The Ministry of Energy and Mining

The National Minerals Policy: Fostering Sustainability in Jamaica's Minerals Industry

National Minerals Policy 2010 – 2030

Ministry of Energy and Mining

June 2011

List of Acronyms

ALCOA	Alumina Company of America
BATCO	Bauxite and Alumina Trading Company of Jamaica Limited
BRIC	Brazil, Russia, India and China
CAP	Clarendon Alumina Production Limited
CERE	Centre of Excellence for Renewable Energy
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
GCT	General Consumption Tax
HIA	Health Impact Assessment
IDP	International Development Partners
JAMALCO	Jamaica Alumina Company
JBI	Jamaica Bauxite Institute
JBM	Jamaica Bauxite Mining Limited
MDAs	Ministries, Departments and Agencies
MEM	Ministry of Energy and Mining
MGD	Mines and Geology Division
MinDAC	Minerals Development Advisory Council
MPDC	Minerals Policy Development Committee
MPDD	Minerals Policy and Development Division
NEPA	National Environment and Planning Agency
NGO	Non-governmental Organization
NIMI	National Industrial Minerals Institute
NLA	National Land Agency
NMI	National Minerals Institute
NRCA	Natural Resources Conservation Authority
OPM	Office of the Prime Minister
OUR	Office of Utilities Regulation
PCJ	Petroleum Corporation of Jamaica
R&D	Research and Development
SD	Sustainable Development
SIDS	Small Island Developing State
SWOT	Strengths, Weaknesses, Opportunities, Threats
WRA	Water Resources Authority

ACKNOWLEDGEMENTS

The Ministry of Energy and Mining wishes to thank the members of the Minerals Policy Development Committee (MPDC) for providing technical support and guidance for the development of this policy and who created the draft Minerals Policy 2009 from which this aligned National Minerals Policy 2010-2030 has, in part, been developed.

We would like to thank the various Ministries and Agencies that assisted the process by providing pertinent data and criticisms.

Finally, we wish to thank the members of the many organisations – public agencies, private sector and professional organisations, non-governmental organisations (NGOs) and community groups for engaging in the consultative process that is so important in national policy development.

MESSAGE FROM THE MINISTER OF ENERGY AND MINING

I am pleased to present to Jamaica, the National Policy on Minerals Development 2010 – 2030. This is the country's first long-term national minerals policy. The overall strategy of this Policy is to ensure that Jamaica's mineral wealth supports sustainable national development and contributes to sustainable prosperity.

Minerals are a significant part of the patrimony of a people. However, left undeveloped, they are of little benefit, particularly in the case of an emerging economy such as Jamaica. The materials that these resources provide are needed to propel the economy, generate wealth and improve the well-being of our people.

The minerals sector represents a critical component in the national development of those countries such as Jamaica that are endowed with exploitable mineral resources. Mineral exploitation, including mining and quarrying, and its related activities are important direct and indirect contributors to the development of modern economies. Commercially exploitable mineral deposits are valuable natural resources that provide metals, fuels, construction aggregates and various other raw materials for many industries and play a central role in the development of modern economies. Minerals in various forms are used in the construction of aircrafts, vehicles, sea-going vessels, civil infrastructure, appliances, tools, and equipment. They are also used in food preservation, animal feed, medicines, water treatment, the manufacturing of toothpaste, paper, paint, glue, ink, glass, jewellery, cosmetics, and other personal items. Other applications occur in soil stabilization, public sanitation, pollution control, and the removal of impurities in numerous industrial processes.

Primary industrial activities generate limited social and economic benefits. I am therefore pleased that the Policy places significant emphasis on the production of value-added mineral products, which create far greater revenues for the country, increased profits and more and better-paying jobs. It is also clear that poorly regulated or unregulated mineral exploitation activities are very serious potential threats as they may cause large-scale environmental, social and economic harm.

The approach taken to the development of this Policy was one that took into account sustainability issues. As such, this Policy is concerned with employing technology to find new reserves, transforming resources to reserves, recycling metals and construction aggregates,

substituting one mineral for another, embracing cleaner technology, minimizing waste and effectively rehabilitating mined lands. Additionally, it involves the application of visionary management to invest the proceeds of mineral exploitation in other sectors of the economy and so protect and guarantee sustainable livelihoods. It also includes, where desirable, foregoing mining owing to critical environmental, cultural and social issues.

This Policy therefore constitutes an important aspect of the Government's determination to develop a broad-based industry within the construct of sustainability and signals its aim to create a modern and diversified minerals industry. It presents Government's vision, establishes the official framework and facilitating structures to guide the effective management and continued transformation of the industry and to ensure its harmonious co-existence with competing interests in the wider economy.

I expect that this Policy will help to fashion a positive, balanced and competitive environment, which encourages investment and development with an emphasis on the manufacture of value-added products, integration with other branches of the local economy coupled with export-led growth and effective environmental management. This, I believe, will generate greater wealth, provide quality employment for larger, more skilled and more highly qualified numbers of Jamaicans and so extract optimum benefits from these resources.

The success of the National Minerals Policy will depend largely on a national consensus to fulfil its underlying principles, goals and strategies, and I welcome all stakeholders to come on board and work with us to achieve a sustainable minerals sector. It is clear within our context that mining is necessary to meet the needs and aspirations of our current and future generation and the sector will be fundamental to Jamaica becoming ***"...the place of choice to live, work, raise families and do business".***

Clive Mullings, M.P.
Minister of Energy and Mining

TABLE OF CONTENTS

SECTION 1

BACKGROUND, OVERVIEW AND CONTEXT

BACKGROUND AND CONTEXT

Minerals are valuable, finite and largely non-renewable natural resources. They provide raw materials for many industries and play a central role in the evolution of human society and the development of leading economies. They are used in various branches of industry, in construction and in our homes and various other places. Minerals in one form or another are used in the construction of aircrafts, sea-going vessels, civil infrastructure, appliances, equipment and vehicles. They are also used in the manufacture of toothpaste, paper, paint, glue, ink, glass, jewellery, cosmetics and other personal items, animal feed, medicines, food, and they form the base material for many fuels and metals. Minerals also find use in soil stabilization, pollution control and purification in numerous industrial processes.

As a major resource for development, the extraction and management of minerals must be integrated into the overall strategy of a country's economic development and has to be guided by long term national goals and perspectives.

The mining sector represents a critical component in the national development of those countries such as Jamaica that are endowed with exploitable mineral resources. Commercially exploitable minerals are of major significance to Jamaica's economic transformation owing particularly to their contribution to the national economy and their impact on, and linkages with other sectors. Additionally, as a major resource for development, the extraction and management of minerals must be integrated into the overall strategy of a country's economic development.

The mining and quarrying sector has been a part of the Jamaican economy for centuries. The quarrying of limestone and construction materials dates back to the earliest days of colonization while sporadic exploration and extraction of metallic minerals such as gold, lead and copper has taken place on a small scale since the eighteenth century. However, the modern era of the sector may be considered to have developed since the discovery of high grade bauxite in 1938 and the establishment of bauxite mining and refining operations by major North American aluminium companies, including ALCAN, Reynolds and Kaiser, beginning in 1952.

Commercially exploitable minerals are of major significance to Jamaica's economic development owing particularly to their contribution to the national economy and their impact on and linkages with other sectors and since its inception been a cornerstone of the Jamaican economy. For example, since 1985 the minerals industry has contributed at least 4.5% to Jamaica's annual Gross Domestic Product. Significant contributions are made through taxes, inflows of foreign exchange and remuneration. Between 2001 and 2007 the industry's annual average growth was 3.2%. By providing a huge amount of minerals and mineral-based products that may otherwise have had to be imported, the industry also functions as a major participant in import substitution. In terms of employment, during the period 2001 – 2008, the industry directly employed between 4,570 and 6,200 persons on a full-time and part-time basis, which represents between 0.42% and 0.59% of the employed labour force. Furthermore, minerals operations are located primarily in rural and semi-rural areas and therefore play a major role in sustaining the livelihood and social fabric of a large percentage of persons in these communities.

The importance of this sector to the socio-economic development of Jamaica requires the development of a national minerals policy that is dynamic, taking into consideration the changing needs of the industry in the context of the domestic and global economic environments. This Minerals Policy is aligned to, and guided by the country's first long-term national development plan – Vision 2030 Jamaica.

INTRODUCTION

The National Minerals Policy presents Jamaica's first long term national policy, designed to establish a strategic framework to manage the country's mineral resources, develop the sector and contribute to the sustainable prosperity of Jamaica. This policy has been closely integrated with and aligned to the Mining and Quarrying Sector Plan of Vision 2030 Jamaica: National Development Plan, and the wider Vision 2030 Jamaica, which provides the long-term national goals and perspectives upon which the policy will be implemented.

By 2030, Jamaica's mineral sector will be "modern, diversified, efficient and attractive… and one that protects environmental integrity and socio-cultural values, adds significant value to the economy, is based largely on the manufacture, local use and export of value-added products, has strong and properly structured institutions and co-exists with competing interests in the wider economy". This vision of the minerals sector is underpinned by the principle that a vibrant minerals industry must be based largely on the manufacture, backward and forward integration into the local economy, the production and export of increasing quantities of value-added products, backed by strong institutions, co-existing with competing interests in the wider economy.

Additionally, the design of this National Minerals Policy takes into consideration the use of new and scientifically advanced technologies in the sector; pursues zero waste mining, and pursues the development of a comprehensive and dynamic regulatory environment conducive to investment and technology flows. These changes to the sector also will be undertaken within the context of strategic partnerships, corporate social responsibility, and environmental stewardship and broad-based sustainability.

Jamaica's National Minerals Policy will support the implementation of Vision 2030 Jamaica by providing the enabling environment for the achievement of the national outcome of "internationally competitive industry structures" as articulated in the Plan and the implementation of three national energy strategies as follows:

- Develop company sophistication and productivity
- Develop economic linkages and clusters
- Promote eco-efficiency and the green economy

This Policy therefore establishes a dynamic strategic framework of goals, outcomes and strategies to address the present and future challenges facing the minerals sector, and, more importantly, within the context of a sustainable Jamaica. The Policy also identifies a mix of short- to medium-term, as well as long term strategic directions and actions for the

government, private sector and industry, as well as civil society, for the advancement of the minerals sector.

STRUCTURE OF THE NATIONAL MINERALS POLICY 2010 – 2030

The National Minerals Policy 2010 – 2030 is structured as follows:

Section 1 – Background, Overview and Context provides the introduction to and rationale for the Policy. This section also describes the mining and quarrying sector and discusses key global and local issues that should be addressed to realize a successful minerals sector.

Section 2 – Defining the Policy Framework presents the vision for the minerals sector in Jamaica and the strategic framework (goals and strategies) for this Policy.

Section 3 – Implementation, Monitoring and Evaluation Framework describes the implementation, monitoring and evaluation framework for this Policy. Section 3 also includes the institutional framework for the minerals sector in Jamaica.

Appendix I is a glossary of terms used in this policy document.

Appendix II is a listing of the different types of minerals that exist in Jamaica which can be exploited.

Appendix III provides detailed descriptions of the mineral resources of Jamaica.

Appendix IV provides maps of the distribution of major mineral resources in Jamaica.

Appendix V lists the members of the Minerals Policy Development Committee.

Appendix VI is an outline of sustainable development and the minerals sector.

Appendix VII is a listing of the schedule of public consultations on the draft National Minerals Policy in 2008 and 2009, plus a list of entities that participated in the public consultations.

Appendix VIII is a listing of the major pieces of legislation impacting the minerals sector.

Appendix IX is a list of references consulted during the compiling of the policy.

THE MINERALS SECTOR IN JAMAICA – A SITUATIONAL ANALYSIS

The mining and quarrying sector represents an important component of the Jamaican economy. In 2008 the sector's contribution to Gross Domestic Product (GDP) stood at 3.8%, almost entirely attributable to the bauxite and alumina industry. The full scope of the sector includes metallic minerals (including bauxite and gold), non-metallic minerals (clay, dolomite, gypsum, limestone, marble, sand and gravel, silica sand, volcanic rocks and shale), and semi-precious minerals.

Jamaica's known mineral resources can be grouped in the following four categories:

1. Metallic minerals: copper, gold, silver, etc.
2. Industrial minerals: bauxite, clay, dolomite, gypsum, limestone, marble, sand and gravel, shale, silica sand, volcanic rocks, etc.
3. Fossil fuels: peat, petroleum, etc.
4. Semi-precious minerals.

However, in 2009 real value added for the mining and quarrying industry declined by 50.2%. The industry contributed 2.0% of GDP when compared with 3.8% the previous year. The year 2009 represented the third consecutive annual downturn and was due to reductions in both alumina and crude bauxite production. This decline was as a result of the global recession and its negative impact on the price and demand for aluminium, which resulted in the closure of the country's less efficient alumina plants. The decline in crude bauxite production was a direct result of the closure of three of the four alumina plants in response to lower international demand for aluminium.

The minerals industry is a conglomeration of activities geared at exploiting the country's mineral resources, and producing raw minerals and value-added mineral products consumed by various sectors of the economy.

MINERAL	RESOURCES AND RESERVES	MINING LIFE (1)
Bauxite	1.6 billion metric tonnes (Resource and reserves. Approximately 10% – 15% proven reserves) (1)	50-100 years (proven and probable) at an extraction rate of 11 million tonnes/yr
Clay	Over 160 million metric tonnes (Reserve and estimated resource. Approximately 10% proven reserves) (1)	

MINERAL	RESOURCES AND RESERVES	MINING LIFE (1)
Gypsum (including 90%, 80%, 70% gypsum and anhydrite)	29.0 million metric tonnes (Reserve) (1)	33-38 years (including anhydrite)
Black Sands (including sand, iron and titanium oxide)	19.0 million metric tonnes (Estimated resource)	
Aggregate (skid-resistant)	270.7 million metric tonnes (Probable reserve) 1.13 billion metric tonnes (probable reserve)	
Alluvial sand and gravel	600 million metric tonnes (2) (Probable reserves)	
Dolomitic limestone	Over 2.7 billion metric tonnes (Resource and reserves. Approximately 10% – 15% proven reserves)	
Limestone (whiting grade)	11.15 billion metric tonnes (3) (Resource and reserve. Approximately 20% proven reserves)	
Limestone (chemical, industrial, metallurgical grade)	57.5 billion metric tonnes (3) (Resource and reserve)	
Silica Sand	To be determined (TBD)	TBD

Source: Mines and Geology Division, Ministry of Energy and Mining
(1) Based on current rates of exploitation
(2) Estimated ten-year replenishment rate
(3) Inferred Resource Estimate

It is important to note that while Jamaica possesses large quantities of high-quality limestone resources, proven reserves of chemical, industrial, metallurgical and whiting grade limestone over the vast majority of our territory are yet to be quantified and demarcated.

SCOPE OF JAMAICA'S MINERALS SECTOR

The scope of the minerals industry in Jamaica includes:

- Mineral exploration and exploitation (namely mining and quarrying)
- Mineral processing, beneficiation and the manufacturing of mineral-based products, including alumina, construction blocks, lime, skid resistant aggregates. (Appendices II and III outline a larger range of mineral-based products and the major minerals found in Jamaica. Appendix IV illustrates the distribution of the various mineral resources)
- Mineralogical, mining and metallurgical research, education and development
- Environmental Management
- Mineral waste management and recycling
- Trading and professional services including health and safety

- Transportation and machinery
- Land management, including land acquisition and divestment, land rehabilitation and management of mineral resources
- Mineral law
- Valuation of mineral concerns.

The Minerals (Vesting) Act and the Quarries Control Act differentiate between "mineral," "quarry material" and "quarry mineral." Whether found on public lands or private lands, minerals (nickel, gold, copper, zinc, tin, high purity limestone, etc.) are the property of the Crown. Quarry materials (sand, gravel, clay, sandstone, construction and low purity limestone) are the property of the landowner.

Quarry material, quarry mineral and mineral are all mineral resources, and a significant part of the country's natural wealth. To this extent, this Policy employs a generic definition of the term "mineral resource" to mean any natural material or geological occurrence that qualifies as a rock or a mineral, exists in commercial quantities and can be developed at a profit.

This Policy covers mineral resources in their gaseous, liquid, solid and semi-solid forms, mineral springs, geothermal resources and the mineral resources that may be found in Jamaica's territorial waters, including the Exclusive Economic Zone (EEZ). However, the Policy makes limited mention of peat, petroleum and natural gas, and water resources owing to their management by the Petroleum Corporation of Jamaica (PCJ), and the Water Resources Authority (WRA), respectively.

EXISTING LEGISLATIVE FRAMEWORK

The main legislative issues impacting the minerals portfolio are captured in the Mining Act, the Quarries Control Act, the Minerals (Vesting) Act, the Petroleum Act, incentive and taxation legislation for the Bauxite and Alumina Industries (Bauxite and Alumina Industries (Encouragement) Act, and the Bauxite and Alumina Industries (Special Provisions) Act), the National Resources Conservation Authority Act, the taxation statutes and the land development statutes. In addition to these, Jamaica is a signatory to various international treaties that also impact the industry.

A Cabinet document dated 1997, which sets out a number of incentives for new investments in the Industrial Minerals Sector, is also of particular importance and provides for the following:

- a ten year tax holiday for all new businesses
- no custom duties (on non-CARICOM goods) for machinery and equipment
- no GCT on goods and services connected with the project
- no withholding tax of any nature on dividends, interest or other branch profit remittances to the extent such dividends, interest or remittances are exempt in the country of domicile.

MANAGEMENT OF THE MINERALS SECTOR

The Ministry of Energy and Mining (MEM) has overall policy responsibility for guiding the development of the mining and quarrying sector. The Mines and Geology Division (MGD) has the statutory responsibility, under the Mining Act and the Quarries Control Act, to supervise all prospecting, exploration, mining and quarrying operations throughout the island. The proponents of such activities must secure the required permits, licences and leases from the Division. The Division is also responsible for the investigation, characterization, documentation and release of information on all aspects of the country's geology.

The Minerals Policy and Development Division (MPDD) of the Ministry of Energy and Mining (MEM) is responsible for policy development with a specific focus on promoting sustainable development and contributing to the ongoing modernization of the minerals industry, including proposing amendments to minerals-related legislation, introducing new minerals-related legislation, and developing programmes and projects to facilitate the industry's continued development and the efficient management of mineral-bearing lands.

The Jamaica Bauxite Institute (JBI) was established in 1976 to deal mainly with the sovereign aspects of the Government's participation in the bauxite and alumina industry. Its main functions include: monitoring and studying the alumina and aluminium industry; providing technical advice; undertaking research and development activities; assessing and ensuing rationalization in the use of Jamaica's bauxite reserves and bauxite lands; and monitoring and making recommendations on pollution control and other environmental concerns in the industry.

In conjunction with other agencies such as the MGD and the National Environmental Planning Agency (NEPA), the JBI is also involved in environmental monitoring and interfacing with communities hosting bauxite and alumina operations.

Jamaica Bauxite Mining Limited (JBM) administers the Government of Jamaica's (GOJ) equity in several partnerships and joint ventures in the bauxite/alumina industry, but does not get involved directly in operations in the respective entities in which it has equity. It owns fifty one per cent (51%) of the physical assets in Noranda Jamaica Bauxite Partners (formerly St. Ann Jamaica Bauxite Partners), seven per cent (7%) of the equity in West Indies Alumina Company (WINDALCO) and one hundred per cent (100%) of the former Reynolds operations at Lydford and Ocho Rios.

The Bauxite & Alumina Trading Company of Jamaica Limited (BATCO) is responsible for trading and marketing the GOJ's share of alumina and bauxite obtained from its equity in the bauxite and alumina industry. The Bauxite & Alumina Trading Company of Jamaica Limited manages contracts related to alumina off-take from Clarendon Alumina Production Limited (CAP) and JBM, seeks to maximize returns on GOJ investment in the Bauxite and Alumina Sector and to promote sector expansion.

Clarendon Alumina Production Limited (CAP) executes the Jamaica Alumina Company (JAMALCO) Joint Venture between the GOJ and Alumina Company of America (ALCOA) Minerals of Jamaica (AMJ). CAP's share of the joint venture was adjusted from 50% to 45% in 2007.

STRUCTURE OF THE MINERALS SECTOR IN JAMAICA

The ownership structure of the bauxite and alumina industry has evolved over time. The industry was initially driven by foreign direct investment by North American companies, then there was government acquisition of assets in the industry in the 1980s when several foreign companies divested their interests. This has been followed by new foreign direct investment in recent years. However, the government continues to have shareholdings in the industry. As at January 2011 the main players in the bauxite industry are:

- The West Indies Alumina Company (WINDALCO) - partnership between Jamaica Bauxite Mining and United Company RUSAL
- Jamaica Alumina Company (JAMALCO) – partnership between Clarendon Alumina Production Limited (CAP) and ALCOA
- Alumina Partners of Jamaica (ALPART) – partnership between Norske Hydro and United Company RUSAL
- Noranda Jamaica Bauxite Partners (produces crude bauxite for export).

Currently, the GOJ is seeking to divest its assets held by CAP in the JAMALCO partnership, and the assets held by JBM in the WINDALCO Joint Venture.

The industry also benefits from port facilities for the export of bauxite and alumina, including Port Rhoades (Discovery Bay, St. Ann), Port Esquivel (St. Catherine), Port Kaiser (St. Elizabeth), Rocky Point (Clarendon) and the Reynolds Pier in Ocho Rios, St. Ann.

With respect to the non-metallic minerals sector, the Survey of Local Quarry Operations completed by the MPDD in 2006 reports that there were 218 licensed quarries on record in the country as at December 2005[1]. Of this total, 173 quarries reported some activity during the year. Approximately 19% of the quarries were active year round. Over 1,500 persons were directly employed by quarries with over 90 % being males.

Quarries are located in all parishes. However, there is a concentration of river-based sand and stone quarries along the Rio Minho in Clarendon. A large number of quarries are also located in St. Catherine. River-based sand quarries are located mainly in the south-central and eastern parishes while most limestone quarries are in the western parishes. Over 75 % of entities within the sector are located in rural and semirural areas. The sub-sector's main products include crushed stone, marl and fill, and sand and gravel.

