INVESTMENT OPPORTUNITIES IN MINERAL SECTOR

1. INVESTMENT CLIMATE

Tanzania has conducive investment environment which include political stability; internationally competitive legal framework and fiscal regime; vast untapped mineral resources; access to geological resource database with adequate and updated information; and infrastructure development such as power, roads, railways, ports and airports which are key to the development of the mineral sector.

2. GEOLOGICAL DATABASE

Tanzania has good geological database at the Geological Survey of Tanzania (GST). Recently, it has completed High Resolution Airborne Geophysical Survey in some potential areas of the country. Interest companies can acquire this geological information at a fee without any complications.

3. MINERAL ENDOWMENT

Tanzania is one of Africa's most mineral-rich countries, with minerals such as precious metals (gold and silver), iron ore, base metals (copper, nickel, cobalt, tin, lead,) Platinum Group Metals (PGM), Rare Earth Elements (REE), coal, uranium; diamonds, varieties of coloured gemstones (tanzanite, ruby, sapphire, tsavorite, rhodolite, tourmaline,) and industrial minerals (limestone, kaolin, kyanite, magnesite, phosphate, gypsum). There are also naturally occurring resources such as ground water; carbon dioxide and helium gas; geothermal energy; and natural gas.

Gold:

The Lake Victoria goldfields (greenstone belt) still stands for areas of investment in gold mining. There are prospects such as Kitongo, Nyakafuru, Miyari and Sekenke which are not yet developed. Many others do exist upon exploration in this belt. The Lupa goldfields in South west of Tanzania and Mpanda area are promising for gold mineralization in which other base metals are associated.

Diamond:

Over 300 kimberlites are known in Tanzania of which, 20% are diamondiferous. Some 600 dipolar magnetic anomalies with similar

geophysical characteristics are known kimberlite pipes which have been recorded during recent geophysical surveys. Also of relevance are the psuedo-kimberlites or para-kimberlites along the young craters where diamonds have been discovered.

Alluvial diamonds have been recorded but a large deposit of economic exploitation has not yet been found. Locating shallow buried superficial deposits using airborne infrared surveys may prove useful. Areas in Tabora and Singida regions are worthwhile for detail work.

Ferrous and non-ferrous metals

Ore bodies for iron, nickel, copper, cobalt, chromium, and Platinum Group Metals (PGM) are associated with ultramafic intrusions whilst tin and tungsten related to granitic intrusions. None of these metals has been mined in Tanzania although there are advanced projects such as Kabanga nickel.

Iron:

Numerous iron ore bodies have been identified in the Proterozoic rocks. Titaniferous magnetic bodies associated with anorthositic gabbro occur at Liganga SW Tanzania and is in close proximity (80 km) to the coal resources of Ketewaka-Mchuchuma. Shallow drilling established a resource of 45 million tonnes grading 52 percent Fe. The Titanium minerals are also known in beach sands along the coast.

Platinum Group Metals (PGMs – platinum, palladium, rhodium, rhenium, osmium and iridium).

Occurrence of these minerals are in layered mafic igneous intrusives such as gabbros and anorthosites; ultramafic rocks such as peridotite, dunite and serpentine. It involves concentration of molten sulfide droplets or oxide crystals in mafic or ultramafic magma.

Localities are Kabanga, Kapalagulu and Zanzui. Others are Kabulyanwele, Mwahanza Hill, Garauja-Basuto, Twamba, Nkenza, Itiso, Haneti and Uluguru Mts.

Gemstones

Varieties of gemstones are found in the Proterozoic rock formations mainly east of the Archaean Craton. Scattered areas in which gemstones are known to occur west and south of the Craton. The gemstones include: ruby, tanzanite, garnets, tourmaline, sapphires, spinel, topaz, scapolite, emeralds, chrysoprase and alexandrite.

