerals.

The Karoo sediments in the Luangwa, Zambezi, and Kafue Basins are being targeted to determine their potential for energy minerals and hydrocarbons. These basins are also known to have prospects for oil and gas. The areas have since been demarcated into oil blocks for prospecting.

2.0. INVESTMENT OPPORTUNITIES IN THE MINING SECTOR IN ZAMBIA

Zambia's broad spectrum of mineral resources such as copper-cobalt and gold, gemstones, a variety of industrial minerals and potential energy resources including uranium, coal and hydrocarbons, presents excellent investment opportunities in the extraction and processing of these minerals in the country.

2.1. Metallic Minerals

2.1.1. Gold

The majority of the deposits are lode-type bodies associated with the Mwembeshi Shear Zone and related syntectonic intrusions. Significant gold mineralisation also occurs, variously with copper and uranium, in major thrust zones near the base of the Katanga succession. More than 300 gold occurrences have been recorded but most are only prospects. Largest historical producers are Dunrobin (990kg) and Matala (225kg) in the Mumbwa area, Jessie (390kg) in the Rufunsa area, and Sasare (390kg) in eastern Zambia.

2.1.2. Copper and Cobalt

The copper-cobalt mineralisation is strata bound within arenites, shales, and carbonate rocks of the lower-Katanga Mine Series Group. Copper resources have also been identified in the thrust zones of north-western Zambia, which represent zones of detachment between Basement and Katanga sequences, and in western and central Zambia where shearing and intrusion emplacement through the lower Katanga succession have generated a considerable number of lode, stock work, breccias and skarn deposits. Other types of deposit include the disseminated copper mineralisation in the granites and aplites of the Mkushi area in central Zambia and copper-bearing stratiform sulphides in the Lusaka area. In excess of one billion tonnes of copper-cobalt ore (c.2.7 % Cu) has been extracted from the mines of the Copperbelt and conservative estimates consider that a further two billion tonnes could be economically exploited.

2.1.3. Zinc and Lead

Carbonate-hosted Zn-Pb ore has been mined from the Kabwe deposit in central Zambia where 11Mt of ore averaged close to 25%Zn and 15%Pb. The strata bound mineralisation comprises massive, breccia and replacement sulphides within carbonate rocks marking the transition from

Lower Roan to Upper Roan. Similar styles of mineralisation at the same stratigraphic position, some copper-rich, are evident through the Kabwe area and northwards to Kapiri Mposhi in central Zambia. Strata bound, probably exhalative, Cu-Pb-Zn deposits occur in Basement and Muva sequences in south-eastern Zambia. Carbonate hosted Pb-Zn mineralisation has also been recorded in Lower Roan limestone's in the Copperbelt and in Lower Kundelungu rocks in western Zambia.

2.1.4. Iron Ore

Substantial resources of iron ore have been identified, occurring primarily as sedimentary ironstones in the lower-Katanga Mine Series successions of central and western Zambia. Total resources of more than 900Mt with iron content of more than 50% have been provisionally estimated, with some individual deposits up to 200Mt in size. Small, high-grade skarn and replacement deposits are associated with Pan-African felsic and mafic intrusions that have penetrated the lower Katanga succession in western Zambia particularly around the Hook Granite Complex.

2.1.5. Manganese

Occurrences are numerous but mostly small occurring as tabular, probably stratiform exhalative, deposits within Basement and Muva sequences, and supergene enrichments either capping low-grade sedimentary accumulations or concentrated within sub-vertical fractures of limited vertical extent. Currently small scale mining is being done in the Luapula Province in the north of Zambia, around a town called Mansa. Occurrences are also known around central Zambia stretching north wise towards the town of Mansa.

2.1.6. Nickel and Platinum Group Elements

Orthomagmatic nickel occurrences are known in the Basement sequences south and east of Lusaka. Sediment-hosted nickel deposits in Mwashia and Mine Series rocks of north-western Zambia are associated with gabbroic intrusions and often show evidence of hydrothermal enrichment. Also, minor platinum group elements are produced as a by-product of copper refining on the major Copperbelt mines and from the Munali deposit, south of Lusaka.

2.2. Gemstones

2.2.1. Diamonds

Alluvial diamonds have been reported throughout much of north-eastern and western Zambia. Kimberlite and lamproite intrusions occur within and near to the western flank of the Luangwa River and in southern Zambia but no diamond-bearing diatremes have yet been discovered.