The non-metallic minerals sub-sector in Jamaica consists mainly of micro to medium-sized local companies, of which some have made significant steps to improve their technological and

[1] As at December 31, 2010 there were approximately 285 licensed and active quarries.

human resource capacities in recent years. The vast majority of limestone, marl, gypsum, shale and igneous rock quarries are very small, each producing under 125,000 tonnes of material per annum. As at the end of 2010, approximately 26% of all licensed quarries possessed crushing facilities, of which 36, generally the largest entities, may be considered as fully mechanized. Approximately 80% of the sub-sector's equipment and rolling stock is over 10 years old.

The non-metallic minerals sub-sector in Jamaica can be classified as follows:

1. Raw material extraction
2. Primary processing (crushing, screening, etc)
3. Value added (mineral based manufacturing)
4. Stone-craft, concrete fabrication and installation
5. Services (professional, maintenance, etc.).

Currently, the sub-sector is largely confined to the extraction and primary processing stages. The majority of the output is used in the local construction industry while local use of gypsum and shale is almost exclusively for the manufacture of cement. Limestone is also used to manufacture calcined and hydrated lime for various applications such as bauxite refinement, flocculants, fillers and agriculture purposes. Over 90 % of the gypsum produced is exported. The majority (99%) of mined high purity grade limestone (whiting) is exported, while only 8.5 % of the sand and gravel produced is exported.

Over 90% of the entities within the sub-sector are locally owned. Direct foreign ownership is represented primarily by the Caribbean Cement Company, its subsidiary Jamaica Gypsum and Quarries Limited, CEMEX Jamaica Limited, and Chemical Lime.

Entities within the sub-sector are privately owned and primarily family-owned. Caribbean Cement Company is the exception with the GOJ having a 20% equity stake.

By world standards, the entities are generally micro to small. Less than 15% are regarded as medium (500,000 – 1,000,000 tonnes annually) and large (over 1,000,000 tonnes annually). Currently, there are no entities of a world-class size with annual production of over 4 million tonnes. However, some local companies have been considering major expansion while several multinationals that can produce these volumes have been considering establishing operations in Jamaica.

The sub-sector possesses only a few entities that may be considered advanced companies with modernized operations and management systems, and existing value-added and export activities or the immediate potential to undertake such activities. There are also a second tier of companies that serve national markets and, while not as well-equipped as the most advanced companies, also possess capacity for value-added and export production. There is a relatively broader range of companies that account for 25%-35% of the total number of licensed entities and serve smaller domestic markets often focused on specific parishes or regions. These entities do not currently possess the ability to undertake production for export markets. The majority of quarries may be considered as community-based operations, which are very small,

often located at significant distances inland, and are primarily dependent on the surrounding communities for their market.

Operations in the 'regional' and 'community-based' companies broadly typify the local quarrying sector. They are generally individual or family-owned, produce small volumes of material, lack effective management and expertise, maintain poor records, have old and poor quality mining equipment, and are staffed by individuals with little or no direct formal training in mining and quarrying. Finally, there are a number of seasonal and special purpose operations, which generally focus on the removal of marl, and to a lesser extent sand and the crushing of limestone for public sector infrastructure projects.

The differences in characteristics of these entities are relevant in planning for the long-term development of the sub-sector. The more advanced companies will be able to respond faster to initiatives aimed at encouraging the production of value-added mineral products and increasing exports, while specific strategies may be required to develop the capacity of smaller operations.

GLOBAL TRENDS IN THE MINERALS SECTOR – A FOCUS ON SUSTAINABILITY ISSUES

The international minerals industry has designed basic guiding principles that are to be modified by individual countries according to the prevailing local conditions. These fundamental best practice principles have been agreed by major minerals-related companies, governments of major minerals-based economies and other stakeholders in the international minerals industry. These best practices will be important for the long-term sustainable development of Jamaica's minerals sector.

The Berlin Guidelines 1991 (revised 2000) on Fundamental Principles for the Mining Sector dictates that governments, mining companies and the minerals industry should, as a minimum, adhere to the following:

1. Recognize environmental management as a high priority, notably during the licensing process and through the development and implementation of environmental management systems. These should include early and comprehensive environmental impact assessments, pollution control and other preventive and mitigation measures, monitoring and auditing activities, and emergency response procedures.
2. Recognize the importance of socio-economic impact assessments and social planning in mining operations. Social-economic impacts should be taken into account at the earliest stages of project development. Gender issues should also be considered at a policy and project level.
3. Establish environmental accountability in industry and government at the highest management and policy-making levels.
4. Encourage employees at all levels to recognize their responsibility for environmental management and ensure that adequate resources, staff and requisite training are available to implement environmental plans.
5. Ensure the participation of and dialogue with the affected community and other directly interested parties on the environmental and social aspects of all phases of mining activities and include the full participation of women and other marginalized groups.
6. Adopt best practices to minimize environmental degradation, notably in the absence of specific environmental regulations.
7. Adopt environmentally sound technologies in all phases of mining activities and increase the emphasis on the transfer of appropriate technologies that mitigate environmental impacts including those from small-scale mining operations.
8. Seek to provide additional funds and innovative financial arrangements to improve environmental performance of existing mining operations.
9. Adopt risk analysis and risk management in the development of regulation and in the design, operation, and decommissioning of mining activities, including the handling and disposal of hazardous mining and other wastes.

10. Reinforce the infrastructure, information systems service, training and skills in environmental management in relation to mining activities.
11. Avoid the use of such environmental regulations that act as unnecessary barriers to trade and investment.
12. Recognize the linkages between ecology, socio-cultural conditions and human health and, safety, the local community and the natural environment. In effect, synergies provided within the sustainable development construct.
13. Evaluate and adopt, wherever appropriate, economic and administrative instruments such as tax incentives and other policies to encourage the reduction of pollutant emissions and the introduction of innovative technology.
14. Explore the feasibility of reciprocal agreements to reduce trans-boundary pollution.
15. Encourage long term mining investment by having clear environmental standards with stable and predictable environmental criteria and procedures.

A SUSTAINABLE MINERALS INDUSTRY

Sustainable development and mining can be compatible and the concept of sustainable development has been applied to the minerals industry through the elaboration of the principles and practice of sustainability as applied to resource use, technology application, land rehabilitation and other aspects of after-care, and investment in other segments of the economy and human resource development with the proceeds garnered from the use of the initial resources. For example, the Mining Association of Canada has expressed its guiding principles as including: sustainable natural resource use; minimizing the impact of mining operations on the environment and biodiversity; supporting the sustainability of mining communities; acting in a transparent and ethical manner; protecting the health and safety of employees, contractors and communities; and practicing continuous improvement through the application of new technology, innovation and best practices in all facets of our operations. Also, in a number of countries and over time, mining has led to the creation of economic activity and financial and social infrastructure, created skilled work forces and contributed to sustainable wealth creation.

Consequently, the performance indicators for sustainable mining include targets for tailings management, energy use and greenhouse gas emissions management, external outreach and crisis management planning.

Within the wider construct of a minerals industry, the performance indicators for sustainability include the above-mentioned, but are expanded to include integration with the wider economy, the ratio of raw minerals to value-added mineral products, biodiversity protection and replenishment, investment in human resource development beyond the requirements of the minerals industry, investment in infrastructure and long-term income generating activities

to facilitate an enhanced livelihood after depletion of the mineral resource, land rehabilitation and other after-care activities.

RATIONALE FOR THE DEVELOPMENT OF A NATIONAL POLICY ON MINERALS

The Government of Jamaica recognizes that a properly planned, efficiently regulated, and professionally marketed minerals industry can make a significant contribution to national development. Within this context, the National Minerals Polciy will seek to ensure that the sector is developed, optimised and sustained, especially in earning foreign exchange, creating jobs, and acting as a base for further industrial development.

The National Minerals Policy 2010 - 2030 will therefore establish the framework for the country's approach to managing its mineral resources and developing its Minerals Industry. It arises out of a necessity to:

- Maximize the economic and social benefits of mineral exploitation and the overall development of the sector,
- Ensure that Jamaica's mineral wealth supports sustainable national development and contributes to sustainable prosperity, while minimizing the negative impacts of the sector on the natural environment,
- Establish an internationally competitive investment environment for the minerals sector towards developing and maintaining a strong, dynamic and profitable mining sector for the benefit of all Jamaicans,
- Stimulate investments in the minerals sector both local and international,
- Create a single, coherent national approach for the Minerals Industry, by developing the enabling environment to encourage further investment, thereby facilitating and promoting the industry's development, and
- Promote technically feasible and environmentally sound exploitation alternatives and minimize and mitigate the adverse environmental impacts of mining activities.

Developed within the context of a small island developing State (SIDS), with the vulnerabilities and limitations attendant upon such a status, the National Minerals Policy creates necessary balances between complex competing interests pertinent to facilitate sustainable national development and to augment the goals of the country's national development plan: Vision 2030 Jamaica. In this regard, it furthers the commitments under Vision 2030 Jamaica relating to the development of the minerals sector as a significant pillar for growth.

SWOT Analysis of the Minerals Sector in Jamaica

Minerals development provides a valuable opportunity for industrialization and sustainable development of nations that possess exploitable mineral resources. A standard tool of strategic analysis is SWOT analysis, which seeks to identify the main strengths, weaknesses, opportunities and threats (SWOT) for a given entity, ranging from a nation to a sector to an individual enterprise. For the minerals sector in Jamaica the identification of strengths and weaknesses represents the internal assessment of the sector while the consideration of opportunities and threats represents the analysis of the external environment for the sector.

The SWOT analysis, along with the Situational Analysis, form the basis for identifying goals, objectives and strategies that may be employed to apply the strengths and address the weaknesses of the sector, and capitalize on the opportunities and mitigate the threats to the long-term development of the sector. Jamaica's Minerals Industry has several strengths which afford it the ability to attract investment, provide employment and create wealth. However, it also has a number of weaknesses, which must be corrected so as to put the industry on a sustainable path, and more importantly, the various threats must be appropriately planned for.

STRENGTHS

- Significant quantities and excellent grade of mineral resources, namely bauxite, limestone and hard volcanic rocks
- The chemical and geomorphological properties of Jamaican minerals including bauxite (where notably the percentage of available alumina and reactive silica, rank among the best in the world) and limestone (where the exceptional purity and amorphous, non-crystalline characteristics are highly regarded)
- Jamaican mineral deposits including bauxite and limestone deposits in general lie close to the surface making them easier and less expensive to mine
- Location of limestone deposits in proximity to port facilities
- Substantial proven reserves of high-quality non-metallic minerals, particularly limestone (approximately 150 billion tonnes) and volcanic materials
- High quality lime being produced
- Several successful quarry operators, as well as local and foreign investors with strong interest in expanding operations and targeting niche markets overseas
- Favourable geographical location with close proximity and timely logistical access with respect to the markets of the Caribbean, USA and South America (Strategic location to major international markets)
- Public institutions with qualified personnel, years of research and regulatory history
- Access to mineral resources via road network

- Highly skilled workforce
- Availability of information/data – the country is mapped, drill data, technical data on mineral resources.

WEAKNESSES

- High level of dependence of bauxite/alumina industry and non-metallic minerals sector on imported, and increasingly expensive, energy (bauxite/alumina requiring the amount of approximately 10 million barrels of oil equivalent per annum at current levels of production)
- Local refineries are – for the most part – designed to process bauxite at low temperature. At the current mature stage of the industry, this could undermine its international competitiveness
- Unavailability of bulk-handling port and loading facilities to accommodate non-metallic minerals exports together with the high capital intensity associated with making the improvements needed
- Inadequate local transportation system (rail and coastal water) leading to an overwhelming reliance on road transport for cross-country movement of construction aggregates
- Insufficient focus on the rehabilitation of mined-out non-metallic minerals bearing lands
- Absence of institutions for human resources development and research for opportunity areas other than bauxite
- Difficulty in accessing financing (such as venture capital) on competitive terms
- Poor practices (quality, environment, safety and management) on the part of some firms that have not had access to industry supported training
- Lack of transparency in the procurement of aggregates for public sector projects
- Difficulty in accessing mineral bearing land at reasonable costs
- Limited size and existing layout of plants limits economies of scale
- Limited local content of goods and services used in industry
- Sterilization of mineral resources
- The absence of a Geological Survey Act
- Absence of dedicated mining institutions/faculties
- Limited spatial planning
- Limited use of new and innovative technologies for improving value added
- High levels of environmental impact
- Lack of reinvestment of proceeds from the minerals sector back into the minerals industry
- Poor coordination among stakeholders
- Absence of developed closure plans.

The Non-Metallic Minerals Sector:

- Large fleet of old and inefficient equipment and plants
- Dominance of undercapitalized and small-scale operations with high production costs

- Concentration on the production of primary products
- Limited exposure is some areas of mining-related human resources: low levels of mining engineering, mineral processing and related skills
- The need for improved coordination of marketing strategies, low levels of exports and low ratio of exports to total annual production
- Very small expenditure on mineral exploration and research: less than 10% of the operators can provide satisfactory data on the quantities and categories of reserves
- Over-reliance on Government as the major consumer
- Limited penetration of sustainable development practices
- Lengthy processing times for licences (new and renewals)
- Short duration of quarry licences
- Difficulties in sourcing affordable financing for business development and expansion.
- High interest rates, import duty, and taxes
- Lack of dedicated bulk-handling port facilities for the quarrying sector
- High costs associated with using existing ports for the export of quarry materials
- High cost of inputs including electricity, fuel and lubricants, plant and equipment
- Informal and planned residential settlements in some quarry areas: an outflow of poor national planning
- Low restoration bond cost
- Illegal activity in the industry
- Many limestone quarries are located outside approved Quarry Zones, thus increasing the possibility for conflict with other land-users.

OPPORTUNITIES

- Use of each company's annual productivity plan as the principal driver of its global cost positioning
- Existence of large local, regional (CSME) and export markets (target exports to be set at US$400M by 2030)
- Existing capabilities within the Hope Analytical Laboratories Network (HALN) with potential to deliver more efficient analytical support to the mining and quarrying sector
- Existence of co-generation power systems based on cheaper and cleaner-burning sources of energy
- Revamped railway system to accommodate increased use of rail as a cost-effective means of inland transportation for industrial minerals
- Potential use of the levy-free fiscal incentive to encourage all the refineries to invest in dual-feed digestion systems
- Existing technology to transport bauxite by pipeline in the form of a treated-slurry from the mine to the refinery, thus minimizing dust pollution and other costs
- Development of integrated minerals industrial park focusing on lime and limestone at Tarentum, Clarendon; Hope River Quarry Zone, St. Andrew; and Lydford, St. Ann in order to maximize scale and scope advantages associated with large-scale port development at Salt River, Harbour Head and Old Reynolds Pier, respectively

- Conditional on successful substitution of renewable energy sources for fossil fuel based sources, there is the potential for generating additional revenue in the form of carbon credits traded under the Clean Development Mechanism of the Kyoto Protocol
- Aligning the 1998 Manley Accord with the prerequisites of attaining developed country status by 2030
- Brazilian, Caribbean and Venezuelan markets for metallurgical limestone and dolomite
- Growing Caribbean/North American markets for construction aggregates
- Production of value-added import substitutes such as calcium citrate and calcium propionate derived from calcium oxide (lime) as well as export products such as GCC and PCC
- Export market expansion through new trade agreements
- Possibility of access to cheaper energy (e.g. LNG, petcoke and coal)
- Potential for development of new products (skid resistant aggregates) and new resources (off-shore minerals)
- Demand for technologies for small scale mineral operations, rehabilitation, stone craft design, etc.
- Opportunity for greater linkages of mining sector to local economy.

THREATS

- Global economic downturn which may reduce the demand for bauxite and alumina exports from Jamaica and lead to contraction in the local industry
- The price volatility of critical imported inputs such as fuel and caustic soda
- Patterns of severe weather – due in some measure to global climate change – that from time to time disrupt production and damage facilities
- Growing competition for investment from low-cost advantaged bauxite and alumina producing countries such as Australia, Brazil and Guinea
- Increasing sterilization of mineral resources due to the unplanned development of bauxite bearing lands
- Possible erosion of support for bauxite mining and processing due to the perception that industry wealth creation is not benefiting communities adequately
- Potential harmful implications of high concentrations of beryllium in Jamaican bauxite/alumina
- Continued (historical) reduction in the real price for raw mineral exports. It is necessary to focus on the production of value-added, and where possible high-end value-added products
- Continued liberalization of the local economy and our inability to compete with cheap imports: cheap marble from India, etc.
- Failure of local capital to make large investment in the sector: profits are repatriated by foreign-based investors
- Aging, small and inefficient alumina plants cannot compete with newer, larger efficient plants in the competing markets

- Poor condition of some public roads
- Extortion and general criminality
- External imposition of standards by mineral importing countries – e.g. non-tariff barriers to trade
- Weak enforcement of mining laws/regulations.

COMPETITIVENESS

Jamaica's minerals sector faces a number of challenges to its long-term competitiveness. While the bauxite and alumina industry is part of a vertically integrated global industry, the non-metallic minerals sector has been relatively less exposed to global economic competition due to:

- the typically low value-to-bulk ratio of industrial minerals,
- the infant stage of development for non-bauxite resources, and
- Jamaica's geographic location.

Jamaica's bauxite and alumina industry faced a very serious challenge to its global competitiveness, particularly during the global economic downturn of 2008-2009.

Jamaica's share of total global alumina production declined from 7.3% of total global alumina production in 2001 to 5.0% in 2008. Its share declined by a further 1.1 percentage point in the first quarter of 2009 to 3.9%, as the percentage cutback in local production consequent on production cutbacks and plant closures outweighed the percentage cutback in global production. This occurred as some of Jamaica's alumina plants operate near the top end of the global cost curve and suffer from relatively higher energy cost. Addressing the high energy costs in Jamaica's bauxite and alumina industry therefore represents a high priority in restoring its global competitiveness.

Additionally, in order to develop value-added industries based on processing of mineral resources, the minerals extraction stages have to provide competitive sources of raw materials. A critical part of this process will be to increase the scale and scope of operations within the industry and to increase the levels of exports from the sector significantly. While productive enterprises in the minerals sector, along with other sectors, will benefit from improvements in the overall macro-economic and business environment, there are sector-specific measures which can improve the competitiveness of the sector, including:

- Facilitation of retooling and upgrading of mines and plants with a view to improving their position on the global cost curve
- Rationalization of legislation to provide similar benefits to all segments of the minerals industry
- Expansion and improved utilization of port facilities employing the principle of coexistence and development of multi-use facilities
- Substantial skills upgrading

- Improved coordination of marketing strategies.

LAND AND MINERAL RESOURCE MANAGEMENT

As with agriculture, the mining sector involves the exploitation of resources that are intrinsic to the land. Planning for the sector therefore requires long-term projections for land use and management, in which the following issues will be important:

- Confinement of exploitation of mineral resources to mineral development zones wherever feasible and sustainable
- Improvement of inventory of mineral resources island-wide to incorporate exclusion of mined out and sterilized resources and addition of new discoveries
- Introduction of Global Positioning Radar (GPR) and related technologies
- Investigation of marine mineral resources
- Provide adequate resources to shorten the turnaround time for processing applications
- Greater levels of community consultation
- Employ internationally recognized categorization in reporting on mineral resources and reserves.

LAND RESTORATION

With regard to land management in the bauxite sector it is worth highlighting that between 1952 and the end of 2010, a total of 8,422 hectares of land has been mined, representing 0.8% of Jamaica's total land area of roughly 1 million hectares. At the end of 2010, approximately 6,033 hectares, 71.6% of the total area mined, had been certified by the Commissioner of Mines as being satisfactorily restored.

PREPARING FOR CLOSURE

Forward-looking regional planning dictates that mineral development activities be considered as a significant economic activity with marked consequences for long-term development. The uses to which specific blocks and parcels of land will be put must be discussed and agreed before mineral exploitation begins.

Prior to quarry licences and mining leases being approved, the proponents of minerals development operations must present to and agree on their mine closure plans with the regulators. Minerals development will then proceed such as to realize the closure plan, unless the regulators decide to effect improvements that will vary the original plan.

SUPPORTING LEGAL AND POLICY FRAMEWORK

The supporting legal and policy framework for the sector also can add to its competitiveness and long-term development, including through:

- Strengthening the capacity, business-friendly orientation and coordination among agencies in the sector, including rationalization and consolidation to increase efficiency and reduce administrative costs.
- Strengthening research and development capacity, including collaboration and partnership between local and international institutions and development of world-class testing facilities.
- Development of systems for market information and quality standards.
- Strengthening of monitoring and evaluation framework for sector.
- Development of continuous and comprehensive training programmes for sector.
- Access to adequate and competitive financing.
- Strengthening of the sector's commitment to tangible sustainable development.

OPTIMAL LONG-TERM EXTRACTION RATES

While Jamaica may seek to increase its production levels of minerals in the short or medium term, the optimization of the value of the island's minerals reserves (including low-grade ores) as a non-renewable resource will depend on the rates of extraction and the market prices over the lifetime of the reserves. Given the general outlook for world commodity prices it is likely that the real prices for various minerals, including bauxite (aluminium), gold and high purity limestone will increase over the long run, driven in part by increased demand from Brazil, Russia, India and China (BRIC) and other developing countries.

THE CASE OF BAUXITE

It is relevant for planning over a 20-year horizon to consider the rates of extraction of Jamaican bauxite that will maximize its present value given likely scenarios for world demand and prices. It has been and will continue to be imperative to sustain the industry's march up the value chain, thereby converting a progressively larger share of total bauxite production into higher value alumina. For example, in 2008 we exported 4.4 million dry metric tons of crude bauxite to the U.S.; there is the need to make a concerted effort to have that material refined locally.

OTHER MINERALS

For the rest of the industry, the non-bauxite component, given its infant stage, optimal extraction rates are yet to be determined. Notwithstanding, this principle will be applied to the sector, and increased emphasis will be placed on achieving higher rates of value-added and a diversification in output.

