International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

Financial Feasibility Study on Antam Pongkor Low-Grade Gold Ore Mine After Implementing Business-Level Strategy

Hoppy Adi Putra[1], Raden Aswin Rahadi[2]
[1,2] School of Business Management, Institut Teknologi Bandung

ABSTRACT: The Pongkor Gold mine is under Production Operation Permit until 2031 while existing feasibility study stated that Pongkor gold Mine only have economical number until 2025 with ore volume in 1.5 million wmt and ore grades above 4 gpt. Pongkor Gold Mine has resources in low-grade gold ore (below 4 gpt) in 1.9 million wmt with the grades is 3.61 gpt. Having a gap period between mining permits (until 2031) and the latest feasibility study (until 2025) and abundant resources in low-grade gold ore, provides research opportunities to finding how to formulate business strategy level for Pongkor Gold Mine in order to maximize gap period by processing low-grade gold ore. This study started with business situation analysis, with VRIO and Internal Factor Evaluation (IFE) Matrix are conducted for internal analysis, while PESTLE (Political, Economic, Sociocultural, Technological, Legal, and Ecological) analysis, Porter's Five Forces framework and External Factor Evaluation (EFE) matrix are conducted as external environment analysis. The result shown Pongkor Gold Mine in region V in internal-external (IE) matrix, the region indicated that hold and maintain strategies are suitable for Pongkor Gold Mine. Study continued with Porter generic competitive framework to define the strategy that most suitable with Pongkor Gold Mine condition. The result shown cost leadership strategy is the most suitable strategy with the detailed strategy are (i) implement a cost reduction program every year, (ii) substitute retired organic workers (permanent Employee) with outsourced or contracted workers, (iii) limiting investment only to things that have a direct impact on revenue and (iv) long-term contract in heavy equipment. The impact of these strategies will calculate in financial feasibility study. Financial feasibility study uses financial criteria of Net Present Value (NPV), Internal rate of return (IRR), and payback period (PBP). The results shown NPV in 25.33 million US$, IRR in 52.2% and payback period in 21 months, these number indicated the Pongkor project extension is feasible. This study also intended to determine the most affecting variable to the NPV by conducting sensitivity analysis. The results shown the extension project is feasible as long as the gold price not declined more than 18.4% from the base, production cost (COGS) not increased more than 22% and the productivity not decreased more than 16.94% from the base.

KEYWORDS: Business Strategy, Financial feasibility Study, Pongkor Gold Mine.

I. INTRODUCTION

A. Background

PT Antam Tbk. (ANTM) was founded in 1968 is one of the diversified metals and mining companies with three main commodities are nickel, bauxite and gold. In doing their business, Antam engages in all stages of the mining and processing process, including exploration, mining, smelting, refining, and marketing. One of Antam's primary commodities that significantly impacted the company's financial performance is gold, silver, and precious metals. The gold and refinery operating segment are comprised of gold and silver mining, Gold and silver are produced from mining and smelting of gold ore into gold bullion. The only one gold mining production that Antam fully owned is Pongkor Gold Mine. Located in West Java Province, Pongkor Gold Mine began with the exploration in the northern part of Mount Pongkor by Aneka Tambang Geologists from 1974 to 1981, and 1988-1991 resumed in a more systematic and complete manner. A feasibility study was then made and the first Exploitation Mining Authority with the number KP.DU893/Jabar covering an area of 4,058 Ha was obtained in 1991. In 1993 the first Gold Processing Plant was built with a capacity of 2.5 tons of gold per year. In the same year Tailings Dam was also built. In 1994 the commissioning of the Gold Processing Plant and then the Pongkor Gold Mining Project officially became the Pongkor Gold Mining Unit. The Pongkor mine is under Production Operation Permit (Mining Business Permit/IUP Production Operation) KW 98 PP 0138 at 541.2/005/kpts/ESDM/2010, with an area of 6,047 Ha. The

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

initial permit was granted in 1991 for a period of 30 years until 2021 for gold and silver commodities, then extended until 2031 based on the Decree of the Head of the Investment Coordinating Board No. 171/l/IUP/PMDN/2020.

B. Business Issue

Pongkor Gold Mine has been operating for almost 30 years and now becoming only one gold mine that 100% owned by ANTAM. Pongkor Gold Mine has mining permit until 2031 but existing production plan limited only until 202. In order to extend the mining lifetime, Antam's geologists are still exploring to find new reserves and optimize the existing locations. The result of recent explorations is Antam extend their mining permit until 2031 and proposed the new feasibility study that Pongkor Gold Mine will continue the production to government until 2025. While geologist team exploring the Pongkor mine reserves, Pongkor Gold Mine management try to find other ways to keep Pongkor production, especially until 2031 due to the Pongkor Production Permit. Pongkor gold mine has abundant reserves in gold-grade below 4 gram per tonnes (gpt) in existing areas. Due to the economic value, these reserves are not mined and processed. The reserves that Pongkor have are estimated in 2.5 million tones, which reflecting the existing production plan, these numbers will extend mining lifetime until next 4-5 years. In order to maximize the reserves, Pongkor need to change their business strategy especially in reducing cost to make low-grade gold ore reserves becoming economical.

Figure II. 1. Gold Price trend in last 5 years

One of impactful factor of economic value of gold-grade is gold price. The number of gold price are affected by global supply and demand and most of times by global safety issues, like war and disease. Gold has long been used by many investors as inflation hedge. While the value of money is decreasing as the time goes by due to inflation, the value of gold is generally stable, or even increasing. In the situation like pandemic Covid-19 era and Russia vs Ukraine war, one of the main driver of gold price is fear, since many people use it as a safe-haven investment, from the graphics showed gold price increased significantly to reach its peak in mid-2020 (pandemic covid-19) and early 2022 (Russia vs Ukraine war) with the price until 2,070 USD/oz and becoming up and down in 1600-1900 USD/oz in the next months. The situation of gold price that increased from 1200-1400 to 1600-1900 USD/oz give Pongkor gold mine opportunity to make low-grade gold ore becoming economic value. Based on these issues, therefore, the Company needs a new business strategy in order to maximize their reserves in the situation of the gold price is high.