2.2.2. Emeralds

Zambia produces about 20% of the world's emeralds and they are sought after due to their deep green colour. The gemstones are recovered exclusively from the Ndola Rural area of the southern Copperbelt where they are hosted by Muva-age talc schist's intruded by tourmaline- and phlogophite–bearing pegmatite bodies.

2.2.3. Other gemstones

Aquamarine and tourmaline are mined in the Lundazi and Nyimba areas of eastern Zambia where they occur in pegmatite's that were synchronous with the c.486Ma Sinda batholiths. Amethyst is currently being mined in the Mwakambiko Hills near Lake Kariba where it occurs in veins and stock works generated during late–Karoo or post-Karoo tectonism.

2.3. Industrial Minerals

Zambia is host to a range of industrial minerals which will help to support anticipated growth in the mining, manufacturing and agricultural sectors. Feldspars, silica sand, talc, barite, phosphate, limestone clays, dimension stone, graphite, gypsum, kyanite, asbestos, and fluorite are all present.

- ***Feldspar*** is produced from two alkali-feldspar pegmatite deposits near Siavonga located in the southern part of the country and partially kaolinised pegmatite at Shipingu, near Kapiri Mposhi in central Zambia.

- ***Sands*** of various specifications occur throughout Zambia but the only occurrence to have been exploited is a deposit of high-quality glass sand at Kapiri Mposhi in central Zambia.

- ***Talc*** deposits in Zambia have not been extensively evaluated but range from talc derived during metamorphism of dolomites near Lusaka to a hydrothermally altered mafic to ultramafic intrusion, also in the Lusaka area and talc schist occurring in the footwall of copper mineralisation near Ndola.

- A variety of ***barite*** deposit types are known, the most significant being the vein and replacement bodies hosted by red shale's and marls of the Mporokoso Group within the Luongo Fold and Thrust Zone of the Bangweulu Block.

- ***Apatite***, the most important potential source of phosphate occurs in significant concentrations in syenitic intrusions (Chilembwe deposit near Petauke in eastern Zambia) and carbonatite bodies (Kaluwe in the Rufunsa-Feira area and Nkombwa Hill at the northern end of the Luangwa Rift.

- ***Limestone*** and ***dolomite*** are abundant in the area around Lusaka and these and other deposits in Southern, North Western, Northern, and Luapula Provinces of the country have been identified as being suitable for cement and agricultural use.

- ***Clay*** deposits. A considerable number of deposits of ball clay and brick clay are known but they have rarely been subjected to bench tests and firing tests. Large deposits of ball clay occur at Solwezi in north-western Zambia and at Kasanka, 60km north of Serenje in central Zambia. Kaolinite-rich clays have been recorded at Masuku in southern Zambia and near Shiwa Ngandu in Mpika town in northern Zambia. Brick clays are exploited at an artisanal level throughout the country.

2.4. Energy Minerals

2.4.1. Uranium

Three significant types of uranium occurrence have been recorded in Zambia in Karoo sandstones associated with the copper mineralisation of the Copperbelt and structurally controlled mineralisation in the Basement domes of north-western Zambia. Uranium mineralisation in the Basement domes is variously accompanied by copper and gold and almost invariably occurs in kyanite-bearing schist's. These are now known to represent major thrust zones developed along the Basement-Katanga contact and propagated up-sequence both northwards and eastwards e.g. the Lumwana Malundwe deposit in north-western Zambia. Major exploration activities are underway in southern Zambia as well as around the Siavonga area in the Gwembe valley.

2.4.2. Coal

Zambia possesses substantial coal resources and has been producing coal since 1967 from the Maamba mine near Lake Kariba in southern Zambia. The Maamba deposit and other known coal occurrences are confined exclusively to the lower-Karoo Gwembe Formation, within a series of fault-controlled basins that comprise the Mid-Zambezi Rift Valley. Other thin coal seams and carbonaceous shale's have been identified in the Gwembe Formation of the Luangwa and Luano-Lukusashi Valleys and in the eastern part of the Barotse Basin in western Zambia.