ENVIRONMENTAL ISSUES

The minerals sector has very significant impacts on the environment, including dust and noise pollution, effluent such as red mud residues, loss of biodiversity, reduction of forest cover, threats to watersheds, sediment loads to surface waters, coastal waters and the marine environment and loss of habitats and relocation of communities.

The Ambient Air Quality Regulations and Guidelines were gazetted in August 2006, requiring continuous monitoring, assessment and verification of emissions and the development and application of dispersion modelling for each major facility. The mineral exploiting sectors also are required to comply with environmental legislation such as the Natural Resources Conservation Authority Act, the Wild Life Protection Act and the Beaches Control Act, where port facilities would be of significance in the value chain.

The operators within the sector are expected to: comply with codes of practice, guidelines, standards and regulations for the maintenance and improvement of the environment, including the controlled release of substances into the environment and the trans-boundary movement of hazardous wastes; dispose of ship-generated wastes in an environmentally sound manner; and engage conservation, management practices in their activities to reduce the risk to disasters and the negative impacts of climate change.

The long-term sustainability of the mining industry will require use of best practices in the rehabilitation of mining sites.

Development projects for the exploitation of mineral and non-mineral resources are subject to having environmental permits that may require an Environmental Impact Assessment (EIA) Report and a Health Impact Assessment (HIA) Report.

In addition, this Policy proposes that mineral exploitation in areas protected under different pieces of legislation and equivalent to the World Conservation Union's (IUCN) categories I and II, as outlined in the Policy for the National System of Protected Areas, will not be undertaken, unless mandated by Cabinet. It will be important, however, to ensure that the impact assessment of any such decisions fully reflect the economic cost of the natural resources and eco-systems of the protected areas that might be affected. The Government also should ensure that the costs of environmental impacts are not passed on to the community.

SECTION 2

DEFINING THE POLICY FRAMEWORK

THE STRATEGIC FRAMEWORK UNDERLYING JAMAICA'S MINERALS POLICY 2010 - 2030

The long-term process of planning for the Minerals Sector is guided by a Vision that describes a future state of the sector that is desirable for its stakeholders and which can be achieved through their own efforts within a realistic time frame. The Strategic Framework (that is, the sector goals and strategies) underpinning this National Minierals Policy is comprehensive and is expected to be durable to 2030 and beyond, yet be flexible and adaptable to meet new challenges and opportunities as they arise.

Jamaica's National Minerals Policy 2010 – 2030

This Policy will provide the foundation for the development of an effective, efficient and competitive regulatory environment for the minerals sector.

The thrust of the policy is to expand and diversify the mineral sector through optimum exploration, extraction, and utilization of resources using modern technology as well as research and development (R&D).

Emphasis is given to environmental protection, sustainable development and the management of social impacts.

Aligned to Vision 2030 Jamaica – National Development Plan, the Strategic Framework also is designed to address and overcome the main barriers to development in the minerals sector and addresses the following key issues:

- Strengthening the supporting framework for the overall development of the sector
- Restoring the international competitiveness of the island's bauxite and alumina industry as the component of the minerals sector that is currently the most mature, well-developed and economically important
- Fostering the growth of other segments of the minerals industry, namely the metallic minerals, industrial minerals, and precious/semi-precious minerals sectors over the medium and long term
- Enhancing the social responsibility and environmental stewardship of the sector.

Additionally, with respect to Vision 2030 Jamaica - National Development Plan, this policy directly supports the achievement of the following National Outcome:

- **National Outcome 12:** Internationally Competitive Industry Structures which aims to support Jamaica in regain its competitiveness in the bauxite and alumina industry, while taking greater advantage of its other mineral resources, particularly through development of value-added products

To restore the international competitiveness of the island's bauxite and alumina industry, the strategies include to:

- **develop cost efficient energy solutions bauxite and alumina industry as a priority**
- **encourage investment in capacity expansion and dual-feed digester systems in alumina plants**
- **allocate sufficient bauxite mineral reserves to sustain production at the targeted level**
- **intensify research and reconfigure technical capabilities to mitigate a declining trihydrate to monohydrate reserves ratio**

The approach to foster the growth of the metallic minerals, industrial minerals and precious/semi-precious minerals sectors includes strategies to:

- **establish a national entity to lead the development of the non-metallic minerals sub-sector, particularly limestone**
- **develop major integrated non-metallic minerals complexes**
- **promote marketing of non-metallic minerals; and ensure access to and development of port facilities for shipping of non-metallic minerals**

The approach toward enhancing the social responsibility and environmental stewardship of the sector includes strategies to:

- **assist in building viable mining communities; participate in development and enforcement of occupational safety and health legislation and regulations for the mining and quarrying sector; promote compliance with relevant environmental standards and legislation;**
- **mine mineral resources with appropriate planning for the end use of land**
- **improve monitoring and enforcement of rehabilitation of mined-out mineral bearing lands.**

To strengthen the supporting framework for the overall development of the sector, this Policy includes a range of strategies, including to: ensure an appropriate policy and regulatory framework for long-term development of the minerals industry; integrate development of mineral resources with overall land use planning and zoning; strengthen partnerships and linkages between the minerals sector and research and academic institutions locally and internationally; facilitate industry specific training and accreditation for the minerals sector; and enhance labour relations and productivity in the minerals industry.

To restore the international competitiveness of the island's bauxite and alumina industry, the strategies include to: develop cost efficient energy solutions bauxite and alumina industry as a priority; encourage investment in capacity expansion and dual-feed digester systems in alumina plants; allocate sufficient bauxite mineral reserves to sustain production at the targeted level; and intensify research and reconfigure technical capabilities to mitigate a declining trihydrate-to-monohydrate reserves ratio.

The approach to foster the growth of the non-metallic minerals/industrial minerals sub-sector includes strategies to: establish a national entity to lead the development of the non-metallic minerals sub-sector, particularly limestone; develop major integrated non-metallic minerals complexes; promote marketing of non-metallic minerals; and ensure access to and development of port facilities for shipping of non-metallic minerals.

The approach toward enhancing the social responsibility and environmental stewardship of the sector includes strategies to: assist in building viable mining communities; participate in development and enforcement of occupational safety and health legislation and regulations for the mining and quarrying sector; promote compliance with relevant environmental standards and legislation; mine mineral resources with appropriate planning for the

end use of land; and improve monitoring and enforcement of rehabilitation of mined-out mineral bearing lands.

The Strategic Framework presented below therefore outlines numerous strategies and actions designed to effectively address the emerging issues, challenges and requirements of a growing industry, within a complex financial, socio-politicial and environmental scenario.

VISION OF JAMAICA'S MINERALS INDUSTRY

"A modern, diversified, integrated and efficient Minerals Industry which protects environmental integrity and socio-cultural values, improves our human resource capabilities, adds significant value to the economy, is based largely on the manufacture, local use and export of value-added products, import substitution, has strong and properly structured institutions and co-exists with competing interests in the wider economy"

The long-term strategic vision for the Minierals Indsutry in Jamaica is built on a number of fundamental elements/principles, including the following:

- A Minerals Industry that uses the mineral resources of Jamaica sustainably to contribute to the long-term economic and social development of the nation
- A Minerals Industry that is driven by private sector investment within a policy and regulatory framework that fosters competition and transparency
- A Minerals Industry that is developed in harmony with other uses of land resources;
- A Minerals Industry that is environmentally sustainable with minimal harmful environmental impacts
- A Minerals Industry that increases the value of the nation's mineral resources by developing higher value production
- A Minerals Industry that ensures the health and safety of communities and workers
- A Minerals Industry that manages the mineral resources, understands the value of the mineral resources, has a detailed and accurate knowledge of the country's mineral resources, ensures proper planning in mineral use, distinguishes between mineral resources and mineral reserves, and prevents the sterilization of mineral resources.

GOALS OF NATIONAL MINERALS POLICY 2010 - 2030

A successful Minerals Industry in Jamaica must be supported by a strategic direction that will lead to greater economic opportunities and higher levels of investment, over the long term. The goals presented below, respresent the ultimate desired state of the minerals sector through which the sector vision will be realized.

The broad goals of this Policy are:

Goal 1: A well-managed and modernized minerals sector that uses its mineral resources in a sustainable manner for long-term economic development and international competitiveness.

Goal 2: An enabling business environment that facilitates investments and growth, underpinned by dynamic governance, regulatory, and institutional framework.

Goal 3: A sustainable and responsible minerals sector fostering environmental stewardship and ensures the health and safety of communities and workers in the industry.

Goal 4: Sustained R & D and innovation within the minerals sector.

Goal 5: Jamaicans are equipped with the technical capacity and knowledge for the development, management and appreciation of the minerals sector.

GOAL 6: Jamaicans have substantial investments in all aspects of the sector, and are the major beneficiaries of the profits derived from the exploitation of our mineral wealth.

OUTCOMES OF THE NATIONAL MINERALS POLICY

These goals along with the strategies to be listed below under each goal, will contribute to the following outcomes in the minerals sector by 2030:

- An enabling policy and regulatory environment
- Long-term development of a minerals sector integrated into the overall land use planning and management objectives of the country

- Increased value of mineral extraction and processing
- A developed and economically feasible integrated and comprehensive minerals industry with keen focus on the weaker segments of the industry
- Provision of competitive infrastructure and technology
- Adequate supply of competent human resources with internationally competitive levels of labour productivity
- Increased exploitation of all mineral resources
- Strengthened hazard mitigation mechanisms in the sector
- Sustainable mining communities
- Harmonious relationships between communities and mining and quarrying entities
- Adoption of a holistic approach to the wellness of sector employees
- Effective control of negative environmental occurrences
- Effective after-care activities, including adequately rehabilitated mined-out mineral bearing lands and the prevention of undesirable impacts of mining / minerals waste on the environment, including habitats and water resources.

The sustainable approach underpinning this policy is therefore concerned with employing technology to find new reserves, transforming resources to reserves, recycling metals and construction aggregates, substituting one mineral for another, embracing cleaner technology, import substitution, integration into the local economy, minimizing waste and effectively rehabilitating mined lands. Additionally, it involves the application of visionary management to invest the proceeds of mineral exploitation in other sectors of the economy and so protect and guarantee sustainable livelihoods. It also includes, where necessary, foregoing mining owing to critical environmental, cultural and social issues.

For each of the six goals elaborated on below, there are short, medium, and long-term strategies for the government and its key implementing agencies, private sector and industry to pursue.

Goal 1: A well-managed and modernized minerals sector that uses its mineral resources in a sustainable manner for long-term economic development and international competitiveness

Under this goal, Jamaica will pursue strategies to ensure the effective management and modernization of the minerals industry. Areas of emphasis will include:

- management of mineral-bearing lands and mineral resources through orderly extraction
- ownership and access to mineral-bearing lands
- inventory of mineral deposits and continued exploration
- mineral rights and ownership
- adherence to environmental regulations and mine closure regulations, market mechanisms and fiscal measures, and also including regulations related to the conservation of the country's cultural and heritage resources
- mineral commodity production and exports
- use of cleaner technology and increased training for improved capacity.

As part of the management of the sector, consideration will be given to conservation of minerals, not in the restrictive sense of abstinence of use but for the purposes of augmenting the reserve base through improvements in mining methods, greater use of modern technologies and pursuance of zero waste mining.

A high priority will be placed on the development of an internationally competitive minerals sector by increasing mineral exploitation, producing/manufacturing value-added goods as well as through the exportation of minerals and mineral products. Strategies will be implemented to facilitate product diversification, increased levels of export substitution and improved product quality. The importance of value-added cannot be over-emphasized and strategies will be developed and implemented to maximize the contribution of this aspect of the minerals sector to the country's Gross Domestic Product (GDP).

The thrust to increasing mineral exploitation also will focus on further investigating the feasibility of promoting the exploitation of off-shore mineral resources.

Additionally, the success of the minerals industry is largely tied to the ability of the investor to source adequate, affordable and reliable energy supplies. The unit cost at which energy and other major inputs are supplied to the industry must be competitive with that of our major competitors. The Government is keen to resolve this critical issue and invites the private sector's assistance. Investment in high value, high profit, but less energy-intensive minerals development activities is being promoted. Actions to improve the needed physical infrastructure are also included under this goal.

To ensure long-term economic development, the minerals sectors must promote and facilitate increased levels of integration with other segments of the economy, including engineering, education, telecommunications, agriculture, tourism, the financial sector, transportation, construction and waste management. This also will for example ensure that issues of conflicting land/ resource use with other productive sectors within the economy e.g. tourism and agriculture is effectively addressed.

KEY STRATEGIES AND ACTIONS

- Promote the use of equipment and machinery that improve efficiencies, productivity and economics of mining operations
- Improve access to mineral-bearing lands and streamline and simplify the process by which these lands are engaged in mineral exploitation, ensuring that these activities are concentrated within Mineral Development Zones (mining zones and quarry zones)
- Facilitate the modernization of mineral exploration and exploitation operations through retooling, improving human resources and management, reviewing current statutes impacting the industry, promoting and facilitating access to ports and port facilities
- Ensure that the identification of mineral development zones are linked to Parish Development Plans and other relevant plans
- Improve the capacity of the Mines and Geology Division and other regulatory agencies to monitor the management, use and rehabilitation of mineral-bearing lands
- Develop and implement mineral-bearing lands guidelines for exploration and exploitation
- Introduce a National Minerals Institute with the specific mandate to transform the minerals sector, including the development of an integrated limestone sub-sector
- Promotion of value-added products
- Design and develop innovative structures and financing mechanisms to support the infrastructure needs of the mining sector
- Develop and maintain an online database (that is integrated with the JAMPRO online portal) in digitized form that shows reserves and remaining resources as well as information on leasehold areas etc, thereby providing investors with instant information
- Design frameworks to ensure that minerals industry is always attuned to the international economic situation in order to derive maximum advantage of foreign trade and as far as possible make efforts to export minerals in value added form
- Align National Minerals Policy with Foreign Trade Policy
- Simplify existing export procedures as part of a broad drive to facilitate increased export of value-added mineral products and minerals

- Identify export markets for mineral products, with an emphasis on value-added mineral products
- Facilitate the multiple use of existing and yet to be developed ports. Also, where possible, the development of dedicated bulk handling ports at strategic locations, and general access to port facilities at rates that encourage export.
- Assist local mining and minerals companies to increase their market share in various markets
- Promote and encourage a systematic investigation of the country's marine mineral resources in its territorial waters and the possibility of their commercial exploitation within the context of a systems approach, which ensures that environmental considerations are given full attention
- Amend applicable statutes, including the Quarries Control Act, to specifically address the exploitation of beach sand and other quarry materials
- Promote port development and facilitate access to ports to allow for intra-island barging and the exportation of minerals and mineral products
- Introduce the use of cheaper and more environmentally forms of fuel sources in the country's minerals sector and facilitate the availability of adequate and competitively priced energy supplies for the minerals sector
- Promote the establishment of secondary and tertiary mineral-based industries aimed at creating job opportunities and adding maximum value to mineral raw materials.

KEY IMPLEMENTING AGENCIES

- Ministry of Energy and Mining
- Ministry of Water, Housing and the Environment
- Ministry of Finance and the Public Service
- National Industrial and Metallic Minerals Institute
- Mines and Geology Division
- Jamaica Bauxite Institute
- Ministry of Foreign Affairs and Foreign Trade
- Jamaica Trade and Invest (JAMPRO)
- Ministry of Transport and Works
- Parish Councils/Local Planning Authorities
- National Land Agency
- National Environment and Planning Agency

Goal 2: An enabling business environment that facilitates investments and growth, underpinned by dynamic governance, legal, regulatory, and institutional framework

Under this goal, efforts will be made to create a favourable climate for further development of the minerals sector aimed at creating an internationally competitive investment environment for the mineral sector in order to have a strong and profitable private sector driven mining industry. This means that strategies will be designed and implemented that provide the conditions conducive to attract and facilitate increased investment in the sector by international as well as local interests. To do this, the Government will put in place an investor-friendly and competitive legal and fiscal framework with well-defined parameters, involving stakeholders in all aspects of the development of the sector. With respect to local investors, attempts will be made to encourage and afford local investors ownership of a larger share of the industry.

Under this goal, emphasis also will be placed on developing a comprehensive legal, regulatory and institutional framework. Laws which are outdated will be phased out or amended and harmonised to conform to current needs and future outlook. Government will pursue the development of a broad set of laws, regulations and guidelines to:

- better manage the social and environmental risks and impacts of mining
- maximize social and economic benefits from mining activities
- enhance development opportunities related to mining investments.

Under this goal, strategies will be pursued towards building institutional capacity to give effect to laws and policies that are put in place.

KEY STRATEGIES AND ACTIONS

- Develop a stable, predictable, legal and fiscal environment to attract foreign and local investments in the minerals sector
- Design measures to attract investors through improving the investment climate - such measures may include better access to information, finance, the freeing up of mineral-bearing lands for exploration, the creation of a suitable tax system and many others.
- Develop and put in place an investor-friendly legal framework
- Work with the Ministry of Finance to develop a progressive tax regime with well-defined parameters for the sector
- Encourage and afford local investors to own a larger share of the minerals industry by among other things, facilitating access to capital

- Promote joint ventures and other ownership arrangements between local and foreign investors
- In partnership with the private sector seek to improve the industry's image and promote its products at the local and international levels
- Provide relevant market intelligence and encourage research into material properties and areas of application
- Facilitate entities whose major focus is the manufacture and/or export of value-added mineral products. Import substitution ventures are particularly encouraged
- Create the enabling environment for state-owned development banks and privately owned financial institutions to provide local investors with financing for minerals-related ventures
- Establish, maintain and facilitate and efficient and well-organized and transparent institutional framework
- Effect legislative amendments, which will provide opportunities to all segments of the Minerals Industry
- Continue the modernization of the major pieces of minerals-related statutes, particularly the Minerals (Vesting) Act, the Mining Act, the Quarries Control Act and corresponding Regulations
- Introduce a Comprehensive Minerals Development Act, which will combine provisions of the current Mining Act and the Quarries Control Act
- Introduce a Minerals Industries (Encouragement) Act which will be applicable to the development of all minerals. Bauxite/Alumina companies will continue to benefit under the Bauxite and Alumina Industries (Special Provisions) Act and the Bauxite and Alumina Industries (Encouragement) Act, which will be subsumed in this larger and more modern piece of legislation
- Simplify and widen the investment and production incentive regimes to benefit all segments of the industry
- Ensure the availability of relevant competent professional and technical staff
- Facilitate access to land for mineral development
- Align the National Minerals Policy with the National Export Strategy
- Organize press conferences, investor conferences and exhibitions, panel discussions, community and other special interest meetings and other opportunities to promote the industry.

KEY IMPLEMENTING AGENCIES

- Ministry of Energy and Mining
- National Industrial and Metallic Minerals Institute
- Ministry of Water, Housing and the Environment

- Ministry of Finance and Planning
- Jamaica Bauxite Institute
- Mines and Geology Division
- Ministry of Foreign Affairs and Foreign Trade
- Jamaica Trade and Invest (JAMPRO)
- Ministry of Industry, Investment and Commerce
- Development Bank of Jamaica
- Office of the Prime Minster
- National Land Agency.

Goal 3: A sustainable and responsible minerals sector fostering environmental stewardship and ensures the health and safety of communities and workers in the industry

Under this goal, the framework will be created to minimize and mitigate any adverse social and environmental impacts associated with the development of the minerals sector. This is because, it is well known that mining is closely linked with forestry, ecosystem and general environmental issues and some areas in which minerals exist are ecologically fragile and/or biologically rich. This means that there always will be need to take a comprehensive view to ensure that the use of land not only takes into account the needs of development but also the need to protect watersheds, forests and the country's ecology. As such, both these aspects – economic development and environmental conservation – have to be properly coordinated to facilitate sustainability in the minerals industry in harmony with the natural environment. Emphasis also will be placed on preserving Jamaica's cultural and heritage resources when they are located in mining communities.

The sector therefore will embrace and exemplify environmental best practices including the recovery of minerals and other waste products from the mining process.

Government will ensure compliance in the sector with existing and future laws and regulations with respect to environment, human health and safety. Much of this will be achieved by:

- Strengthening environmental enforcement and monitoring activities
- Reviewing and updating health and safety regulations
- Encouraging the application of environmentally-friendly technologies in mineral exploitation
- Ensuring that regulations on health, safety and heritage are current and accompanied by appropriate sanctions.

This sustainable approach to the development of the minerals sector will optimize the economic and social benefits to be derived from the use of the country's mineral wealth, as well as promote harmonious coexistence with other competing land-use interests. Additionally, attempts will be made to integrate the concepts and principles of sustainable development in decisions that affect the industry. Society's growing awareness towards environmental pollution hazards will be factored into the overall planning and developmental consideration of all future mining activities.

New techniques for waste disposal and waste management systems will be introduced in order to meet the likely new challenges, in dealing with the more complex tailing disposals and waste water treatment. Consistent with this, will be the planning for post-mine transition or mine

closure as no mining operation can be considered sustainable if planning for closure is not present during the entire operation of the mine.

Under this goal, the issue of emergency preparedness will be pursued, recognizing that with the best oversight mechanisms, best management systems and the implementation of best practices, there remains the risk of sudden failure from natural events/hazards or human error. For this reason, emergency preparedness planning has to be a critical element of this policy.