Carbonatites

The carbonatites are associated with the rift valley system and occur in northern, southern and central parts of the country. Alteration zones of up to 1.5 km width surround the carbonatites. Minerals hosted in carbonatites include Rare Earth Metals (thorium cerium, lanthanum, neodymium, lanthanum and praseodymium)

Coal:

The country possess a coal resource may be as higher as 1.5 billion tonnes and their ash content varies from 14.2% to 45%. Coal resources occur in Karoo rock formations in southwestern part of Tanzania. Reserves in the order of 1000 million tonnes of coal have been proved by drilling in all the coal fields and only 40% can be extracted by surface mining methods. Currently coal is being exploited on a small scale at Kiwira Coal Mine. Coalfields with highest potential are Katewaka –Mchuchuma in the Ruhuhu basin and Songwe – Kiwira. The caols vary in rank from sub-bituminous C to medium-volatile bituminous (mvb). The ash content between 15% and 20% and other seams as higher as 40% and generally low in sulphur (less than 2%). Songwe-Kiwira coalfield is the only coalfield producing coal using mechanized underground coal mine at Kiwira.

Evaporites

Evaporites such salt, gypsum and soda ash occur in the rift valley and younger rock formations along the coastal belt.

Industrial minerals:

A variety of industrial minerals and rocks include kaolin, diatomite, bentonite, clays, mica, magnesite, talc, vermiculite, phosphate, feldspar, fluorspar, graphite, limestones and marble stands to be priority areas for investment.

6. Mineral Value addition:

According to 2017 amendment of the Mining Act all Minerals shall be benefiated before exportation. There is a big opportunities to have jewelry, smelters and refineries in Tanzania. Cutting and polishing industries and refineries of gold can be constructed.

Also there is a good potential of gold from our neighboring country Democratic Republic of Congo which can be mined in the near future and refined in Tanzania.

7. Laboratory Services (Environmental and mineral analysis)

Establishment of laboratories for mineral analysis and environmental are currently needed as there are many exploration and mining activities which are being carried out in the country. Based on detailed information regarding iron and limestone reserves found in Tanzania, we would like to invite you in our country to invest. The land to build your factory is available after submitting your request in the Ministry of Energy and Minerals.

1.1 Occurrences of Iron Ore Deposits in Tanzania

There are many occurrences of various grades and types of iron ore deposits in Tanzania. The titaniferous type is found in large quantities and it is rich in iron oxide, vanadium pentoxide and titanium dioxide. The known titaniferous magnetite ore deposits in Tanzania are found at Liganga/Maganga Hills,

Lugarawa, and Mlangali in Ludewa District and at Kisaki in Morogoro District. The ore deposits at Liganga/Maganga Hills have been a subject of economic interest for many years. Early studies on the deposits indicate that the Liganga/Maganga Hills are rich in Iron oxide (51-63%), vanadium oxide (0.5-1.7%) and titanium dioxide (13%) contents and are estimated to be between 200 and 1200 million tones. However, only 45 million tones (grading 52 percent Fe) of these reserves have been proved through drillings.

1.2 Location of Liganga Titaniferous Ore Deposits

The Liganga/Maganga area is located about 600 km Southwest of Dar Es Salaam between Latitudes 9° 51´00"S and 10° 00´05"S and Longitudes 34° 51´00"E and 35° 00´20"E. The area is in the Ludewa District of Iringa Region and can be reached from Dar Es Salaam by a 845 km road.

1.3 Geology

Titaniferous magnetite (Liganga deposits) is a hard dense type rock and is strongly magnetic. The ore bodies are sharply delimited at contact with the prevailing country rock, anorthosite and in a few instances with chlorite schiests. The average mineral composition has been indicated by volume as follows: -

Magnetite	53%
Ilmenite	22%
Spinel	10%
Chlorite	13%
Garnet/Pyrite	2%

In terms of Chemical composition, the analysis of 1:1 mixture of ore samples from Liganga and Maganga hills conducted by Lurgi Chemie of Germany (1984), produced the following results: -

Fe2O3	51.4%	MgO	4.80%
TiO_2	12.9%	Al_2O_3	8.90%
V_2O_5	0.49%	MnO	0.20%
CaO	0.01%	Ni	0.10%
SiO_2	0.90%	Cr	0.20%

Uluguru Mountains. Several titaniferous magnetite bodies occur within an anorthosite body in the Uluguru Mountains, south of Morogoro. The geological setting and composition are similar to Liganga, but the 8 Mt resources and the grade of 40% iron and 10% titanium does not warrant economic exploitation at this time. The only advantage is the proximity to railway line/road and to Dar es Salaam port.