2.4.3. Hydrocarbons

Historically, the country has had two major exploration programs by Mobil and Placid Oil undertaken between 1986 and 1991 within the Luangwa Rift Valley, one was terminated before intersecting the most favourable reservoir horizons. Considerable thicknesses of littoral and continental sediments underlain by carbonaceous rocks with oil generating potential are present within the Karoo-age graben of both the Luangwa and Mid-Zambezi Valleys. Recent exploration work for petroleum covering parts of North-Western, Western and Eastern Provinces of Zambia, using the Microbial Prospecting for Oil and Gas technique, indicated that the Okavango and North Luangwa basins have potential for oil and gas. Government has tendered the oil blocks for oil and gas prospecting by private sector.

3.0 ADMINISTRATION OF THE MINING SECTOR

The Mining Sector is governed and regulated by the Mines and Minerals Development Act No. 7 of 2008 which broadly deals with the following:

- Types of Mining Rights
- Acquisition of Mining Rights
- Rights/Obligations Conferred on the Mining Right Holder
- Transferability of Mining Rights
- Safety, Health and Environment and Provides for the Environmental Protection Fund
- Mineral Royalties, Fees and Charges, and Export of Minerals

3.1 Types of Licences

STRUCTURE OF MINERAL RIGHTS IN ZAMBIA

Type of right	**Large-scale prospecting licence (PL)**
Place of application	Registry for Mineral Rights (RMR)
Required documents or data	■ Prescribed form and payment of fee ■ Name and applicant information ■ Description and plan for the applied area ■ Statement about the target minerals ■ Mineral rights previously granted to the applicant ■ Such further information as may be prescribed by the minister
Validity	Two years for the initial period, and two renewals for two additional years each, plus one more year. Maximum total of seven years
Maximum surface	1,000km^2 up to a maximum cumulative of 5,000km^2
Rights granted	Exclusive rights for prospecting (for minerals specified in licence)
Other comments	50% relinquishment is mandatory for renewal

Type of right	**Small-scale prospecting permit**
Place of application	Registry for Mineral Rights (RMR)
Required documents or data	■ Prescribed form and payment of fee ■ Statement of the ores, other than gemstones, to be prospected ■ Description of the land and a plan of the proposed mining area ■ Sum to be expended ■ Mineral rights previously granted to the applicant
Validity	Two years, not renewable
Maximum surface	10km^2
Rights granted	Exclusive rights for prospecting operations in the granted area, excepting gemstones

Type of right	**Artisanal mining right**
Place of application	Regional Mining Bureau
Required documents or data	Prescribed form and payment of fee
Validity	Two years, not renewable
Maximum surface	6.68ha
Rights granted	Exclusive rights for exploration and mining operations in the granted area
Other comments	A zone description and sketch map are not mandatory with the application, but must be attached to the right itself

Type of right	**Large-scale mining licence**
Place of application	Registry for Minerals Rights (RMR)
Required documents or data	■ Prescribed form and payment of fee ■ Period for which the licence is sought ■ Statement about the deposit, including reserves and mining conditions ■ Programme for mining operations and capital investment ■ Environmental management plan ■ Expected infrastructure requirements ■ Plans for employment of Zambian citizens ■ Description of the land and a plan of the proposed mining area ■ Such other information as the Minister may reasonably require
Validity	25 years and additional renewal periods of 25 years each. Total duration unlimited
Maximum surface	250km^2 per licence
Rights granted	Exclusive rights for prospecting and mining operations in the granted area

Type of right	**Small-scale mining licence**
Place of application	Registry for Mineral Rights (RMR)
Required documents	■ Prescribed form and payment of fee ■ Description of the land and a plan of the proposed mining area ■ Identify the relevant prospecting permit ■ Description of the mineral deposit ■ Programme of mining operations ■ Applied duration ■ Such other information as the director may reasonably require
Validity	Ten years, not renewable
Maximum surface	400ha
Rights granted	Exclusive rights for mining operations in the area, excepting gemstones
Other comments	It can be transformed into a large-scale mining licence

Type of right	**Large-scale gemstone licence**
Place of application	Registry for Mineral Rights (RMR)
Required documents or data	■ Prescribed form and payment of fee ■ Area description and sketch ■ Statement of the gemstone deposit ■ Programme for mining operations ■ Such other information as the Director may reasonably require
Validity	■ Ten years, and additional renewals of ten years each. Total duration, unlimited.
Maximum surface	250km^2
Rights granted	Exclusive rights for mining operations for gemstones in granted area
Other comments	The large-scale gemstone licence is tranferable