KEY STRATEGIES AND ACTIONS

- Infuse social, environmental and economic considerations in the decision-making process within the industry, including the infusion of natural resources valuation in making decisions related to mineral exploration and exploitation
- Develop a sustainable mining strategy that takes into account care for biodiversity and ensures that mining activities take place within the context of suitable measures for restoration of the ecological balance
- Pursue opportunities for zero waste mining
- Adopt pollution prevention as opposed to 'end-of-pipe' or pollution control approaches. The preventative approach addresses both the Precautionary Principle and the Polluter Pays Principle. Pollution prevention promotes the use of clean and more efficient technologies and encourages the industry to strive for environmental excellence ensuring that compliance with environmental standards is attained and/or exceeded
- Ensure the application of the Ecosystem Approach which requires that the impact of human activity on ecosystem integrity be minimized. It incorporates the concept of ecological integrity and also includes social and economic components, as a healthy ecosystem may be described as one where the environment is viable and the economy is sustainable
- Ensure that focus is placed on the prevention of environmental hazards, particularly on surrounding communities, which could be posed by mineral operations
- Create mechanisms to protect heritage sites. This includes close collaboration with the relevant authorities to ensure that this is achieved
- Ensure enforcement of mining plans and adoption of proper mining methods and optimum utilization of minerals
- Develop models of stakeholder interests and purse the development of sustainable communities within mining areas
- Granting of mining leases only will be undertaken with a proper environmental management plan which provides for the control of environmental damage, restoration of mined out areas and the re-vegetation of affected forest areas being undertaken in

accordance with the latest internationally accepted norms and modern reafforestation practices

- Improve the competence and capacity of regulatory agencies in order to ensure partnership within the industry in the regulatory and approval processes
- Promote improved environmental health and safety practices at the workplace and in host communities
- Monitor, audit and ensure compliance of minerals-related companies with the operating conditions of their licences and leases, mining and environment-related statutes and standards. Specific attention will be given to managing sensitive ecosystems, minimizing pollution, improving plant efficiency and finding uses for waste products
- Ensure the effective rehabilitation of mined-out lands and other areas disturbed during mineral exploitation
- Encourage constant improvements in environmental best practices in minerals operations
- Require mineral operations to provide Life of Mine Plans before licences are granted and monitor their activities to ensure that the plans are followed
- Effectively enforce penalties against mineral exploiting operations for breaching the conditions of their licences and or applicable statutes
- Create 'no-go areas' in which mineral exploitation activities will not be allowed. This will be related to the level of biological and socio-cultural significance as classified in the Protected Areas System Policy. Particular emphasis will be placed on protecting critical watershed areas
- Establish community-based Mine and Quarry Monitoring Committees (MQMC)
- Encourage minerals-related companies to be good corporate neighbours and be more responsive to the concerns of host communities. Host communities will be encouraged to accommodate these companies
- Ensure that mined lands are rapidly rehabilitated, certified and brought into non-mining economic activities
- Ensure that companies rehabilitate mineral exploitation sites to an environmentally and geologically acceptable topography and vegetation within three years after mining is completed or within other periods as dictated by applicable statutes, and promote the feasibility of these sites being used for other purposes, including agriculture, reforestation, afforestation, urban development, water storage and minerals-based tourism
- Ensure that NEPA and the local planning authorities review new minerals-related projects in an effort to minimize conflicts with other sectors
- Ensure that emergency preparedness programmes are developed by all mining entities and that these programmes conform to international best practices

- Ensure that closure plans prepared by mining entities are of a high standard and updated on a regular basis.

KEY IMPLEMENTING AGENCIES

- Ministry of Energy and Mining
- Ministry of Water, Housing and the Environment
- National Industrial and Metallic Minerals Institute
- Mines and Geology Division
- Jamaica Bauxite Institute
- Ministry of Health
- National Land Agency
- Ministry of Agriculture and Fisheries
- National Environment and Planning Agency
- Local Planning Authorities
- Jamaica National Heritage Trust.

Goal 4: Sustained research and development and innovation within the minerals sector

Under this goal, a comprehensive framework will be developed for the increased application of science and technology in the minerals sector. Research and development in the minerals sector will cover a range of activities from geological survey, exploration, mining, beneficiation, to value added through the development of materials. Efforts also will be directed towards the development of new technologies for the conversion of mineral resources into economic resources. Research and development activities will ultimately be directed to improving efficiencies in the sector.

This use of state of the art exploration techniques, scientific mining and optimal use of minerals will require the establishment of appropriate educational and training facilities for human resources development to meet the manpower requirements of the minerals industry.

KEY STRATEGIES AND ACTIONS

- Develop a comprehensive institutional framework for research and development and training
- Facilitate research, technological product and human resource development to foster the sector's efficiency and competitiveness
- Strengthen research institutions for the development of processes for beneficiation and agglomeration techniques to bring lower grades and finer size materials into use
- Strengthen the linkages and interaction between the various institutions engaged in research and development in the minerals sector to derive the maximum benefits
- Promote, strengthen and where possible establish and fund research facilities and appropriate educational and training opportunities
- Encourage local institutions and academia to pursue research and development relating to the minerals industry
- Facilitate the formation of strategic partnerships with learning institutions to advance minerals and science and technology institution/bodies
- Develop new and clean technologies to improve efficiencies in the minerals sector
- Upgrade appropriate technologies to clean technologies and where necessary engage in technology adoption and/or adaptation
- Promote quality assurance standards and the optimal utilization of mineral resources in line with their physical, chemical, metallurgical and other characteristics
- Create incubation facilities that allow the local private sector to improve its capacity for import substitution and increased market share in foreign markets

- Create mechanisms for cross linkages and sharing of information in research and development across various ministries, departments and agencies (MDAs) and with tertiary level institutions.

KEY IMPLEMENTING AGENCIES

- Ministry of Energy and Mining
- Ministry of Finance and the Public Service
- National Industrial and Metallic Minerals Institute
- Mines and Geology Division
- Jamaica Bauxite Institute
- Ministry of Industry, Investment and Commerce
- Scientific Research Council
- Jamaica Bureau of Standards
- Tertiary institutions
- Ministry of Education

Goal 5: Jamaicans are equipped with the technical capacity and knowledge for the development, management and appreciation of the minerals sector

Under this goal, a comprehensive review of the manpower needs of the minerals sector will be explored. Educational institutions at all levels will work through the policy framework to meet these needs in the medium and long term. Focus will be placed on the development of specialized training to ensure that adequately trained manpower at all levels is available for the development of the sector.

Special emphasis will be provided to government officials to ensure that they have the required capacity for carrying out geological, geochemical and geophysical surveys as well as to be able to process, analyze and interpret geo-scientific data. Additionally, the institutional capacity of the government sector will also be enhanced for the promotion, regulation and governance of the country's mineral resources. This will ensure that these institutions are able to fulfil their key regulatory and promoting roles.

KEY STRATEGIES AND ACTIONS

- Develop and strengthen local capacity for minerals development
- Develop and implement educational and training programmes in dedicated institutions to provide the required pool of skilled personnel for the industry
- Promote the licensing of minerals-related professionals
- Encourage private sector companies to dedicate resources to improve the competencies of their employees and provide bursaries for students
- Develop specific programmes in collaboration with tertiary institutions to ensure that government has the required competencies to carry out geological, geochemical and geophysical surveys of the entire island and at varying scales
- Facilitate the introduction of programmes that allow for constantly improving the competencies of employees in government-owned entities and mineral companies
- Review and upgrade from time to time existing facilities for basic and specialized training to ensure that adequately trained manpower at all levels is available for the development of mines and minerals
- Provide training in the use of new and innovative technologies
- Work with tertiary institutions to design curricula that would meet the needs of the development of the minerals sector
- Promote the uptake of exchange programmes to learn industry best practices.

KEY IMPLEMENTING AGENCIES

- Ministry of Energy and Mining
- Ministry of Finance and the Public Service
- National Industrial and Metallic Minerals Institute
- Jamaica Bauxite Institute
- Mines and Geology Division
- Ministry of Industry, Investment and Commerce
- Scientific Research Council
- Local universities and training institutions
- HEART Trust/NTA
- Ministry of Education

Goal 6: Jamaicans have substantial investments in all aspects of the sector, and are the major beneficiaries of the profits derived from the exploitation of our mineral wealth

Under this goal, significant attempts will be made to ensure the equitable sharing of benefits from mineral resources to the people of Jamaica. Strategies will be designed under this goal to ensure that it is recognized that minerals are one part of a country's natural wealth or patrimony for which users must pay rent to the "people" or State to deplete. This means that Government will ensure that tax and royalty revenues derived from exploration, mine development and mining reflect the value to society of the resources mined, and are collected and put to work in support of the sustainable prosperity of Jamaica.

To better enable the Government to derive its share of rent from the industry a comprehensive system of taxation will be developed for levying taxes on the industry, as well as for collecting income from rentals (royalties) on State-owned mineral rights. Royalties to compensate the State for the depletion of its mineral wealth are generally calculated on the volume or value (sales) of the mineral mined.

This also implies among other things that particular efforts will be made to encourage and afford local investors ownership of a larger share of the industry. Accordingly, mineral prices will reflect their value and the royalty structures will be revised to ensure that the producer earns and the consumer pays the true value of the minerals produced and consumed. This will contribute to sustainable national development as the general aim will ensure that adequate compensation is provided to the state in return for various concessions and grants.

Strategies also will be employed towards ensuring that the host communities where mining takes place benefits from the proceeds of the mining and that the community is allowed to develop sustainably. This would involve various elements including, encouraging the employment of suitably qualified persons from the immediate communities in which minerals-related operations are located as well as encouraging companies and the Government of Jamaica to actively participate in community development activities. It is well known that engagement with communities establishes and maintains a constructive relationship with these said communities over the life of the project. Under this goal, an effective community engagement process will be pursued allowing communities' views, interests and concerns to be heard, understood and taken into account in project decisions and in the creation of development benefits, thereby allowing communities to better understand mining, its opportunities and challenges.

KEY STRATEGIES AND ACTIONS

- Develop a comprehensive system of taxation for levying taxes on the industry, as well as for collecting income from rentals (royalties) on State-owned mineral rights
- Develop strategies to facilitate ownership of equity in mineral operations by Jamaicans, including the promotion of joint ventures and other ownership arrangement between local and foreign capital
- Facilitate the creation of a capital development fund to encourage development within the sector
- Encourage minerals-related companies to be good corporate neighbours and be more responsive to the concerns of host communities
- Promote minerals exploitation activities as a stimulus to attract further economic development in host communities, particularly those in rural areas
- Promote and facilitate sustainable 'life after mining' projects and maintaining and/or upgrading the environmental quality of these communities
- Promote state and private sector investment in host communities
- Create process to effectively engage communities in mining decisions and takes into account their views and interests
- Create mechanisms to establish strong relations with the financial community to locate funds to finance new investments.

KEY IMPLEMENTING AGENCIES

- Ministry of Energy and Mining
- Ministry of Finance and Planning
- National Industrial and Metallic Minerals Institute
- Mines and Geology Division
- Jamaica Bauxite Institute
- National Environment and Planning Agency
- Social Development Commission
- Development Bank of Jamaica
- JAMPRO
- Ministry of Industry, Investment and Commerce.

Section 3

Implementation, Monitoring and Evaluation Framework

A continuous programme of monitoring and evaluation, involving relevant stakeholders from public and private sectors, will be implemented. This will be aligned to the Monitoring and Evaluation Framework that is part of Vision 2030 Jamaica as well as the Whole of Government Business Planning Process.

The Ministry responsible will use several indicators to assess the effectiveness of the National Minerals Policy in achieving the goals, which will form the basis for reviewing the policy and recommending any changes to the policy framework.

The policy will be evaluated mid-term, after three years, to see if the targets, objectives and deliverables are being achieved. It will be updated in the light of progress to assess whether any amendments in policy are required. Sustainable development criteria – economy, environment and social priorities - will be used to guide strategy in a balanced way for the longer-term. At the same time, Government and the private sector will monitor worldwide technical developments in energy efficiency and renewable energy with a view to identifying technologies and applications that may be particularly appropriate to Jamaica's situation in the long-term, making the best use of partnerships where possible, both locally and internationally.

INSTITUTIONAL FRAMEWORK

The key players in the implementation of the National Minerals Policy and their roles and responsibilities are described below. The successful implementation of this policy will require that linkages be made between the minerals sector as well as other segments of the economy and society including, but not limited to, energy, manufacturing, engineering, transport, environment, construction, finance, agriculture, sanitation and education.

The **Ministry of Energy and Mining (MEM)** will lead and facilitate the implementation of the Minerals Policy, in collaboration with other Government Departments and Agencies, the private sector, academia and NGOs. MEM also will be responsible for building the requisite human resource capacities across the various implementing partners to strengthen information access and knowledge in the minerals sector.

Through the Commissioner of Mines, the **Mines and Geology Division (MGD)** functions as the main geological research and regulatory entity concerned with the management and development of the country's mineral resources and Minerals Industry. The Geological Survey within the MGD studies and explains the island's geology and metallogeny, is a major repository

of geological and mineralogical information and an authority on various aspects of the country's geology, mineral wealth and related topics. Importantly, the MGD executes the regulatory functions necessary to promote compliance with the mining and quarrying legislation.

The **Jamaica Bauxite Institute (JBI)** is the immediate authority on bauxite and several aspects of the Bauxite and Alumina Sector, whose development it oversees. Its responsibilities include managing bauxite resources and reserves, undertaking research, and promoting development specific to this sector of the minerals industry. In conjunction with MGD and NEPA, the JBI is also involved in environmental monitoring and interfacing with communities hosting bauxite and alumina operations.

The **ministry with portfolio responsibility for the environment (Environmental Management Division)** has responsibility for environmental management, land use planning and development, spatial planning and solid waste management.

The **National Environment and Planning Agency (NEPA)** has national oversight for environmental and planning matters. Prior to the issuance of a prospecting licence, mining lease or a quarry licence, the Commissioner of Mines consults NEPA as part of the process to arrive at the terms and conditions. NEPA also has the responsibility for monitoring adherence to environmental regulations, standards and guidelines relating to land use, air and effluent quality.

The Natural Resources Conservation Authority (NRCA)[2] has delegated to the JBI the responsibility of monitoring the bauxite and alumina sector under agreed conditions. NEPA therefore plays a critical role in guiding development, resource use and promoting environmental management.

The **Jamaica Bauxite Mining Limited (JBM), the Bauxite and Alumina Trading Company of Jamaica Limited (BATCO) and Clarendon Alumina Production Limited (CAP)** are either shareholders in bauxite and alumina operations, managers of bauxite lands and related assets or are involved in the marketing of the Government's share of bauxite and alumina production.

Other entities such as the **Water Resources Authority (WRA), the National Land Agency (NLA), the Forestry Department and the local planning authorities (Parish Councils)** play important roles, particularly in the licence-granting process for minerals development operations.

Local universities and other research institutions will play a key role in keeping abreast of research as well as engage in R & D in minerals exploitation to meet the country's emerging

[2] The NRCA is one of three statutory bodies – along with the Town and Country Planning Authority and the Land Development and Utilization Commission – that formed NEPA in 2001. The NRCA remains the legal entity that grants environmental permits to effect development activities.

needs and continuously work with government and private sector to keep them abreast of these emerging technologies as well as facilitate the adoption and adaptation of these technologies by consumers and investors. Universities and other tertiary level training institutions will take a leading role in the provision of training courses for persons working in or wishing to pursue a profession within the minerals industry.

PROPOSED INSTITUTIONS

The establishment of the following entities is proposed to further the development of the minerals sector in Jamaica.

A **Minerals Development Advisory Council (MinDAC)** will work closely with the Ministry responsible for the minerals portfolio. The MinDAC will assist in providing guidance to the Minister and institutions in respect of matters related to the development of the minerals industry. Its purview will include policy integration, mineral promotion, marketing, mineral exploitation, exportation, product development and the management of mineral resources and mineral-bearing lands.

A **National Industrial and Metallic Minerals Institute (NIMMI)** will pilot the management and development of the country's mineral and geological resources so as to facilitate the minerals sector's transformation into a multi-minerals and predominantly value-added entity closely linked with various segments of the economy.

A refocused and renamed Bauxite and Alumina Trading Company of Jamaica (BATCO) (Minerals Trading Company (MCT)) and the Geological Survey segment of the Mines and Geology Division (MGD) with advanced laboratory facilities will form NIMMI's core. The institute will seek to lead research aimed at developing the country's industrial minerals wealth, including the development of an integrated limestone sub-sector, market the mineral products and manage our geological resources.

THE NATIONAL MINERALS POLICY ACTION PLAN

The table below presents a draft action plan for the Minerals sector and it is aligned to Vision 2030 Jamaica as well as to outcomes of this minerals policy. The projects identified are listed along with the responsible agencies for implementation.