Mbabala. At this locality, 10 km from LakeTanganyika and north of Karema, lenses of magnetite and hematite occur within hornblende gneiss. A sample assayed 56% iron and 14.4% Ti02' The hematite appears to be a metamorphic replacement of magnetite.

The high titanium content, lensoid form and occurrence within hornblende gneisses suggest that this is a metamorphosed Liganga type magmatic segregation. The locality is near Lake Tanganyika but remote from all other infrastructure.

Manyoro"Gondite". Bedded metasedimentary rocks, 50 km southeast of Karema on Lake Tanganyika, consist of finely banded quartz and magnetite, with manganese oxides and the manganese-rich garnet spessartite. The metal content varies inversely with the proportion of quartz bands. The magnetite-rich material assays about 33% Fe, 30% Si02, 10% Mn and 0.5% Ti02' The rock has been compared with the "gondites" of India. Many tens of millions of tonnes of rock are known, but the low grade and complex metallurgy render near-term exploitation unlikely. Interestingly, traces of gold have been panned from adjacent streams.

Itewe. This occurrence is 10 km southwest of the town of Chunya. Investigations by a Chinese Team continued from 1974 to 1978. Mineralisation consists of limonite and hematite. A resource of 50 million tonnes containing 32% iron was estimated.

2. Limestone

Limestone is a sedimentary rock consisting of 50% or more of the minerals calcite and dolomite, with calcite predominating. High-calcium limestone consists of at least 95% calcite, $CaCO_3$. On the other hand high purity dolomite contain 87 to 94% of the mineral dolomite, $CaMg(CO_3)_2$.

Limestone occurs in various places within Tanzania. It occurs in marine sedimentary rocks extending from 60 to 160 kilometers inland from the coast. They include coral limestone from raised beach deposits of Tertiary age and various types of limestone formations of Cretaceous to Jurassic age. Extensive layers of limestone interbedded with sandy clays in areas of internal drainage and in lake beds exist in the country.

The coastal areas extending from Tanga in the north to Mtwara in the south has extensive limestone occurrences of high quality that can be used for lime and cement production as well as for other industrial uses. The Tanga Cement and Wazo Hill Cement companies are examples of limestone of this type.

PROJECT UNDER STATE MINING CORPORATION

Tanzania State Mining Corporation (STAMICO), the State run mining Corporation, undertakes several mining roles including exploration projects, Joint venture Projects and Subsidiary mines. It is the right holder of several potential and accessible older mines that are considered commercially viable such as Buhemba gold mine and Kiwira coal mine as per the breakdown below:

(a) Kiwira Coal Mine and Power Project (200-400MW)

Implementation of the project shall involve four components, Expansion of the existing underground mine; Construction of an Opencast Mine; Construction of

Power Plant and Construction of Transmission Line. The existing underground mine is to be expanded to produce about 300,000 tpy coal to support initial production of 50MW power. Later an open cast mine will be constructed with capacity to produce 1.5 mtpy coal for production of 200 MW power.

Item	Remarks
Project Location:	Kiwira, Rungwe district-Mbeya Region.
Short Description:	STAMICO aims at utilizing over 85 million tons of coal reserves available in Ivogo and Kabulo ridges within the Kiwira Coalfields at Mbeya Region to generate 200-400MW coal fired power. The 200-400MW power will be transmitted through a 400 kV transmission line (100km) from Kiwira to connect to the National grid at Mwakibete substation Mbeya city. The projects will also producing coal for selling to the cement Companies and other coal users.
Project Cost estimates:	Construction of Coal Fired Power Plant- **USD 358 Million,** Construction of a Transmission line (100Km, 400Kv)- **USD 40 Million,** Construction of Open Cast coal mine and associated infrastructure to produce 1.2 Mt pa - **USD 50 Million,** Rehabilitation and expansion of existing underground mine and its associated infrastructure to produce 300,000 metric tonnes per annum **– USD 20 Million.** **Total Project Cost- USD; 468 Million**

(b) Re-development Of Buhemba Gold Mine project.

Project Location:	Buhemba village in Butiama District- Mara region.

