BUSINESS PLAN

For

OPERATIONALIZATION

OF

KHYBER PAKHTUNKHWA MINERALS DEVELOPMENT AND MANAGEMENT COMPANY LIMITED (KP-MDMCL)

(A Public Limited Company formed under the relevant provisions of the Companies Act, 2017)

Submitted to

MINERALS DEVELOPMENT DEPARTMENT
Government of Khyber Pakhtunkhwa

ICAEW AUTHORIZED TRAINING EMPLOYER

IECnet S.K.S.S.S
CHARTERED ACCOUNTANTS

IFC International Finance Corporation WORLD BANK GROUP

AFFILIATED ASSOCIATED ENTITIES

IECnet Consulting (Pvt) Limited
Management Consultants

SHAHID AHMAD & CO
CHARTERED ACCOUNTANTS

INTEGRA
Integra Consulting (Pvt) Limited
Digital Transformation Consultants

August-2025

KP-MDMCL's business plan outlines a transformative initiative aimed at revolutionizing the mineral sector in Khyber Pakhtunkhwa (KP). It presents a detailed roadmap to tap into the province's vast untapped mineral resources through responsible, structured and innovative practices. Key principles include environmental sustainability, economic inclusivity and compliance with international best practices, positioning KP as a leader in responsible mineral development.

Unlocking Khyber Pakhtunkhwa's Mineral Wealth: A Strategic Roadmap for Sustainable Development

A Path to Harness Khyber Pakhtunkhwa's Natural Resources for Sustainable Growth and Economic Resilience

DISCLAIMER

This Business Plan has been prepared solely for informational and internal planning purposes. The information, analysis, and projections are based on current knowledge, assumptions and preliminary assessments which may change. This Report contains forward-looking statements and projections that are not guarantees of future performance and are subject to known and unknown risks & uncertainties. No representation or warranty,express or implied, is made as to the completeness or reliability of the information, which has not been independently verified. The Company, its authors, advisors, and affiliates disclaim all liability for any loss or damage from reliance on this Report. The reader is advised that this Report does not constitute an offer, invitation or recommendation and should not be used as the sole basis for making any business, investment or strategic decisions; independent due diligence is the responsibility of the reader.

Table of Contents

ACRONYMS

AGM – Annual General Meeting

ASTM – American Society for Testing and Materials

BoD – Board of Directors

BS – British Standards

CEO – Chief Executive Officer

CFO – Chief Financial Officer

CIA – Chief Internal Auditor

CPEC – China–Pakistan Economic Corridor

CSR – Corporate Social Responsibility

CS – Company Secretary

EIA – Environmental Impact Assessment

EPA – Environmental Protection Agency

ESG – Environmental, Social and Governance

ESIA – Environmental and Social Impact Assessment

FDI – Foreign Direct Investment

GoKP – Government of Khyber Pakhtunkhwa

GSP – Geological Survey of Pakistan

HR – Human Resources

ISO – International Organization for Standardization

IoT – Internet of Things

JVs – Joint Ventures

KPI – Key Performance Indicator

KPIs – Key Performance Indicators

KP-MDMCL – Khyber Pakhtunkhwa Minerals Development and Management Company Limited

KPPRA – Khyber Pakhtunkhwa Public Procurement Regulatory Authority

LTIFR – Lost Time Injury Frequency Rate

MDD – Minerals Development Department

MIZs – Mineral Investment Zones

P&D – Planning and Development

PSX – Pakistan Stock Exchange

ROI – Return on Investment

R&D – Research and Development

SECP – Securities and Exchange Commission of Pakistan

SMT – Senior Management Team

SECTION-I

EXECUTIVE SUMMARY

Unlocking Khyber Pakhtunkhwa's Mineral Wealth Through Strategic Development
A Comprehensive Roadmap for Sustainable Exploration, Mining, value addition, Innovation and Investment

This 'Business Plan' outlines a strategic & professional approach for KPMDMCL to overcome the initial challenges and establish itself as a key driver of mineral sector development in Khyber Pakhtunkhwa. The plan also establishes a comprehensive roadmap designed to unlock the province's significant untapped mineral potential through responsible, structured and innovation-driven approaches. Grounded in principles of environmental sustainability, economic inclusivity and responsible stewardship, this document provides a clear and actionable framework to modernize the KP's mineral economy from traditional, fragmented extraction methods to a contemporary, investment-ready sector that adheres to Environmental, Social and Governance (ESG) standards and international best practices.

About KP-MDMCL

KP-MDMCL is a state-owned public limited company established to serve as the province's primary vehicle for mineral exploration, resource management and investment facilitation. Operating with potential nationwide scope, KP-MDMCL has been constituted with a focused mandate to enhance the commercial viability of Pakistan's mineral sector, strengthen strategic public-private partnerships and establish an institutional framework capable of delivering large-scale mineral development projects with transparency, operational efficiency and measurable socio-economic impact.

Vision and Strategic Direction

Under guidance of Minerals Development Department (MDD), Government of Khyber Pakhtunkhwa (GoKP) the provincial mineral development vision centres on 'responsible resource development'. This vision encompasses unlocking KP's substantial geological potential to drive socio-economic advancement while ensuring environmental sustainability, regulatory compliance and equitable regional growth. The MDD envisions developing a mineral sector that generates significant revenue streams and employment opportunities while uplifting economically disadvantaged regions and contributing to Pakistan's broader economic resilience and diversification.

Operational Excellence Framework

The strategic approach as aforesaid, emphasizes deployment of advanced digital exploration technologies including drone-based LiDAR mapping, mechanized mining operations, comprehensive capacity building programs and strict adherence to ESG-compliant operational frameworks. All operations are suggested to be designed with full integration of existing data from GSP and Mineral development department seeking technical expertise, ensuring geological validation and regulatory compliances.

Strategic Areas of Focus for KP-MDMCL

The company will undertake projects in the following areas, prioritizing direct investment while also considering strategic joint ventures (JVs) after necessary due diligence. A dedicated mineral development fund will enable this direct investment approach.

Exploration

Being the core function of the company, KP-MDMCL will strategically undertake investment in most viable exploration projects to identify and develop new mineral assets.

1. *Direct Exploration Projects: The company will initiate and manage its own large-scale exploration projects. This includes conducting detailed geological surveys, core drilling and resource modeling using modern geospatial, geophysical, drilling tools and software.*
2. *Joint Exploration Ventures: Strategic partnerships with existing private leaseholders will also be considered to conduct targeted exploration. The company's investment can take the form of capital and technical expertise, with returns structured as share of future production or profits.*
3. *Data Validation and Modernization: KP-MDMCL will invest in advanced detailed geological mapping and resource assessment technologies to create a modern, reliable mineral database for the province. This data will be offered as a service to potential investors, generating revenue and improving the overall investment climate.*

Mining

KP-MDMCL will directly own and operate mining projects, while also using joint ventures to improve efficiency in the sector.

1. *Direct Mining Operations: The company will acquire and operate its own mines, leveraging the mineral development fund to invest in modern, mechanized equipment. This approach allows KP-MDMCL to control the full value chain from extraction to processing.*
2. *Joint Ventures for Mechanized Mining: KP-MDMCL can form JVs with private leaseholders who lack the capital for modern equipment. The company will invest its capital to purchase and deploy state-of-the-art machinery and, in return, will receive a pre-negotiated share of the output or profits. This model addresses the issue of inefficient, manual mining operations.*

Processing

KP-MDMCL will directly own and operate processing and value addition projects, for key minerals.

1. *Processing and refinement are critical for unlocking the true value of minerals. KP-MDMCL will make a significant impact by investing directly in these facilities.*
2. *Establishment of Common Processing Facilities: KP-MDMCL will invest in and establish centralized processing plants for key minerals such as marble, granite, or industrial minerals. These facilities will not only serve the company's own projects but will also offer services to multiple private leaseholders for a fee. This promotes value-added production within the province and moves beyond the simple extraction and export of raw materials.*

3. *Gemstone Cutting, Polishing and Certification Centers: The province is rich in gemstones. A dedicated, modern facility for cutting, polishing and certifying gemstones as per international standards (like Gemological Institute of America) would be a high-value investment. This would elevate the value of local products and establish a reputable "Made in KP" brand for gemstones in the international market.*

Value-Added Services and Equipment Rentals

This area offers immediate revenue streams and helps embed KP-MDMCL as a key partner in the sector's development.

1. *Equipment Rental Program: The company will acquire a fleet of modern, heavy-duty mining equipment (excavators, loaders, dump trucks, rock drills, crushers, etc.) and lease them to private leaseholders. This service can be offered with trained operators and a robust maintenance package, generating predictable income while improving productivity and safety across the sector.*
2. *Technical and Advisory Services: Leveraging its technical expertise, KP-MDMCL can offer consultancy services to private leaseholders on mineral exploration, mine planning, mining, safety audits, environmental compliance and best practices.*

Projected Impacts & Outcomes

The comprehensive KP-MDMCL roadmap will deliver transformative outcomes across four key dimensions: economically, through multi-billion rupee strategic investments creating Pakistan's largest minerals processing and value addition hub with substantial revenue generation and significant employment opportunities across integrated value chains; socially, through comprehensive community development programs, skills training for thousands of local residents and meaningful revenue-sharing mechanisms that ensure inclusive growth and local empowerment; environmentally, through zero-waste mining protocols, dedicated environmental rehabilitation funding, carbon-neutral processing facilities, and advanced water management systems demonstrating environmental leadership; and institutionally, through establishing KP-MDMCL as a major state enterprise with proprietary technology development, international certification compliance, and strategic mineral reserves infrastructure. This holistic approach positions Khyber Pakhtunkhwa as South Asia's premier responsible mining hub, demonstrating how mineral development can serve as a catalyst for sustainable economic growth, community empowerment, and environmental stewardship while strengthening Pakistan's strategic mineral security and contributing significantly to the national economy.

Conclusion

This business plan represents a comprehensive strategic blueprint that serves as both a practical implementation framework for executing the broader mineral development agenda envisioned by the Government of Khyber Pakhtunkhwa and a transformative roadmap designed to position KP's mineral sector as a globally competitive, technologically advanced, and environmentally sustainable industry. Most importantly, it directly supports the realization of core objectives outlined in the KP Mineral Policy 2022, ensuring responsible, transparent, and value-driven development of the province's vast mineral resources for sustainable benefit to the people of KP and Pakistan. Through the systematic development of strategic minerals investment zones, spanning from high-value gemstones, base-metals and industrial minerals, Khyber Pakhtunkhwa is positioned to unlock substantial strategic investments while generating significant annual revenues that will fundamentally transform the provincial economy. The integrated approach outlined in this plan, encompassing complete value chains from exploration through value-added manufacturing, establishes the foundation for KP-MDMCL to emerge as Pakistan's premier state-owned mining enterprise by leveraging productive geological resources, advanced mining technologies and strategic public-private partnerships that will contribute significantly to both provincial economic diversification and Pakistan's mineral security objectives. With successful implementation, this roadmap will position Khyber Pakhtunkhwa as a regional hub for responsible mineral development, creating sustainable employment for thousands while establishing Pakistan as a competitive player in global mineral markets, ensuring that economic growth is balanced with environmental stewardship and community development to create lasting value for current and future generations.

SECTION-II

VISION, MISSION AND STRATEGIC OBJECTIVES

The establishment of KP Minerals Development and Management Company Limited (KP-MDMCL) marks a transformative moment in Khyber Pakhtunkhwa's mineral development history, representing a fundamental shift from traditional, fragmented extraction methods to integrated, responsible resource development that serves community prosperity and national interests. This framework recognizes that KP's vast geological endowment, spanning gemstones like swat emeralds, Batakundi ruby, copper-gold deposits, precious metals and strategic minerals across four priority zones, called mineral investments zones (MIZs), represents not merely mineral wealth, but an opportunity for transformative change that can extract our province from cycles of untapped potential while creating sustainable economic foundations for future generations. The Vision, Mission and Strategic Objectives are grounded in principles of sustainable development, community partnership, environmental stewardship and economic inclusivity, acknowledging that true success will be measured by lives transformed, communities empowered, environments restored and lasting value created for all stakeholders. This framework positions KP-MDMCL as both a catalyst for provincial economic growth and contributor to Pakistan's broader strategic mineral security objectives, while serving as a covenant with the people of Khyber Pakhtunkhwa that their natural resources will finally serve their communities through equitable, transparent and environmentally responsible development that honors both the geological heritage and the entity's responsibility to future generations.

Vision Statement

To position Khyber Pakhtunkhwa as South Asia's premier hub for responsible and technologically advanced mineral development, transforming the province's geological wealth into sustainable prosperity and significant value-added growth for its people, by attracting investment and fostering efficient, mechanized operations.

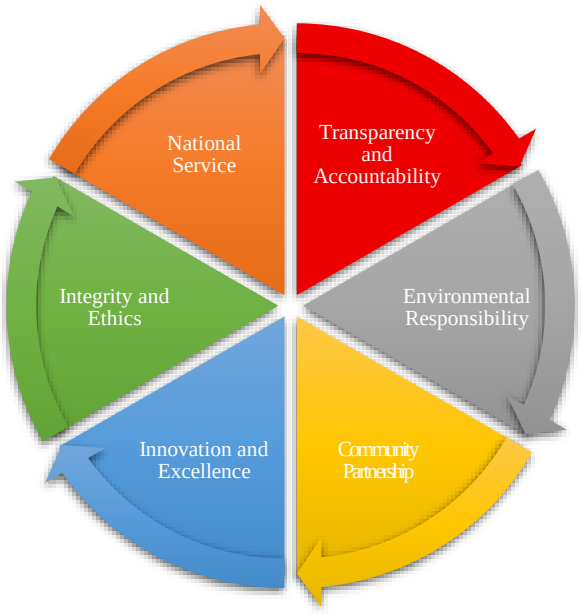
Mission Statement

KP-MDMCL is dedicated to unlocking the full potential of Khyber Pakhtunkhwa's mineral resources through innovative exploration, mechanized extraction and value-added processing. Our mission is to create lasting economic opportunities for local communities and strengthen the provincial economy by attracting and securing sustainable investment. We will achieve this while upholding the highest standards of transparent governance, ensuring equitable benefit distribution and demonstrating global best practices in all our operations.

KP-MDMCL Strategic Objectives

Category	Objective	Description
Economic Development	Unlock geological potential & generate revenue.	Mobilize multi-billion rupees in strategic investments across four priority mineral zones. Generate substantial annual revenues and establish Pakistan's largest minerals processing hub with strong export capabilities. Create thousands of direct and indirect jobs.
Institutional Leadership	Establish KP-MDMCL as a premier state-owned enterprise.	Develop proprietary technologies through dedicated R&D. Achieve international certifications (ISO 14001, OHSAS 18001). Create a strategic minerals reserve infrastructure to support national security and technology needs.
Community & Social Impact	Ensure inclusive growth and community benefit.	Implement comprehensive community development programs and skills development initiatives in all mining zones. Establish meaningful revenue-sharing mechanisms to fund local development projects.
Environmental Stewardship	Implement sustainable and eco-friendly practices.	Execute zero-waste mining protocols and mandatory environmental rehabilitation programs. Develop carbon-neutral processing facilities using renewable energy and advanced water management systems.
Strategic Partnerships	Attract investment and enhance market position.	Facilitate strategic public-private partnerships to leverage international expertise and capital. Establish export-oriented value chains and form alliances with global companies and financial institutions to attract foreign direct investment.
Regulatory Innovation	Enhance transparency and governance.	Streamline commercial functions to increase revenue realization. Implement transparent, technology-driven monitoring systems and single-window operations for investors. Align all activities with the KP Mineral Development Policy 2022.
Technology & Digital Transformation	Integrate modern technology into operations.	Deploy advanced digital exploration technologies like drone-based LiDAR mapping and 3D seismic surveys. Establish comprehensive digital mapping and cadastral systems and implement mechanized mining and automated processing.
National Security	Develop domestic capacity in critical minerals.	Develop domestic capacity in critical minerals for national defense and technology. Establish strategic stockpiling facilities and reduce national dependence on mineral imports through enhanced domestic production.

Core Values & Principles



Success Measurement Framework

Short-Term Goals (1-5 Years)	Medium-Term Goals (6-10 Years)	Long-Term Vision (11th Year onward)
Operational legal entity with functional governance structure	Substantial revenue generation and investment attraction	Regional mining hub status with global recognition
Initial revenue streams from priority Mineral Investment Zones- MIZs	International certification and compliance achievements	Complete sector transformation and value chain integration
Digitaization of Royalty Collection Mechanisms	Significant employment creation and skills development	Sustainable community development and environmental leadership
Basic environmental and safety protocols implementation	Advanced technology deployment across operations	

*It may also be noted that the company's operational scope is projected to expand from a **'provincial'** to a **'national'** and ultimately an **'international'** level operations in the short, medium and long term.*

SECTION-III

GOVERNANCE FRAMEWORK, ROLES & REPORTING LINES

This section details the foundational governance framework, organizational structure and reporting lines for the KP-MDMCL. The structure is designed to enable the company to operate as an entrepreneurial "*one-stop*" commercial entity, while upholding the highest standards of transparency, accountability and public sector stewardship.

1. Guiding principles of Governance

The governance of KP-MDMCL is anchored in a set of core principles that balance commercial objectives with its public mandate. These principles ensure that all decisions and actions are aligned with the company's vision of injecting dynamism and efficiency into the provincial mineral sector.

Stewardship & Accountability

The BoD and management are entrusted with the responsible stewardship of the province's mineral assets, ensuring accountability to MDD, Government of Khyber Pakhtunkhwa (GoKP), as the sole shareholder.

Transparency

All operations, from project procurement to financial reporting, shall be conducted with highest standards of transparency and zero tolerance for corruption. This commitment is essential not only for ensuring public accountability and compliance with applicable regulations but also for fostering trust among stakeholders and attracting credible, long-term investment partners.

Compliance & Integrity

The company is committed to strict adherence to the Companies Act, 2017, the Companies (Corporate Governance) Regulations, 2013, and all relevant rules governing Public Sector Companies, besides enforcing best international practices.

Efficiency & Entrepreneurialism

The structure is built to minimize bureaucratic bottlenecks, empowering management to make agile, commercially sound decisions while maintaining robust oversight.

Innovation & Best Practices

The company will adopt private sector best practices in its technical, financial, and operational management to achieve sustainable growth and maximize value for the province.

2. Organizational Structure

The effective realization of KP-MDMCL's ambitious business plan, encompassing mineral exploration, mining operations, processing, value addition, and the development of robust fiscal mechanisms, hinges critically on a well-defined and strategically aligned organizational structure. This section comprehensively details the hierarchical and functional framework designed to ensure efficient operational activities, clear lines of accountability, and robust governance, all essential for navigating the complexities of the mining sector and its public-private interface in Khyber Pakhtunkhwa. As illustrated in the accompanying visual organogram (Figure X), the structure is anchored by a vigilant Board of Directors (BoD) providing strategic oversight, led by a dynamic Chief Executive Officer CEO) driving operational execution, and supported by key independent functions such as the Chief Internal Auditor (CIA) ensuring compliance and risk mitigation, alongside a capable Chief Financial Officer (CFO) managing fiscal health, and a dedicated team of down-the-line management responsible for specialized functional areas. This meticulously crafted structure is engineered to foster collaboration, optimize resource allocation, and facilitate seamless decision-making, thereby enabling KP-MDMCL to achieve its strategic objectives and contribute significantly to the province's economic development.