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
1.1: An enabling policy and regulatory environment	1.1.1.1 Complete and promulgate the National Minerals Policy, including provisions for development of non-metallic minerals sub-sector	**MEM**, JBI	
	1.1.1.2 Simplify licensing process for metallic and non-metallic minerals	**MGD,** JBI, MEM	
	1.1.1.3 Extend the period of licences for non-metallic minerals quarries	QAC, MEM	
	1.1.1.4 Rationalize procedures for granting of blasting licences and regulating importation, handling, storage and transportation of explosive materials	**MTW, MGD**, MNS, MEM	
	1.1.1.5 Promote public awareness of importance of minerals sector	**MEM, JTI**, MQAJ, MGD, Private sector	
	1.1.1.6 Modernize minerals-related legislation	**MEM**, MGD	
	1.1.1.7 Recognize exploration in minerals legislation	**MEM**, MGD	
	1.1.1.8 Introduce certification for mineral operations and materials/products	**BSJ, MGD**	
	1.1.1.9 Review fiscal regime for bauxite/alumina	**MEM, MFPS**, JBI, OPM, JBM, CAP	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	industry		
	1.1.2.1 Revise and improve access to incentives encouraging investment in the non-metallic minerals sub-sector	**MFPS, JTI,** MEM	
	1.1.2.2 Rationalize treatment of metallic and non-metallic minerals under mining and quarrying legislation and incentives (exploration; transferability of licences)	**MEM, MGD**, JBI	
	1.1.3.1 Carry out education of stakeholders on licensing and regulatory requirements and breaches and international best practices	**MEM, MGD**, JBI	
	1.1.3.2 Promote improved industry self-regulation	**JBI, MQAJ, MGD,** MEM	
	1.1.3.3 Strengthen institutional capacity of regulatory agencies	**MEM, MGD,** JBI, NEPA, NWA	
	1.1.3.4 Review and revise penalties for breaches including discrete notices and penalties for operators and individuals	**JBI, MGD,** MLSS, NEPA	
	1.1.3.5 Develop modes of enforcement of penalties for specific breaches on operators and individuals	**JBI, MGD,** MLSS, NEPA	
	1.1.3.6 Create public database of status of operators in breach of licenses and regulations	**JBI, MGD**, MLSS, MNS	
	1.1.3.7 Become ISO Certified and Compliant in all mission-critical operational areas	**BSJ, Private Sector, MQAJ**	
	1.1.4.1 Strengthen collection and use of data on minerals sector	**JBI, MGD, STATIN,** MEM, PIOJ	
	1.1.4.2 Develop monitoring and evaluation framework for development of minerals sector	**MEM, JBI, MGD,** JTI, PIOJ, NEPA, WRA	
	1.1.4.3 Develop accountability framework and mechanisms for evaluating and monitoring	**MEM, CO,** OPM, PIOJ	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	effectiveness of sector agencies		
	1.1.5.1 Create public database of status of licensed and certified operators	**MGD, MEM**	
	1.1.5.2 Ensure adequate penalties for operating and /or purchasing from unlicensed operators	**MEM, MGD**, MQAJ	
	1.1.5.3 Carry out public education on purchasing only from licensed and certified operators	**MEM, MGD**, MQAJ	
1.2:- Long-term development of minerals sector integrated into the overall land use planning and management objectives of the country	1.2.1.1 Carry out a comparative assessment on the economic extraction potential of reserve base	**JBI, MGD**, MEM	
	1.2.1.2 Classify reserve base based on economic potential	**JBI, MGD,** MEM, PIOJ	
	1.2.1.3 Provide priority planning approval for mineral development of mineral reserves	**NEPA, LAs,** CoL, NLA, JBI, MGD	
	1.2.2.1 Introduce framework for use of mineral-bearing lands including sequential land-use	**MEM, OPM**, MGD, RADA, NEPA, LAs, MQAJ, Private sector	
	1.2.2.2 Prevent conflicting land use at pre-mining stage and during mining on lands with priority planning approval for mineral development	**MEM, OPM, NEPA, LAs,** MGD, RADA,	
	1.2.2.3 Support strengthening of capacity of planning agencies and authorities	**OPM, NEPA, LAs, MEM,** MOE (PetroCaribe Fund)	
	1.2.2.4 Ensure productive use of unmined lands including through tenant farming	**MOAF, RADA**, Private Sector	
	1.2.2.5 Ensure compliance with end use of land as per terms of approval and rehabilitation plan	**JBI (BCDP), MGD**	
	1.2.2.6 Integrate rehabilitation plans with regional land use plans	**OPM, NEPA, LAs,** MEM, JBI, MGD	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.2.3.1 Identify all mineral-bearing lands including through non-invasive technological approaches e.g. Ground Penetrating Radar (GPR), infrared satellite imaging and hand drilling	**Private sector, MGD**, JBI	
	1.2.3.2 Prepare updated geological maps of entire island including location of mineral resources	**MGD, MGI, NLA**	
	1.2.3.3 Register mineral resources and reserves with Land Management Bank	**MEM, NLA, JBI, MGD**	
	1.2.3.4 Integrate mineral resource maps into planning information systems including GIS	**MGD, MGI, OPM, NEPA**, LAs, JBI, PIOJ	
	1.2.3.5 Ensure zoning of lands containing valuable mineral resources (including metallic minerals, dolomite, gypsum, whiting, marble, chemical-grade limestone)	**OPM, NEPA, LAs, MGD,** MEM, JBI	
	1.2.3.6 Update zoning (and provide flexibility in mining outside of zones)	OPM, NEPA, LAs, MGD, MEM, JBI	
	1.2.3.7 Establish and enforce no go areas for mineral exploitation	**MEM, OPM, NEPA, LAs, MGD,** WRA	
	1.2.4.1 Integrate infrastructural development of mineral bearing lands in parish development and regional plans	**MEM, OPM, NEPA, LAs, MGD,** JBI, MTW, NWA, WRA, NWC	
	1.2.4.2 Integrate infrastructure built by mining projects into national and regional plans where possible after mining	**MEM, OPM, NEPA, LAs, MGD,** JBI, MTW, NWA, WRA, NWC	
	1.2.4.3 Develop mechanisms for joint development of infrastructure between government and private investors (e.g. roads, ports)	**MEM, MTW, JTI, PAJ, Private sector**, MOE (PetroCaribe Fund)	
	1.2.4.4 Rationalize location of quarries to be consistent with development and maintenance of transport network	**QAC, MQAJ, MTW, MGD**	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.2.4.5 Identify/rationalize island-wide road network for the transportation of bulk minerals	**MTW, NWA, MEM, MGD**	
	1.2.5.1 Establish a National Mineral-Bearing Lands Management Committee	**MEM,** JBI, MGD	
	1.2.5.2 Establish a National Mineral-Bearing Land Management Bank	**MEM**, JBI, MGD	
1.3:- Increased value of bauxite extraction and processing	1.3.1.1 Provide Accelerated Depreciation Allowance for investment in capacity expansion and dual-feed digester systems	**MFPS,** JBI, JTI, TAAD	
	1.3.1.2 Undertake conversion of energy sources at bauxite / alumina plants to graduate to high-temperature processing format in coordination with national decisions on diversification of fuel supply between coal and natural gas and underlying economics in energy markets	**MFPS,** JBI, JTI, TAAD, MOE	
	1.3.2.1 Allocate bauxite reserves adequate to sustain production for at least 25 years in the case of new plants	**JBI,** OPM, MEM, MGD	
	1.3.2.2 Improve monitoring of rate of depletion of allocated reserves and quality of remaining unallocated reserves	**JBI**	
	1.3.2.3 Provide additional reserves to existing companies as needed to sustain planned levels of production	**JBI,** OPM, MEM, MGD	
	1.3.3.1 Identify primary locations for sourcing bauxite based on logistics and material specifications (with particular reference to Haiti and Guyana)	JBI, Private sector, JBM, CAP, BATCO	
	1.3.3.2 Develop procurement, transportation and storage policy and arrangements	**JBI, Private sector,** PAJ, BATCO	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.3.3.3 Initiate/conduct negotiations to secure stable supplies on a long-term strategic basis	**JBI, Private sector,** PAJ, MFAFT, BATCO	
1.4:- A developed and economically feasible non-metallic mineral sub-sector	1.4.1.1 Establish National Minerals Institute (NMI) with Jamaica Limestone Institute (JLI) to spearhead development of limestone and its derivatives and other non-metallic mineral resources	**MEM,** MGD, JBI	
	1.4.1.2 Develop long-term strategic plan for integrated non-metallic minerals sub-sector with emphasis on value-added production	**MEM,** MGD, JTI, MQAJ	
	1.4.2.1 Develop and implement long-term plans for: • Tarentum • Cane River • Lydford • Port Esquivel • Rio Bueno • Bowden	**Private sector, JTI, MEM**, MGD, PAJ	
	1.4.3.1 Develop technical assistance programmes to expose industry operations to best practice in: • Management • Resource/reserve management • Drilling and blasting • Extraction • Environmental management and rehabilitation • R&D • Product development	**MGD, JBI, MQAJ, JTI**, Tertiary institutions	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.4.3.2 Encourage consolidation of smaller enterprises	**MEM, MQAJ**, JTI	
	1.4.3.3 Encourage development of strategic alliances with internal and external partners who bring value	**JTI, Private sector,** MEM	
	1.4.4.1 Develop and promote quality assurance standards for non-metallic minerals enterprises	**MQAJ, BSJ, JLI,** MEM	
	1.4.4.2 Encourage substitution of local value-added products	**MQAJ, JTI, Private sector**, MEM, MGD	
	1.4.4.3 Promote awareness of range of products, end-uses and profitability of non-metallic minerals	**MQAJ, JTI, Private sector**, MEM, MGD	
	1.4.5.1 Establish and maintain non-metallic minerals as a priority sub-sector for investment promotion	**JTI,** MEM, MGD	
	1.4.5.2 Promote investment opportunities in non-metallic minerals in domestic and international markets	**JTI, MEM, MGD**	
	1.4.5.3 Develop financing mechanisms for exploration and R&D	**JLI, MQAJ, DBJ, Private sector,** MFPS	
	1.4.6.1 Establish National Minerals Week as an annual event	**MEM**, MQAJ, MGD, Private sector	
	1.4.6.2 Develop online and hard copy catalogues of available products	**Private sector, MEM, JTI,** MQAJ, JEA	
	1.4.6.3 Develop market intelligence through networking alliances and conducting market studies	**Private sector, JTI,** MQAJ, JEA	
	1.4.7.1 Strengthen relationships with other sector associations	**MQAJ, JMA, IMBJ**	
	1.4.7.2 Establish appropriate marketing and information systems to bring together producers and purchasers in the mining and quarrying sector	**MEM, MQAJ, JMA, IMBJ**	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	and linkage sectors		
	1.4.8.1 Manage allocation of valuable high-quality non-metallic mineral resources	**MEM, MGD**, MQAJ, Private sector	
1.5:- Provision of competitive infrastructure and technology	1.5.1.1 Use the annual productivity plan to drive a progressive reduction in the share of energy in the overall bauxite and alumina industry cost structure by increasing energy efficiency and promoting co-generation	**Private sector, JBI, Unions**	
	1.5.1.2 Coordinate conversion of energy sources at bauxite / alumina plants with national decisions on diversification of fuel supply between coal and natural gas and underlying economics in energy markets	**MEM, PCJ,** JBI, JPSCo, Private sector	
	1.5.1.3 Promote retooling of non-metallic minerals operations to introduce energy-efficient equipment including variable speed motors	**MEM**, JTI, MQAJ	
	1.5.1.4 Promote use of renewable energy sources including wind, solar and hydro-power	**PCJ, MEM,** JTI, MQAJ	
	1.5.1.5 Encourage more energy-efficient methods of drilling, blasting, loading, crushing and transport	**MEM, MGD, MQAJ**	
	1.5.2.1 Undertake comprehensive port study to identify existing ports including sufferance wharves and develop recommendations for expansion and rationalization of port infrastructure	**PAJ**, MTW, MEM	
	1.5.2.2 Explore potential for consolidation of alumina exports through Port Esquivel and establish Rocky Point as a port for export of non-metallic minerals from South-Central Jamaica	**MEM, MTW, PAJ, Private sector**	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.5.2.3 Expand and upgrade gypsum port to accommodate non-metallic minerals exports from South-Eastern Jamaica	**CCC, PAJ**, MEM	
	1.5.2.4 Develop suitable port facility for non-metallic minerals exports on North Coast	**Private sector, PAJ, MEM**	
	1.5.2.5 Require multi-use access to new port facilities for non-metallic minerals	**MEM, MTW, PAJ, Private sector**	
	1.5.2.6 Develop facilities to allow compatible multi-use of existing bauxite ports	**Private sector, PAJ, MEM**	
	1.5.3.1 Include identification of coastal barge system in port study	**PAJ**, MTW, MEM	
	1.5.3.2 Undertake dredging and development of port facilities for barge transport as alternate means of transport	**PAJ**, MTW, Private sector	
	1.5.3.3 Undertake study of economics of coastal shipping	**PAJ**, MTW, MEM	
	1.5.4.1 Develop point-to-point rail network with adequate load-bearing capacity from major new and existing mining and quarrying operations to ports and land-based customers	**JRC, Private sector,** MTW, MEM	
	1.5.5.1 Ensure that vehicles used for transporting minerals on public roadways conform with load-carrying and combined weight-bearing restrictions and other regulations of the Road Traffic Act	**MTW**, MEM, MGD, JCF, ISCF	
	1.5.5.2 Require inclusion of weigh bridges and scales in quarry operations	**MTW**, MEM, MGD	
	1.5.5.3 Encourage introduction of vehicles with higher capacity on an OEM basis	**MTW**, MEM, MGD, MQAJ	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.5.6.1 Encourage use of conveyor and cable belt and pipeline systems as means of transportation from plant to port (e.g. Ocho Rios)	**JBI,** MEM, MGD, Private sector	
	1.5.7.1 Leverage the capabilities within the Hope Analytical Laboratories Network (HALN) as a critical underpinning of sector development	**JBI,** SRC, MGD, MOAF, WRA	
	1.5.7.2 Research the mineralogy and processing of bauxite reserves with a high concentration of goethite and associated phosphates	**Universities, SRC, JBI**, Private sector	
	1.5.7.3 Support research into the potentially hazardous effects of beryllium found in alumina	**JBI**, Private sector	
	1.5.8.1 Explore alternatives to double-digester for processing high monohydrate bauxite, including pre-treatment and sintering approaches	**JBI, Private sector**	
	1.5.8.2 Strengthen reserves definition and mine planning to allow appropriate blending of trihydrate and monohydrate bauxite	**JBI, Private sector**	
	1.5.9.1 Investigate the mineralogy and commercial feasibility of isolating and extracting titanium oxide and other materials from red mud residue	**JBI,** SRC, Universities, Private sector	
	1.5.9.2 Investigate the mineralogy, identification and commercial feasibility of: • Dolomitic, calcitic and hydrated lime • GCC (packaged to lab-specs) • PCC (packaged) • Specialty lime chemicals (e.g. calcium citrate, calcium propionate) • Stone craft and decorative stone products (including from agates and marble) • Manufactured sand	**MEM, National Minerals Institute, JBI, Private sector**	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	• Clays and ceramics • Construction finishes and plasters (e.g. gypsum ceilings, decorative finishes such as stucco and plasters) • Mineral springs		
	1.5.11.1 Encourage use of local limestone in desulphurization operations locally and overseas (with by-product of gypsum)	**MEM, MQAJ**, Private sector	
	1.5.12.1 Explore potential for dredging beach sand and aggregate offshore	**Private sector, MGD**	
	1.5.12.2 Explore application of seabed mineral exploitation best practice to Jamaica's Exclusive Economic Zone (EEZ)	**MEM**, MGD, NEPA, Private sector	
	1.5.13.1 Develop internship programmes and project assignments for engineering students related to the Bayer process	**UTech, UWI (St. Augustine), JBI, Private sector**	
	1.5.13.2 Develop capacity and opportunities for academic institutions to apply knowledge to industry problems and challenges	**Universities, MEM, JBI, MGD, Private sector**, NMI	
	1.5.13.3 Develop relationships with alumni and industry experts through discussion fora, seminars and presentations on topics of mutual interest	**Universities, Private sector**,	
	1.5.13.4 Develop strategic alliances and research partnerships between JBI and UC Rusal-affiliated VAMI and CSIRO in Australia among others	**JBI, UC Rusal**	
	1.5.14.1 Strengthen research capacity of JBI	**JBI**, Universities, SRC	
	1.5.14.2 Upgrade JBI pilot plant for practical training and research	**JBI**	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.5.14.3 Strengthen research and development capacities of mining institutions and enterprises	**Private sector**	
1.6:- Adequate supply of human resources with internationally competitive levels of labour productivity	1.6.1.1 Leverage the skills upgrade model piloted at the Breadnut Valley Training Institute and the Alpart/HEART Apprenticeship programme to boost productivity and enhance international competitiveness	**HEART**	
	1.6.1.2 Establish certification programmes for mining and quarrying operatives	**HEART**	
	1.6.2.1 Develop tertiary-level training programmes in the Bayer process using the JBI pilot plant	**JBI, Universities**, SRC	
	1.6.2.2 Introduce applied electives on bauxite and limestone in tertiary geology curricula	**Universities**, JBI, MQAJ, JLI, SRC	
	1.6.3.1 Review and enhance existing 1998 Industry MOU for bauxite industry	**MEM, MFPS, JBI, Private sector, Trade unions**	
	1.6.4.1 Establish benchmarks for internationally competitive levels of labour productivity	**JBI, MQAJ**, JLI, Private sector, Trade unions	
	1.6.4.2 Encourage application of performance-based compensation schemes	**Private sector, JEF, Trade unions, MLSS**, JBI, MQAJ, JLI	
1.7:- Increased exploitation of other mineral resources	1.7.1.1 Package and provide baseline data from existing studies on potential of other metallic minerals resources in Jamaica	**JTI,** PCJ, MGD, JBI, JLI, UWI	
	1.7.1.2 Promote exploration for other metallic minerals	**JTI**, PCJ, MGD, JBI, JLI	
	1.7.2.1 Review international programmes and models for exploitation of marine minerals resources to determine suitable model and approach for Jamaica	**MEM, UWI, JBI, PCJ,** JLI, NEPA, PAJ, MGD, ISA	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	1.7.2.2 Develop zoning and commercial blocks for exploration (see PCJ model)	**MEM**, PCJ UWI, JBI, JLI, NEPA, PAJ, MGD,	
	1.7.2.3 Package and provide baseline data from existing studies on potential of marine minerals resources	**JTI, PCJ**, MGD, JBI, JLI, UWI	
	1.7.2.4 Promote exploration for marine minerals resources	**JTI**, PCJ, MGD, JBI, JLI	
1.8:- Strengthened hazard mitigation mechanisms in the sector	1.8.1.1 Design and retrofit operational, transportation and storage facilities to meet standards appropriate to natural hazard profile of Jamaica including tropical storms, hurricanes, earthquakes and floods	**Private sector, ODPEM, MGD,** JBI, MQAJ, PAJ, JLI, NEPA, JIE, LAs	
	1.8.1.2 Ensure hazard preparedness and response plans	**Private sector, ODPEM, MGD,** JBI, MQAJ, PAJ, JLI, NEPA, JIE, LAs	
	1.8.1.3 Ensure maintenance and related training programmes incorporate hazard mitigation system checks	**Private sector, ODPEM, MGD**, JBI, MQAJ, PAJ, JLI, NEPA, JIE, LAs	
	1.8.2.1 Strengthen linkages between umbrella organization and national disaster preparedness and emergency management system, including throughout the prevention, preparation, response and recovery phases	**Private sector, ODPEM, MGD**, JBI, MQAJ, PAJ, JLI, NEPA, LAs	
	1.8.2.2 Encourage collaboration between mining and quarrying enterprises and community-level disaster committees	**Private sector, ODPEM, MGD**, JBI, MQAJ, JLI, NEPA, LAs	
	1.8.2.3 Implement periodic on-site monitoring programmes of mining and quarrying	**ODPEM**, NEPA, MGD, JBI, private sector, MQAJ,	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	enterprises	PAJ, JLI, LAs	
2.1:- Sustainable mining communities	2.1.1.1 Collaborate in the design and implementation of skills training, agro-processing, micro enterprise development initiatives and replacement industries	**HEART, MOAF, MIIC, JBDC, JBI,** JAS, Private entities	
	2.1.1.2 Maximize the use of tenant farmer programmes in the pre-mining and post-mining stages in order to boost agricultural production in all active mining leases	**MOAF, JBI, JAS, Private entities**	
	2.1.1.3 Encourage corporate social responsibility to develop social infrastructure in mining communities	**MEM,** MOE, MOHE, MOAF, SDC, JBI, Private entities	
	2.1.2.1 Ensure effective resettlement plans for communities or residents displaced by mining activities	**MEM, JBI,** LAs, NEPA, MOAF, MWH, Private entities	
	2.1.2.2 Encourage development of land subdivision projects for sector employees	**LAs, Private entities,** PDCs, NEPA, NLA	
	2.1.3.1 Strengthen use of Community Development Fund by CBOs in bauxite mining communities	**JBI, Community Councils,** Private entities, MPs	
	2.1.3.2 Deepen collaborative mechanisms with mining and quarrying stakeholders including establishment of community-based monitoring committees, especially in sensitive areas	**MEM, MGD, JBI, Community Councils,** Private entities	
2.2:- Harmonious relationships	2.2.1.1 Strengthen role of Community Councils including capacity development and communications	**Private entities, JBI, SDC**	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
between communities and mining and quarrying entities	2.2.1.2 Recognize communities as stakeholders in MOUs agreed on by main stakeholders including owners, government and unions	**Private entities, JBI, Unions, Community Councils**	
	2.2.2.1 Review and update compensation policy to ensure conformity with best practice	**Private entities**, unions, JBI, Community Councils, MEM	
	2.2.2.2 Include community representatives in review and development of compensation policies	**Private entities, unions, JBI, Community Councils**	
2.3:- Adoption of a holistic approach to the wellness of sector employees	2.3.1.1 Promote and ensure compliance with Personal Protective Equipment (PPE) Guidelines across all operational activities with appropriate equipment	**Private entities, unions, MLSS, MOHE, MEM**, NEPA, JBI	
	2.3.1.2 Ensure compliance with provisions of health and safety policy and operating procedures necessary for safe, healthy and injury–free environment	**Private entities, unions, MLSS, MOHE, MEM, NEPA, JBI**	
	2.3.1.3 Implement containment and early warning systems	**Private entities, unions, MLSS, MOHE, MEM, JBI**	
	2.3.2.2 Ensure establishment, upgrading and maintenance of first-response health and emergency facility in major minerals processing facilities	**Private entities, unions, MLSS, MOHE,** MEM, JBI	
	2.3.2.3 Ensure planned access to designated emergency facilities for incidents at all mining, quarrying and processing facilities	**Private entities, unions, MLSS, MOHE,** MEM, JBI	
	2.3.3.1 Ensure adherence to legal and international standards through certification (OSHA, ISO, National Safety Council)	**Private entities, unions, MLSS, MOHE,** MEM, JBI	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	2.3.3.2 Ensure participation of mining and quarrying representatives in ongoing review and updates of occupational safety and health legislation and regulations	**Private entities, unions, MLSS, MOHE**, MEM, JBI	
	2.3.4.1 Identify and classify major hazardous elements of mining and quarrying sector	**MOHE, Private sector, MQAJ, JBI,** JLI, NEPA	
	2.3.4.2 Develop research programmes for each classification and identify funding sources and implementing institutions	**UWI, NEPA, SRC, PIOJ, Private sector,** MQAJ, JBI, JLI	
	2.3.4.3 Undertake research programmes and disseminate findings	**UWI, NEPA, SRC, PIOJ, Private sector,** MQAJ, JBI, JLI	
3.1:- Effective control of negative environmental occurrences	3.1.1.1 Ensure that environmental permits are required for new facilities	**NEPA,** MGD, JBI	
	3.1.1.2 Ensure that EIAs are required for all mining and quarrying activities	**NEPA**, MGD, JBI	
	3.1.1.3 Ensure that air pollutant discharge licenses are required for air emissions	**NEPA**, MGD, JBI	
	3.1.1.4 Encourage increasing levels of self monitoring and reporting (on monthly and annual basis) to environmental agency of emissions testing (at the stacks or suspended particulate measurements)	**NEPA**, MGD, JBI, MQAJ, private sector	
	3.1.1.5 Encourage minimization of generation of air pollutants to the environment	**NEPA**, MGD, JBI, MQAJ, private sector	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	3.1.1.6 Apply "polluter pays" principle to air emissions	**NEPA**, MGD, JBI	
	3.1.1.7 Ensure that penalties are applied for breaches of environmental standards	**NEPA,** MGD, JBI, Justice system, JCF	
	3.1.1.8 Update environmental legislation and regulations based on tracking of global best practices	**NEPA,** MGD, JBI, MQAJ, private sector	
	3.1.2.1 Ensure that red mud disposal systems keep pace with industry capacity expansion and are sufficiently insulated from groundwater sources	**NEPA, MGD, JBI, private sector,** WRA	
	3.1.2.2 Reduce the environmental impact of trucking minerals	**LAs, NWA, NEPA,** JBI, MGD, MQAJ, private sector	
	3.1.2.3 Ensure that practices associated with the handling, treatment, storage, transportation and disposal of hazardous waste are in conformity with best practice.	**NEPA, MGD, JBI,** Justice system, JCF, NSWMA, MFPS, LAs, private sector, MQAJ	
	3.1.2.4 Maximize the benefits to accrue under the EU's Emissions Trading Scheme (ETS) from the conversion to cleaner burning fuels	**PCJ, MOE, private sector**	
	3.1.2.5 Develop cost-benefit assessments of new environmental legislation and regulations	**Private sector, NEPA, MGD**, JBI, MQAJ, LAs	
	3.1.2.6 Establish appropriate buffer zones around existing and planned mining and processing facilities based on best available practices and technology	**NEPA, private sector, MGD,** JBI, MQAJ, LAs, MOHE, WRA, NWA	
	3.1.2.7 Provide incentives to encourage introduction of environmentally friendly technologies and conservation projects	**MFPS, MOE, MEM, PCJ,** NEPA, private sector, MQAJ, OPM, JBI	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	3.1.3.1 Develop scientifically sound procedures for controlling the uptake of cadmium by agricultural crops grown in bauxitic soil	**MOAF, JBI, UWI**, SRC, private sector	
	3.1.3.2 Seek to limit dust exposure by actively exploring the prospect of transporting feedstock by pipeline in the form of a treated slurry	**JBI, MQAJ, private sector,** NEPA, LAs	
	3.1.4.1 Encourage development and implementation of pollution prevention strategies in the sector	**NEPA, MEM,** MGD, JBI, JLI, MQAJ, private sector, NSWMA	
	3.1.4.2 Conduct environmental audits of operations	**Private sector, NEPA, JBI,** MQAJ, JLI	
	3.1.4.3 Encourage backward linkages using waste as inputs including waste oil	**Private sector, NEPA, JBI, MQAJ,** JLI, PCJ, NSWMA	
	3.1.4.4 Develop environmental accounting procedures	**Private sector, NEPA,** JBI, MQAJ	
	3.1.5.1 Develop and implement training programmes for sector enterprises and employees in environmental best practices and sustainable development	**Private sector, NEPA,** JBI, MQAJ	
	3.1.5.2 Carry out public education to increase environmental awareness of minerals development stakeholders	**NEPA, MEM, MGD,** JBI, MQAJ	
	3.1.6.1 Consolidate environmental regulatory responsibilities for the sector (e.g. along the lines of the US EPA)	**OPM, NEPA,** MGD, JBI	
	3.1.6.2 Establish clear and consistent framework of environmental standards, regulations and guidelines in collaboration with stakeholders	**OPM, NEPA,** MGD, JBI	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	3.1.6.3 Develop and extend multi-agency model of coordination between environmental regulatory agency and the sector developmental agencies (e.g. MOU between NEPA and JBI) based on capacities and clear lines of authority	**OPM, NEPA, MEM, MGD,** JBI, JLI	
	3.1.6.4 Provide appropriate training for relevant staff in environmental regulatory and developmental agencies	**OPM, NEPA, MGD, JBI,** JLI	
	3.1.6.5 Upgrade and maintain equipment on ongoing basis (including dispersal modelling, SO_2 monitors, particulate emissions, gas analysers)	**NEPA, MGD, JBI,** JLI, UWI, SRC, MOAF, private sector	
3.2:- Adequately rehabilitated mined-out mineral bearing lands	3.2.1.1 Integrate use of mined-out sites with sequential land use planning for mineral resources	**Private sector, NEPA, LAs, MGD,** JBI, MQAJ	
	3.2.1.2 Link end use to licensing conditions	**JBI, MGD, private sector, NEPA,** LAs, MQAJ	
	3.2.2.1 Establish Restoration Committee for mining and quarrying operations	**MEM, MGD,** Private sector, NEPA, LAs, JBI, MQAJ, MOAF, Forestry Dept., WRA	
	3.2.2.2 Strengthen penalties for non-compliance to encourage self-monitoring	**MGD**	
	3.2.3.1 Fully determine types of dry limestone ecologies	**NEPA, MOAF, Forestry Dept.,** MGD, JBI, JLI, UWI	
	3.2.3.2 Determine types of plant species that can be successfully re-introduced into each type of ecology	**NEPA, MOAF, Forestry Dept.,** MGD, JBI, JLI, UWI	
	3.2.4.1 Determine feasibility of increased use of mined-out sites for non-toxic solid waste disposal,	**MEM, MGD, Private sector,** NEPA, LAs, JBI,	

OUTCOMES	ACTIONS	RESPONSIBLE AGENCIES AND STAKEHOLDERS	TIME-FRAME
	rainwater harvesting, recreation, tourism, real estate development and other uses	MQAJ, MOAF, Forestry Dept., WRA	
	3.2.5.1 Develop alliances with tertiary and research institutions for student-led research projects on biodiversity surveys in known reserve areas	**NEPA,** UWI, SRC, JBI, MGD, NCU, UTech, CASE,	
	3.2.5.2 Secure technical assistance from international development partners (IDPs) for pre-mining biodiversity surveys	**NEPA,** UWI, SRC, JBI, MGD, NCU, UTech, CASE, NEPA, PIOJ	

MONITORING AND EVALUATION FRAMEWORK

The Ministry of Energy and Mining will be accountable for monitoring and evaluating the implementation of this Policy based on the guidelines of the Cabinet Office. The proposed indicators outlined in this policy represent the foundation of a results-based monitoring and evaluation system to ensure that its six goals are achieved. This will, in turn, contribute to the achievement of the related goals as set out in Vision 2030 Jamaica - National Development Plan.