Short Description:	STAMICO acquired the Buhemba property through a prospecting license 7132/2011. The project has two components namely; reprocessing of old gold tailings and undertaking hard rock mining. Total 30,433 ounces of gold is estimated to be available from the old tailings and 610,590 ounces of gold to be at hard rock.
Project Cost estimates:	i) Gold tailings component **US $ 4,475,722**, ii) Hard rock component **US$ 19,933,642**, Total estimated Costs required: **US$ 24,409,364**

Other Projects:

a. Mambilu Rare Earth Elements (REE)

The project aims at identifying areas which have shown positive results in respect of Rare Earth Elements and thereafter continue with the exploration, mining and exploitation of these minerals.

b. Mahene Gold Prospect

The property is located within the Greenstone Belt famous for its gold mineralization. The license area covers about 49 square kilometers

4. OTHER ADVANCED MINERAL PROJECTS

There an advanced niobium project at Panda Hill, Songwe in Mbeya Region which has a world-class resource estimated at 82 million tonnes of 0.52% Nb_2O_5. This project will fourth in the world producing 5% of total world production. Another project is Mkuju River uranium project.

A: Application For Primary Mining Licence (for all Mineral Commodities)

Mineral Right/License/Permit	Procedures	Minimum Requirement
Application For Primary Mining Licence	Step 1. Applicant identifies Area of interest	Site Plan / Map/ Geological Info (coordinates) (1:50,000 Scale)
	Step 2 (***optional***). Applicant obtains a search report from the Mines Office to ascertain whether an area of interest is free or available for the applicant to apply for a mineral right.(if area of interest is outside a demarcated Small Scale Mining Area)	(a)Site Plan / Map/ Geological Info (1:50,000 Scale) (b)Prescribed Search Fees
	Step 3. Applicant completes and submits a Primary Mining License Application Form and supporting documents to the Resident or Zonal Mines Officer	(a)2 copies of Application form (MRF 05) (b)A site plan (c)Geographic Coordinates (Arc 1960 datum) (d) environmental management plan (e)Individual – 2 Passport Size Pictures (f) Group made up of at least 10 members - 2 Passport Size Pictures of each member & a Constitution of the group (g) Co-operative Society - Registration Certificate, Details of Members & Regulations (h) Registered Enterprise/Venture (which as mining listed as part of its core business) – Certificate of Registration & (i) Registered Company - Certificate of Incorporation, Company memorandum and articles of association. (which as mining listed as part of its core business) (j)Prescribed Application fee

	Step 4. The Resident/Zonal Mines Officer Receives application and issues an acknowledgement receipt to the applicant	Memo/FlexiCadastre report
	Step 5. The Zonal Mines Officer reviews the application and issues an Offer or Rejection Letter	Memos/Reports
	Step 6. Successful Applicant pays prescribed Preparation fees	(a) Letter of Acceptance (b)Prescribed Preparation fee
	Step 7. Zonal Mines Officer Grants a Primary Mining Licence to Applicant	Prescribed Annual rent
	Step 8. Licensed Applicant Prepares and submits a baseline environmental investigation and social study report to Zonal Mines Officer	Environmental report
	Step 9. Zonal officer Approves mining operations in the Primary Mining Licence	Environmental Protection Plan
	Step 10. Licensed Applicant obtains entry permit and begins operation	Permit/Letter from legal holder of surface right (Individual/village/District council/National Authority, etc)

B: Application For a Mining Licence Originating From a Prospecting Licence

Mineral Right/License/Permit	Procedures	Minimum Requirement
Application For a Mining Licence Originating From a Prospecting Licence	Step 1. Applicant identifies Area of interest	Site Plan /Topographical Map/ Geological Info (1:50,000 Scale)
	Step 2. Applicant submits an Application form for Mining Licence and supporting documents to the Minister	(a) 3 copies of Application form (MRF 03) with Coordinates in Arc 1960 (b) 3 copies of map of the applied area, with reference to a topographic sheet. (c)3 copies of Feasibility Study Report (d) Latest Audited Accounts report (e) Company Details: i. If a Registered Enterprise/Venture – Certificate of Registration ii. If a Registered Company - Certificate of Incorporation & Company memorandum
	Step 3. Evaluation of application by the Technical Committee on Mineral Rights	Back ground information of applicant relating to financial capability and technical expertise Bank reference of applicant and/or its principals
	Step 4. Applicant obtains an Environmental Permit from the Vice President's Office and submits to the Commissioner for Minerals	(a) Complete Licence application details (b) NEMC Project registration form
	Step57. Recommendation to the Commissioner for	Application Evaluation Report from