3. Members of the Company – Shareholder(s)

The Government of Khyber Pakhtunkhwa (GoKP) is the sole shareholder and ultimate owner of KP-MDMCL. As long as the company remains fully owned by the GoKP and does not initiate a public offering of its shares, it continues to function entirely under the government ownership and controls, despite being incorporated as a public limited company. While the legal framework permits the company to offer shares to the general public, such a course of action entails significant procedural, regulatory and financial obligations, including compliance with Securities and Exchange Commission of Pakistan (SECP) regulations, listing requirements of the Pakistan Stock Exchange (PSX) and enhanced financial disclosures and adherence to the corporate governance frameworks applicable to publicly traded companies. As the sole shareholder, the Government of Khyber Pakhtunkhwa plays a pivotal role in defining the strategic direction of the company. It is responsible for approving major policy decisions, endorsing long-term business plans, and ensuring that the company's operations are aligned with the province's economic development priorities. In this capacity, the GoKP exercises oversight to ensure that KP-MDMCL remains financially sustainable while delivering on its broader public mandate, particularly in contributing to mineral sector reforms, value addition, and socio-

The Government of Khyber Pakhtunkhwa (GoKP) stands as the sole shareholder and ultimate owner of KP-MDMCL. This structure ensures the company operates under full government ownership and control, even while incorporated as a public limited company. The GoKP plays a pivotal role in defining the strategic direction, approving major policy decisions, and endorsing long-term business plans. This oversight ensures KP-MDMCL's operations align with provincial economic development priorities, promoting financial sustainability and contributing to mineral sector reforms and socio-economic uplift.

4. Board of Directors (BoD)

The Board of Directors is the highest decision-making authority of the company. It is responsible for the overall strategic direction, oversight of management, and safeguarding the company's interests and assets. The general direction and administration of KP-MDMCL's affairs are vested in its Board of Directors, which is constituted as per the Companies Act, 2017, with a professional management team appointed on merit. The Board of Directors will be a diverse group, comprising:

4.1 Non-Executive Directors

Senior executive officers, not less than the rank of Secretary to Government of KP, from the Minerals Development Department, Finance Department and Planning & Development Department shall have their representation as Members of the Board of Directors.

4.2 Independent Directors

A majority of the board will consist of independent directors with significant experience and expertise in mining, geology, corporate finance, law, and business management. These individuals will be selected based on their professional merit and ability to provide impartial and expert guidance. In the case of KP-MDMCL, the number of Independent Directors shall be four (04), one amongst them shall be appointed as Chairman of the Board.

4.3 Chairman of the Board

The Government of Khyber Pakhtunkhwa shall appoint the Chairman of the Board of Directors from among the independent Directors, ensuring the position is held by a professional from the private sector. This approach reflects KP-MDMCL's hybrid governance model, which combines public oversight with private sector expertise to drive efficiency, transparency, and commercial viability in the mineral development sector. While the selection of the Chairman remains the exclusive prerogative of the Government, it may, if deemed appropriate, invite recommendations or input from the Board of Directors of the company on a need basis. The appointed Chairman is expected to bring relevant experience in corporate governance, natural resource management, strategic planning or business leadership, particularly in sectors aligned with KP-MDMCL's core functions such as mining, geology, infrastructure development, public-private partnerships or investment promotion. The Chairman shall play a pivotal role in steering the Board's deliberations, facilitating balanced decision-making and ensuring the company's strategic direction aligns with both its commercial objectives and its public sector mandate.

4.4 Board's composition

The Board of Directors of KP-MDMCL shall consist of a Chairman, the Chief Executive Officer (CEO) and a mix of non-executive and independent directors, as prescribed in the Company's Articles of Association and in accordance with the provisions of the Companies Act, 2017. Directors shall be appointed by the Government of Khyber Pakhtunkhwa through formal notifications issued from time to time. The Board shall comprise a total of eight (08) voting members, including the CEO.

The Board shall include non-executive ex-officio members representing key government departments such as Finance, Planning & Development (P&D) and Mineral Development Department (MDD), who shall retain their positions on the Board as long as they hold their respective official designations relevant to KP-MDMCL. In order to benefit from sectoral expertise and promote informed decision-making, the Board may also associate external professionals or subject-matter experts as advisors. Such individuals may participate in Board discussions; however, they shall not possess voting rights. This composition is intended to ensure a balanced, diverse, and professionally competent Board, adhering to principles of sound corporate governance while maintaining strategic oversight and alignment with the Government's mineral sector policies and development agenda.

- Strategic Direction: *Approving the company's business plan, annual budget, and long-term strategy.*
- Policy Formulation: *Establishing key company policies related to finance, human resources, risk management, and corporate social responsibility.*
- Oversight of Management: *Appointing, evaluating, and, if necessary, removing the Chief Executive Officer (CEO). Monitoring the performance of the CEO and the senior management team.*
- Financial Integrity: *Ensuring the accuracy and integrity of the company's financial statements, internal controls, and reporting mechanisms.*
- Compliance: *Verifying strict compliance with all applicable laws and regulations.*

5. Board Committees

In order to ensure robust governance, transparency and effective oversight, KP-MDMCL will establish a series of specialized Board Committees. These Committees function as integral components of the Company's governance framework, supporting the Board in discharging its fiduciary, strategic and regulatory responsibilities. Each Committee operates under formal Terms of Reference (ToRs) approved by the Board, in compliance with the Companies Act, 2017, and applicable rules of corporate governance. Consequently, each Committee maintains detailed minutes of meetings convened, and their activities are disclosed in accordance with the good corporate governance standards.

a. Audit & Risk Management Committee

The Audit & Risk Management Committee (ARMC) plays a critical role in safeguarding the integrity of KP-MDMCL's financial reporting, internal controls, and risk management processes. It is composed of non-executive and independent directors, one of whom serves as the Committee Chairperson. The Head of Internal Audit reports functionally to this Committee. Key responsibilities include:

- Reviewing and endorsing audited and unaudited financial statements.
- Overseeing the internal audit function and ensuring independence.
- Monitoring effectiveness of internal controls and risk mitigation frameworks.
- Recommending the appointment or rotation of external auditors; and
- Ensuring compliance of applicable accounting standards, tax-laws & corporate regulations.

Given the nature of KP-MDMCL's business, the Committee also examines project-specific financial exposures, operational risks and legal contingencies associated with mineral development and public-private investments.

b. Finance & Investment Committee

The Finance & Investment Committee advises the Board on all matters related to financial strategy, budgeting, and investment planning. It ensures that financial decisions are aligned with the Company's long-term business goals and public interest objectives. Key responsibilities include:

- Reviewing annual budgets and financial projections.
- Evaluating funding models and capital investment proposals, including those related to exploration and infrastructure development
- Monitoring financial performance and liquidity position.
- Recommending financial policies and instruments for revenue generation and investment partnerships.

This Committee also plays a crucial role in assessing project viability and ROI (return on investment), particularly for large-scale mining, processing, or joint venture arrangements.

c. Procurement & Contract Committee

Given KP-MDMCL's role in project execution, the Procurement & Contract Committee ensures transparency, efficiency, and accountability in all procurement-related matters. Key responsibilities include:

- Reviewing and endorsing procurement strategies, plans, and procedures.
- Overseeing major tenders, bid evaluations, and contract awards.
- Ensuring compliance with KPPRA rules or rules framed.
- Monitoring contract execution and vendor performance.
- Resolving procurement-related disputes and advising on corrective actions.

This Committee provides oversight for both goods and services procurement, particularly in technical fields such as geological surveys, exploration equipment, and environmental studies.

d. Human Resource, Nomination & Remuneration Committee

This Committee oversees HR policies, staffing, compensation, and appointments to ensure that KP-MDMCL attracts and retains qualified professionals while adhering to merit and inclusivity. Key responsibilities include:

- Recommending policies on recruitment, performance evaluation, career progression, & capacity building.
- Reviewing remuneration structures for senior management and technical staff.
- Advising on succession planning for key positions, including the CEO.
- Assessing nominations for Board-level and senior executive appointments, subject to government approval.
- Ensuring adherence to principles of equity, diversity, and non-discrimination.

e. Sustainability & Environmental Considerations Committee

In view of KP-MDMCL's responsibility for responsible mineral development, this Committee focuses on the Company's environmental, social, and sustainability obligations. Key responsibilities include:

- Reviewing and approving Environmental and Social Impact Assessments (ESIAs) for new projects.
- Monitoring compliance with provincial and national environmental laws and international standards.
- Advising on climate change mitigation strategies, rehabilitation plans, and post-mining transitions.
- Integrating gender equality, social inclusion, and community engagement into project design and implementation.
- Promoting sustainable resource use and aligning operations with KP's Green Growth Strategy.

This Committee works closely with technical, legal, and community liaison units to ensure that KP-MDMCL's operations reflect global best practices in sustainable mineral development.

6. Chief Executive Officer (CEO)

The Chief Executive Officer (CEO) of KP-MDMCL serves as the apex operational leader, directly accountable to the Board of Directors (BoD) and its chairman. This pivotal role is the primary driver for translating the strategic vision and business plan approved by the BoD into tangible, successful outcomes across all facets of KP-MDMCL's mandate, particularly in the complex and critical mining sector of Khyber Pakhtunkhwa. The CEO's strategic positioning, accountability, and operational effectiveness, along with their core responsibilities for the Company's operational activities, are described as follows:

6.1 Positioning & Accountability of CEO

Reporting directly to the Board of Directors and its Chairman, the CEO is the ultimate authority for the day-to-day management and operational execution of KP-MDMCL. While the BoD provides strategic oversight, governance, and ultimate approval, the CEO is empowered to make tactical decisions, deploy resources, and manage the extensive project portfolio. This structure ensures a clear delineation of responsibilities, allowing the BoD to focus on governance and long-term strategy, while the CEO drives efficient and effective operational delivery.

6.2 CEO’s effectiveness towards Business Operations

The CEO of KP-MDMCL is the pivotal operational leader, directly responsible for the hands-on, strategic execution of the business plan, requiring a unique blend of expertise to unlock Khyber Pakhtunkhwa's mineral potential and drive economic development. Beyond general leadership, this role demands proven sector-specific expertise in mineral exploration, mining operations, processing technologies, and value chain development, coupled with a successful track record in large-scale, multi-stakeholder project management within infrastructure or natural resources.

6.3 CEO’s Core responsibilities towards Business Operations

The CEO's responsibilities are comprehensive and directly aligned with KP-MDMCL's core business plan objectives. These include, but are not limited to:

6.4 Project Execution & Strategic Management Framework

Strategic Pillar	Key Functions	Core Responsibilities
Project Leadership and Execution (Exploration, Mining, Processing, Value Addition)	• Project Lifecycle Management • Operational Excellence • Value Addition Promotion	• Oversee end-to-end project execution, from geological exploration to processing facilities setup. • Ensure mining and processing activities meet top safety, environmental, and efficiency standards. • Lead value-addition initiatives by fostering downstream industries, driving local economic impact and employment.
Joint Ventures (JVs) and Strategic Partnerships	• JV Identification & Due Diligence • Agreement Negotiation & Execution • Relationship Management	• Identify, evaluate, and secure domestic/international JV opportunities. • Lead negotiations to ensure favourable and balanced JV agreements. • Build strong, trust-based relationships for joint project success.
Revenue Generation and Fiscal Responsibility	• Revenue Optimization • Royalty & Excise Duty Mechanisms • Financial Management	• Maximize mineral sales and profitability through efficient operations. • Collaborate with government departments to improve and implement transparent royalty and excise duty collection systems. • Ensure sound budgeting, cost control, and long-term financial sustainability.
Government Liaison and Stakeholder Management (through BoD/Chairman)	• Government Interface • Policy Advocacy • Compliance & Reporting • Community & Environment Engagement	• Act as liaison with ministries/departments (e.g., Mines, Finance, EPA, P&D). • Support policy development and regulatory improvement with the BoD/Chairman. • Ensure legal/regulatory compliance and timely reporting. • Promote CSR and environmental best practices in local communities.
Organizational Development & Talent Management	• Team Building • Organizational Culture	• Recruit and retain qualified professionals, especially in technical and project domains. • Foster a high-performance, ethical, innovative, and safety-first culture.

Crucially, the CEO must possess strong financial acumen encompassing project finance, investment appraisal, and public financial management, particularly pertaining to royalties and duties, alongside extensive experience in public sector engagement, including navigating government bureaucracies and influencing policy. Exceptional negotiation and diplomatic skills are also essential for forging commercial agreements, Joint Ventures, and managing inter-governmental relations, ensuring KP-MDMCL's effective mandate execution and achievement of ambitious financial targets.

7 Chief Internal Auditor (CIA)

The Chief Internal Auditor (CIA) of KP-MDMCL serves as an independent and objective assurance and consulting professional, providing critical oversight to the Board of Directors (BoD) and its Audit Committee. His precise positioning within the organizational structure is paramount for safeguarding the company's assets, ensuring adherence to the business plan and promoting efficient and ethical operations, particularly within the complex and high-value mining sector. ***In line with the Public Sector Companies (Corporate Governance) Rules, 2013, and the State-Owned Enterprises (Audit Committee, Internal Control and Risk Management) Regulations, 2024,*** the CIA's role is mandated to provide independent assurance that the organization's risk management, governance, and internal control processes are operating effectively. The strategic positioning, independence and the core responsibilities in furtherance of the Business Plan, relevant to CIA, is described below:

The Chief Internal Auditor (CIA) of KP-MDMCL serves as an independent and objective assurance and consulting professional, providing critical oversight to the Board of Directors (BoD) and its Audit Committee. His precise positioning within the organizational structure is paramount for safeguarding the company's assets, ensuring adherence to the business plan and promoting efficient and ethical operations, particularly within the complex and high-value mining sector. The strategic positioning, independence and the core responsibilities in furtherance of the Business Plan, relevant to CIA, is described below:

7.1 Strategic Positioning and Independence:

The CIA reports functionally to the Audit Committee of the Board of Directors and administratively to the Chief Executive Officer (CEO). This dual reporting line is crucial for maintaining the CIA's independence and objectivity. While administratively working with the CEO for day-to-day operations of the internal audit department, their direct functional reporting to the Audit Committee ensures that audit findings and recommendations are communicated without undue influence, directly addressing the governance oversight required by the Board. The CIA has unrestricted access to all company records, personnel, and properties, as well as direct and unfettered access to the Audit Committee, enabling them to fulfill their mandate effectively.

7.2 Core Responsibilities in Furtherance of the Business Plan

The CIA's responsibilities are intrinsically linked to the successful execution of KP-MDMCL's business plan, which encompasses exploration, mining, processing, value addition, royalty collection mechanisms and joint ventures. His role is to provide assurance and insights that strengthen the company's ability to achieve its strategic objectives while mitigating risks. Key responsibilities include:

a. Risk-Based Audit Planning and Execution

Developing and implementing a comprehensive, risk-based annual internal audit plan, approved by the Audit Committee. This plan will strategically focus on high-risk areas identified in KP-MDMCL's business plan, including critically reviewing the mechanisms for royalty and excise duty collection, internal controls over revenue recognition, expenditure management and financial reporting to ensure accuracy, transparency and compliance with government regulations and the business plan's financial models. Additionally, CIA's role towards assessing the effectiveness of controls over exploration and mining operations, reviewing contractual compliances of all JVs and strategic partnerships are equally important, for the furtherance of business plans.

b. Fraud Detection and Investigation

Establishing robust mechanisms for fraud prevention and detection, and conducting independent investigations into suspected fraudulent activities or irregularities, protecting the company's assets and reputation.

c. Reporting and Recommendation

Preparing clear, concise, and actionable audit reports for the Audit Committee, CEO, and relevant management, highlighting significant findings, risks, and practical recommendations for improvement. The CIA is responsible for monitoring the implementation of these recommendations.

d. Advisory Role

Providing objective advice and insights to management on improving risk management, control processes, and governance practices, while maintaining independence. This advisory role is crucial for proactive problem-solving aligned with the business plan.

8. Company Secretary (CS)

The Company Secretary (CS) holds a crucial statutory position within KP-MDMCL, serving as a key officer responsible for ensuring the company's adherence to corporate governance best practices and compliance with all applicable laws and regulations. As per the Companies Act, 2017, and the Public Sector Companies (*Corporate Governance*) Rules, 2013, the Company Secretary is an officer of the company, playing a pivotal role in maintaining corporate integrity and facilitating seamless communication between the Board, management, and shareholders, in this case the Government of KP. The positioning, reporting-line and role & responsibilities of the Company Secretary, particularly regarding obligations to the BoD and its Committees, are outlined as follows:

8.1 Positioning and Reporting Line

The Company Secretary reports directly to the Board of Directors (BoD) as a whole, ensuring impartiality and independence in their advisory and compliance functions. While they may interact closely with the CEO for administrative matters related to Board functions, their ultimate accountability rests with the Board, particularly the Chairman. This reporting structure underscores their role as a guardian of corporate governance, providing objective advice and ensuring that Board procedures are meticulously followed.

8.2 Role and Responsibilities

The Company Secretary is central to the effective functioning of the Board and its various Committees, ensuring legal and regulatory compliance and facilitating informed decision-making in furtherance of KP-MDMCL's strategic objectives and the successful execution of its Business Plan. Their responsibilities include, but are not limited to:

a. Board and Committee Meeting Management

- *In consultation with the Chairman, preparing and circulating comprehensive agendas, board papers, and supporting documentation for all Board and Board Committee meetings (e.g., Audit Committee, Human Resources & Remuneration Committee).*
- *Ensuring timely and accurate recording of minutes for all Board and Committee meetings, capturing key discussions, decisions, and action points.*
- *Managing the logistics and arrangements for Board and Committee meetings, ensuring compliance with notice period requirements*

b. Corporate Governance and Compliance

- *Advising the Board and its Committees on their legal, regulatory, and corporate governance obligations, including compliance with the Companies Act, 2017, the Public Sector Companies (Corporate Governance) Rules, 2013, and other relevant statutes and regulations specific to the mining sector.*
- *Monitoring and ensuring the company's compliance with its Memorandum and Articles of Association.*
- *Acting as the primary liaison with regulatory bodies such as the Securities and Exchange Commission of Pakistan (SECP) for statutory filings and compliance matters.*

c. Record Keeping and Information Management:

- *Maintaining all statutory registers, records, and minute books accurately and securely.*
- *Ensuring that all official returns, statistics, and accounts are duly completed and submitted to the relevant authorities.*
- *Facilitating access to company records for authorized individuals, including directors, auditors, and regulators.*

d. Shareholder Relations

- *Managing all matters related to share issuance, transfers and maintenance of the statutory Share Register.*
- *Ensuring effective communication with shareholders, including the timely dissemination of notices for general meetings, annual reports, and dividend distributions.*

e. Advisory Role

- *Providing legal and procedural advice to the Board and individual directors on corporate matters, conflicts of interest, and best practices in corporate governance.*
- *Assisting the Chairman in ensuring that Board procedures are followed and that all applicable rules and regulations are complied with.*

9. Senior Management Team (SMT)

The Senior Management Team (SMT) is composed of the heads of key departments and reports directly to the Chief Executive Officer (CEO). This team is responsible for managing the company's functional areas, driving performance, and implementing the strategic business plan to ensure efficient operations and sustainable growth. The SMT's collective expertise and leadership are essential for achieving the company's objectives and maximizing its potential. Essential members of the SMT include:

9.1 General Manager (Finance) / Chief Financial Officer (CFO): This role is responsible for the financial health of the company. The CFO oversees all financial planning, budgeting, accounting, and reporting. They are also responsible for managing fiscal controls, securing financing, and ensuring compliance with financial regulations and auditing standards.

9.2 General Manager (Exploration): This manager provides expert geological analysis and technical support for all company projects. Their mandate includes conducting mineral exploration, developing and maintaining the province's mineral resource database, and identifying new, economically viable mining prospects.

9.3 General Manager (Mining/Production): This manager is responsible for the overall operations of the company's mining and production sites. They oversee all mining activities, ensuring that production targets are met efficiently, safely, and in compliance with all environmental and regulatory standards.

9.4 General Manager (Business Development): This position is crucial for identifying new business opportunities and driving company growth. This manager leads efforts to secure new contracts, build strategic partnerships, and expand the company's market presence. They are responsible for conducting market research, feasibility studies, and negotiating key business deals.

9.5 General Manager (Human Resources and Administration): 7This role is vital for managing the company's most important asset: its people. The HR and Admin head oversees recruitment, training, employee relations, and compensation. They are also responsible for all administrative functions, ensuring a productive and compliant work environment.

9.6 General Manager (Legal and Corporate Affairs): This manager provides legal counsel and guidance to the CEO and SMT on all corporate matters. Their mandate includes managing legal risks, ensuring regulatory compliance, handling corporate governance, and overseeing communication with external stakeholders and government bodies.