A continuous programme for monitoring and evaluation, conducted by relevant stakeholders from public and private sectors, will be implemented.

The responsible Ministry, currently the Ministry of Energy and Mining, will conduct broad stakeholder consultations periodically to review and assess the effectiveness of the Policy using the indicators identified below as a guide. The results of the assessment, including recommendations, will be published in an annual report for submission to the Cabinet.

PROPOSED INDICATORS

The proposed indicators for the National Minerals Policy over the period 2010-2030 are presented in the table below. These indicators are the building blocks of the Monitoring and Evaluation programme. Targets will be set in collaboration with the key implementation partners.

INDICATORS AND TARGETS – NATIONAL MINERALS POLICY 2010 – 2030

MINERALS SECTOR					
PROPOSED OUTCOME INDICATORS	**BASELINE**	**PROPOSED TARGETS**			**COMMENTS**
	2007 or Most current	**2012**	**2015**	**2030**	
Percentage change in exports earning from the bauxite industry (%)	14.2%	2-4%			JBI notes that it is not able at this time to set a target for this indicator beyond 2012.
Average % change in value	290 tonnes	50%			Locally set by Ministry of Energy and

MINERALS SECTOR					
added outputs of non-metallic minerals (lime, cement, whiting, etc.)					Mining
Percentage change in exports earning from the Industrial Minerals Sector (%)					
Percentage change in US$ foreign exchange inflows of exports earnings from bauxite industry (%)	14.2%	2-4%			
Average % change in value-added outputs of non-metallic minerals (lime, cement, whiting, etc.) (%)	290 tonnes	Increase by 50%			
Percentage of total bauxite used in the production of alumina (%)	70.0%	≥ 80%	≥ 85%	≥ 95%	

MINERALS SECTOR					
Total operating cost of production per ton of alumina (US$)	US$350.00				
Percentage of mined and quarried lands rehabilitated (%)	66.00%				

Other indicators to be considered for the monitoring and evaluation of this policy are listed below:

- Use of fuel as a percentage of its annual output (fuel efficiency)
- Community development initiatives as a percentage of royalties
- Percentage contribution to GDP
- Percentage of investments in the minerals sector as a percentage of total investments in the country
- Level of FDI in the sector as a percentage of total FDI in the country
- Percentage of employment in the sector as a percentage of total employment
- Number of jobs created by the industry and the number of indirect beneficiaries
- Percentage of ISO 14000 certified mining operations
- Quality of water bodies, air, soil and biodiversity in mining areas
- Number of geo-hazard maps developed annually
- Amount of geological data updated, archived and protected annually
- Number of exploration licences issued and renewed annually
- Number of geological and resource assessment reports produced annually.

APPENDICES

APPENDIX I - GLOSSARY

Beneficiation
A variety of processes whereby extracted ore from mining is reduced to particles that can be separated into mineral and waste, the former suitable for further processing or direct use.

Ecosystem approach
The integrated management of natural and manmade landscapes, ecological processes, physical and biological components, and human activities, designed to maintain the integrity of our ecosystem (Natural Resources of Canada, 1995).

Extractive metallurgy
The practice of extracting metal from ore, purifying it, and recycling it.

Host community
The location in which mineral exploitation activities occur.

Metallogeny
The study of the genesis of mineral deposits, with emphasis on their relationship in space and time to regional petrographic and tectonic features of the earth's crust.

Metallurgy
A domain of materials science of materials engineering that studies the physical and chemical behaviour of metals, their inter-metallic compounds, and their alloys.

Mineral
*A*n element or chemical compound that is normally crystalline and that has been formed as a result of geological processes.

Mineral-bearing lands
Lands, including areas covered by water, containing mineral resources of commercial value or which in future will have commercial value.

Mineral deposit:
A geologic occurrence of minerals in relatively concentrated form.

Mineral Development Zone
A declared area set aside for the concentration of mineral exploiting operations.

Mineral exploitation

The systems, processes and techniques through which mineral deposits are transformed into usable mineral commodities. It includes mineral extraction, processing (raw minerals or high value value-added products), transportation and sale for commercial purposes. It also includes recycling and rehabilitation of mined areas.

Mining
The extraction of valuable minerals or other geological materials from the earth, usually, but not always, from an ore body, vein, or seam. In a wider sense, it can also include the extraction of petroleum, natural gas and water, and may be defined as the activity, occupation, and industry concerned with the extraction of minerals.

Quarrying
A form of mining that is generally centred on the extraction of rocks or minerals at the Earth's surface. Quarries are generally used for extracting building materials, including sand and gravel, limestone and dimension stone, and other relatively cheap and bulky minerals such as salt. They are usually shallower than other types of open-pit mines. However, there are instances in which a part of a quarry or an entire quarry is located underground.

Sequential land-use
The series of processes, planning and management systems which facilitate the orderly use of land for different purposes at different times.

Sustainable development
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Report, 1987).

Sustainable mining development
Financially viable mining development that takes place in an environmentally and socially responsible manner with sound governance that provides benefits that last beyond the life of the mine to the communities where mineral development, production and transportation take place (World Bank).

APPENDIX II - MINERALS AND MINERAL-BASED PRODUCTS

The Minerals Industry is a conglomeration of activities geared at utilizing mineral resources, and producing raw minerals and value-added mineral products consumed by various sectors of the economy. Jamaica's known mineral resources can be grouped in the following four categories:

- Metallic minerals: copper, gold, silver, etc.
- Industrial minerals: bauxite, clay, dolomite, gypsum, limestones, marble, sand and gravel, shale, silica sand, volcanic rocks, etc.
- Fossil fuels: peat, petroleum, etc.
- Semi-precious minerals

The uses of minerals found in Jamaica are shown in the table below.

MINERAL AND MINERAL-BASED PRODUCT	USES
Bauxite	Transportation, Construction; Containers, Consumer durables, Mechanical equipment, Packaging, Pipes and tubes, Refractory and Abrasives, Electrical transmission components, etc.
Gold	Jewellery, Decorative articles, Dentistry, Electronics
Marble	(Geological) Slabs: counter tops, monuments, cladding, furniture, tiles (Commercial) Tiles: flooring, wall
Limestone	(Chemical and Industrial):Industrial lime, Grounded Calcium Carbonate, Precipitated Calcium Carbonate, Quicklime, PVC pipes, Adhesives, Fertilizer Hydrated Calcium Carbonate (calcium hydroxide) (Construction) Aggregates, Construction blocks, Dimension stones Refractory, Agriculture, Environmental
Dolomitic Limestone	Refractory blocks, Iron and steel manufacturing, Magnesium metal, Chemicals
Sand and Gravel	Construction, Filtration, Concrete blocks, Ready mix concrete, Glass, Filler, Abrasives
Volcanic Rocks	Cement , Dimension stone, Construction aggregates, Tiles, Slabs, Cladding material
Bonding Agents	Cement, Grout, Thin-set, Lime-based mortar, Dry wall, Ceiling material, Construction-ready cement mix: cement with sand and gravel
Clay	Tiles, Art work, Ceramics, Drillers' mud, Beauty products.
Gypsum	Construction, Cement, Agriculture, Filler
Shale	Cement
Semi-precious minerals	Jewellery, Decorative articles

APPENDIX III – MINERAL RESOURCES IN JAMAICA

Clay [3]

DEPOSIT TYPE	DEPOSIT LOCATION	PARISH	ESTIMATED RESOURCE (Million Metric Tonnes)
Alluvial Deposit	Frome Plains	Westmoreland	**152.4**
Alluvial Deposit	Black River Valley	St. Elizabeth	**0.508**
Alluvial Deposit	Holland	St. Elizabeth	**0.254**
Alluvial Deposit	Frenchman's	St. Elizabeth	**0.03**
Alluvial Deposit	Cow Market	St. Elizabeth	**0.304**
Alluvial Deposit	Nassau and Essex Valley	St. Elizabeth	**2.54**

[3] Inferred Estimate of Total Clay Resources = 158.9 million metric tones. Source: Bailey, B. V. (1970) Jamaican Clay Deposits, Economic Geology Report, Geological Survey Division.

Alluvial Deposit	Bog Walk	St. Catherine	**2.15**
Alluvial Deposit	Cave Valley	St. Ann	**0.762**
Alluvial Deposit	Liguanea	St. Andrew	**Unknown**
Residual Deposit	Above Rocks	St. Andrew	**Unknown**
Residual Deposit	Golden River	St. Andrew	**0.002**
Hydrothermal Deposit	**Jobs Hill**	**St. Mary**	**0.007**

GYPSUM [4]

DEPOSIT NAME	90% GYPSUM	80% GYPSUM	70% GYPSUM	ANHYDRITE
Brooks	1,299,770 mt	1,524,200 mt	1,645,100 mt	**3,097,400 mt**
Av. Grade	*94.29%*	*92.89%*	*91.66%*	***22.55%***
Bito	1,539,400 mt	2,060,700 mt	2,229, 900 mt	**2,154,600 mt**
Av. Grade	*93.98%*	*92.43%*	*91.22%*	***35.79%***
Halberstadt	3,663,500 mt	3,668, 600 mt	3,688,600 mt	**2,366,900 mt**
Av. Grade	*93.49%*	*93.44%*	*93.44%*	***11.97%***
Total Reserves	**6,502,600 mt**	**7,273,500 mt**	**7,563,600 mt**	7,618,900 mt
Wtd. Av. Grade	93.76%	93.03%	92.39%	**23.00%**
Life (Years)	**33**	**36**	**38**	

[4] Source: Jamaica Gypsum Ltd (Technical Reports – Mines and Geology Division /Jamaica Bauxite Institute) 1957 – 1980. A recent exploration project by a local company has generated information which indicates the presence of a much larger gypsum reserve than stated here.

HEAVY METALS/MINERALS/BLACK SANDS [5]

DEPOSIT NAME	TOTAL SAND ESTIMATE	TOTAL IRON	TOTAL TITANIUM OXIDE
Alligator Pond (Western Extension)	3,356,640 mt	241,678 mt *(7.2%)*	**46,267 mt *(1.4%)***
Alligator Pond (Eastern Extension)	11,249,280 mt	1,723,680 mt *(15.3%)*	**308,448 mt *(2.74%)***
Sand Hill Deposit	1,767,040 mt	277,213 mt *(15.67%)*	**59,194 mt *(3.12%)***
TOTAL	16,372,960 mt	2,242,571 mt	413,909 mt

Additionally, there are some 500,000.00 mt of silica sands in the Hodges, Luana and Punches areas of St. Elizabeth.

CALCAREOUS DOLOMITE/DOLOMITIC LIMESTONE [6]

Known Dolomitic Limestone Resources

DEPOSIT NAME	PARISH	MgO RANGE	$CaCO_3$ RANGE	ESTIMATED RESOURCE
Stewart Bay/White Bay	Trelawny	0.49% - 19.64%	58.94% - 99.33%	**2.632 billion mt**
Port Henderson	**St. Catherine**	**17.99% - 21.7%**	**32.16% - 35.04**	**150 million mt**

[5] Source: Geddes, A.J.S. (1975) Preliminary Study on Black Sands Deposits of Southern Manchester, Mines and Geology Division, Kingston.

[6] Source: Mineral Resources of Jamaica, Bulletin No. 8, 1981, Mines and Geology Division, Kingston. NB: Total dolomite reserves currently unknown.

SKID RESISTANT AGGREGATES [7]

DEPOSIT NAME	DEPOSIT LOCATION	RESERVES
Bito Ramble	St. Andrew/St. Thomas	**122 million metric tonnes (Confirmed)** **Approx. 1 billion metric tonnes (Inferred)**
Lottery	St. James	**12.6 million metric tonnes**
Tom Spring	Hanover	**11.5 million metric tonnes**
Nutfield	**St. Mary**	**14.64 million metric tonnes**

LIMESTONE (CALCIUM CARBONATE - WHITING GRADE)

Total reserves of whiting grade limestone deposits are yet to be completely quantified. An inferred resource estimate of 11.15 billion tonnes of high quality whiting grade limestone is theorized to exist within the island.

LIMESTONE (CALCIUM CARBONATE – CHEMICAL, INDUSTRIAL, METALLURGICAL GRADE)

Total reserves of industrial, chemical and metallurgical grade limestone deposits are yet to be quantified. An inferred resource estimate of 57.5 billion metric tonnes of high quality limestone for chemical, industrial and metallurgical applications is theorized to exist within the island.

[7] Source: Phase 1 - Skid Resistant Aggregates of Jamaica, Bulletin No. 13, Economic Minerals Unit, Mines and Geology Division, Kingston. Total known reserves currently approximately 160 million metric tonnes. N.B: Project ongoing with two other potential reserves being evaluated.

ALLUVIAL SAND AND GRAVEL

DEPOSIT NAME	DEPOSIT LOCATION	ESTIMATED REPLENISHMENT RATE [8]	EXTRACTION RATE (2004)
Rio Minho[9]	Clarendon	24 million mt (extreme flood events) 29.8 million mt (small flood events)	**352,272 mt**
Yallahs[10]	St. Thomas	17.1 million mt (extreme flood events) 24 million mt (small flood events)	**915,002 mt**
Rio Grande	Portland	unknown	**14,348 mt**
Morant River	St. Thomas	unknown	**13,446 mt**
Wagwater River	St. Mary/St. Andrew	unknown	**215,167 mt**
Rio D'Oro	St. Catherine	unknown	**4,334 mt**
Dry River	St. Mary	unknown	**17,796 mt**
Rio Pedro	St. Catherine	unknown	**3,922 mt**
Flint River	**St. Mary**	**unknown**	**1,011 mt**

SUMMARY OF MARBLE DEPOSITS [10]

LOCATION	PARISH	COLOUR	ESTIMATED RESOURCE (mt)
Braziletto	Clarendon	off-white, beige	**50**
Rodon Store	Clarendon	variety of brown, beige	**20**
Thatch Pen	Clarendon	off-white, beige	**4**
Cave Valley	Hanover	off-white, beige, variety of brown	**-**

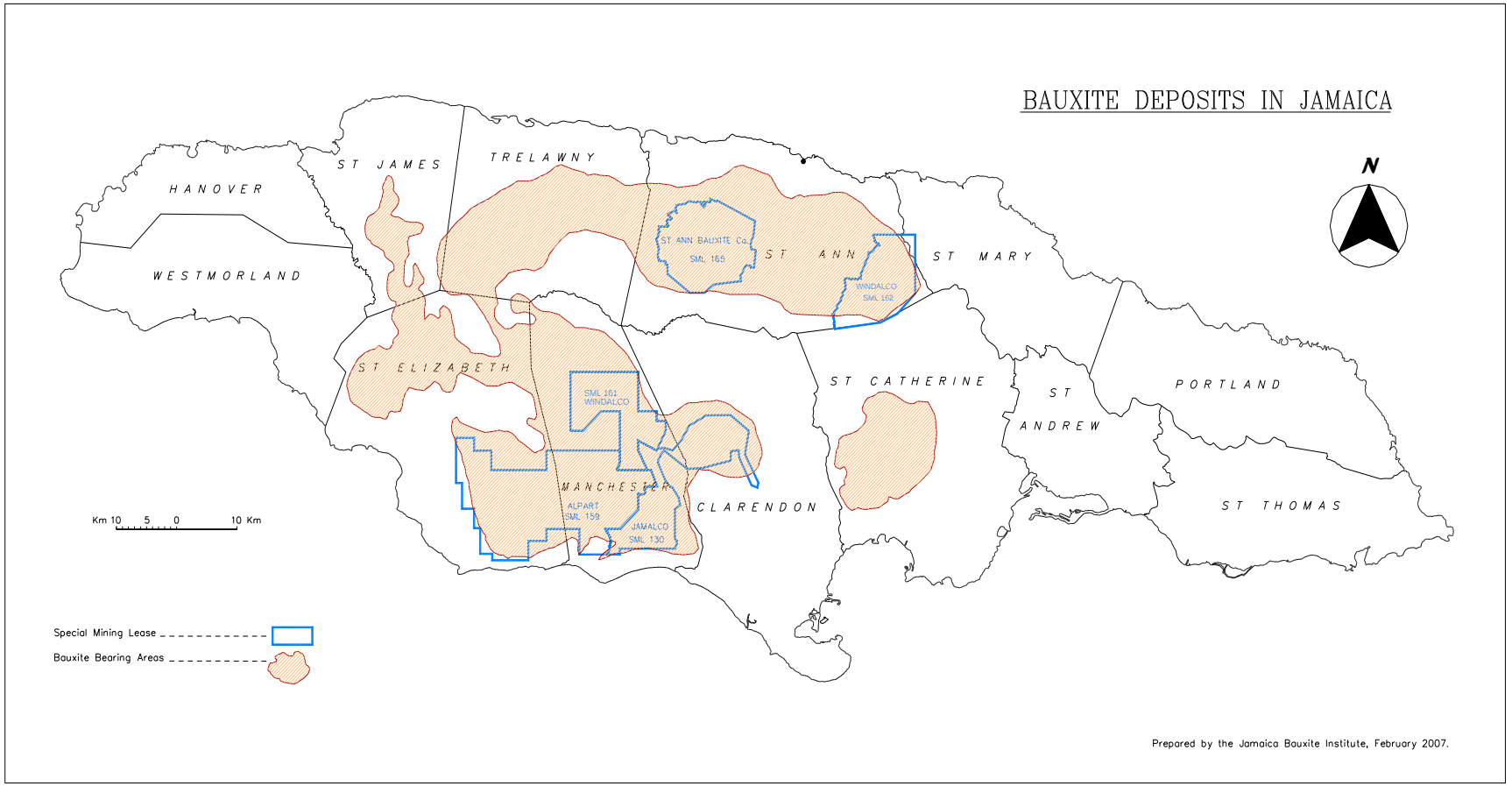
[8] Estimated replenishment rate over a ten year period.

[9] Sediment Budget Resource Estimate (SEBRA) Project, Technical Report, N. Miller, 2004. Source: Mines and Geology Division.