	Minerals by the Registrar of Mineral Rights	Registrar of Minerals Rights
	Step 6. The Commissioner for Minerals issues an Offer Letter to applicant with prescribed fees	Memos/Reports
	Step 7. The Commissioner for Minerals sends a Recommendation to the Minister to grant Mineral Right to application	(a) Letter of Acceptance of Offer (b) Payment of Fee as stated in the Offer Letter (c) Memos / Reports
	Step 8. The Minister reviews and Grants the Mineral Right to Applicant	Memos / Reports/Agreement
	Step 9. The applicant obtains an Operating Permit from the Chief Inspector of Mines and Local Authorities, before any work on the concession area can commence.	(a) Copy of the Registered and Stamped Mineral Right (b) Environmental Certificate

C: Application For Prospecting Licence

Mineral Right/License/Permit	Procedures	Minimum Requirement
APPLICATION FOR PROSPECTING LICENCE	Step 1. Applicant identifies Area of interest	Site Plan /Topographical Map/ Geological Info (1:50,000 Scale)
	Step 2. Applicant completes and submits a Prospecting License Application Form and supporting documents to the Commissioner for Minerals	(a) 3 copies each of: i. Application Form ii. Map of the area of interest, with reference to a topographic sheet (b) Work Program for the proposed prospecting operation (c) Local procurement plan and training program (d) Particulars of Company: i. Certificate of Incorporation ii. Memorandum and articles of Association iii. Latest audited Accounts of the Company (e) Evidence of financial capability to carry out the proposed operations.
	Step 3. Evaluation of application by the Technical Committee on Mineral Titles	Back ground information of applicant relating to financial capability and technical expertise

	Step 4. Recommendation to the Commissioner for Minerals by the Registrar of Mineral Resources	Application Evaluation Report
	Step 5. The Commissioner for Minerals issues an Offer Letter to applicant with prescribed fees	Memos/Reports
	Step 6. The Registrar of Mineral Rights sends a Recommendation to the Commissioner for Minerals to grant Mineral Right to applicant	(a Letter of acceptance (b) Payment of Fee as stated in the Offer Letter (c) Memos / Reports
	Step72. Commissioner for Minerals reviews and Grants the Mineral Right to Applicant	Memos / Reports
	Step 8. The applicant obtains an entry Permit respective local authority body, before any work on the concession area can commence.	Copy of the Registered and Stamped Mineral Right

D: Application For License To Deal In Minerals

Mineral Right/License/Permit	Procedures	Minimum Requirement
Application For Dealer License	Step 1. Applicant submits application to the Zonal Mines Officer together with supporting documents	1) Certificate of Incorporation 2) Memorandum and Articles of Association 3) Latest Audited Accounts 4) Evidence of Financial Capabilities 5) Estimate of amount of money proposed to be spent 6) Tax Clearance Certificate 7) Particulars of the Applicant's proposal with respect to the employment and training of Tanzanians 8) Curriculum Vitae of key/technical staff 9) Particulars of Machinery and Equipment available for project 10) Particulars of other capital items available for the project 11) Payment of consideration fee
	Step 2. Zonal Mineral Trade Officer inspects Applicant's business premises	Evidence of working condition for the following a) Machinery and Equipment available for project b) Other capital items available for the project

		c) Technical Staff
	Step 3. Zonal Mineral Trade Officers reviews the application to determine Applicant capability/ suitability to undertake project	Back ground information of applicant relating to Dealership experience, financial capability and technical expertise Bank reference of applicant and/or its principals Business inspection details
	Step 4. Recommendation to the Zonal Mines Officer by Zonal Mineral Trade Officers	DL Application Review report
	Step 5. Zonal Mines Officer reviews and Grants the Dealer Licence to Applicant	Memos / Reports
		Application inspection report