9.7 General Manager (ESG- Environmental, Social & Governance): The position is responsible for developing, implementing and monitoring KPMDMCL’s ESG strategy, ensuring that environmental stewardship, social responsibility and governance excellence are fully integrated into the company’s operations, projects and corporate culture, besides other roles and KPIs as fully described in HRM reporting.

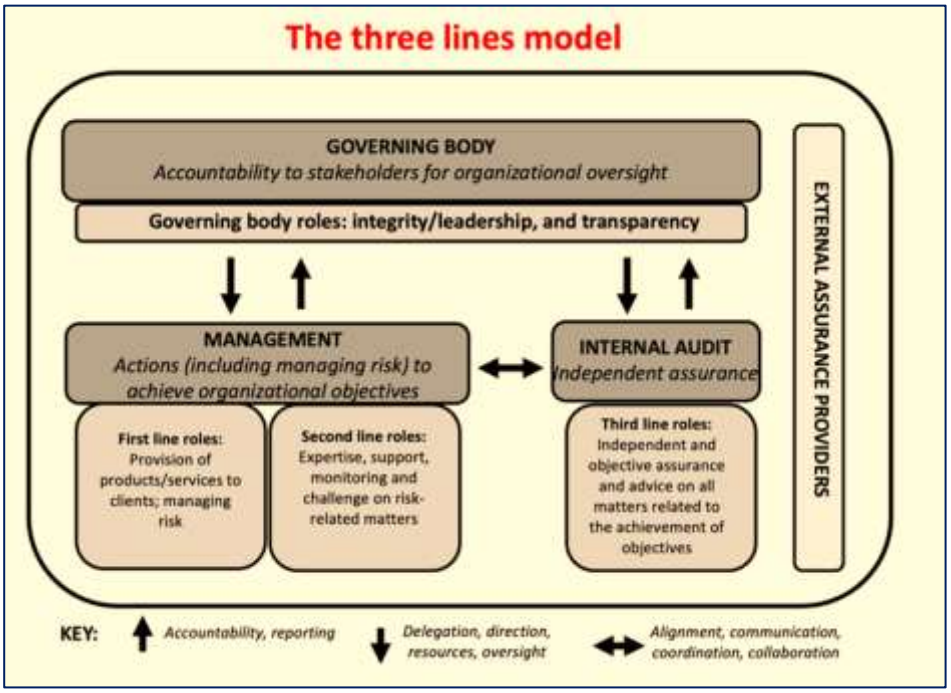
10. Reporting Lines & Communication

Clear and efficient reporting lines are crucial for maintaining control and ensuring that the company's operations are aligned with its strategic goals.

Type	From	To	Reporting Frequency & Content
INTERNAL	Senior Management Team (SMT)	Chief Executive Officer (CEO)	Weekly & Monthly Reports • Departmental performance updates • Financial summaries • Project progress reports *(To ensure operational alignment, monitor KPIs, and facilitate timely executive decisions)*
	CEO	Board of Directors (BoD)	Quarterly & Annual Reports • Quarterly performance review • Financial statements • Annual performance and strategy report • Ad-hoc briefings on risks/developments *(To extend strategic oversight & maintain BoD's awareness of company performance & emerging risks)*
EXTERNAL	Board of Directors (Via Chairman)	Shareholder (Mines and Minerals Department, GoKP)	Annual Submission • Approved Annual Report • Audited financial statements • Strategic business plans *(To meet statutory obligations, maintain transparency, & align corporate goals with government expectations)*
	Board of Directors (Via Chairman)	AGM (All Stakeholders)	Annual General Meeting (AGM) • Review of company performance • Approval of resolutions and strategy • Dividend to Shareholder (GoKP) *(Formal platform for performance review, decision-making, and shareholder oversight)*

11. Conclusion

This governance framework for KP-MDMCL is a deliberate and strategic design intended to support the company's mandate as an innovative hybrid entity. By establishing a professional, expert-driven Board of Directors, a performance-oriented management team, and clear lines of accountability, the company is poised to become the "one-stop" solution for mineral sector development in Khyber Pakhtunkhwa. These three lines **model** structure will enable the company to operate with the agility of the private sector while maintaining the robust public accountability expected of a state-owned enterprise, thereby maximizing the value of the province's mineral resources.



SECTION-IV

OPERATIONAL PROCESSES – For KP-MDMCL

This comprehensive section delineates the operational processes framework for KP-MDMCL, encompassing four critical operational domains: (a) Exploration, (b) Mining, (c) Processing, and (d) Commercialization. The framework serves as the operational backbone designed to facilitate and support the company's strategic transformation trajectory from its initial establishment as a provincial mining entity during Years 1-5, through its evolution into a nationally recognized mining corporation during Years 5-10, and ultimately positioning it as an internationally competitive player from Year 10 onwards. The operational architecture strategically leverages and builds upon the extensive institutional knowledge, technical expertise, and regulatory experience accumulated by established governmental institutions including the Directorate of Mines and Minerals, Commissionerate of Mines, and Inspectorate of Mines. This approach ensures continuity with existing regulatory frameworks while simultaneously incorporating cutting-edge mining technologies, digital transformation initiatives, and internationally recognized sustainable mining practices that align with global environmental and social governance standards.

The four operational domains represent the complete value chain of mining operations, from initial resource identification through final product delivery to market. Exploration operations focus on systematic identification, evaluation, and quantification of mineral resources across target regions, establishing the foundation for all subsequent activities. Mining operations encompass the physical extraction of identified mineral resources using appropriate surface and underground techniques tailored to specific geological conditions and economic parameters. Processing operations transform raw extracted materials into refined products meeting market specifications and quality standards through various beneficiation, concentration, and value-addition processes. Commercialization operations manage the marketing, sales, distribution, and customer relationship aspects that convert processed products into revenue streams and market presence. This integrated operational framework ensures seamless coordination across all domains while maintaining operational excellence, regulatory compliance, and strategic alignment with KP-MDMCL's growth objectives throughout its evolution from a provincial mining company to an internationally recognized mining corporation, as detailed in the ensuing sections.

1. Exploration Operations

KP-MDMCL's exploration strategy follows a three-phase approach: initially focusing on KP's mineral resources (Years 1-5), expanding nationally to other provinces (Years 5-10) and eventually pursuing international opportunities (Years 10+). The operations utilize systematic geological assessment, resource estimation using JORC standards, and modern technologies including drone surveying and AI- powered data analysis. Key performance indicators track budget utilization (95%+), license acquisition rates, exploration-to-mining conversion rates (25%+), and annual resource discovery volumes by mineral type. This framework leverages existing institutional knowledge while building technical capabilities to transform KP-MDMCL from a provincial entity into an internationally competitive mining corporation.

1.1 Strategic Exploration Framework

KP-MDMCL's exploration strategy is structured in three distinct phases aligned with the company's strategic evolution from provincial to international operations, as already explained. This initial phase will leverage existing geological surveys and comprehensive data archives maintained by the Directorate of Mines and Minerals and Geological survey of Pakistan, ensuring cost-effective utilization of established knowledge bases. The company will establish strategic partnerships with the Geological Survey of Pakistan (GSP) and the respective Mining and Geology departments/research centers of universities to enhance technical capabilities and access specialized expertise. Modern geophysical and geochemical exploration techniques will be deployed to upgrade exploration methodologies and improve resource identification accuracy. In the second phase, KP-MDMCL will extend exploration activities to mineral-rich province, i.e. Baluchistan. This expansion will be facilitated through strategic partnerships with the provincial mining department, ensuring regulatory compliance and local stakeholder engagement. The company will implement advanced remote sensing and drone- based exploration technologies to enhance exploration efficiency across diverse geographical terrains. Regional exploration offices will be established in key mining areas to provide operational oversight and maintain close relationships with local mining communities and regulatory authorities. The international operations phase (Years 10+) positions KP-MDMCL as a regional mining leader through joint ventures for exploration in Afghanistan, Central Asia, and Africa. This phase emphasizes technology transfer partnerships with established international mining companies to access cutting-edge exploration technologies and global best practices. Cross- border mineral exploration projects along the China-Pakistan Economic Corridor (CPEC) will be prioritized to capitalize on infrastructure development and regional economic integration opportunities.

1.2 Operational Procedures

The geological assessment component of exploration operations encompasses comprehensive desktop studies utilizing existing geological maps and reports from various government agencies and research institutions. Field reconnaissance and detailed geological mapping activities will be conducted by qualified geologists to validate desktop findings and identify potential mineral occurrences. Systematic geochemical sampling and analysis programs will be implemented to determine mineral content and distribution patterns across target areas. Artificial intelligence and machine learning algorithms will be integrated into data analysis processes to identify patterns and anomalies that may indicate mineral potential. Real-time data collection systems connected to cloud-based storage platforms will enable immediate access to exploration data and facilitate collaborative analysis by geographically dispersed teams. Advanced geophysical surveys, including magnetic, electromagnetic, and induced polarization etc., will be employed to identify subsurface geological structures and potential mineralization zones. Resource estimation procedures will adhere to internationally recognized JORC-compliant standards to ensure credibility and investor confidence in reported mineral resources. Advanced 3D geological modeling using specialized software platforms will enhance visualization and understanding of mineral deposit geometry and continuity. Comprehensive mineral reserve calculations and feasibility assessments will be conducted to evaluate economic viability and development potential of identified resources. Environmental baseline studies and impact assessments will be integrated into the exploration process to ensure compliance with environmental regulations and sustainable development principles.

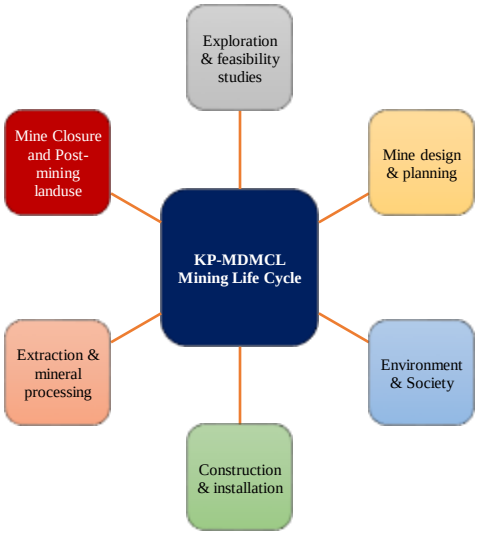
1.3 Key Performance Indicators

The exploration operations will be evaluated against specific performance metrics designed to measure operational efficiency and strategic success. Annual exploration budget utilization targets are set at 95% or higher to ensure optimal resource allocation and operational efficiency. The number of exploration licenses secured annually will demonstrate the company's ability to identify and secure promising exploration opportunities across target regions. Conversion rate of exploration licenses to mining licenses is targeted at around 10 %, reflecting the quality of exploration activities and resource identification capabilities. Resource discovery rates, measured in tons per year by mineral type, will quantify the company's success in adding mineral resources to its portfolio and support long-term strategic planning initiatives.

2. Mining Operations

2.1 Mining Strategy and Methods

KP-MDMCL's mining strategy encompasses a comprehensive approach utilizing both surface and underground mining methods tailored to specific geological conditions and mineral types. Surface mining operations will primarily employ open-pit mining techniques for extensive limestone and marble etc., ~~and coal deposits~~ where mineral bodies occur near the surface, enabling cost-effective extraction with minimal overburden removal. Quarrying operations will be strategically implemented for dimension stones and aggregates, particularly focusing on KP's renowned marble and black granite deposits and construction materials that require precision cutting and quality preservation. Additionally, placer mining techniques will be utilized for alluvial deposits, especially for recovering precious metals and gemstones from river gravels and sedimentary accumulations.



Underground mining operations will be selectively employed where surface mining proves uneconomical or environmentally unsuitable, utilizing the room and pillar method for coal, salt and gypsum deposits to ensure structural stability while maximizing resource recovery. Cut and fill mining techniques will be implemented for precious metal deposits where ore bodies occur in irregular shapes or steep angles, allowing for selective extraction and waste backfilling. Sublevel stopping method will be applied for metallic ore extraction in competent rock formations, enabling efficient bulk mining of large ore bodies. All underground operations will incorporate modern ventilation and safety systems implementation, ensuring optimal air quality, temperature control, and emergency evacuation capabilities in compliance with international mining safety standards. Digital twin technology for mine planning will enable sophisticated modeling and simulation capabilities, supporting optimal mine design, production scheduling, and risk management throughout the mining lifecycle.

2.2 Operational Excellence Framework

The operational excellence framework is structured around three progressive phases aligned with KP-MDMCL's strategic growth trajectory. Phase I operations during Years 1-5 will focus on establishing 3-5 flagship mining operations within Khyber Pakhtunkhwa, serving as demonstration projects that showcase the company's technical capabilities and operational standards. These initial operations will concentrate on high-value, low-complexity deposits that minimize technical risks while maximizing early returns on investment, enabling the company to build operational expertise and refine management systems. Comprehensive safety and environmental management systems will be implemented from the outset, establishing the foundation for sustainable mining practices and regulatory compliance that will characterize all future operations. Phase II expansion during Years 5-10 represents a significant scaling of operations to 15-20 active mines distributed across Pakistan's mineral-rich regions, leveraging proven methodologies developed during the initial phase. This expansion will necessitate the development of specialized mining units tailored to different commodities, ensuring optimal extraction techniques and operational efficiency for diverse mineral types. Advanced automation and digital mining technologies will be systematically implemented across operations, enhancing productivity, safety, and operational control while reducing labour- intensive processes. Regional operational centers will be established in key mining areas to provide localized management oversight, technical support, and stakeholder engagement capabilities. Phase III international operations, commencing from Year 10 onwards, will position KP- MDMCL as a regional mining leader through joint venture mining operations in neighboring countries, particularly Afghanistan and Central Asian republics where geological similarities and infrastructure development create opportunities for expansion. The company will develop technology and expertise export services, leveraging accumulated knowledge and proven methodologies to support mining development in emerging markets. Contract mining services will be offered to international clients seeking technical expertise and operational capabilities, while cross-border mining projects will be developed to capitalize on transnational mineral resources and infrastructure connectivity initiatives.

2.3 Technology and Equipment Strategy

The technology and equipment strategy balances conventional proven technologies with advanced digital innovations to optimize operational efficiency and competitive positioning. Conventional equipment deployment will include heavy earth-moving equipment such as excavators, haul trucks, and bulldozers sized appropriately for specific mining operations and production targets. Comprehensive drilling equipment for both surface and underground operations will ensure versatility across different mining methods and geological conditions. On-site crushing and screening equipment will be strategically positioned to minimize transportation costs and enable immediate processing of extracted materials. Efficient transportation and material handling systems will be designed to optimize logistics from extraction points to processing facilities or shipping destinations.

Advanced technologies will be progressively integrated to enhance operational capabilities and maintain technological leadership in the regional mining sector. Autonomous mining equipment and Internet of Things (IoT) integration will be implemented to improve operational safety, precision, and efficiency while reducing human exposure to hazardous conditions. Real- time monitoring and control systems will provide continuous operational oversight, enabling immediate response to changing conditions and optimization of production parameters. Predictive maintenance programs utilizing sensor data and machine learning algorithms will minimize equipment downtime and extend asset lifecycles.

2.4 Safety and Environmental Management

Safety and environmental management represent a fundamental pillar of KP-MDMCL's operational philosophy, with comprehensive protocols designed to protect personnel, communities, and environmental resources. Safety protocols will ensure full compliance with Pakistan Mining Safety Rules and applicable international standards, establishing rigorous procedures for hazard identification, risk assessment, and incident prevention across all operational activities. Comprehensive training programs for mining personnel will cover technical skills, safety procedures, emergency response, and environmental awareness, with regular refresher courses and competency assessments to maintain high safety standards. Emergency response and rescue capabilities will be established at each operational site, including specialized equipment, trained response teams, and coordination protocols with local emergency services and medical facilities. Regular safety audits and risk assessments will be conducted by qualified professionals to identify potential hazards, evaluate control measures, and implement continuous improvements in safety performance. Environmental management initiatives will commence with comprehensive Environmental Impact Assessments (EIA) for all operations, ensuring thorough evaluation of potential environmental effects and development of appropriate mitigation measures before project implementation. Mine closure and rehabilitation planning will be integrated into operational planning from project inception, ensuring adequate financial provisions and technical preparations for post-mining land restoration and environmental remediation. Advanced water management and treatment systems will be implemented to prevent contamination of surface and groundwater resources, including treatment of mine drainage, process water recycling, and monitoring of water quality parameters. Carbon footprint reduction initiatives will encompass energy efficiency improvements, renewable energy integration where feasible, equipment optimization, and exploration of carbon offset opportunities to support Pakistan's climate change commitments and enhance corporate environmental responsibility.

3. Processing Operations

3.1 Processing Infrastructure Development

KP-MDMCL's processing infrastructure development strategy is structured around three progressive phases designed to build processing capabilities in alignment with the company's operational expansion and market development objectives.

Phase I infrastructure development during Years 1-5 will establish 2-3 strategically located regional processing facilities within Khyber Pakhtunkhwa, positioned to serve the company's initial flagship mining operations while minimizing transportation costs and logistics complexity. These facilities will focus on value-added processing of gypsum, feldspar, and white marble, leveraging KP's comparative advantages in these commodities while developing expertise in specialized processing techniques that command premium market prices. Comprehensive quality control laboratories will be developed at each facility to ensure consistent product quality, regulatory compliance, and customer satisfaction through rigorous testing and analysis protocols. Basic beneficiation processes will be implemented to upgrade raw materials through physical separation techniques, removing impurities and concentrating valuable minerals to meet market specifications and enhance product value.

Phase II expansion during Years 5-10 represents a significant scaling of processing capabilities through establishment of processing facilities in major mining regions across Pakistan, creating a national processing network that supports the company's expanded mining operations. Advanced metallurgical processing capabilities will be developed to handle complex ore types and enable extraction of multiple valuable components from single ore bodies, maximizing resource utilization and revenue generation. Automated processing systems will be systematically implemented across facilities to enhance operational efficiency, reduce labor costs, improve safety performance, and ensure consistent product quality through precise process control. Specialized processing units for different commodities will be created to optimize processing parameters for specific mineral types, ensuring maximum recovery rates and product quality while enabling flexible response to market demand variations.

Phase III advanced processing operations, commencing from Year 10 onwards, will establish world-class processing and refining facilities that position KP-MDMCL as a regional leader in mineral processing technology and capability. Development of rare earth and critical mineral processing capabilities will address growing global demand for technology metals and position the company in high-value specialty markets with limited competition. Technology licensing and processing services export will create additional revenue streams by monetizing accumulated technical expertise and proven processing technologies through partnerships with international mining companies. Strategic processing partnerships internationally will facilitate access to advanced technologies, specialized markets, and joint venture opportunities that enhance the company's global competitiveness and market reach.

3.2 Processing Technologies and Methods

The processing technologies and methods employed by KP-MDMCL encompass a comprehensive range of mechanical and extractive metallurgical processes designed to optimize mineral recovery, product quality, and operational efficiency across diverse commodity types. Mechanical processing forms the foundation of mineral beneficiation operations, utilizing crushing, grinding, and size reduction systems to liberate valuable minerals from host rock and achieve optimal particle sizes for subsequent processing stages. Classification and separation processes employ various techniques including screening, cycloning and spiral separation to segregate materials based on size, density, and other physical properties. Advanced concentration techniques including flotation, magnetic separation, and gravity separation are utilized to separate valuable minerals from gangue materials, with process parameters optimized for specific mineralogical characteristics and recovery objectives.

Comprehensive dewatering and drying systems ensure final products meet moisture specifications while minimizing transportation costs and preventing product deterioration during storage and handling. Extractive metallurgy capabilities encompass sophisticated pyrometallurgical processes for metal extraction from sulfide and oxide ores, utilizing controlled high-temperature environments to achieve chemical reduction and metal recovery through smelting and roasting operations. Hydrometallurgical processes for complex ores employ aqueous chemistry solutions to selectively dissolve and recover metals from low-grade or complex ore types that cannot be effectively processed through conventional physical separation methods. Electrometallurgical refining processes utilize electrochemical principles to produce high-purity metals meeting exacting market specifications while enabling recovery of precious metal by-products. Systematic recovery of by-products and rare elements maximizes resource utilization and revenue generation while supporting circular economy principles through comprehensive material recovery and waste minimization.