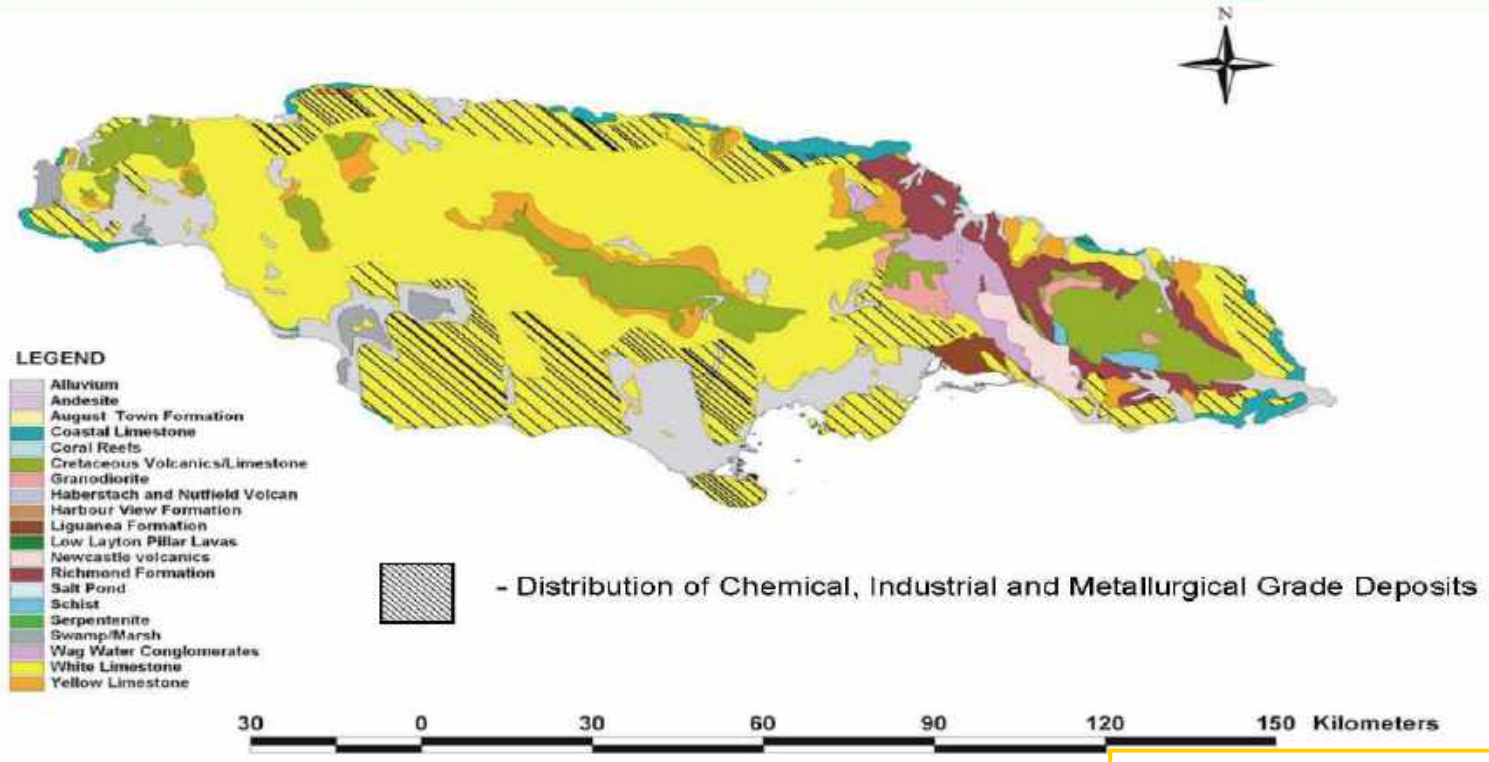
[10] Source: Jamaica Marble, Bulletin No. 12, Mines and Geology Division, 1998.

LOCATION	PARISH	COLOUR	ESTIMATED RESOURCE (mt)
Cuckold Point	Manchester	cream-beige to brown, pink	**50**
Troy	Manchester	cream-beige, pink, brown	**50**
Chepstowe	Portland	grey and black	**10**
Mavis Bank	St. Andrew	white, grey and black	**10**
Lumsden	St. Ann	variety of brown, pink	**5**
Above Rocks	St. Catherine	black and pink "granite"	**-**
Colbeck	St. Catherine	off-white, beige, pink	**20**
Fort Clarence	St. Catherine	off-white, beige	**20**
Hellshire	St. Catherine	off-white, pink, variety of brown	**50**
Paul Mountain	St. Catherine	cream, pink	**10**
Point Hill	St. Catherine	off-white, beige, pink, variety of brown, yellow	**20**
Redground	St. Catherine	variety of brown, yellow, pink	**5**
Flower Hill	St. James	off-white, pink	**5**
Garbrand Hall	St. Thomas	grey, black and green	**10**
Greenfields	St. Thomas	green	**-**
Serge Island	St. Thomas	red and white, green and maroon	**3.5**
Stewart Bay	**Trelawny**	**white and off-white**	**8**

APPENDIX IV – DISTRIBUTION OF MAJOR MINERAL RESOURCES IN JAMAICA

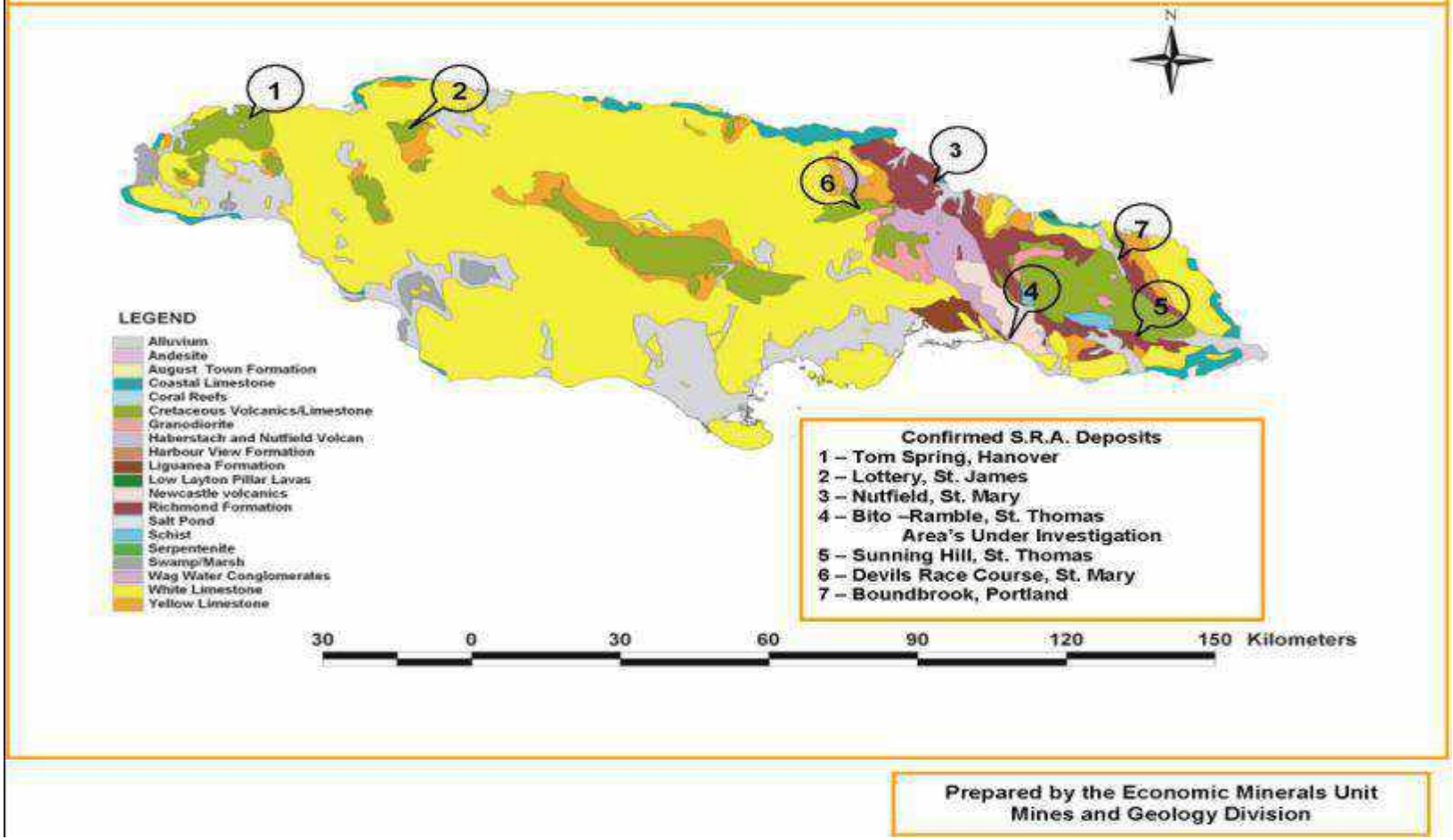


CHEMICAL, INDUSTRIAL, METALLURGICAL GRADE LIMESTONE DEPOSITS



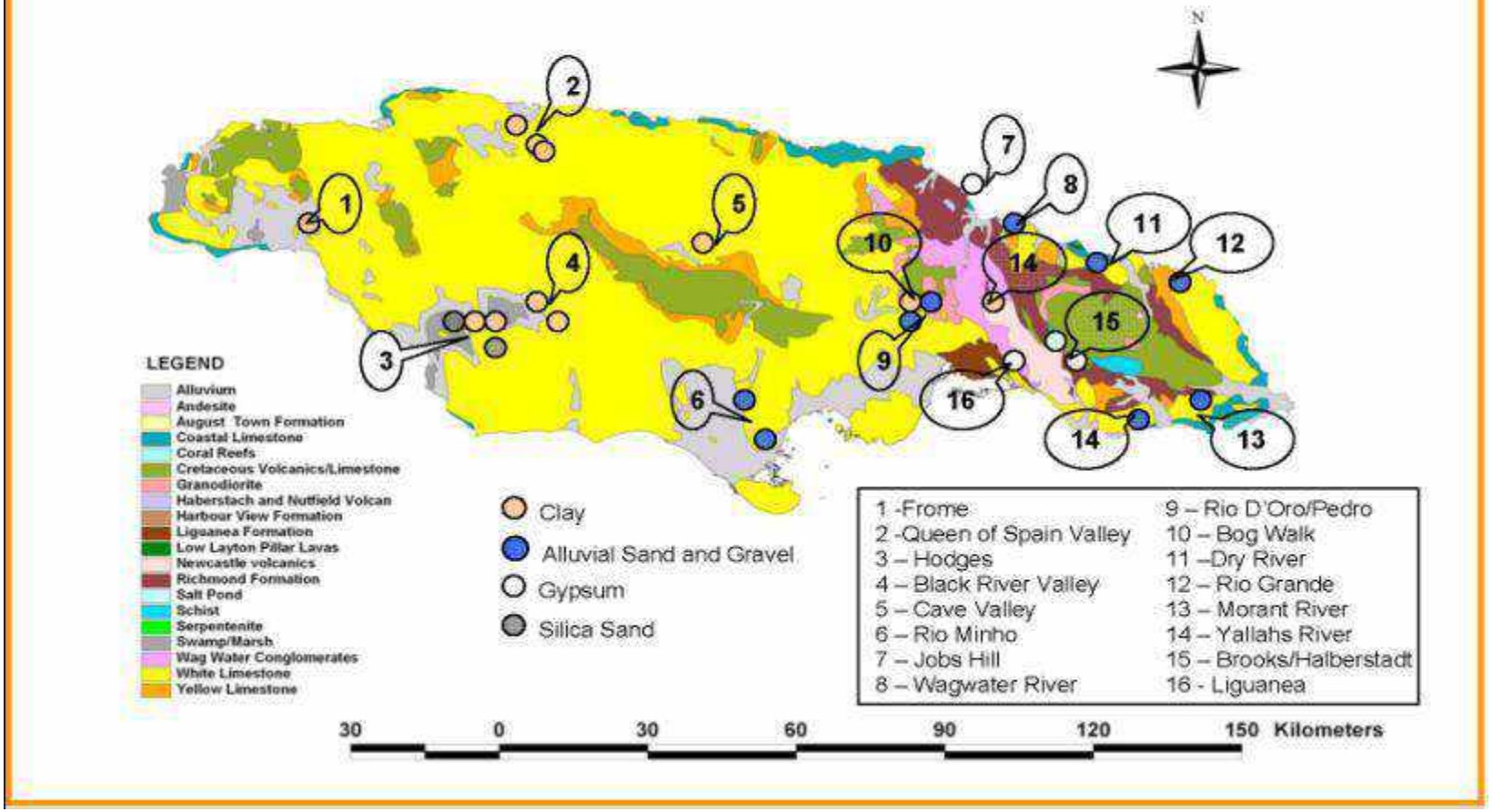
Prepared by

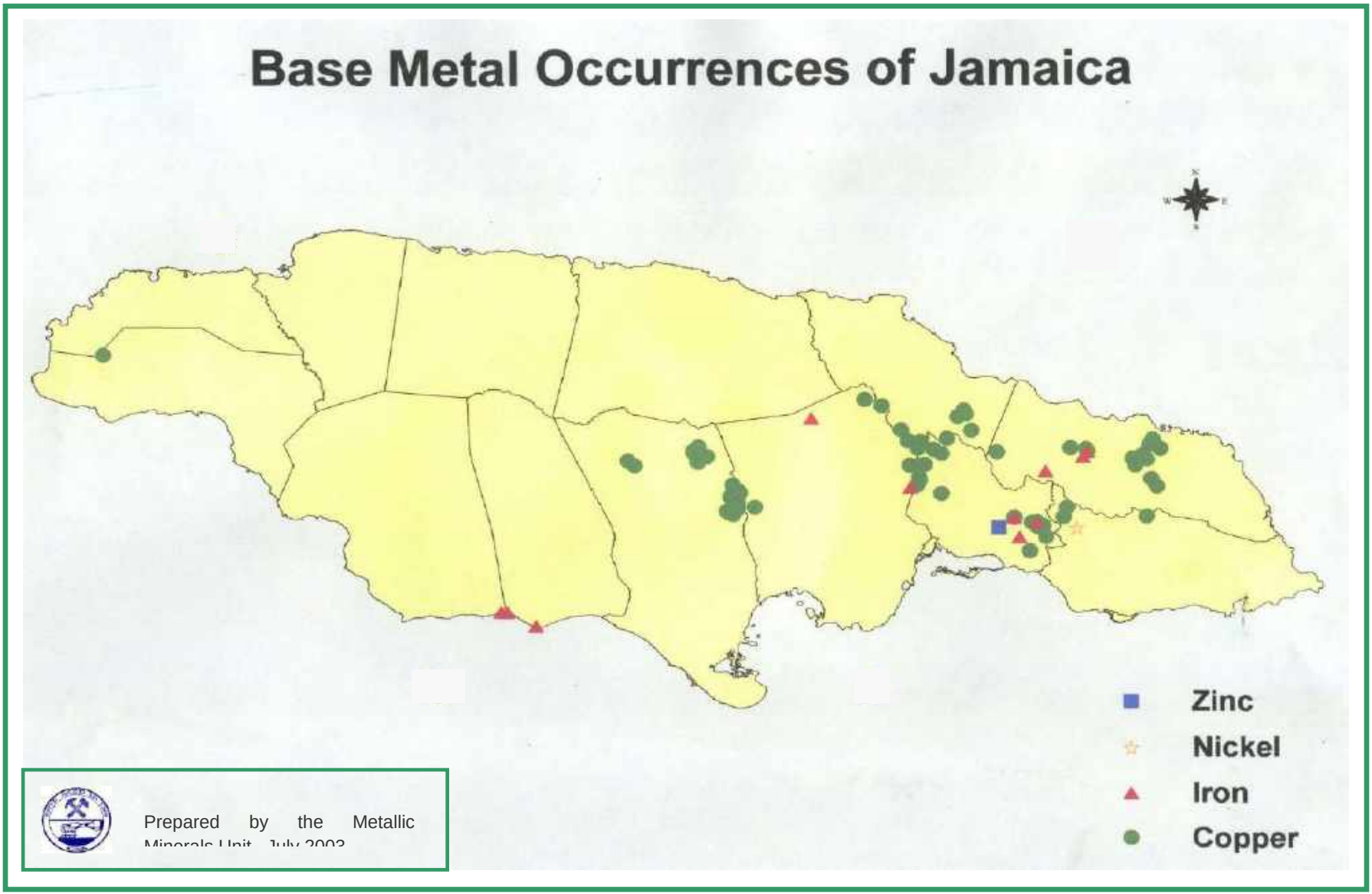
SKID RESISTANT AGGREGATE DEPOSITS IN JAMAICA

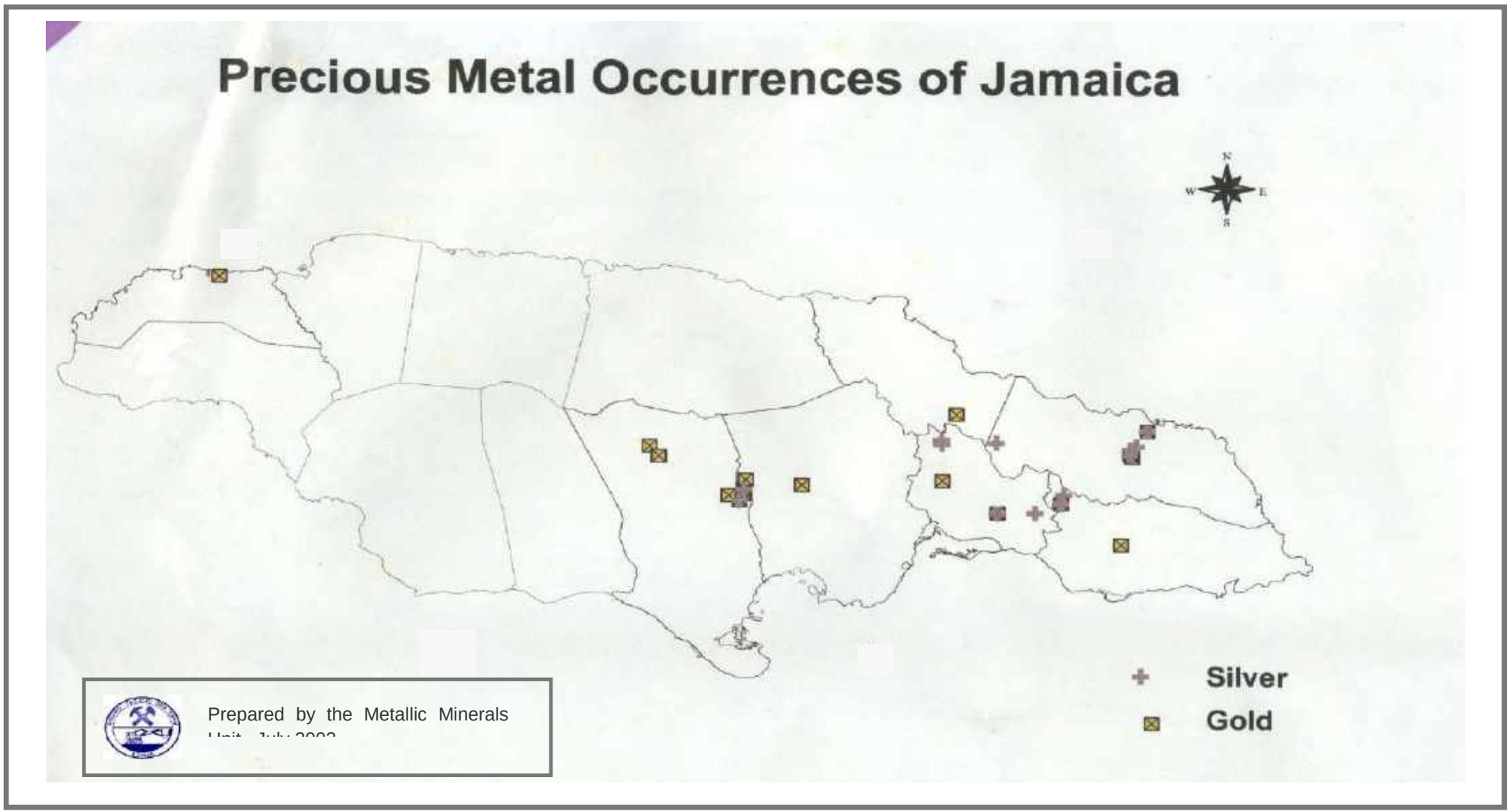


Prepared by the Economic Minerals Unit
Mines and Geology Division

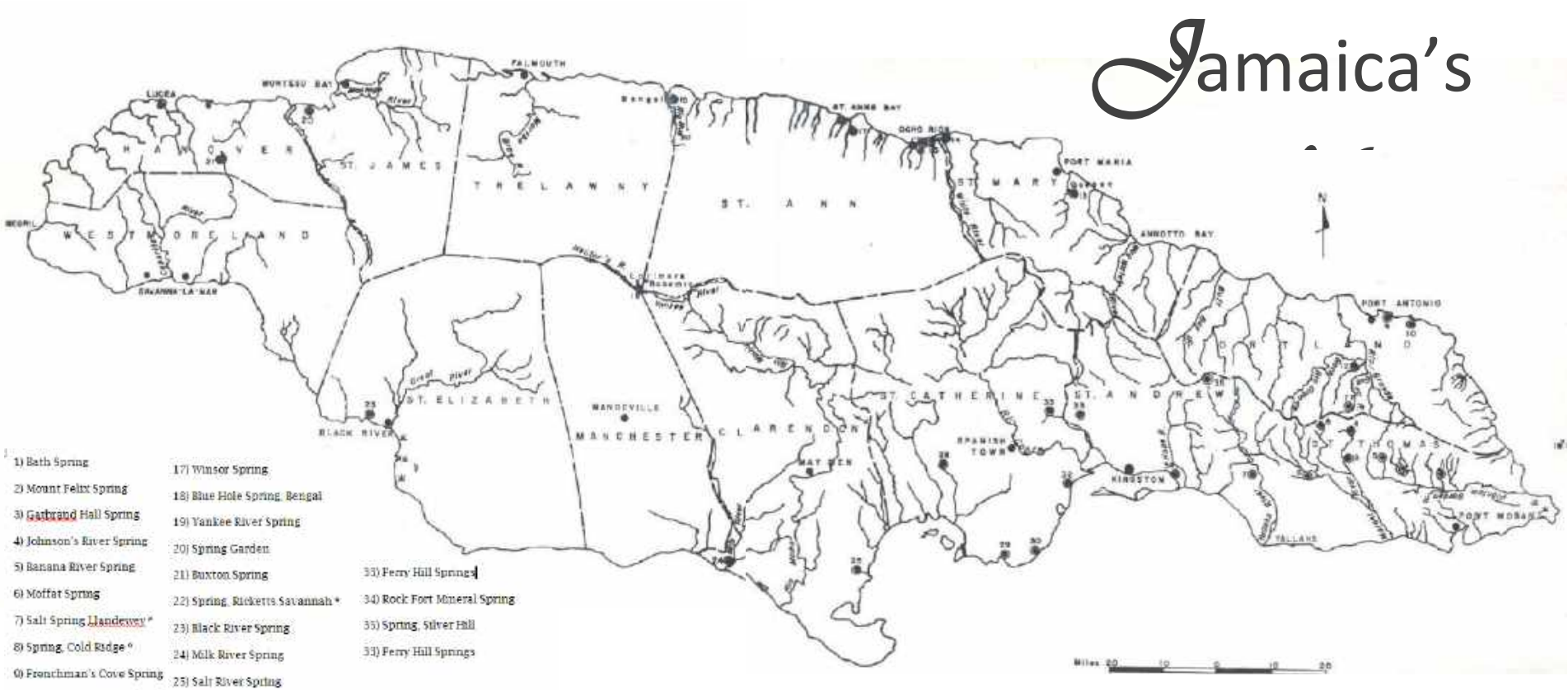
OTHER MAJOR INDUSTRIAL MINERAL DEPOSITS




Base Metal Occurrences of Jamaica
Zinc
Nickel
Iron
Copper
Prepared by the Metallic