Type of right	**Small-scale gemstone licence**
Place of application	Registry for Mineral Rights (RMR)
Required documents or data	■ Prescribed form and payment of fee ■ Area description and sketch ■ Statement of the gemstone deposit ■ Programme for mining operations ■ Such other information as the director may reasonably require
Validity	Ten years, and additional renewals of ten years each Total duration, unlimited
Maximum surface	400ha
Rights granted	Exclusive rights for mining operations for gemstones in the granted area
Other comments	It can be transformed into a large-scale mining licence

3.2 Mining Fiscal Regime

The Mining Sector provides for attractive tax regime to facilitate investments in the sector. The taxes applicable to the sector is summarised as follows:

- **Corporate Tax**; Any mining company holding a large-scale mining license carrying on the mining of base metals is taxed at 30%. Other mining companies are taxed at 35%

- **Mineral Royalty** is at 6% for base metals and 3% for other minerals.

- **Capital Allowances;** Capital expenditure deductions for mining equipment, plant, machinery and other capital expenditure claimed at the rate of 25% per annum. The deductions are available from the year that the asset is brought into use.

- **Variable Profit Tax;** There is 15% variable profit tax on taxable income which is above 8% of the gross income earned by mining companies.

- **Property Transfer Tax**; There is 10% Property Transfer Tax on value of the mining assets applicable on Transfer or Sale of Mining Rights

3.3 Prescribed Fees/Charges

The prescrivbed fees and charges applicable to various mine licences are as follows.

TYPE OF LICENCE	VALIDITY PERIOD	LICENCE FEE (ZMK)	AREA CHARGES (ZMK/ha/year)						
LARGE SCALE MINING OPERATIONS			**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Prospecting Licence	2 years. Renewable – 7 years maximum tenure	1,800	0.720	0.720	2.160	2.160	2.880	2.880	3.960
			MINIMUM EXPENDITURE (ZMK/ha/year)						
			7.20	7.20	21.60	21.60	28.80	28.80	39.60
Large Scale Mining Licence	25 years. Renewable	28,800	**AREA CHARGES (ZMK/ha/year)**						
			10.080	10.080	10.080	10.080	10.080	10.080	10.080
Large Scale Gemstone Licence	10 years Renewable	28,800	36.00	36.00	36.00	36.00	36.00	36.00	36.00
SMALL SCALE MINING OPERATIONS			**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Prospecting Permit	5 years Renewable	540	**AREA CHARGES (ZMK/ha/year)**						
			0.360	0.360	0.900	0.900	1.440	N/A	N/A
Small Scale Mining Licence	10 years Renewable	2,700	5.040	5.040	5.040	5.040	5.040	5.040	5.040
Small Scale Gemstone Licence	10 years Renewable	2,700	9.00	9.00	9.00	9.00	9.00	9.00	9.00
ARTISANAL MINING									
Artisan Mining Rights	2 years Renewable	540	2.520	2.520	N/A	N/A	N/A	N/A	N/A
OTHERS – NON MINING									
Mineral Processing Licence	15 Years. Renewable	28,800							
Transfer Fee (large scale mining operations)		28,800							
Transfer Fees (Small scale mining operations)		2,700							

4.0 USEFUL CONTACTS OF AGENCIES RESPONSIBLE FOR INVESTMENTS IN THE MINING SECTOR

NAME	ADDRESS	TELEPHONE	FAX	EMAIL
1. Zambia Development Agency (ZDA)	**P.O Box 30819, Lusaka**	**260-211-220177**	**260-211-225270**	**zda@zda.org.zm**
2. Chamber of Mines in Zambia	P.O. Box 260566, Kalulushi	260-212-730743	260-212-730302	cmz@zamnet.zm
3. Zambia Environmental Management Agency (ZEMA)	P.O Box 51254, Lusaka	260-211-254130 260-211-254023 260-211-254059	260-211-254164	zema@zema.org.zm
4. Ministry of Mines, Energy and Water Development (MMEWD)	P.O. Box 31969, Lusaka	260-211-235306	260-211-237307	mmmd@zamnet.zm