Quality control and certification systems ensure all processed products meet international standards and customer requirements through implementation of ISO 9001:2015 quality management systems across all processing facilities. Product certification to international standards including ASTM, BS, and relevant industry specifications ensures market acceptance and premium pricing for KP-MDMCL products. Continuous improvement programs systematically identify and implement operational enhancements, technology upgrades, and process optimizations to maintain competitive advantage and operational excellence. Customer satisfaction monitoring through regular feedback collection, performance metrics tracking, and responsive customer service ensures long-term customer relationships and market reputation.

3.4 Processing Efficiency Targets

Processing efficiency targets establish specific, measurable objectives that drive operational excellence and continuous improvement across all processing facilities. Plant availability targets exceeding 90% for all processing facilities ensure maximum utilization of capital investments while minimizing production disruptions and maintaining consistent product supply to customers. This target encompasses planned maintenance optimization, equipment reliability programs, and rapid response maintenance capabilities to minimize unplanned downtime. Recovery rates targeting minimum 85% for primary products ensure optimal utilization of mined resources while maximizing revenue generation from each ton of ore processed, with specific recovery targets established for different commodity types based on mineralogical characteristics and processing complexity.

Energy efficiency improvements targeting 5% annually drive cost reduction, environmental performance enhancement, and competitive advantage through systematic optimization of energy-intensive processes, equipment upgrades, and operational procedure refinements. These improvements encompass motor efficiency upgrades, process optimization, waste heat recovery, and renewable energy integration where technically and economically feasible. Waste reduction targets of 10% annually through circular economy principles demonstrate commitment to environmental stewardship while creating additional revenue opportunities through by-product recovery, tailings reprocessing, and waste-to-resource conversion initiatives. This comprehensive approach to waste management encompasses water recycling, reagent recovery, and systematic evaluation of all waste streams for potential value recovery or environmental impact reduction.

4. Commercialization Operations

4.1 Market Development Strategy

KP-MDMCL's market development strategy follows a systematic three-phase approach designed to build market presence and revenue streams in alignment with operational capacity expansion and strategic growth objectives. The domestic market focus during Years 1-5 concentrates on establishing a strong presence in Pakistan's construction and manufacturing sectors, which represent the largest consumers of mineral products including limestone, marble, coal, and aggregates. Strategic relationship development with cement, steel, and energy industries will secure long-term customer partnerships and provide stable revenue foundations for the company's growth. Direct sales channels for high-value products such as dimension stone, processed marble, and specialty minerals will be established to capture premium pricing and maintain direct customer relationships. Comprehensive brand recognition building for KP- MDMCL products will emphasize quality, reliability, and technical expertise to differentiate the company from competitors and establish market credibility.

Regional market expansion during Years 5-10 represents a strategic shift toward international revenue generation through export development to Afghanistan, Central Asia, and Middle Eastern markets where Pakistan maintains trade relationships and geographical advantages. Active participation in regional trade agreements and initiatives, including those facilitated through the China-Pakistan Economic Corridor and regional economic cooperation frameworks, will provide preferential market access and regulatory support for export activities. Development of specialized products for export markets will address specific customer requirements and market conditions in target regions, enabling premium pricing and competitive differentiation. Establishment of international sales offices in key markets will provide local presence, customer support, and market intelligence capabilities essential for sustained international growth.

Global market presence from Year 10 onwards positions KP-MDMCL as an internationally recognized mining company through strategic partnerships with international mining and trading companies that provide access to global distribution networks and technical expertise. Development of niche products for global markets will focus on high-value specialty minerals, processed products, and customized solutions that command premium pricing and limited competition. Active participation in international mining exchanges and bourses will enhance market visibility, facilitate price discovery, and provide access to international financing and partnership opportunities. Technology and expertise export services will create additional revenue streams while establishing KP-MDMCL as a regional center of mining excellence and technical innovation.

4.2 Sales and Marketing Framework

The sales and marketing framework encompasses comprehensive product portfolio management designed to maximize market coverage and revenue generation across diverse customer segments and market conditions. Development of a diversified product portfolio ensures market resilience through balanced exposure to different commodity cycles, customer segments, and geographical markets. Value-added product development programs will systematically upgrade raw materials into higher-value processed products that command premium pricing and provide competitive differentiation. Custom product solutions for industrial clients will address specific technical requirements and application needs, enabling long-term partnership relationships and stable revenue streams. Premium product lines for international markets will leverage superior quality standards and specialized processing capabilities to compete effectively in global markets. Distribution and logistics capabilities will be developed through strategic partnerships with established logistics companies that provide efficient, cost-effective transportation and delivery services across target markets. Development of efficient supply chain networks will optimize inventory management, reduce delivery times, and minimize logistics costs through integrated planning and coordination. Digital platforms for order management and tracking will enhance customer service, operational efficiency, and supply chain visibility through real- time information sharing and automated processes. Customer relationship management systems will be implemented to provide comprehensive customer management capabilities including contact management, sales tracking, service history, and performance analytics. Regular customer satisfaction surveys and feedback collection will ensure continuous improvement in product quality, service delivery, and customer experience. Technical support services for industrial customers will provide specialized expertise, application guidance, and problem-solving capabilities that enhance customer loyalty and competitive positioning. Long-term supply agreements with major clients will provide revenue stability, production planning certainty, and strategic partnership opportunities for mutual growth and development.

4.3 Revenue Optimization Strategies

Revenue optimization strategies encompass sophisticated pricing methodologies designed to maximize revenue generation while maintaining market competitiveness and customer satisfaction. Market-based pricing for commodity products will ensure competitive positioning while capturing appropriate margins through cost optimization and operational efficiency. Premium pricing for value-added and specialized products will reflect superior quality, specialized processing, and unique technical capabilities that provide customer value and justify higher margins. Long-term contract pricing for bulk commodities will provide revenue stability and production planning certainty while enabling volume-based pricing advantages for both company and customers. Dynamic pricing based on market conditions will enable responsive adjustment to commodity price fluctuations, supply-demand imbalances, and competitive pressures. Revenue diversification strategies will reduce market risk and enhance growth opportunities through multiple income streams beyond traditional product sales revenue.

Processing services revenue will be generated through toll processing arrangements, technical services, and specialized processing capabilities offered to other mining companies and industrial clients. Technical consulting and services revenue will monetize accumulated expertise in exploration, mining, processing, and project development through consulting services, feasibility studies, and project management contracts.

5. Operational Integration & Governance

5.1 Integrated Operations Management

Integrated operations management provides the organizational framework and technological infrastructure necessary to coordinate complex multi-site operations across exploration, mining, processing, and commercialization activities. Enterprise Resource Planning (ERP) system implementation will provide integrated data management, process automation, and decision support capabilities across all operational domains, enabling real-time visibility into operational performance, financial results, and strategic progress. Integrated planning across exploration, mining, processing, and sales will optimize resource allocation, production scheduling, and market responsiveness through coordinated decision-making and systematic information sharing. Real-time operational dashboards and reporting will provide management visibility into key performance indicators, operational metrics, and strategic objectives, enabling proactive management and rapid response to changing conditions. Performance monitoring and continuous improvement programs will systematically identify optimization opportunities, implement operational enhancements, and drive sustained performance improvement across all operational areas.

Supply chain management capabilities will encompass the complete value chain from mine to market, ensuring optimal coordination of materials, information, and financial flows throughout the operational network. Integrated supply chain management will optimize inventory levels, reduce working capital requirements, and enhance customer service through coordinated planning and execution. Strategic supplier partnerships and vendor management will ensure reliable supply of equipment, materials, and services while optimizing costs and quality through long-term relationships and performance-based contracts. Inventory optimization and just-in-time delivery will minimize carrying costs while ensuring operational continuity and customer satisfaction. Risk management and contingency planning will identify potential supply chain disruptions and establish mitigation strategies to ensure operational continuity under various scenarios.

5.2 Regulatory Compliance and Governance

Regulatory compliance and governance systems ensure adherence to all applicable laws, regulations, and industry standards while maintaining transparent and accountable organizational management. Full compliance with federal and provincial mining regulations will be maintained through systematic monitoring, reporting, and continuous improvement of regulatory performance across all operational areas. Environmental protection and monitoring compliance will encompass comprehensive environmental management systems, regular monitoring and reporting, and proactive measures to prevent environmental incidents and ensure sustainable operations. Labor law and safety regulation adherence will protect employee rights, ensure workplace safety, and maintain positive labor relations through comprehensive policies, training, and monitoring systems. Tax and royalty payment compliance will ensure timely and accurate fulfillment of all fiscal obligations while optimizing tax efficiency through proper planning and professional tax management. Corporate governance frameworks will provide oversight, accountability, and strategic direction through board oversight of operational performance, strategic planning, and risk management. Risk management and internal audit functions will provide independent assessment of operational effectiveness, regulatory compliance, and financial control systems while identifying areas for improvement and ensuring accountability. Stakeholder engagement and community relations programs will maintain positive relationships with local communities, government agencies, environmental organizations, and other stakeholders through transparent communication, responsive service, and proactive engagement. Transparency and sustainability reporting will provide regular public disclosure of operational performance, environmental impact, social contribution, and governance practices in accordance with international standards and best practices.

5.3 Human Resource Development

Human resource development programs will build organizational capabilities, technical expertise, and leadership capacity necessary to support KP-MDMCL's growth and operational excellence objectives. Comprehensive capacity building programs will include technical training and skill development programs designed to enhance employee capabilities in exploration, mining, processing, safety, environmental management, and other critical operational areas. Leadership development and succession planning will ensure continuity of management expertise and organizational knowledge while preparing high-potential employees for increased responsibilities and leadership roles. International exposure and technology transfer programs will provide employees with global best practices, advanced technical knowledge, and cross-cultural competencies essential for international operations and competitive advantage. Performance management and incentive systems will align individual and team performance with organizational objectives while providing competitive compensation and career development opportunities. Local community engagement initiatives will contribute to regional economic development while building positive stakeholder relationships and social license to operate. Employment generation in mining areas will provide direct and indirect employment opportunities that contribute to local economic growth and community development.

Local supplier development programs will strengthen regional supply chains, support local business development, and enhance community economic benefits through preferential procurement policies and supplier development assistance. Community development initiatives will address local infrastructure, education, healthcare, and social needs through strategic investments and partnership programs. Environmental and social impact management will ensure positive community relationships through proactive management of operational impacts, transparent communication, and responsive community engagement programs.

6. Operational Performance Framework

6.1 Key Performance Indicators (KPIs)

The operational performance framework establishes comprehensive measurement systems across financial, operational, and market performance dimensions to ensure accountability, drive continuous improvement, and support strategic decision-making. Financial performance indicators target aggressive growth objectives with annual revenue growth rates of 25% or higher during Years 1-10, followed by sustained growth of 15% or higher from Year 10 onwards as the company matures and expands internationally. EBITDA margin targets of 30% or higher by Year 3 reflect operational efficiency improvements, scale economies, and value-added product development. Return on assets targeting 15% or higher by Year 5 demonstrates effective capital utilization and investment returns. Export revenue targeting 50% or higher of total revenue by Year 10 reflects successful international market development and revenue diversification.

Operational performance indicators focus on production efficiency, safety excellence, and environmental stewardship across all operational domains. Production volumes by commodity type will be tracked and reported to ensure achievement of production targets and optimal resource utilization. Processing recovery rates and efficiency metrics will measure technical performance and continuous improvement in processing operations. Safety performance targets of zero fatalities and less than 2 Lost Time Injury Frequency Rate (LTIFR) reflect commitment to world-class safety standards and employee protection. Environmental compliance scores targeting 95% or higher demonstrate commitment to environmental stewardship and regulatory excellence.

Market performance indicators measure customer satisfaction, product quality, and market development success across domestic and international markets. Market share tracking in domestic markets by product category will assess competitive positioning and market development effectiveness. Customer satisfaction index targeting greater than 8.5 out of 10 reflects commitment to customer service excellence and relationship management. Product quality compliance rates targeting 99% or higher demonstrate technical excellence and customer value delivery. New product development pipeline strength will be assessed through innovation metrics, research and development investments, and market introduction success rates.

6.2 Risk Management Framework

The risk management framework provides systematic identification, assessment, and mitigation of operational and strategic risks that could impact KP-MDMCL's performance and strategic objectives. Operational risks encompass equipment failure and maintenance risks that could disrupt production, increase costs, and impact customer service, requiring preventive maintenance programs, equipment redundancy, and rapid response capabilities. Safety and environmental incident risks require comprehensive management systems, employee training, emergency response capabilities, and continuous monitoring to prevent incidents and ensure regulatory compliance. Regulatory and compliance risks necessitate proactive monitoring of regulatory changes, strong compliance management systems, and positive relationships with regulatory authorities. Market and commodity price risks require diversified product portfolios, flexible production capabilities, and financial risk management strategies including hedging and long-term contracts.

Strategic risks encompass longer-term challenges that could impact the company's competitive position and growth prospects. Competition and market disruption risks require continuous innovation, operational efficiency, and strategic flexibility to maintain competitive advantages. Technology obsolescence risks necessitate ongoing research and development, technology partnerships, and systematic technology upgrading to maintain technical leadership. Political and regulatory change risks require stakeholder engagement, regulatory relationship management, and contingency planning for various political and regulatory scenarios. Currency and financial risks require sophisticated financial management, hedging strategies, and diversified financing sources to manage exposure to foreign exchange fluctuations and financial market volatility.

7. Conclusion & Strategic Recommendations

The operational processes framework for KP-MDMCL provides a comprehensive roadmap for establishing and scaling mining operations from provincial to international levels, encompassing all critical aspects of modern mining operations from exploration through commercialization. Success in implementing this framework will depend on systematic implementation through a phased approach that ensures operational excellence at each stage of development while building capabilities for subsequent expansion phases. Technology integration through adoption of modern mining and processing technologies will provide competitive advantages, operational efficiency, and safety improvements essential for sustained success in global markets.

Regulatory compliance and environmental stewardship through maintenance of the highest standards of safety and environmental protection will ensure social license to operate while supporting sustainable development principles and community relationships. Human capital development through building skilled workforce and management capabilities will provide the foundation for operational excellence, innovation, and strategic execution across all operational domains. Strategic partnerships that leverage relationships for technology transfer, market access, and operational expertise will accelerate growth while reducing risks and capital requirements.

The framework positions KP-MDMCL to become a leading mining company in Pakistan and the broader region, contributing significantly to economic development, employment generation, and export earnings while maintaining sustainable and responsible mining practices that protect environmental resources and support community development. Regular review and adaptation of operational processes will ensure continued relevance and effectiveness in the dynamic global mining industry, enabling sustained competitive advantage and long-term value creation for shareholders, stakeholders, and the broader Pakistani economy.

SECTION-V

ECONOMIC JUSTIFICATIONS – For Operationalization of KP-MDMCL

A robust economic justification is fundamental to the establishment and operationalization of any capital-intensive venture. For the Khyber Pakhtunkhwa Mineral Development & Management Company Limited (KP-MDMCL), its existence as the provincial government's primary vehicle for mineral development is not merely a policy decision but a strategic response to a significant economic imperative. This chapter provides a detailed economic analysis, using a demand-supply framework to justify the company's role as a catalyst for growth and a solution to a critical gap in Pakistan's mineral sector.

1. Demand-Supply Gap in Pakistan's Mineral Sector

The economic case for KP-MDMCL begins with an analysis of the national and provincial mineral market. Like any manufacturing or processing industry, the mineral sector is governed by market forces of demand and supply, which in Pakistan's context, reveal a significant and costly gap.

a. Domestic Demand

Pakistan's demand for minerals is substantial and continues to grow. This demand is driven by key sectors of the economy:

- Construction: The nation's expanding infrastructure, housing, and commercial development projects require vast quantities of limestone, marble, granite, and aggregates.
- Industrial Production: Industries such as cement, glass, ceramics, and fertilizer production rely on a steady supply of industrial minerals like gypsum, silica sand, and rock salt.
- Emerging Technologies: The push towards a digital economy and national security requires access to strategic and high-value minerals for electronics, telecommunications, and defense industries.

b. Domestic Supply

The existing domestic mineral supply chain is largely fragmented, inefficient and under-regulated. It is dominated by individual lease owners and small-scale mining companies that often lack the capital, technical expertise and modern machinery to conduct efficient exploration and extraction. This leads to:

- Low Productivity: Outdated methods result in low resource recovery rates and high operational costs.
- Lack of Value Addition: Raw minerals are often sold without any local processing, which exports potential jobs and profits.
- Inconsistent Quality: The absence of standardized practices leads to inconsistent product quality, making it difficult to compete in both domestic and international markets.

c. The Economic Gap

The result is a glaring economic gap: Pakistan's growing demand for minerals is not being met by a fragmented, underperforming domestic supply. This gap directly translates into:

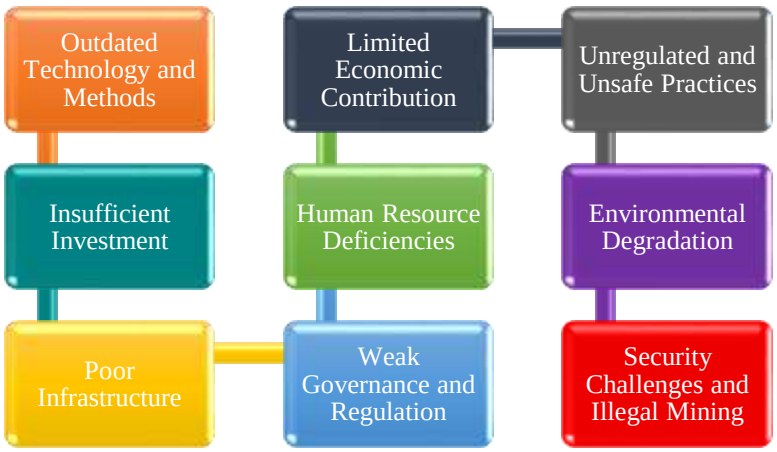
- A Drain on Foreign Exchange: The nation spends billions of rupees annually on importing minerals that could be sourced domestically.
- Missed Revenue Opportunities: The provincial government loses out on significant revenue that could be generated from a well-managed and high-yield mining sector.
- Stifled Economic Growth: The lack of a stable and high-quality mineral supply acts as a bottleneck for the growth of key industrial sectors.

2. Historical Developmental Imbalances - In KP'S Mineral Sector

Khyber Pakhtunkhwa (KP) is exceptionally rich in diverse mineral resources, holding immense potential to significantly bolster the provincial economy. Its unique geological setting, situated at a continental-continental collisional boundary, has resulted in an abundance of minerals, including precious base metals, a wide range of metallic and non-metallic minerals, various dimension stones, and numerous precious and semi-precious gemstones. The province holds approximately 95% of Pakistan's total marble reserves, amounting to an estimated 2900 million tons, and possesses a significant gemstone potential of 70 million carats. KP alone contributes 20% to Pakistan's total mining output. Despite this substantial mineral wealth, KP's mining sector accounts for a mere 3% of the provincial GDP. This stark disparity highlights a significant internal imbalance within KP, where vast natural resources are not translating into commensurate economic prosperity for the province. This chapter will delve into the historical challenges that have hindered the realization of this potential and outline the provincial government's strategic initiatives to foster sustainable and inclusive growth.