Precious Metal Occurrences of Jamaica
N
W
E
S
Silver
Gold
Prepared by the Metallic Minerals

Jamaica's



Source: Mines and Geology Division

The Minerals Springs of Jamaica

APPENDIX V - MEMBERS OF THE NATIONAL MINERALS POLICY WORKING GROUP

Ministry of Energy and Mining	Oral Rainford **(Committee Chairman)**
Ministry of Mining and Telecommunications	Oral Rainford **(Committee Chairman)**
Ministry of Environment and Lands	Oral Rainford **(Committee Chairman)**
Ministry of Mining and Energy	Oral Rainford **(Committee Chairman)**
Ministry of Agriculture & Lands	Oral Rainford, Rohan Richards, Delroy Coley, Cecille Blake, Mohini Kiswani, Claudette Hall
Ministry of Agriculture & Fisheries	Tasha Nembhard
Forestry Department	Marilyn Headley
Ministry of Local Government	Rollin Alveranga, Leonie Barnaby, Lorna Perkins, Donna Blake
Ministry of Industry, Technology, Energy and Commerce	Conroy Watson
Ministry of Tourism, Entertainment and Culture	Althea Johnson, Tina Williams
Ministry of Housing, Transport, Water and Works	Melissa Nangle, Doreen Prendergast, Shernette Simpson
Ministry of Finance and Planning	Pauline Gregory-Lewis, Richard Murray, Shauna Trowers, Verdayne Wallace
Ministry of Finance and the Public Service	Sophia Lindsay
National Environment and Planning Agency	Betsy Bandy, Vivian Blake, K. Bradshaw, Tameka Clough, Gilroy English, Kirk Haughton, Andrea Jones-Bennett, Gina Sanguinetti-Phillips,
Mines and Geology Division	Clinton Thompson, Leighton Williams, Trevor MaCain, Ronald Edwards, Laurence Henry, Coy Roache
Jamaica Bauxite Institute	Yolanda Drakapoulos, Sonia Mitchell, Dianne Gordon, Ciaron Walker, Shanti Persaud
Petroleum Corporation of Jamaica	Gavin Gunter
Ministry of Transport and Works	Shernette Sampson
Ministry of Health	A. Graham
Ministry of Foreign Affairs and Foreign Trade	Deon Williams
Forestry Department	Owen Evelyn, Susan Watson
Rural Physical Planning Division	Vincent Campbell, Marvell Gray
Office of the Cabinet	Peter Myers, Jacqueline daCosta, Ann-Marie Bonner
Office of the Prime Minister (Ministry of Development)	Arlene Nelson, Joy Douglas (Highway 2000 Development Project), Sonia Hyman, Wayne Robertson
Planning Institute of Jamaica	Peter-Anne Donaldson, Christine Duncan, Richard Kelly
Water Resources Authority	Basil Fernandez, Lawrence Barrett
Statistical Institute of Jamaica	Janet Geoghagan-Martin, Philone Mantock
National Investment Bank of Jamaica	Beverley Robinson

Jamaica Trade and Invest (JAMPRO)	Ruth Crooks, Robert Kerr, Camille Savage, Ricardo Durrant
National Land Agency	Donovan Hayden
National Works Agency	Errol Mortley
Jamaica Constabulary Force	Keith Gardner, Charles Simpson
Jamaica Bauxite Mining Limited	Coy Roache, Bridget Spaulding
Bureau of Standards Jamaica	Hopeton Brown
Rugby Jamaica Lime & Minerals Limited	Norman Davis
Private Sector Organisation of Jamaica	Eleanor Jones
Mining and Quarrying Association of Jamaica	Anthony Morgan, Godfery Perkins, Keith Scott, Harry Ince, Norman Davis, Jennifer Ince
Incorporated Master Builders Association	Patrick Gordon
Alpart Mining Venture	Glen Lynagh, Frank Ross
Mining Engineering Associates	Audley Roberts
Quarries Advisory Committee	Carl Thomas, Godfrey Perkins, Ronal Edwards, Coy Roache, Oral Rainford, Clinton Thompson, Authur Geddes
JAMALCO	Christopher Bovell, Timothy O'Driscoll, Candice Stewart
Jamaica Premix	Donovan Matthews
Silica Mining and Engineering Limited	Harry Ince, Jennifer Ince
West Indies Alumina Company	Locksley Allen
Jamaica Institute of Environmental Professionals	Denise Forrest
Somerset Enterprises Limited	William W. Powell, Albert Powell
Michael Black Limited	Marjorie Paul
Shaw's Quarry	Michelle Shaw

APPENDIX VI

SUSTAINABLE DEVELOPMENT AND THE MINERALS SECTOR

Sustainable development is one of a range of ideas about how humans should best interact with each other and the biosphere. Considering its importance in modern society and its possible impact on the environment, the minerals industry internationally has adopted the Brundtland definition of sustainable development: *"…development that meets the needs of the present without compromising the ability of future generations to meet their own needs".*

To harness this commitment within a strategic framework, the International Council on Mining and Metals (ICMM) adopted a set of sustainable development principles in May 2003 which pledged the international industry, including the industry in Jamaica, to:

1. Implement and maintain ethical business practices and sound systems of corporate governance.
2. Integrate sustainable development considerations within the corporate decision-making process.
3. Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities.
4. Implement risk management strategies based on valid data and sound science.
5. Seek continual improvement of our health and safety performance.
6. Seek continual improvement of our environmental performance.
7. Contribute to conservation of biodiversity and integrated approaches to land use planning.
8. Facilitate and encourage responsible product design, use, re-use, recycling and disposal of our products.
9. Contribute to the social, economic and institutional development of the communities in which we operate.
10. Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.

Viability of the Minerals Industry.

The minerals industry cannot contribute to sustainable development if companies cannot survive and succeed. This requires a safe, healthy, educated, and committed work force; access to capital; a social licence to operate; the ability to attract and maintain good managerial talent; and the opportunity for a return on investment.

The Control, Use, and Management of Land.

Mineral development is one of a number of often competing land uses. There is frequently a lack of planning or other frameworks to balance and manage possible uses. As a result, there are often problems and disagreement around issues such as compensation, resettlement, land claims of indigenous peoples, and protected areas.

Minerals and Economic Development.

Minerals have the potential to contribute to poverty alleviation and broader

economic development at the national level. Countries have realized this with mixed success. For this to be achieved, appropriate frameworks for the creation and management of mineral wealth must be in place. Additional challenges include corruption and determining the balance between local and national benefits.

Local Communities and Mines.

Minerals development can also bring benefits at the local level. Recent trends towards, for example, smaller work forces and outsourcing affect communities adversely, however. The social upheaval and inequitable distribution of benefits and costs within communities can also create social tension. Ensuring that improved health and education or economic activity will endure after mines close requires a level of planning that has too often not been achieved.

Mining, Minerals, and the Environment.

Minerals activities have a significant environmental impact. Managing these impacts more effectively requires dealing with unresolved issues of handling immense quantities of waste, developing ways of internalizing the costs of acid drainage, improving both impact assessment and environmental management systems, and doing effective planning for mine closure.

An Integrated Approach to Using Minerals.

The use of minerals is essential for modern living. Yet current patterns of use face a growing number of challenges, ranging from concerns about efficiency and waste minimization to the risks associated with the use of certain minerals. Companies at different stages in the minerals chain can benefit from learning to work together

Viability of the Minerals Industry

The greatest challenge to embedding sustainable development in minerals companies is the difficulty of linking the concept to financial success. Most companies are struggling to establish a clear business case for pursuing this path. There is indeed a business case for addressing sustainable development concerns: lower labour and

health costs, improved access to lenders and insurers, lower post-closure costs, and often reputational and market advantage.

Some companies are undertaking specific measures to integrate the principles of sustainable development into corporate practice, but most are far from developing a detailed vision. Several tools are commonly used, including corporate strategy and policy, change management programmes, formal risk management procedures, implementation and auditing of internal objectives and targets, project appraisals, and core staff

Minerals and Economic Development

Minerals development is hard to justify if it does not bring economic benefits, particularly to countries and regions that lack alternative sources of development and are otherwise unattractive to foreign investors. In addition to gaining hard currency from taxes and royalties, benefits from mineral development should include employment, infrastructure such as roads and hospitals, linkages upstream to industries that supply goods and services or downstream to industries that process mineral outputs, and technology transfer.

In some countries, however, mineral activities have not brought sustained economic development. Sudden wealth may have detrimental effects on social and political life, leading to or supporting corruption, authoritarian government, human rights abuse, or armed conflict.

Source:

International Institute for Environment and Development and World Business Council for Sustainable Development. 2002. *Breaking New Ground - The Report of the Mining, Minerals and Sustainable Development Project*. London: Earthscan Publications Limited

APPENDIX VII

SCHEDULE OF PUBLIC CONSULTATIONS AND LIST OF PARISHES AND ENTITIES THAT WERE INVOLVED IN THE ISLAND-WIDE PUBLIC CONSULTATIONS ON

THE DRAFT NATIONAL MINERALS POLICY IN 2008

PARISH	VENUE	LOCATION	DATE	TIME	REMARKS
ST. THOMAS	Yallahs Baptist Church	Yallahs	Oct. 2, 2008	4:00 p.m.	HELD
ST. ELIZABETH	St. Elizabeth Technical High School	Santa Cruz	Oct. 30, 2008	5:00 p.m.	HELD
	ALPART Sports Club	Nain	Nov. 27, 2008	10:00 a.m.	HELD
MANCHESTER Central Manchester	Ridgemount United Church	Mandeville	Nov. 3, 2008	5:00 p.m.	HELD
South Manchester	Porus Community Centre	Porus	Nov. 27, 2008	5:00 p.m.	HELD
CLARENDON Hayes	Vere Technical High School	Hayesl	Nov. 12, 2008	5:00 p.m.	HELD
Mocho Area	Lennon High School	Mocho	Nov. 13, 2008	5:00 p.m.	HELD
KINGSTON	Hilton Hotel	New Kingston	Dec. 4, 2008	5:00 p.m.	HELD

	Ballroom				
ST. ANN	Brown's Town Anglican Church	Brown's Town	Nov. 26, 2008	5:00 p.m.	HELD
ST. CATHERINE	Ewarton Community Centre	Ewarton	Dec. 3, 2008	5:00 p.m.	HELD
ST. MARY	St. Theresa Catholic Church Hall	Annotto Bay	Dec. 8, 2008	5:00 p.m.	HELD
WESTMORELAND	Wesley Methodist Church	Savanna-La-Mar	Dec. 11, 2008	5:00 p.m.	HELD

REPRESENTATIVES OF THE FOLLOWING ENTITIES PARTICIPATED IN THE ISLAND-WIDE PUBLIC CONSULTATIONS IN 2008

1. Ministry of Mining and Telecommunications
    i. Hon. Laurence Broderick, Minister of State
    ii. Jamaica Bauxite Institute (JBI)
    iii. Jamaica Bauxite Mining Limited / Bauxite and Alumina Trading Company (JBM/BATCO)
    iv. Mines and Geology Division (MGD)
2. National Environment and Planning Agency (NEPA)
3. Forestry Department
4. JAMALCO Bauxite Company and Alumina Refinery
5. Mining and Quarrying Association of Jamaica (MAQJ)
6. Northern Jamaica Conservation Association (NJCA)
7. Manchester Parish Development Committee
8. St. Ann Parish Council

9. Westmoreland Chamber of Commerce
10. Social Development Commission
11. Mocho Citizens Association
12. St. Thomas Parish Development Committee
13. Windsor Research Centre
14. ALPART Council of Community Councils
15. ALPART
16. Petroleum Corporation of Jamaica
17. Jamaica Trade and Invest / JAMPRO
18. Thompson Town Anglican Church
19. Lennon High School
20. Mocho Tourism Committee
21. Osbourne Store Primary School
22. Mocho Community Development Council
23. Porus Community Development Council
24. Rocky Point Citizens Association
25. Corn Piece Citizens Association
26. E. B. Singh and Sons Limited
27. Sha-Gore Aggregates Limited
28. Maston Company Limited
29. Salt River Citizens Association, Clarendon
30. Chemical Lime Quarry
31. Jamaica Information Service
32. Clarendon Parish Development Committee
33. Mr. Winston Maragh – Councillor, Rocky Point Division
34. Island Special Constabulary Force
35. Mr. Luther Buchanan - Member of Parliament, Eastern Westmoreland
36. Jamaica Red Cross

37. Wesley Methodist Church
38. Green Produce Farm Limited
39. Clarke's Quarry
40. Brown's Town Primary School
41. St. Mark's Church
42. Midland Ranch
43. Marcus and Bob Community League
44. Explosives Sales and Services Limited
45. The Gleaner Company Limited
46. CEMEX Jamaica Limited
47. Jamaica Environment Trust
48. St. Thomas Environmental Protection Agency
49. Michael Black Limited
50. Mincenco Limited
51. Irie FM
52. Caribbean Cement Company Limited
53. Carib Stone Industry Limited
54. Paul Mountain Quarry
55. PowerGen Limited
56. Office of the Prime Minister
57. Optimist Club of Cane River
58. National Water Commission
59. Environmental Solution Limited
60. Sunbeam Basic School
61. Llandewey Community Development Council
62. Excel Youth Club
63. Yallahs Primary School
64. Aeolus Valley All Age School Parent Teacher Association

65. Ogilvie's Quarry
66. Southhaven Citizens Association
67. Scott's Pass Development Committee
68. Porus Craft and Agriculture Association
69. Spring Grove United Youth Club
70. Porus Community Development Council
71. Restaurant Owken
72. Ewarton Community Committee
73. Cross Roads Citizen Association
74. US Peace Corps / ECOPAC
75. Mrs. Beverly R. Jobson – Councillor, Ewarton Division
76. Whitehouse Citizens Association
77. Jamaica Aggregates Limited
78. Annotto Bay Health and Environmental Association
79. Annotto Bay Baptist Church
80. Mr. Tarn Peralto – Member of Parliament, South East St. Mary
81. Dr. Maurice Guy - Member of Parliament, Central St. Mary
82. Enfield Citizens Association
83. Jamaica National Building Society
84. Cameron Quarry
85. Santa Cruz Police Youth Club
86. St. Elizabeth Technical High School
87. St. Elizabeth Community Development Fun
88. Manchester Environment Protection Association
89. Mr. Goyfield Harrison – Councillor, Knockpatrick Division
90. Manchester High School
91. Mandeville Police Youth Club
92. Manchester Development Area Committee

93. Asia Development Committee

94. Central Manchester Retirement Citizens Association

95. Trevor Dunkley & Company

96. Sangster and Walter Mining Company

97. Knox Community College

98. Java District Citizens Association

Written comments were also received from the following persons who were unable to attend the consultations:

1. Mr. Learie Miller, Planning & Urban Design Dept., Town of Markham, Ontario, Canada

2. Mr. Craig Foreman

3 Ms. Claudette Hall, Land Administration and Management Division, Office of the Prime Minister.

The following entities were also represented at a high-level inter-government agency 'after public consultations' consultation on April 2, 2009:

1.	Ministry of Mining and Telecommunications:	Mrs. Marcia Forbes (Permanent Secretary), Mr. Oral Rainford, Mr. Clinton Thompson, Mr. Robert Royer
2.	Port Authority of Jamaica:	Captain Hopeton Delisser and Mr. E. Marsh
3.	National Works Agency:	Mr. Roger Smith, Mr. Mark Richards
4.	Ministry of Industry, Investment and Commerce:	Mr. Douglas Webster, Ms. Deirdre Salmon
5.	Cabinet Office:	Mr. Peter Myers
6.	Jamaica Bauxite Institute:	Mr. Parris Lyew-Ayee, Dr. Phillip Baker Mrs. Sonia Mitchell, Mrs. Dianne Gordon,
7.	Jamaica Bauxite Mining Limited:	Mr. Coy Roache
8.	Quarries Advisory Committee:	Mr. Harold Brady
9.	Ministry of Water and Housing:	Ms. Melissa Nangle
10.	Ministry of Finance and the Public Service:	Ms. Rose-Marie Smith
11.	Office of the Prime Minister:	Mr. Orlan Simpson

12.	Ministry of Tourism:	Mr. Osbourne Chin, Ms. Tina Williams
13.	Planning Institute of Jamaica:	Mr. Richard Kelly
14.	Ministry of Agriculture and Fisheries:	Ms. Stacy Rose
15.	Ministry of Transport and Works:	Ms. Monifa Blake

APPENDIX VIII

EXISTING LEGISLATION IMPACTING THE MINERALS SECTOR

The main pieces of legislation governing the minerals sector are the Mining Act, the Quarries Control Act and their Regulations, the Minerals (Vesting) Act, and taxation and incentive legislation for the Bauxite and Alumina Industries. However, there are several other statutes that influence mineral exploitation in Jamaica. The most important of them are listed below.

Mining Legislation

The Minerals (Vesting) Act

The Mining Act

The Mining Regulation

The Petroleum Act

The Quarries Control Act

The Quarries General Regulations

Land Use Legislation

Crown Property (Vesting) Act

Land Acquisition Act

Land Development and Utilization Act

Local Improvements Act

Town and Country Planning Act

Environmental Legislation

Beach Control Act

Endangered Species Act

National Solid Waste Management Authority Act

Natural Resources Conservation Authority Act

Air Quality Regulations

Public Health Act

The Forest Act

The Jamaica National Heritage Trust Act

Watersheds Protection Act

Taxation Legislation

Customs Act

General Consumption Act

Harbour Fees Act

Income Tax Act

Land Taxation (Relief) Act

Land Valuation Act

Property Tax Act

Stamp Duty Act

The Bauxite (Production Levy) Act

The Bauxite and Alumina Industries

Water Resources Act

Wildlife Protection Act

Other Operating Statutes

Foreign Nationals and Commonwealth Citizens (Employment) Act

Labour Relations and Industrial Disputes Act

Shipping Act

Standards Act

The Caribbean Community and Common Market Act

The Cargo Preference Act

The Export Industry (Encouragement) Act

The Free Zone Act

Wharfage Act

(Encouragement) Act

The Bauxite and Alumina Industries (Special Provisions) Act

The Cement Industry (Encouragement and Control) Act

Transfer Tax Act

International Agreements

Free Trade Area of the Americas (FTAA)

World Trade Organization Agreement

European Partnership Agreement

CARICOM

APPENDIX IX

REFERENCES

Bailey, B. V. 1970. *Jamaican Clay Deposits*. Economic Geology Report. Kingston: Geological Survey Division, Government of Jamaica

Geddes, A.J.S. 1975. *Preliminary Study on Black Sands Deposits of Southern Manchester.* Kingston: Mines and Geology Division, Government of Jamaica

Government of Jamaica. 1997. Policy for the National System of Protected Areas. Kingston: Natural Resources Conservation Authority

International Institute for Environment and Development and World Business Council for Sustainable Development. 2002. *Breaking New Ground - The Report of the Mining, Minerals and Sustainable Development Project*. London: Earthscan Publications Limited

International Organisation for Standardization (ISO)/International Electrotechnical Commission (IEC) 17000: 2004, Geneva

Jamaica Gypsum Limited. 1980. Technical Reports – MGD/JBI: 1957 – 1980. Kingston: Jamaica Gypsum Limited

Mine Monitoring Unit. 2000. *Mining and the Economy*. Kingston: Ministry of Mining and Energy, Government of Jamaica

Minerals Policy and Development Division. 2006. *A Programme to Develop the Industrial Minerals Sector:*

Integration with the Bauxite and Alumina Sector and other Sectors of the Economy. Kingston: Ministry of Agriculture and Lands, Government of Jamaica

Mines and Geology Division. 2004. *Sediment Budget Resource Estimate (SEBRA) Project. Technical Report*. Kingston: Ministry of Land and Environment, Government of Jamaica

Mines and Geology Division. 1998. *Jamaica Marble, Bulletin No. 12*. Kingston: Mines and Geology Division, Government of Jamaica

Mines and Geology Division. 1981. *Mineral Resources of Jamaica, Bulletin No. 8*. Kingston: Mines and Geology Division, Government of Jamaica

Mines and Geology Division Phase 1 - Skid Resistant Aggregates of Jamaica, Bulletin No. 13, Economic Minerals Unit, Kingston

Minister of Public Works and Government Services Canada. 1996. *The Minerals and Metals Policy of the Government of Canada: Partnerships for Sustainable Development*. Ottawa: Ministry of Natural Resources Canada

Ministry of Local Government and Environment. 2006. *Watershed Policy for Jamaica (Final Draft).* Kingston: Ministry of Local Government and Environment

Planning Institute of Jamaica. 2009. *Economic and Social Survey Jamaica 2007*. Kingston: Planning Institute of Jamaica

Planning Institute of Jamaica. 2007. *Economic and Social Survey Jamaica 2005*. Kingston: Planning Institute of Jamaica

Planning Institute of Jamaica. 2005. *Economic and Social Survey Jamaica 2004*. Kingston: Planning Institute of Jamaica

Planning Institute of Jamaica. 2004. *Economic and Social Survey Jamaica 2003*. Kingston: Planning Institute of Jamaica

Statistical Institute of Jamaica. 2005. *National Income and Product 2004*. Kingston: Planning Institute of Jamaica