2.1 Key Historical Imbalances

Khyber Pakhtunkhwa's mineral sector has historically been characterized by underdevelopment and a lack of strategic planning, leading to a disproportionately low contribution to the provincial economy. This is due to a combination of interconnected factors as demonstrated below:



2.2 The Imperative for Addressing Imbalances

Addressing these historical and developmental imbalances is crucial for Khyber Pakhtunkhwa to unlock its economic potential and ensure sustainable development:

- **Economic Growth:** A well-managed and developed mineral sector can be a powerful engine for provincial economic growth. By attracting investment, modernizing technology, and creating value-added industries, the sector can increase its contribution to provincial GDP, create employment opportunities, and boost exports.
- **Social Development:** Sustainable mining can have a transformative impact on local communities. It can provide jobs, improve living standards, and fund social services like healthcare and education. By implementing transparent and equitable policies, the benefits of mineral wealth can be distributed more fairly, addressing the historical "resource curse" phenomenon.
- **Environmental Stewardship:** Modern mining practices incorporate environmental impact assessments and mitigation strategies. Adopting these practices is essential to protect the environment and ensure that the exploitation of mineral resources does not come at the cost of ecological damage and public health.
- **Energy Security:** Utilizing indigenous resources like coal and natural gas within KP can reduce the province's and the country's dependence on imported fuels and contribute to long-term energy security.
- **Job Creation:** The mining sector, when developed properly, can generate a wide range of jobs, from skilled labor in exploration and extraction to specialized roles in processing, management, and environmental monitoring. This would help address the issue of unemployment and foster a skilled workforce within the province.

3. KP-MDMCL As the Vehicle to Bridge The GAP

KP-MDMCL has been conceived as the strategic vehicle to directly address and bridge this critical economic gap. Its operational model is designed to overcome the limitations of the existing sector and transform the province’s mineral wealth into a powerful economic engine.

- Consolidation and Centralization: KP-MDMCL will consolidate the fragmented sector by taking on large-scale, high-potential projects. This centralized management will enable a strategic, long-term approach to exploration and mining that is impossible for small-scale operators.
- Driving Technology and Efficiency: By introducing modern exploration technologies (e.g., drone-based surveys, advanced drilling) and mechanized mining operations, KP-MDMCL will dramatically improve productivity and resource recovery rates. This will enable the company to produce high-quality minerals at a competitive cost, directly addressing the supply side's inefficiencies.

- Promoting Value Addition: A key component of KP-MDMCL's strategy is the establishment of mineral processing hubs. Instead of exporting raw materials, the company will process them into value-added products, creating a robust local industry, generating higher revenues, and fostering job growth.
- Attracting and De-risking Capital: The company's professional structure and government backing make it a credible partner for foreign direct investment and public-private partnerships. This allows KP-MDMCL to attract the multi-billion rupee capital injections necessary for large-scale projects, effectively de-risking opportunities for private investors and providing the financial muscle needed to close the demand-supply gap.

4. Quantifiable Economic Justifications

The economic benefits of KP-MDMCL are not abstract; they are quantifiable and directly contribute to the provincial and national economy.

- Substantial Revenue Generation: KP-MDMCL's effective operations will generate significantly higher revenue for the provincial exchequer through a predictable, transparent, and higher-yielding royalty and tax collection system, in addition to dividends as the government is the major shareholder.
- Import Substitution and Foreign Exchange Savings: By becoming a major domestic supplier of essential minerals, KP-MDMCL will directly contribute to import substitution, saving the country a significant amount of foreign exchange.
- Employment Creation and Local Empowerment: The large-scale, mechanized operations and value-added processing hubs will create thousands of direct and indirect jobs, providing skilled employment opportunities for local residents and fostering economic empowerment in mineral-rich regions.
- Infrastructure Development: The company's projects will act as a catalyst for the development of supporting infrastructure, including roads, power, and water supply, in often remote and underdeveloped areas. This creates a positive spillover effect, improving the quality of life for surrounding communities and facilitating further economic activity.

In conclusion, the establishment of KP-MDMCL is economically justified as a targeted and effective solution to a long-standing demand-supply imbalance in Pakistan's mineral sector. By acting as a central, professional, and technologically advanced corporate entity, it is uniquely positioned to unlock the province's mineral wealth and convert it into sustainable economic growth, revenue, and prosperity.

SECTION-VI

STRATEGIC PROJECT SELECTION FOR INITIAL BUSINESS PLAN

The selection of mineral exploration, exploitation and development projects is not merely a technical exercise but, in essence, a strategic decision that defines the trajectory of economic transformation, environmental stewardship, and regional equity. In the case of Khyber Pakhtunkhwa (KP), with its abundant yet underutilized geological wealth, the stakes are particularly high. It is worth adding that the entire mineral exploration, exploitation and development initiative is premised on a fundamental understanding of KP-MDMCL's capability to undertake these projects by equipping itself with modern mechanical mining and mineral processing mechanisms. This transition is vital, as conventional and outdated mining practices have historically led to significant wastage of valuable mineral resources. Embracing mechanized mining and mineral processing is not only expected to enhance operational efficiency but also to ensure optimal resource recovery in accordance with global best practices.

Mineral Investment Zones – Shaping a Sustainable Future:

Guided by the strategic vision to Explore, Innovate & Diversify mineral economy, the concept of Mineral Investment Zones (MIZs) provides a forward-looking framework for unlocking the mineral wealth of Khyber Pakhtunkhwa (KP). The initiative is designed to attract investment, generate employment and foster industrial development while ensuring sustainable utilization of the province's vast geological resources. The rationale behind identifying and prioritizing Six Mineral Investment Zones (MIZs) is based on scientific evidence, geological mapping and economic viability, ensuring that investment flows toward projects with the highest potential for value addition, industrial linkages and export opportunities. Each zone has been selected considering its unique mineral profile, accessibility, and potential to drive downstream industries.

THE SIX PRIORITY ZONES

Chitral – Gemstone & Rare Metal Pegmatites

Rich in high-value gemstones and rare metals, Chitral offers a unique opportunity to establish cutting-edge gemstone mining, processing, and export hubs that can cater to both domestic and international markets.

Karak – Gypsum Processing Facilities

Karak has large reserves of gypsum, a critical raw material for cement, fertilizer, and construction industries. Setting up processing facilities will reduce imports, create jobs and stimulate local industries.

Placer Gold Deposits – Downstream of Tarbela Reservoir (River Indus)

The placer gold deposits hold promise for sustainable gold extraction, creating direct revenue streams while supporting artisanal and mechanized mining initiatives under a regulated framework.

Newly Merged Districts (NMDs) – Metallic Minerals, Gemstones & Industrial Minerals

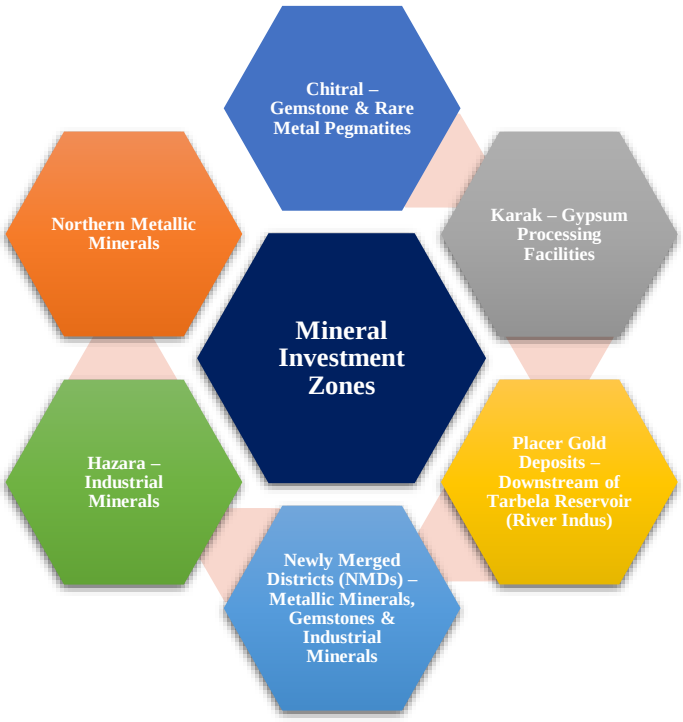
The NMDs are endowed with diverse resources including copper, chromite, calcite marble and other semi-precious stones. Their development will contribute to regional uplift, integrate marginalized areas into the mainstream economy and create inclusive growth.

Hazara – Industrial Minerals

Hazara is strategically placed for developing industries based on feldspar, phosphate, iron, quartz, and other industrial minerals. This zone can fuel construction, steel and allied industries across KP and beyond.

Northern Metallic Minerals

Northern KP contains untapped metallic minerals including lead, zinc and copper. These resources can drive metallurgy, alloy production and specialized industries, providing both domestic and export advantages.



The selection of these six zones is not arbitrary; it is anchored in comparative advantage, resource clustering, and alignment with industrial demand. Together, they create a diversified portfolio that reduces risk, maximizes resource efficiency, and ensures long-term sustainability. By focusing on these Mineral Investment Zones, KP positions itself as a regional hub for mineral-based industries, driving investment, innovation, and inclusive development in line with global sustainability standards. In an attempt to justify strategic project selection, absolutely at the roadmap stage only, we hereby outline following process to conclude our view point:

1.	Background and Strategic Context
2.	Project Selection Criteria
3.	Technical Justification in Brief
4.	Institutional readiness and project alignment
5.	Environmental, Social & Governance (ESG) Considerations
6.	Final Recommendations and Path Forward
7.	Conclusion

1. Background and Strategic Context

Khyber Pakhtunkhwa (KP) possesses the second-largest exposed geological area in Pakistan, spanning approximately 95,000 sq. km, yet only about 4.16% (3,956 sq. km) is currently under prospecting and mining titles. The Khyber Pakhtunkhwa Mineral Development & Management Company Limited (KP-MDMCL) was established to transform this underexplored and underexploited, but geologically rich, terrain into a frontier for sustainable mineral development. Recognizing that a modern mining company's success depends on acquiring land, ensuring the optimal use of resources through efficient mining and processing and upholding environmental and social responsibilities while generating revenue, KP-MDMCL has developed a comprehensive business strategy. This plan outlines specific modes to secure the optimal utilization of the province's mineral wealth and significantly increase revenue for the provincial government, considering all potential impacts on the mining industry with a focus on inclusivity, as follows:

- Acquiring exploration / prospecting and mining rights;
- Identification of potential JV projects with existing mineral title-holders;
- Investment in mineral processing and value addition facilities;
- Extending technical expertise and services in the fields of exploration, mine-planning and design mining, mine-closure & environmental rehabilitation to private/public entities; *and*`
- Attract investments in dissimilar forms including shares to successful mining projects.

Based on the fact that most known mineral deposits in the province are already under the control of individual and small-scale mining operators, KP-MDMCL has developed a practical and pragmatic business plan for mineral development. This plan, which is built on the operational modes outlined earlier, focuses on executing initial projects to ensure sustainable business growth. These projects are detailed below:

S#	Project	Remarks	Investment Source
01	Gypsum Mining and Value Addition Facility (GMVAF)	Brownfield	MDF/JV/DFI
02	Northern Feldspar Mining and Value Addition Facility, Mansehra (NFMVAF)	Brownfield	MDF/JV/DFI
03	Exploration & Exploitation of Metallic Minerals in NMDs, especially Waziristan Copper (JV & own capacity)	Brownfield	MDF/JV/DFI
04	Parachinar Soapstone Mining and Value Addition Facility (PSMVAF)	Brownfield	MDF/JV/DFI
05	Mohmand White Marble Mining & Value Addition Facility (MWMMVAF)	Brownfield	MDF/JV/DFI
06	Phosphate Mining and Value Addition Facility in Abbottabad	Brownfield	MDF/JV/DFI
07	Quartz Mining and Value Addition Facility in Battagram	Brownfield	MDF/JV/DFI
08	Langrial Iron Ore Mining and Value Addition Facility in Abbottabad	Brownfield	MDF/JV/DFI
09	Chromite Mining and Value Addition Facility in Kohistan	Brownfield	MDF/JV/DFI
10	Nephrite Mining and Value Addition Facility in Mohmand/Bajaur	Brownfield	MDF/JV/DFI
11	Exploration and Exploitation of Placer Gold and Placer Deposits in KP	Brownfield	MDF/JV/DFI
12	Exploration of Gemstones and Rare Metal Pegmatite Belt in District Chitral	Greenfield	MDF/JV/DFI
13	Exploration & Evaluation of Metallic Minerals in Districts Chitral, Dir, & Mansehra	Greenfield	MDF/JV/DFI

2. Project Selection Criteria

The identification of the following projects for mineral exploration, exploitation, and value addition is the result of a structured, multi-dimensional evaluation framework. Each project has been assessed across critical dimensions to ensure that the selection aligns with KP-MDMCL's strategic mandate, sustainable operations, and early revenue generation capacity.

The following five criteria form the foundation of this evaluation:

2.1 Geological Potential

The primary criterion was the existence of reported and promising mineral resources, supported by DGMM statistics, regional mapping, historical mining activity, and current extraction indicators.

- Placer Gold (Brownfield): Already proven along the Indus River, with artisanal mining confirming strong gold potential.
- Copper in Waziristan: Medium-scale deposits with tonnage in millions, suitable for JV exploitation.
- Gemstones & Rare Metals in Chitral: Global market recognition for gemstone, along with rare metals (niobium, tantalum, lithium), based on reported presence in Nuristan area of Afghanistan.
- Industrial Minerals:

Mineral	District(s)	Reserves	Infrastructure / Production	Applications	Opportunities / Market Potential
Metallic Minerals	Chitral, Dir & Mansehra	Not Estimated	N/A	Electrical, Mechanical & IT Appliances	Growing international demand
Gypsum	Kohat, Karak	Billions of tons	Established mining & processing units	Cement, plaster, fertilizer, construction	Strong domestic demand, export potential
Feldspar	Mansehra	Millions of tons (production)	Active extraction	Glass, ceramics, tiles, abrasives	Value addition for ceramics & glass industry
Soapstone	Parachinar	Huge deposits	Mining in progress	Talc powder, paints, cosmetics, rubber, pharmaceuticals	Growing demand in pharma & cosmetics
White Marble	Mohmand	Extensive horizons (industrial-grade)	Established quarrying & trade	Packaging industries	Byproduct of tile grade marble
Phosphate	Abbottabad	Significant deposits	Limited processing	Fertilizer production	import substitution & export
Quartz	Battagram	Huge deposits	Partially exploited	Glass, electronics, semiconductors, solar panels	Rising global demand (tech & renewable energy)
Iron Ore	Langrial (Abbottabad)	~20 million tons	Extraction and development potential	Steel production	Beneficiation & value addition for domestic steel industry
Chromite	Kohistan	Abundant, low- to medium-grade	Mining ongoing	Stainless steel, alloys, refractories	Processing & upgradation needed for exports
Nephrite	Mohmand, Bajaur	High-quality reserves	Reported deposits, ongoing mining	Gemstones, ornaments, carvings	Strong semi-precious stone market demand (domestic & international)

Gypsum reserves in billions of tons in district Kohat & Karak with existing mining and processing infrastructure, Feldspar production in Millions of tons in district Mansehra in the past six years, Huge Soapstone reserves in Parachinar, extensive industrial grade White Marble horizons in district Mohmand, Phosphate deposits necessitating value addition in district Abbottabad, Huge Quartz deposit in district Battagram, Iron Ore worth tonnage of twenty millions in Langrial area of Abbottabad, Abundant deposits of low to medium grade Chromite in district Kohistan, and high quality Nephrite deposits reported in district Mohmand/Bajaur, all have established production records and significant demand.

2.2 Accessibility and Infrastructure

Project zones were evaluated for terrain navigability, road connectivity, and utility availability.

- Accessible Regions: Karak, Kohat, Mansehra, Abbottabad, Battagram, Mohmand, and Parachinar benefit from existing road networks and market linkages.
- Chitral Projects: Despite mountainous terrain, the Lowari Tunnel and hydropower potential improve feasibility for gemstones and rare metals.
- Waziristan Copper: Located in the NMDs with growing connectivity, feasible for bulk transport and processing.

This ensures that projects will not be stranded due to prohibitive infrastructure costs.

2.3 Regulatory Readiness

The feasibility of timely project execution is heavily influenced by the licensing regime and institutional responsiveness of the Mines & Minerals Department.

- Most projects fall within zones where exploration or mining leases are available.
- DGMM KP has demonstrated willingness to facilitate structured investments, especially for placer gold, copper, gypsum, and feldspar projects.
- Ongoing cadaster reforms, digital licensing, and competitive bidding processes further enhance project readiness.

This creates an enabling environment for both KP-MDMCL-owned and JV-based projects.

2.4 Investment Attractiveness

Each project was evaluated for its financial viability and ability to attract investment, whether through Public-Private Partnerships (PPP), Joint Ventures (JV), or equity participation.

- High-Value Commodities:
  - Emeralds with global market acceptance.
  - Placer gold as a priority brownfield, quick-revenue project.
  - Copper in Waziristan (Project 04) offering large-scale JV potential.

- Industrial Minerals:
  - Gypsum from Karak–Kohat can support plasterboard exports.
  - Feldspar from Mansehra and Soapstone from Parachinar have consistent domestic demand.
  - White marble (Mohmand) for packaging industries and nephrite (Mohmand/Bajaur) is premium ornamental stone for export.
  - Quartz, iron ore, phosphate, and chromite supports indigenous industrial use and import substitution.

Collectively, these projects ensure a balanced portfolio of high-value exports and industrial-use minerals for sustained revenue.

2.5 Environmental and Social Context

All projects were screened for compliance with Environmental, Social, and Governance (ESG) standards, including community involvement and ecological sensitivity.

- Chitral Emerald Mining: Relatively low ecological footprint, manageable under ESMPs, and historically supported by artisanal miners.
- Karak and Kohat Gypsum: Communities are already engaged in small-scale operations and can transition into large scale formal employment.
- NMDs Copper: Requires strong community engagement (FPIC) to ensure social acceptance.
- Marble, Feldspar, Soapstone, Quartz, and Nephrite: Offer high employment potential for local communities while maintaining a moderate environmental footprint.

This ensures projects contribute positively to community development, job creation, and provincial sustainability goals.

3. Technical Justifications in Brief

For a newly established entity like KP-MDMCL, robust technical justifications are essential to establishing credibility, ensuring project viability, and securing long-term success. In a sector marked by geological uncertainty and capital-intensive operations, selecting projects based on **scientific data, proven and productive mineral potential and mining activity, and operational feasibility** enables efficient resource deployment and builds investor confidence.

Such justifications also serve as the foundation for regulatory approvals, environmental safeguards, and public-private partnerships. This disciplined, data-driven approach is central to KP-MDMCL's mandate to move beyond legacy inefficiencies toward a modern, strategic, and sustainable model of mineral development.

The following **13 projects** have been technically analyzed and justified:

3.1 Exploration of Gemstones & Rare Metal Pegmatite Belt (District Chitral) Greenfield

Geological Overview:

Underexplored Kafiristan and Garam Chashma Plutons are reported to host beryl group gemstones (emerald, aquamarine, tourmaline etc.) with recent reports of lithium anomalies. Comparable pegmatites across the border in Nuristan (Afghanistan) are enriched in lithium, tantalum, niobium, tin, and cesium besides various gemstones such as emeralds, aquamarine, kunzite etc.

Strategic Edge:

- Unique pegmatite belt in KP.
- Potential to host both rare metals and gems.
- Supported by USGS studies in bordering area of Chitral, i.e. Nuristan of Afghanistan and regional geological surveys.

Key Recommendations:

- Small scale mapping, sampling, and geochemical analysis.
- If confirmed, mining and establishment of gemstone cutting and rare-metal processing facilities.
- Attract foreign JV partners (US, EU, China) for technology and financing.

3.2 Exploration & Evaluation of Metallic Minerals (Chitral, Dir, Mansehra) Greenfield

Geological Overview:

These northern crystalline belts are enriched in base metals (copper, lead, zinc) and associated precious metals. Mineralization occurs in granitic intrusions and volcanogenic systems with scattered artisanal mining evidence. The exploration of metallic minerals in Chitral began in 1953 with DEMAG's geophysical survey and geological mapping of the Dommel Nisar iron ore occurrence, followed by GSP's study in 1958. Subsequent work, including the 1981 joint USGS-GSP investigation, expanded knowledge of Chitral's geology and documented several metallic mineral prospects including copper, lead, zinc, and others. The Hazara and Mansehra regions have been extensively studied geologically since the late 19th century, with pioneering work by Waagen and Wynne (1872) and later studies by Middlemiss (1896), Wadia (1931), and others, who established the area's structural and stratigraphic framework. Mansehra is known for its complex geology, including granitic bodies and metamorphic sequences, hosting economically significant deposits such as soapstone, phosphate, and iron ore, while the adjoining Dir district shows potential for metallic minerals like copper, lead, and zinc, making the entire region important for future mineral exploration and economic development.

Strategic Edge:

- Potential polymetallic districts with copper, gold, and zinc.
- Favorable geology similar to metallogenic provinces in Tethyan Belt.

Key Recommendations:

- Regional stream sediment geochemistry and prospecting.
- Identify JV partners for medium-scale operations.
- Integrate with future smelting and beneficiation facilities.

3.3 Exploration & Exploitation of Placer Gold (KP) – Brownfield Priority

Geological Overview:

The Indus River system hosts extensive placer gold deposits formed by the erosion and transport of gold-bearing rocks from the highlands of the Hindukush, Karakoram, and Kohistan regions. Over time, gold particles are naturally concentrated in river sediments, particularly within point bars, channel beds, and floodplains. While placer gold occurs along many stretches of the river, the area below the Tarbela Dam is of particular interest due to its high sediment load and continuous replenishment from upstream sources. Here, favourable hydraulic conditions promote the accumulation of fine gold, and traditional panning by local communities has confirmed its presence. This zone represents a promising target for systematic exploration and potential development using modern, sustainable recovery methods.

Strategic Edge:

- Quick-revenue project, already proven.
- Historically mined; artisanal operations exist.
- Low CAPEX, high cash flow potential.

Key Recommendations:

- Detailed sampling, GIS mapping, and bulk testing.
- Deploy portable gravity recovery units (sluices, concentrators).
- Pilot-scale mining followed by scalable operations.

3.4 Exploration & Exploitation of Metallic Minerals in NMDs (Waziristan Copper) – Brownfield/JV

Geological Overview:

The newly merged districts of the former FATA in Khyber Pakhtunkhwa are endowed with a wide range of mineral resources, including chromite, coal, marble, limestone, and gemstones, offering strong economic development potential. Waziristan, in particular, is notable for its volcanic-hosted massive sulfide (VMS) copper deposits associated with the Waziristan Ophiolite Complex. These deposits contain copper with minor gold and other base metals, showing significant promise for future development. The Frontier Works Organization (FWO) has initiated mining and value-addition activities in the region, playing a vital role in unlocking its mineral potential. With systematic exploration, modern mining practices, and downstream processing facilities, Waziristan could become a key contributor to Pakistan's copper production and value-added mineral exports.

Strategic Edge:

- Among the largest copper resources of KP.
- Rising global copper demand (EVs, renewables).

Key Recommendations:

- JV with leaseholders and investors for mine development.
- Install beneficiation plant for copper, cobalt, silver recovery.
- Ensure ESG compliance and local employment integration.

3.5 Gypsum Mining & Value Addition Facility (Karak/Kohat) – Brownfield

Geological Overview:

Karak holds many active mine leases with part of the 4.9 billion tons of high-quality gypsum reserves shared with Kohat—representing 89% of Khyber Pakhtunkhwa's total reserves. Gypsum content is over 90% purity, highly suitable for plaster, cement, and gypsum board production. Karak contributes significantly to the 3.5 million tons/year gypsum output of the region.

Strategic Edge:

- Largest gypsum reserves in Pakistan.
- Low-cost mining, high domestic demand (CPEC, housing).
- Export potential to South Asia and Central Asia.

Key Recommendations:

- Mechanized mining and processing facility.
- Secure supply contracts from leaseholders.
- Develop gypsum board/value-add industries.

3.6 Northern Feldspar Mining & Value Addition Facility (Mansehra) – Brownfield

Geological Overview:

The Mansehra district hosts extensive feldspar deposits within the Mansehra Granite Complex, a key source of high-quality potassium and sodium feldspar used in ceramics, glass, and tiles. Over the past six years, more than 3 million tons of feldspar have been mined, mostly through small-scale operations supplying local industries. With modern mechanized mining and value-addition facilities such as crushing and beneficiation plants, the region holds significant potential to enhance production efficiency, reduce wastage, and boost revenue through expanded domestic and export markets.

Strategic Edge:

- Critical input for ceramics, glass, paints.
- Domestic demand + export to Gulf region.

Key Recommendations:

- Processing facility near Mansehra.
- Partner with ceramic/glass industries.
- Ensure beneficiation to produce premium-grade feldspar.

3.7 Parachinar Soapstone Mining & Value Addition Facility – Brownfield

Geological Overview:

The Parachinar area in District Kurram, Khyber Pakhtunkhwa, hosts substantial soapstone deposits, occurring within talc-rich metamorphic zones associated with ultramafic rocks. These deposits are known for their high purity and white to light-green coloration, making them ideal for use in cosmetics, pharmaceuticals, ceramics, paper, and paint industries. Over the years, soapstone from Parachinar has been mined primarily through small-scale, manual methods, with limited value addition.

Strategic Edge:

- High-quality deposits with export demand (Middle East, South Asia).
- Traditional artisanal mining already present.

Key Recommendations:

- Reserve quantification and quality certification.
- Establish processing to remove asbestos/impurities.
- Develop value-added talc products.

3.8 Mohmand White Marble Mining & Value Addition Facility – Brownfield

Geological Overview:

The Mohmand district of Khyber Pakhtunkhwa hosts significant deposits of high-purity white marble, primarily occurring within metamorphosed limestone and dolomitic units of the Lesser Himalayan sequence. This marble is renowned for its bright white color, fine grain, and low impurity levels, making it ideal for industrial applications, particularly in the packaging industry, where finely ground calcium carbonate is used in paper, plastics, and coatings.

Strategic Edge:

- Internationally recognized for whiteness and quality.
- Export demand in Middle East and Europe.
- Potential for industrial fillers in plastics/paper.

Key Recommendations:

- Modern quarrying techniques (wire saws).
- Establish GCC plant for value addition.
- Target both architectural and industrial markets.

3.9 Phosphate Mining & Value Addition Facility (Abbottabad) – Brownfield

Geological Overview:

The Abbottabad district hosts significant phosphate deposits within sedimentary dolomitic and limestone formations of the Lesser Himalayas, vital for fertilizer production. Currently, mining is mostly small-scale, with raw phosphate supplied to local plants. There is strong potential for value addition through modernized mining, crushing, and beneficiation to produce finished fertilizers like DAP and SSP, which would reduce imports, boost agricultural productivity, and generate employment and revenue for the region. Phosphate-bearing horizons in Hazara Formation, hosts medium-grade rock phosphate (18–24% P_2O_5).

Strategic Edge:

- Essential for fertilizer industry (DAP, SSP).
- Import substitution for Pakistan's fertilizer sector.

Key Recommendations:

- Beneficiation to improve grade.
- Develop integrated fertilizer industry linkages.
- Secure off-take with fertilizer plants.

3.10 Quartz Mining & Value Addition Facility (Battagram) – Brownfield

Geological Overview:

The Battagram and Mansehra districts of Khyber Pakhtunkhwa host extensive deposits of high-purity quartz, primarily occurring within pegmatites and quartz veins associated with granitic and metamorphic rocks of the Lesser Himalayas. This quartz is suitable for use in glass manufacturing, ceramics, silicon chips, and solar panel industries. Currently, mining is largely manual and small-scale, leading to high wastage and limited economic returns. By introducing modern mechanized mining techniques and establishing processing units for crushing, grading, and purification, these districts can significantly enhance value addition, enable the production of export-grade quartz products and support downstream industries while boosting local employment and revenue.

Strategic Edge:

- Raw material for glass, ceramics, solar PV, electronics.
- Rising demand in high-tech industries.

Key Recommendations:

- Beneficiation for high-purity silica.
- JV with glass/ceramics producers.
- Explore export to Gulf countries.

3.11 Langrial Iron Ore Mining & Value Addition Facility (Abbottabad) – Brownfield

Geological Overview:

The Langrial iron ore occurs as discontinuous syn-sedimentary beds within limestone, sandstone, and shale, likely of Cretaceous age, with thicknesses ranging from 1–6 meters. It is divided into two parallel zones: the western oolitic hematite belt between Kalabagh Cantonment and Dubran, and the eastern ferruginous sandstone/laterite belt extending from Kohala Gali to Dartian. The ore primarily consists of hematite, limonite, and iron silicates, with Fe grades ranging from <35% in oolitic layers to <10% in laterites. Earlier studies by GSP estimated 20 million tons, later revised by SDA to 40 million tons of total reserves, highlighting its potential for development through modern mining and beneficiation techniques.

Strategic Edge:

- Potential to minimize imported iron ore.
- Linkage with Pakistan Steel and re-rolling mills.

Key Recommendations:

- Beneficiation for steel-grade feed.
- Partner with steel industry investors.
- Conduct metallurgical testing for yield improvement.

3.12 Chromite Mining & Value Addition Facility (Kohistan) – Brownfield

Geological Overview:

The Kohistan region hosts notable chromite deposits within the Kohistan Island arc complexes, mainly the Jijal, Sapat, and Dubair ultramafic complexes. The ore occurs as podiform and lens-shaped bodies in peridotites and dunite, typical of ophiolitic settings. These deposits are generally medium-high-grade, suitable for ferrochrome and refractory industries. Currently mined on a small scale, the area offers strong potential for mechanized mining and beneficiation, enabling higher recovery and value-added chromite products for domestic and export markets.

Strategic Edge:

- Critical input for stainless steel and refractories.
- Export demand from China and Gulf countries.

Key Recommendations:

- Reserve delineation with modern mapping.
- Processing (gravity separation) to upgrade ore.
- JV with ferrochrome industries.

3.13 Nephrite Mining & Value Addition Facility (Mohmand/Bajaur) – Brownfield

Geological Overview:

The Mohmand and Bajaur districts of Khyber Pakhtunkhwa host significant nephrite jade deposits, occurring within ultramafic and associated metamorphic rocks such as serpentinites and talc-carbonate schists. These deposits are typically found along shear zones and fault contacts, where hydrothermal alteration transformed ultramafic rocks into nephrite. The jade from this region is valued for its green to whitish hues and fine texture, making it suitable for ornamental and carving industries.

Strategic Edge:

- Global demand (China, East Asia).
- High export value compared to industrial minerals.

Key Recommendations:

- Modern quarrying with quality grading.
- Develop lapidary and carving industry.
- Branding of KP nephrite in international gem markets.

4. Institutional Readiness & Project Alignment – With business plan

The proactive readiness of the Minerals Development Department (MDD) and its field operations is directly linked to the effective execution of KP-MDMCL's business plan. This institutional support and policy alignment are critical for a successful and operative strategy.

Enabling a Digital First Approach: The establishment of a Mining Cadaster System provides the digital and transparent backbone necessary for KP-MDMCL's modern, technology-driven approach. This system streamlines licensing, making it easier for the company to secure prospecting and mining titles efficiently, which is the foundational step of its business plan.

Facilitating Strategic Partnerships: The Directorate's proactive calls for Expressions of Interest (EOI) for Joint Ventures directly align with KP-MDMCL's core strategy of attracting Public-Private Partnerships (PPPs). This demonstrates that the department is not only open to, but actively seeking, the collaboration models that KP-MDMCL has been designed to spearhead.

Creating a Predictable Business Environment: The implementation of streamlined royalty and leasing frameworks creates a predictable and stable business environment. This is a crucial factor for attracting investment and is a key component of KP-MDMCL's financial strategy to build investor confidence and secure funding.

In summary, the institutional advancements by the MDD provide the essential regulatory and operational framework for KP-MDMCL. This synergy ensures that the company's proposed business development plan is not just a theoretical model but an effective and operative strategy with strong governmental backing. This readiness, from the highest administrative levels down to the field inspectorates, justifies the company's existence and provides a solid foundation for achieving its strategic objectives.

5. Environmental, Social & Governance (ESG) Considerations

All shortlisted projects are located in zones where Environmental and Social Management Plans (ESMPs) can be implemented without significant displacement of communities. Project design will prioritize local labor engagement and structured community participation to ensure shared socio-economic benefits. Reclamation measures and clear ESG Key Performance Indicators (KPIs) will be incorporated into contract enforcement and licensing frameworks from the outset. A central ESG commitment is to integrate women and youth employment opportunities, along with comprehensive post-mining rehabilitation plans, beginning from the exploration phase to ensure sustainable, inclusive, and responsible mineral development.

6. Final Recommendations and Path Forward

6.1 Instant Action (0–24 Months)

Immediately prioritize the preparation of comprehensive Technical Feasibility Reports for at least three high-potential zones, covering geological, environmental, and economic aspects in detail. Secure NOCs and exploration licenses in close coordination with the Directorate General of Mines and Minerals, Government of Khyber Pakhtunkhwa, to avoid administrative delays. Concurrently, develop investment prospectuses and robust PPP models for targeted market pitching. Initiate baseline environmental assessments and structured community consultations to build early stakeholder confidence and ensure compliance with environmental and social safeguards.

6.2 Mid-Term (24–60 Months)

Commence systematic exploration, mining, and pilot processing in at least two selected zones. Execute PPP contracts with reputable private partners through transparent procurement processes, ensuring shared risk and benefit. Implement targeted capacity-building programs to develop a skilled local workforce and foster SME clusters that can support and benefit from the growing mineral sector.

6.3 Long-Term (60 Months Onwards)

Scale up successful pilot operations into full commercial-scale mining, integrating advanced technology and best practices for efficiency and sustainability. Strengthen downstream value chains by establishing refining, gemstone cutting, and marketing facilities to maximize in-province value retention. Form strategic alliances with the Ministry of Industries, Commerce, and Technical Education, Government of KP, to establish regional mineral-based industrial zones for gypsum, feldspar, calcite, and other resources—transitioning from raw exports to finished goods production. Position KP as a regional hub for responsible, high-value mining investment by actively engaging stakeholders such as the Department of Industries, Commerce & Technical Education and Khyber Pakhtunkhwa Economic Zones Development and Management Company (KPEZDMC) to drive integrated mineral sector growth and diversification of the provincial economy.

7. Conclusion

The mineral wealth of Khyber Pakhtunkhwa provides with a unique opportunity to shift from fragmented, raw mineral extraction to a fully integrated, value-driven, and ESG-compliant mineral economy. Building on these promising zones, KP-MDMCL can further diversify by exploring other high-potential districts—thereby broadening its resource base and investment appeal. To realize this transformation, targeted exploration, phased resource development, and responsible public-private partnerships (PPPs) will be essential. In doing so, KP-MDMCL may adopt proven models of collaboration and institutional structuring, as seen in the success stories of Mari Minerals (Pvt) Limited, a dynamic subsidiary of Mari Energies Limited, and Baluchistan Mineral Resources Limited (BMRL), which have demonstrated the viability of JVs with both domestic and international partners in de-risking projects and accelerating development.

This Business Plan lays out a pragmatic, technically justified, and investor-aligned roadmap, ensuring that KP-MDMCL is equipped not only to unlock billions in untapped economic value but also to deliver environmentally sustainable and socially inclusive outcomes. With strategic partnerships, regulatory alignment, and institutional capacity-building, mineral development can become a cornerstone of KP's economic revival and industrial modernization.

SECTION-VII

ACTION PLAN FOR PROPOSED PROJECTS

Project 01	Exploration of Gemstones and Rare Metal Pegmatite Belt in District Chitral
Project 02	Exploration and Exploitation of Placer Gold and Placer Deposits in KP
Project 03	Gypsum Mining and Value Addition Facility (GMVAF)
Project 04	Exploration & Exploitation of Metallic Minerals in NMDs, especially Waziristan Copper (JV & own capacity)
Project 05	Northern Feldspar Mining and Value Addition Facility, Mansehra (NFMVAF)
Project 06	Parachinar Soapstone Mining and Value Addition Facility (PSMVAF)
Project 07	Mohmand White Marble Mining & Value Addition Facility (MWMMVAF)
Project 08	Phosphate Mining and Value Addition Facility in Abbottabad
Project 09	Quartz Mining and Value Addition Facility in Battagram
Project 10	Langrial Iron Ore Mining and Value Addition Facility in Abbottabad
Project 11	Chromite Mining and Value Addition Facility in Kohistan
Project 12	Nephrite Mining and Value Addition Facility in Mohmand/Bajaur
Project 13	Exploration & Evaluation of Metallic Minerals in Districts Chitral, Dir, & Mansehra

Project -1

Exploration of Gemstones and Rare Metal Pegmatite Belt in District Chitral

(2026–2034)

- Total Estimated Cost: PKR 6,450 million
- Built-in Contingency & Inflation: ~15–20% over 5 years
- Key Drivers of Cost: Terrain difficulty, gemstone lab testing, imported machinery, and skilled labor

Year	Activities	Details	PKR in Million
2026-2031 (Phase 1)	Detailed Geological mapping & geochemical sampling & Geo-Physical Survey Core drilling in priority pegmatite zones Gemstone & rare metal laboratory analysis (aquamarine, emerald, tourmaline, tantalum, lithium, etc.) Feasibility study & resource estimation	Detailed Geological mapping, geo chemical sampling, lab analysis for delineating prospective areas, Resistivity/IP System, Magnetometer, training Subsurface confirmation Technical study & market, valuation of Rare-metals and Gems-stones.	1,500
	Phase-1 Total		**1,500**
(Phase-II) - 2031-2034			
2031-2032	Mine planning & site development. Purchase of heavy machinery for mining.	Detailed engineering design, mine layout planning, permits, initial site clearing, portal/shaft development, purchase of heavy mining equipment	900
	Designing & processing facility.	Final design, tendering & procurement of crushers, grinders, sorters, optical scanning equipment for processing.	320
	Infrastructure	Road access upgrades, initial camp setup (temporary housing)	180
2032-33	Initiating of mining	Full-scale excavation (underground/bench mining), ventilation systems, dewatering setup, haulage system installation	1,200
	Processing facility	Civil works for plant buildings, installation of main processing line, cutting/polishing machinery procurement	880
	Infra-structure	Power connection or on-site generation (diesel/solar hybrid), water supply, permanent housing	280
2033-34	Mining	Final development to production-ready level (stopping prep, ore handling systems), training of operational crews	850
	Processing facility	Plant commissioning, trial runs, operator training, gemstone grading calibration	250
	Infra-structure	Security facilities, storage warehouses, communications	90
	Phase-II total		**4,950**

Project -2

Exploration and Exploitation of Placer Gold and Placer Deposits in KP

(2026–2029)

Project Life Cycle (Phases & Duration)

Processing plant capacity is 2,500 tons/day

Total Investment = PKR 390 million (spread across ~3 years before revenue generation).

Phase	Activity	Duration	Key Cost Drivers
Phase I	Exploration & Evaluation	Year 2–Year 3 (24 months)	Geological mapping, bulk sampling, test wash operations, feasibility, licensing
Phase II	Mine Development & Processing Setup	Year 4–Year 5 (24 months)	Mine construction, equipment purchase, wash plant setup, site infrastructure, labor, environmental safeguards
Phase III	Production & Commercial Mining	Year 6 onward	Operational mining, gold recovery, processing, refining, logistics
Phase IV	Peak Production	Year 7–Year 15 (~9 years)	Steady-state production with declining costs/unit
Phase V	Closure & Rehabilitation	Year 16	Environmental rehab, dismantling, legal closure

Total Life = ~15–16 years.

Costs & Year-wise Breakup (Rs. 390 Million)

Phase I – Exploration & Evaluation (Years 2–3, Rs. 100)

Activities	Amount in Million
Geological Geo-chemical & Geophysical Survey	80
Bulk Sampling & Pilot Wash Plant	20
Total One hundred million	**100**

Phase II – Mine Development & Processing (Years 4–5, Rs. 290m)

Activities	Amount in Million
Mine Infrastructure (access roads, camp, power, water)	20
Heavy Equipment (excavators, trucks, wash plant, processing plant)	250
Civil Works & Tailings Management	20
Total One hundred million	**290**

Project-3:
Gypsum Mining and Value Addition Facility (GMVAF)
(2026–2029)

Proposed 800 TPD Gypsum Processing Facility – District Karak

1. Plant Capacity

Total Capacity: 800 tons per day

Annual Capacity: ~240,000 tons (assuming 300 working days)

Product Mix:

- *Plaster of Paris (calcined gypsum) – 50%*
- *Gypsum Powder (uncalcined) – 20%*
- *Gypsum Boards & Tiles – 30%*

2. Year-wise Project Cost Estimate (PKR Million)

Year	Project Activity	Scaled 800 TPD Estimate	Remarks
Year 1 (2026)	Feasibility, Land Acquisition, Approvals	120	Larger land & infra design
Year 2 (2027)	Civil Works & Infrastructure	400	Storage, utilities, processing halls
Year 3 (2028)	Plant & Machinery	1,000	Crushers, grinders, calciner, board line
Year 4 (2029)	Testing, Commissioning, Training	150	Scale-up commissioning costs
Year 5 (2030)	Working Capital & Initial Operations	130	Inventory, marketing, logistics
Total Project Cost		**1,800**	

Project-4:

Exploration of Metallic Minerals in NMDs, especially Waziristan Copper (JV & own capacity)

(2026–2030)

Project Life Cycle (Phases & Duration)

- Processing Plant Capacity: 500 tons/day (~150,000 t/year, 300 operating days)
- Total Investment: PKR 1,445 million (spread across ~5 years before full revenue generation).

Phase	Activity	Duration	Key Cost Drivers
Phase I	Exploration & Evaluation	Year 1–Year 3 (2026–2028)	Licensing, security, geological mapping, geophysical & geochemical surveys, exploratory drilling, feasibility, EIA
Phase II	Mine Development & Processing Setup	Year 4–Year 5 (2028–2030)	Overburden removal, mine infrastructure, modular processing plant procurement, site construction, labor, initial training
Phase III	Production & Commercial Mining (Ramp-up)	Late Year 5 (2029–2030)	Plant commissioning, trial production, workforce training, initial ore throughput
Phase IV	Steady-State Production	Year 6 onward (2030–2045+)	Operational mining, copper concentrate production, logistics, refining contracts
Phase V	Closure & Rehabilitation	End of mine life (~after 15–20 years of production)	Environmental rehab, dismantling, mine closure obligations

Estimated Life: ~20–25 years
(including exploration, ramp-up, steady-state production, and closure).

Costs & Year-wise Breakup (PKR 1,445 million)

Phase I – Exploration & Evaluation (Years 1–3, Rs. 375 million)

Year	Activities	Rs in M
2026 (Year 1)	Licensing, Security & Community Engagement	15
	Geological Mapping & Sampling	15
	Geophysical Surveys (IP/Resistivity)	20
Subtotal Year 1		**50**
2027 (Year 2)	Exploratory Drilling (RC/core – initial 1,500 m)	90
	Geological Mapping (follow-up)	15
	Community Engagement & Security	10
Subtotal Year 2		**115**
2028 (Year 3)	Exploratory Drilling (remaining 1,500–2,000 m)	90
	Pre-feasibility, Feasibility & EIA	50
	Geophysical & Geochemical follow-up	20
Subtotal Year 3		**160**
2028 (transition)	Minor feasibility finalization & reporting	50
Phase I Total		**375**

Phase II – Mine Development & Processing Setup (Years 4–5, Rs. 1,070 million)

Year	Activities	Amount (Million PKR)
2029 (Year 4)	Overburden Removal & Haul Roads	50
	Procurement of Modular Processing Plant (advance)	150
	Plant Installation – Civil Works (initial mobilization)	120
Subtotal Year 4		**320**
2030 (Year 5)	Overburden Removal & Haul Roads (completion)	50
	Procurement of Modular Processing Plant (balance)	200
	Plant Installation & Commissioning (mechanical & electrical)	500
Subtotal Year 5		**750**
Phase II Total		**1,070**

Project-5

Northern Feldspar Mining and Value Addition Facility, Mansehra (NFMVAF)

Project Profile

- Processing Capacity: 800 tons/day (~240,000 tons/year assuming 300 days)
- Product: Processed Sodic Feldspar (sized/powdered for ceramics, glass, tiles)
- Total Estimated Investment: PKR ~1,575 million
- Project Life: 20+ years (depending on resource/reserves)
- Revenue Generation: Expected from Year 4

Phase-Wise Project Cost Estimate

Year	Activity / Cost Head	PKR (m)	Notes
2026 (Year 1)	Geological Resource Mapping & Geochemical Sampling	10	Field surveys, sampling
	Feasibility Study, Licensing & Initial Leaseholder Agreements	200	Early agreements @ Rs.1,800/ton raw feldspar
Subtotal 2026		**210**	
2027 (Year 2)	Balance Feasibility & Licensing	50	Final studies & approvals
	Raw Material Purchase Agreements (Advance Commitment)	225	Remaining leaseholder contracts
Subtotal 2027		**275**	
2028 (Year 3)	Mine Infrastructure (road, power, water)	10	Site preparation
	Heavy Mining Equipment Procurement	220	Excavators, loaders, dump trucks
	Crushing & Grinding Unit (Partial)	315	Major machinery payments (import/assembly)
Subtotal 2028		**545**	
2029 (Year 4)	Crushing & Grinding Unit (Balance)	5	Final installation & commissioning
	Magnetic Separation & Beneficiation Plant	260	Purification & beneficiation
	Screening, Packing & Loading Facility	100	Grading, bagging, storage
	Civil Works, Buildings & Tailings Mgmt.	180	Plant, workshops, waste mgmt.
Subtotal 2029		**545**	
Grand Total		**1,575**	

Project-6:
Parachinar Soapstone Mining and Value Addition Facility (PSMVAF)
(2026–2034)

Parachinar Soapstone Mining and Value Addition Facility (Brownfield)

- Total Estimated Cost (Conservative): PKR 4,400 million
- Built-in Contingency & Inflation: ~8–9% spread across 8 years
- Key Drivers of Cost: Mine development, processing plant setup, terrain accessibility, value-addition machinery (micronizing, calcining, coating), and workforce training.

Year-wise Action Plan (Conservative Projection)

Year / Phase	Activities	Details	PKR in Million
2026–2028 (Phase I)	Geological verification, mine survey, feasibility update	Streamlined geological mapping, bulk sampling, feasibility validation focused on priority sectors (ceramics, pharma).	250
	Environmental & social assessment	EIA/ESIA, land approvals, community inclusion plan.	120
	Pilot-scale mining & processing	Controlled quarrying, limited lab/industrial tests, asbestos-free certification.	280
Phase I Subtotal			650
2028–2031 (Phase II)	Mine development & machinery procurement	Stripping, benches, partial leasing of equipment (excavators, loaders, trucks).	850
	Processing facility (Stage I)	Scaled crushers, grinders, micronizes, packaging (reduced initial capacity).	700
	Infrastructure	Road upgrades (priority sections only), power (grid focus, solar deferred), basic worker housing.	250
Phase II Subtotal			1,800
2031–2034 (Phase III)	Full-scale mining operations	Fleet expansion (phased), ore haulage, compliance certification.	900
	Processing facility (Stage II – Value Addition)	Advanced calcination, coating, phased-in exports of high-value grades.	850
	Infrastructure & logistics	Warehouses, basic labs, market connectivity (staged).	200
Phase III Subtotal			1,950
Grand Total			**4,400**

Project-07

Mohmand White Marble Mining & Value Addition Facility (MWMMVAF)

(2026–2034)

Mohmand White Marble Mining and Value Addition Facility (Brownfield)

- Total Estimated Cost (Conservative): PKR 4,700 million
- Built-in Contingency & Inflation: ~8–9% spread across 8 years
- Key Drivers of Cost: Mine development, quarrying equipment (wire saws, cutters), gang saws, polishing lines, CNC finishing, infrastructure, and workforce training.

Year-wise Action Plan (Conservative Projection)

Year / Phase	Activities	Details	PKR in Million
2026–2028 (Phase I)	Geological re-assessment & feasibility update	Streamlined reserve verification, updated surveys, feasibility validation (focused on GCC/EU demand).	300
	Environmental & social assessment	ESIA, land rights, water studies, community inclusion.	120
	Pilot-scale quarrying & processing	Limited quarrying, trial cutting, polishing tests, certification of export-grade quality.	400
Phase I Subtotal			820
2028–2031 (Phase II)	Mine development & machinery procurement	Road access, stripping, benches; partial leasing of wire saws, loaders, cranes, trucks.	950
	Processing facility (Stage I)	Reduced-capacity gang saws, block cutters, polishing lines (basic slabs/tiles).	850
	Infrastructure	Priority roads, grid electricity (solar deferred), essential worker housing.	250
Phase II Subtotal			2,050
2031–2034 (Phase III)	Full-scale quarrying operations	Large-scale extraction, certification, phased fleet expansion.	850
	Processing facility (Stage II – Advanced Value Addition)	CNC cutting, resin treatment, epoxy coating, cut-to-size exports (staggered installation).	800
	Infrastructure & logistics	Warehouses, export logistics (phased offices/marketing), security.	180
Phase III Subtotal			1,830
Grand Total			**4,700**

Project-08

Phosphate Mining and Value Addition Facility in Abbottabad

(2026–2034)

Phosphate Mining and Value Addition Facility – Abbottabad (Brownfield)

- Total Estimated Cost (Conservative): PKR 4,950 million
- Built-in Contingency & Inflation: ~8–9% spread across phases
- Key Drivers of Cost: Beneficiation plant, flotation units, fertilizer-grade processing, mine mechanization, infrastructure, and environmental compliance.

Year-wise Action Plan (Conservative Projection)

Year / Phase	Activities	Details	PKR in Million
2026–2028 (Phase I – Feasibility & Pilot Stage)	Geological & reserve re-assessment	Updated mapping, sampling, focused beneficiation validation (P_2O_5 content).	280
	Environmental & Social Impact Assessment (ESIA)	Water management, waste disposal, community engagement.	150
	Pilot-scale beneficiation testing	Crushing, grinding, flotation pilot trials (reduced scope).	370
Phase I Subtotal			800
2028–2031 (Phase II – Mine & Plant Setup)	Mine development & mechanization	Stripping, benches; partial leasing of fleet (excavators, trucks, crushers).	1,050
	Beneficiation & processing facility (Stage I)	Crushing, grinding, flotation, dryers (reduced initial throughput).	950
	Infrastructure	Priority roads, grid power (solar deferred), water supply, basic housing.	250
Phase II Subtotal			2,250
2031–2034 (Phase III – Value Addition & Expansion)	Full-scale mining	Expanded extraction, quality monitoring, compliance certification.	850
	Fertilizer-grade processing facility (Stage II)	Staggered installation: acidulation first, then granulation/blending for fertilizer-grade output.	850
	Infrastructure & Logistics	Storage silos, loading stations, limited export facilities.	200
Phase III Subtotal			1,900
Grand Total			**4,950**

Project-09

Quartz Mining and Value Addition Facility in Battagram

(2026–2034)

Quartz Mining and Value Addition Facility – Battagram (Brownfield)

- Total Estimated Cost (Conservative): PKR 4,550 Million
- Built-in Contingency & Inflation: ~8–9% spread across phases
- Key Drivers of Cost: Beneficiation, acid-leaching, purification furnaces, infrastructure, and export logistics.

Year-wise Action Plan (Conservative Projection)

Year / Phase	Activities	Details	PKR in Million
2026–2028 (Phase I – Feasibility & Pilot Testing)	Geological & reserve re-assessment	Focused mapping, sampling, SiO_2 purity & impurity profiling (Fe_2O_3, Al_2O_3).	240
	Environmental & Social Impact Assessment (ESIA)	Dust control, water recycling, community consultations.	120
	Pilot beneficiation testing	Reduced pilot scope: crushing, washing, flotation, limited acid-leaching & separation.	340
Phase I Subtotal			700
2028–2031 (Phase II – Mine & Processing Plant Setup)	Mine development & mechanization	Stripping, benches; partial leasing of excavators/loaders; reduced upfront haul road costs.	950
	Beneficiation & processing facility (Stage I)	Scaled units: crushing, grinding, flotation, separators, acid-leaching (medium capacity).	850
	Infrastructure	Priority roads, water supply; housing deferred; hybrid power limited to critical ops.	250
Phase II Subtotal			2,050
2031–2034 (Phase III – Value Addition & Expansion)	Commercial-scale mining	Expanded extraction, phased fleet additions, certification.	800
	High-value processing facility (Stage II)	Staggered advanced purification: start with industrial/electronic grade, expand to solar-grade.	850
	Infrastructure & Logistics	Warehouses, testing labs (basic first), transport terminals scaled gradually.	150
Phase III Subtotal			1,800
Grand Total			**4,550**

Project-10

Langrial Iron Ore Mining and Value Addition Facility in Abbottabad

(2026–2034)

Langrial Iron Ore Mining & Value Addition Facility – Abbottabad (Brownfield)

- Total Estimated Cost (Conservative): PKR 6,250 Million
- Built-in Contingency & Inflation: ~10% spread across phases
- Cost Reduction Levers:
  - Lower drilling/pilot plant cost through outsourcing & staged trials.
  - Scaled beneficiation facility (start with 60% capacity, expand later).
  - Pelletizing plant modularized (JV model for expansion).
  - Infrastructure rationalization — hybrid captive power (diesel/solar mix), use of existing regional roads/logistics.
  - Deferred downstream studies (DRI) to reduce Phase III CAPEX.

Year-wise Action Plan

Year / Phase	Activities	Details	PKR in Million
2026–2028 (Phase I Feasibility & Pilot Stage)	Feasibility study & resource confirmation	Geological modeling, ore grade testing, selective beneficiation test work.	300
	Environmental & Social Impact Assessment (ESIA)	Tailings & dust mgmt., stakeholder engagement.	200
	Pilot beneficiation unit	Scaled-down plant for crushing, grinding, magnetic separation.	400
Phase I Subtotal			900
2028–2031 (Phase II Mine & Processing Plant Development)	Mine mechanization & infrastructure	Open-pit benches, limited heavy machinery fleet, haul roads, dewatering.	1,600
	Beneficiation facility (Stage I)	Crushing, grinding, magnetic separation, flotation; ~62–65% Fe concentrate.	1,900
	Infrastructure	Hybrid captive power (diesel/solar), road linkages, lean housing/workshops.	850
Phase II Subtotal			4,350
2031–2034 (Phase III – Value Addition & Expansion)	Pelletizing plant (modular)	Small-to-mid capacity unit, JV-financed expansion option.	750
	Beneficiation/logistics expansion	Throughput expansion, warehousing, rail/road integration.	200
	Downstream (DRI/sponge iron) study	Pre-feasibility only (defer CAPEX).	50
Phase III Subtotal			1,000
Grand Total			**6,250**

Project-11
Chromite Mining and Value Addition Facility in Kohistan
(2026–2034)

Chromite Mining and Value Addition Facility – Kohistan (Brownfield)

- Total Estimated Cost (Conservative): PKR 5,150 million
- Built-in Contingency & Inflation: ~8–9% spread across 8 years
- Key Drivers of Cost: Mine mechanization, beneficiation, ferrochrome furnace, infrastructure, and logistics.

Year-wise Action Plan (Conservative Projection)

Year / Phase	Activities	Details	PKR in Million
2026–2027 (Phase I – Feasibility & Pilot Stage)	Geological & technical feasibility	Resource confirmation, Cr_2O_3 grade/Fe ratio, streamlined mine planning.	200
	Environmental & Social Impact Assessment (ESIA)	Effluent control, tailings, safety review, basic stakeholder consultations.	120
	Pilot beneficiation plant	Small-scale gravity separation; limited spiral concentrators for +45% Cr_2O_3 concentrate.	330
Phase I Subtotal			650
2027–2030 (Phase II – Mine & Processing Development)	Mine mechanization & infrastructure	Partial leasing of mine fleet, priority shafts & haul roads, limited dewatering.	1,050
	Beneficiation Plant (Stage I)	Scaled crushing, screening, washing; fewer spiral concentrators, expandable later.	1,350
	Infrastructure	Essential roads, partial hydro/diesel power (grid-backed), basic housing/workshops.	450
Phase II Subtotal			2,850
2030–2034 (Phase III – Value Addition & Smelting)	Ferrochrome smelting facility	Modular EAF unit (lower initial capacity), scalable in later phases.	1,200
	Expansion of beneficiation & logistics	Incremental throughput expansion, basic warehousing, roads only (rail deferred).	300
	Downstream development	Desktop PPP/JV study for stainless steel mini-mill.	150
Phase III Subtotal			1,650
Grand Total			**5,150**

Project-12

Nephrite Mining and Value Addition Facility in Mohmand/Bajaur

Type: Brownfield | Model: MDF + JV | Start: 2036

- Total Estimated Cost: PKR 2,950 Million
- Built-in Contingency & Inflation: ~8–10% only (JV absorbs part of risk).
- Cost Drivers Optimized:
  - Limited mechanization (focus only on high-yield nephrite zones).
  - JV-funded modular cutting/polishing units.
  - Shared export hubs (Peshawar/Islamabad).
  - Incremental luxury/ornamental expansion.

Year-wise Action Plan

Year / Phase	Activities	Details	PKR in Million
2036–2037 (Phase I – Resource & Pilot Processing)	Geological & technical surveys	Reserve confirmation, selective grade mapping (outsourced partially to JV).	120
	ESIA & community engagement	Basic mine waste mgmt., social license, MDF covers part.	80
	Pilot cutting & polishing unit	Small modular unit, co-financed by JV (tiles, blocks).	250
Phase I Subtotal			450
2037–2039 (Phase II-Mining & Processing Infrastructure)	Mine mechanization & infra	Scaled mechanization (fewer saws/excavators), MDF covers roads/power.	600
	Cutting & Polishing Plant (Stage I)	Mid-sized facility, partly JV-financed.	850
	Export facilitation	Shared hub with limited warehousing.	250
Phase II Subtotal			1,700
2039–2042 (Phase III – High Value Addition & Branding)	Ornamental & jewelry unit	Medium-scale, JV brings tech & financing.	550
	Expansion of processing facility	Precision finishing line, only on demand.	150
	Branding & international marketing	2 fairs/year max, digital promotion.	100
Phase III Subtotal			800
Grand Total			**2,950**

Project-13

Exploration & Evaluation of Metallic Minerals in Districts Chitral, Dir, & Mansehra (2026–2034)

Exploration & Evaluation of Metallic Minerals in Chitral, Dir & Mansehra – Greenfield

- Total Estimated Cost: PKR 3,850 million
- Built-in Contingency & Inflation: ~10%
- Cost Control Levers:
  - Cut drilling meters to 12,000–14,000
  - Outsourced assays, labs, & some geophysics.
  - Modular staged feasibility (leaner JORC/NI 43-101).
  - Limited pilots & shared infrastructure.
  - Fewer investor events (digital roadshows instead of frequent physical).

Year-wise Action Plan

Year / Phase	Activities	Details	PKR in Million
2026–2027 (Phase I Preliminary Exploration)	Remote sensing & desk studies	Scaled GIS mapping, selective high-res imagery (outsourced).	150
	Reconnaissance surveys	Fewer grids, selective stream sediment & rock chip sampling.	200
	Community mobilization & baseline E&S	Lean team, shared consultants, early social license.	80
Phase I Subtotal			430
2027–2029 (Phase II Detailed Exploration)	Geophysical & geochemical surveys	Magnetic & resistivity prioritized, limit IP to hot zones.	500
	Core drilling campaigns	~12,000–14,000 meters only, fewer rigs, staged.	950
	Laboratory testing & metallurgy	Outsourced assays & lean beneficiation tests.	350
Phase II Subtotal			1,800
2029–2032 (Phase III Resource Estimation & Feasibility)	Resource modeling & compliance	JORC/NI 43-101 but only on high-confidence prospects.	350
	Pre-feasibility & feasibility	Modular mine planning; outsource some studies.	500
	JV structuring & investor outreach	Limited physical roadshows, more digital investor pitches.	200
Phase III Subtotal			1,050
2032–2034 (Phase IV Development Readiness)	Pilot processing & test mining	Small-scale bulk samples, modular pilot runs.	300
	Infrastructure planning	Only high-level engineering, defer site investment.	270
Phase IV Subtotal			570
Grand Total			**3,850**

SECTION-VIII

PROJECTED IMPACTS & OUTCOMES

The KP-MDMCL roadmap is designed not just to mine and process minerals, but to transform Khyber Pakhtunkhwa (KP) into South Asia's premier responsible mining hub. The impacts will be felt across economic, social, environmental and the institutional dimensions, ensuring benefits are broad-based, sustainable and long-term. The business plan focuses on integrating value chains, empowering communities, preserving the environment and building institutional capacity. This multi-dimensional framework guarantees that KPMDMC's mineral development acts as a catalyst for inclusive growth rather than a narrow, extractive activity.

1. Economic Impacts

- Investment & Revenue Generation – *Multi-million rupees strategic investments to establish Pakistan's largest minerals processing hub*.
- Job Creation – *Besides creation of direct jobs, there is likelihood for creation of manifold indirect jobs through service providers, suppliers and downstream industries*
- Value Chain Integration – *Local beneficiation and refining to keep value-addition within the province.*
- Export Potential – *Access to global markets for processed minerals, improving the province's trade balance.*

2. Social Impacts

- Skills Development – *Training thousands of local residents in technical, operational, and environmental management skills.*
- Community Development Programs – *Healthcare, education, and infrastructure support in mining regions.*
- Revenue-Sharing Mechanisms – *Ensuring a portion of profits directly benefit local communities.*
- Inclusive Growth – *Opportunities for women and marginalized groups in the mining value chain.*

3. Environmental Impacts

- Zero-Waste Mining – *Maximizing material usage and minimizing waste disposal.*
- Carbon-Neutral Processing – *Adoption of renewable energy sources for processing plants.*
- Water Conservation – *Recycling and advanced water treatment systems.*
- Rehabilitation Funding – *Dedicated funds for restoring mined lands.*

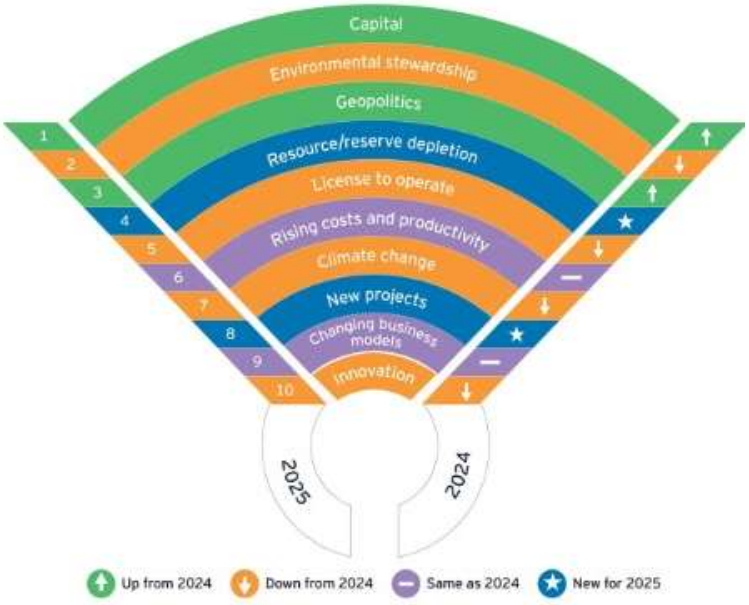
4. Institutional Impacts

- Strengthened Governance – *Transparent, accountable corporate structure.*
- Technology Development – *Proprietary mining and processing technologies.*
- International Certifications – *Compliance with ISO, ESG, & responsible sourcing standards.*
- Strategic Mineral Security – *Building reserves to support Pakistan's long-term needs.*

5. Risks & Opportunities for KP-MDMCL's Business Plan (2026-2035)

RISKS	OPPORTUNITIES
Political and Security Instability: KP-MDMCL's status as a state-owned public limited company, strategically backed by the provincial government, offers a unique layer of stability and credibility that mitigates many risks. However, the company's strong government ties also expose it to certain risks. As a state-owned entity, its operations and long-term strategy could be influenced by shifts in political priorities or the directives of successive political leadership. This could lead to a lack of continuity in projects or changes in the business plan.	KP-MDMCL is uniquely positioned to capitalize on the major opportunities within the sector, forming the basis of its competitive advantage. Special Investment Facilitation Council (SIFC) & Mineral Investment Facilitation Authority (MIFA): The company's business plan is built to leverage these platforms. KP-MDMCL will act as a forefront vehicle for GoKP, presenting investment-ready projects and benefiting from streamlined processes designed to attract global capital.
Regulatory & Legal Complexity: KP-MDMCL's operations are totally dependent upon changes in legal structure of the existing Act, rules and regulations. Furthermore, there is no representation of the Company's representative in MIFA's decision structure.	Untapped Mineral Potential: KP-MDMCL's business plan prioritizes modern, data-driven exploration using technologies like LiDAR and geophysical surveys. This will allow the company to accurately map and quantify Khyber Pakhtunkhwa's untapped mineral wealth, turning geological potential into defined, bankable projects.
Infrastructure Deficiencies: A significant risk for KP-MDMCL's operations lies in the province's underdeveloped infrastructure. This places heavy financial and operational burden on the company, potentially increasing project costs, delaying timelines and impacting profitability.	Modernization of the Sector: The company will be a first mover in bringing in international technology and best practices. Its business plan allocates significant resources to mechanization, automation, and the use of big data analytics to optimize every stage of the value chain, setting it apart from traditional operators.
Local Community and Social License Issues: Historically, mining projects have faced resistance from local populations due to environmental concerns, perceived lack of benefits and a history of mistrust. If KP-MDMCL's operations are not perceived as genuinely beneficial by local communities, the company could face protests, operational disruptions and legal challenges.	Value-Added Processing: A core part of KP-MDMCL's strategy is to establish processing hubs for key minerals. By moving up the value chain from exporting raw materials to creating finished products, the company will generate higher revenue, create more skilled jobs, and position the province as a manufacturing base rather than just an extraction site.
Informal and Unregulated Mining: Informal and unregulated mining poses a significant risk to KP-MDMCL's business plan. The prevalence of small-scale, often unlicensed, operators create an uneven playing field, characterized by market volatility and under-reported revenues. Furthermore, the mining association is likely to oppose operations of KP-MDMCL for insecure competitive environment which remains unaddressed so far.	Energy Transition Minerals: The business plan includes a dedicated focus on identifying and exploring for strategic minerals required for global energy transition. This forward-looking approach positions KP-MDMCL to capture a share of this high-growth market, securing the company's and the province's economic future.

In the context of ascertaining risks and the opportunities associated with reference to the KP-MDMCL's business plan, it was noted that EY, a renowned international consulting entity being experts on mines and mineral studies have identified "Capital" to be the No.1 risk, with miners balancing growth and capital discipline to satisfy soaring demand for energy transition minerals. According to EY, mines have elevated environmental stewardship above a broader approach to ESG, with a laser focus on waste, water and natural positive. Top Ten Risks and Opportunities for Mining Sector, identified worldwide, for 2025 with a comparison from 2024, is demonstrated as follows:



Source: https://www.ey.com/en_gl/insights/energy-resources/risks-opportunities

SECTION-IX

CORPORATE SOCIAL RESPONSIBILITY (CSR)

Khyber Pakhtunkhwa Mineral Development & Mining Company Limited (KP-MDMCL) recognizes that sustainable mineral development must go hand in hand with social responsibility and community upliftment. The Company's operations have a direct impact on communities in the vicinity of its mining and exploration sites, and it is therefore committed to investing in initiatives that improve education, healthcare, livelihoods, and overall quality of life for the local population. The CSR program is designed in line with national development priorities, global best practices in responsible mining, and the Sustainable Development Goals (SDGs). It reflects KP-MDMCL's belief that long-term business success is only possible when local communities are empowered to share the benefits of resource development.

1. Scholarships for Undergraduate Students

To promote education and create a pipeline of future professionals in the mining and minerals sector, KP-MDMCL will establish a "Mineral Development Scholarship Fund" targeted at deserving undergraduate students, particularly from districts near project sites. Key Features and the Expected Impact, are as follows:

1. *Eligibility: Students from local communities pursuing higher education in disciplines relevant to the Company's operations, such as Geology, Mining Engineering, Mineral Processing, Environmental Sciences, and related technical fields.*
2. *Coverage: Tuition fees, learning materials, and stipends for living expenses (where necessary).*
3. *Quota System: Preference for students from marginalized backgrounds, with special allocation for female students to ensure gender inclusivity.*
4. *Partnerships: Collaboration with local universities and technical institutes to identify talent and facilitate placement.*

Expected Impact:

- *Development of a skilled local workforce for the mineral sector.*
- *Creation of opportunities for youth empowerment and social mobility.*
- *Enhanced goodwill and trust between the Company and host communities.*

2. Internship Programs for Graduate Students

To bridge the gap between academic learning and industrial application, KP-MDMCL will launch structured internship opportunities for graduate students in technical and professional disciplines. Key Features and the Expected Impact, are as follows:

- *Fields of Internship: Geology, Mining Engineering, Mineral Processing Engineering, Environmental Management, Community Development, and Corporate Finance.*
- *Duration: 6–12 weeks, depending on project requirements.*
- *Structure: Interns will be attached to ongoing exploration and mining projects, receiving hands-on training and mentorship from senior professionals.*
- *Stipend: A modest stipend will be provided to support living and travel expenses.*
- *Certification: Formal certificate issued upon successful completion, enhancing employability of participants.*

Expected Impact:

- *Building a pool of job-ready graduates for the mineral development industry.*
- *Strengthening linkages between academia and industry.*
- *Enhancing KP-MDMCL's reputation as an employer of choice.*

3. Community Development and Essential Projects

In line with its commitment to inclusive growth, KP-MDMCL will allocate part of its CSR budget to essential community upliftment projects in its operational areas. The focus will be on healthcare, infrastructure, and livelihood enhancement.

Priority Areas:

- *Medical Facilities Support*
- *Setting up mobile health units in remote project locations.*
- *Supporting local clinics and hospitals with medical equipment and supplies.*
- *Arranging periodic health camps for general check-ups, maternal care, and awareness on hygiene.*

Educational Support:

- *Upgrading primary and secondary schools in project areas.*
- *Provision of furniture, books, and IT resources for digital learning.*
- *Capacity building programs for teachers in science and technical subjects.*
- *Water and Sanitation Projects*
- *Installation of clean drinking water facilities and solar-powered tube wells.*
- *Community awareness campaigns on sanitation and hygiene practices.*
- *Livelihood & Skills Development*
- *Short training courses in trades relevant to mining support industries (mechanical, electrical, welding, safety management, etc.).*
- *Promotion of women's vocational training centers (sewing, handicrafts, food processing).*
- *Infrastructure Enhancement*
- *Improvement of local access roads to project sites.*
- *Electrification projects in off-grid communities (in partnership with government initiatives).*
- *Implementation & Governance*
- *CSR initiatives will be managed by a dedicated Community Development and CSR Department within KP-MDMCL.*
- *Annual CSR budgets will be drawn from a fixed percentage of company receipts, with allocations approved by the Board of Directors.*
- *Periodic monitoring and evaluation will be conducted to assess social impact and ensure accountability.*
- *Community engagement forums will be established to ensure local voices guide CSR priorities.*

SECTION-X

FRAMEWORK FOR BUSINESS PLAN

KP-MDMCL, being a public limited company established and financed by the Government of Khyber Pakhtunkhwa (GoKP), shall operate under the regulatory and policy framework of the Minerals Development Department (*the "Administrative Department"*) and the Directorate of Mines and Minerals, GoKP. To ensure transparent, efficient, and investor-friendly operations, while safeguarding the interests of the provincial government, the following key principles shall govern the Company's operationalization and shall serve as the guiding framework for this Business Plan.

1. Governance & Regulatory Alignment

The business operations of the Khyber Pakhtunkhwa Minerals Development and Management Company Limited (KP-MDMCL), being a public limited company owned and financed by the Government of Khyber Pakhtunkhwa (GoKP), shall be carried out within the overall policy framework of the Minerals Development Department (MDD), as the administrative department, and the Directorate of Mines & Minerals (DGMM), as its subordinate directorate. In parallel, the Company shall strictly comply with the provisions of the Companies Act, 2017 and all other applicable statutory requirements, ensuring adherence to environmental, labor, safety, and mining regulations. While KP-MDMCL shall operate as an independent and with full autonomy, its business operational activities should not conflict with or compromise the overarching policies, regulatory framework and guidelines issued by the MDD and DGMM. The Company shall remain fully accountable to the Administrative Department of GoKP, while upholding its statutory obligations under the Companies Act, 2017.

2. Public–Private Partnership (PPP) & Joint Ventures (JV)

All JV/PPP projects with investors shall be structured to ensure effective control remains with KP-MDMCL, particularly in financial and operational decision-making, regardless of shareholding proportions. JV frameworks shall be developed on transparent, win–win terms, balancing investor comfort with provincial interest. Agreements shall include provisions for dispute resolution (mediation, arbitration) to safeguard investor confidence while protecting the provincial government rights.

3. Board Oversight, Independence & Due Diligence

The Board of Directors (BoD) shall exercise strict due diligence in the initiation, evaluation, and approval of the projects. The BoD shall not be bound to undertake any project(s) proposed or analyzed in the business plan (whether one, more than one, or all). All projects included in the plan represent initial business plans, recommendations of the management consultants only, subject to further review, modification or rejection by the Board. Likewise, the cost estimations, financial models and operational results provided by consultants are indicative and non-binding and shall not impose any obligation on the Company, its management or the Administrative Department, GoKP. Only technically, financially and environmentally viable projects should be undertaken for practically implementation, giving preference to JV/ PPP/ FDI/Etc.

4. Resource Utilization & Land Access

Priority shall be accorded to mineral-bearing lands owned by the Forest Department and other provincial departments or entities, subject to obtaining all statutory clearances. As a matter of its business plan, the KP-MDMCL, shall undertake the Exploration and mining activities on the basis of scientific geological surveys and application of advanced mechanized technologies. Accordingly, the company shall formulate clear policy guidelines for exploration and mining, ensuring sustainability, environmental protection, and the efficient utilization of mineral resources in consultation or consensus with the Minerals Development Department (MDD), Government of Khyber Pakhtunkhwa (GoKP), while also considering the efforts already made in the said regard in the form of inter-departmental consultations.

5. Investor Participation & Transparency

KP-MDMCL shall adopt open, transparent, and competitive bidding processes to attract both national and international investors. A clearly published PPP framework, JV policy, and investor facilitation regime will provide predictability, confidence, and comfort to all stakeholders. To institutionalize these practices, the Company shall devise and develop a comprehensive **Operational Manual**, setting out the modes, procedures, and mechanisms for investor participation, transparency, and partnership arrangements, including detailed guidelines on PPP frameworks and joint venture modalities. Independent feasibility studies shall precede every major project to ensure credibility, accountability, and informed decision-making.

6. Sustainability, CSR & Community Engagement

Environmentally sustainable mining practices, reclamation of mined areas and strict compliance with Environmental Protection Agency (EPA) standards shall be ensured. Corporate Social Responsibility (CSR) programs will focus on:

- *Scholarships for students in mining-affected areas.*
- *Employment generation & vocational training.*
- *Local infrastructure development & health initiatives.*

Local communities shall be regarded as key stakeholders, ensuring inclusive socio-economic development.

7. Technology Adoption & Capacity Building

All Joint Venture (JV) agreements shall incorporate mandatory technology transfer provisions to promote provincial self-reliance in mineral exploration, extraction, and processing. Capacity building of the local workforce will be prioritized through structured training programs, scholarships, and collaborative initiatives with academic and technical institutions. To institutionalize these efforts, KP-MDMCL shall establish a Technical Resource & Training Center in partnership with investors, academia, and the Minerals Development Department (MDD), GoKP. The policies, procedures, and mechanisms for technology adoption, knowledge sharing, and skill development shall be clearly defined in the Company's Operational Manual, ensuring consistency, transparency, and long-term sustainability of capacity building initiatives.

8. Risk Management & Accountability

KP-MDMCL shall establish a Risk Management & Compliance Unit for:

- *Financial risk mitigation.*
- *Shariah/environmental compliance.*
- *Investor-related risk assessments.*

Internal audit and external independent audits will be mandatory for all projects to ensure transparency. A comprehensive anti-corruption and accountability framework shall be enforced in all operations.

9. Institutional Coordination

KP-MDMCL will maintain active coordination with:

- *MDD-GoKP for policy alignment.*
- *MIFA for licensing and technical compliance.*
- *Forest & Environment Department for land/resource clearance.*
- *Finance Department, GoKP for project financing and guarantees* where necessary.

Periodic Joint Working Groups (JWGs) with these departments will streamline coordination.

10. Strategic Vision & Roadmap

KP-MDMCL's strategic objective is to promote sustainable mineral development in Khyber Pakhtunkhwa, maximizing value addition and ensuring equitable benefits for the Government, investors, and communities. The operational roadmap will include:

Phase I (0-2 Years)	*Institutional strengthening, policy guidelines and initial pilot projects.*
Phase II (3-5 Years)	*Expansion of PPPs/JVs, development of mid-sized projects, community CSR initiatives.*
Phase III (6-10 Years)	*Establishment of large-scale mining and processing facilities, global investor integration and advanced downstream industries.*

REFERENCES

Government & Regulatory Documents (Pakistan)

Board of Investment (BOI), Government of Pakistan. (n.d.). *Pakistan investment policy and mining sector investment opportunities*. Retrieved from https://boi.gov.pk

Directorate General of Mines and Minerals (DGMM), Government of Khyber Pakhtunkhwa. (2017). *KP Mines and Minerals Act, 2017; KP Mines and Minerals Rules, 2017; Annual reports and investment brochures*. Peshawar: DGMM. Retrieved from https://dgmm.gkp.pk

Geological Survey of Pakistan (GSP). (n.d.). *Geological maps, mineral resource assessments, and exploration reports for Khyber Pakhtunkhwa*. Islamabad: Ministry of Petroleum and Natural Resources. Retrieved from https://gsp.gov.pk

Government of Khyber Pakhtunkhwa, Minerals Development Department. (2022). *Khyber Pakhtunkhwa Mineral Development Policy, 2022*. Peshawar: Government of KP. Retrieved from https://mdd.gkp.pk

Special Investment Facilitation Council (SIFC), Government of Pakistan. (2023). *Framework and sector-specific investment directives*. Islamabad: SIFC. Retrieved from https://sifc.gov.pk

State Bank of Pakistan (SBP). (n.d.). *Annual reports, economic surveys, and foreign exchange regulations*. Karachi: SBP. Retrieved from https://www.sbp.org.pk

Industry & Market Data

Pakistan Bureau of Statistics (PBS). (n.d.). *Monthly and annual trade statistics on minerals and mineral products*. Islamabad: Government of Pakistan. Retrieved from https://www.pbs.gov.pk

Pakistan Stone Development Company (PASDEC). (n.d.). *Market studies and reports on the marble and granite sector*. Islamabad: PASDEC. Retrieved from https://pasdec.org.pk

Trade Development Authority of Pakistan (TDAP). (n.d.). *Export data and market research on mineral products*. Karachi: TDAP. Retrieved from https://www.tdap.gov.pk

World Bank. (2022). *Pakistan economic update and sectoral development reports*. Washington, DC: World Bank. Retrieved from https://www.worldbank.org

Asian Development Bank (ADB). (2022). *Pakistan country partnership strategy and sector studies*. Manila: ADB. Retrieved from https://www.adb.org

International Best Practices & Standards

International Financial Reporting Standards (IFRS) Foundation. (2004). *IFRS 6: Exploration for and evaluation of mineral resources*. London: IFRS Foundation. Retrieved from https://www.ifrs.org

International Council on Mining and Metals (ICMM). (2021). *Sustainable mining principles and good practice guidelines*. London: ICMM. Retrieved from https://www.icmm.com

World Gold Council. (2021). *Responsible gold mining principles*. London: World Gold Council. Retrieved from https://www.gold.org

US Geological Survey (USGS). (2023). *Mineral commodity summaries*. Reston, VA: USGS. Retrieved from https://www.usgs.gov

British Geological Survey (BGS). (2023). *Global mineral reserves and market outlook reports*. Nottingham: BGS. Retrieved from https://www.bgs.ac.uk