III. LITERATURE REVIEW

A. VRIO Analysis

VRIO is a theoretical framework that explains and predicts firm-level competitive advantage. To obtain and maintain a competitive advantage and to maximize the value of the resource, a company needs to have a resource that is valuable, rare, costly to imitate and organized to capture value.

Valuable: A resource that enables the company to take advantage of an external opportunity or offset an external threat. A valuable resource enables a business to increase its production of economic value.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

Rare: If only one or a small number of businesses own a resource, it is rare. If the resource is widely available, perfect competition will result where no company can sustain a competitive advantage. A valued but common resource can, at most, result in competitive parity. A company is only on the path to competitive advantage if it has access to a valuable and rare resource.

Costly to Imitate: If businesses without access to the resource are unable to create or acquire it at a competitive price, the resource will be costly to imitate. It is an internal strength and a core capability if the resource in question is valuable, rare, and costly to imitate. The company may temporarily gain an advantage over its rivals if they are unable to replicate the strategy based on the valuable, rare, and costly to imitate resource.

Organized to capture value: The internal organization of the company will play a role in determining if a valuable and costly to imitate resource can be used as the foundation for a sustained competitive advantage. A company must be structured to capture value if it is to fully recognize the competitive potential of its resources, capabilities, and competencies.

B. PESTLE Analysis

PESTLE Analysis is a framework used to identify and analyse macro-environmental factors of a company that have significant impact towards its performance. PESTLE is an acronym, stands for Political, Economic, Sociocultural, Technological, Ecological, and Legal.

Political Factors: The political variables are based on how the government intervenes in the economy through its actions and outputs. Government policy, political stability or instability in foreign markets and other factors may be considered.

Economic Factors: Economic factors in a firm's external environment are largely macroeconomic, affecting economy-wide phenomena. Economic growth rates, interest rates, currency exchange rates, price stability (inflation and deflation), employment levels, and consumer disposable income are several factors that affect a company's success both directly and indirectly over the long term.

Sociocultural Factors: Sociocultural factors capture a society's cultures, norms, and values. The demand for particular goods and services is influenced by social values, attitudes, cultural influences, and lifestyles, as well as demographic aspects like population size, growth rate, and age distribution.

Technological Factors: Technological factors capture the application of knowledge to create new processes and products. Technology is developing these days rapidly. As a result, technology has a greater impact on business than expected. All of the factors that can help in facing business challenges and maximizing the effectiveness of a company's business operations are included in these factors.

Legal Factors: Legal factors include the official outcomes of political processes as manifested in laws, mandates, regulations, and court decisions, all of which can have a direct bearing on a firm's profit potential. Legal factors, however, also include more particular regulations such those law regulates copyright and patents, consumer protection, antitrust, and health and safety. Any prospective changes to these factors must be monitored by a firm since they could have a big impact on how well the company performs.

Ecological Factors: Ecological factors relate to the influence of the surrounding environment towards the company's policies. These factors involve broad environmental issues such as the natural environment, global warming, and sustainable economic growth.

C. Porter's Five Forces Analysis

Porter's Five Forces model is a framework that identifies five forces that determine the profit potential of an industry and shape a firm's competitive strategy. The stronger the five forces, the lower the industry's profit potential, making the industry less attractive for competitors. The reverse is also true, the weaker the five forces, the greater the industry's profit potential, making the industry more attractive.

Threat of New Entrants: describes the risk that potential competitors will enter the industry. The threat to existing players decreases with increasing entry barriers. Economies of scale, high brand loyalty, network effects, high capital requirements are several examples of entry barriers.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

Bargaining Power of Suppliers: captures pressures that industry suppliers can exert on an industry's profit potential. This force reduces a firm's ability to obtain superior performance for two reasons: powerful suppliers can raise the cost of production by demanding higher prices for their inputs or by reducing the quality of the input factor or service level delivered.

Bargaining Power of Buyers: concerns the pressure an industry's customers can put on the producer's margins in the industry by demanding a lower price or higher product quality. Customers, order size, pricing differences between competitors, the buyer's ability to substitute, and the buyer's information accessibility are several factors that affect this force.

Threat of Substitute Products or Services: is the idea that products or services available from outside the given industry will come close to meeting the needs of current customers. This force is influenced by a number of factors, including the availability of substitute goods or services, the propensity of consumers to do so, the perceived level of differentiation, and the comparative pricing performance of substitutes.

Rivalry among Existing Competitors: describes the intensity in which companies within the same industry jockey for market share and profitability. The other four forces all exert pressure upon this rivalry. Competition is fierce when there are numerous companies with comparable size and influence, when the market is developing slowly, and when customers can simply switch to a competitor with lower prices.

D. Internal-External Evaluation (IE) Matrix

This strategy-formulation tool provides a platform for identifying and evaluating relationships between those functional areas as well as a summary and evaluation of the internal and external analysis. Weight factor that ranges from 1 to 4 indicate the relative importance of that factor to the success of the company business. Internal and external key factor has differentiation in evaluation, for internal evaluation rating assignment which ranges from 1 to 4 with major weakness (rating = 1), a minor weakness (rating = 2), a minor strength (rating = 3) or a major strength (rating= 4). While external evaluation, rating assignment which ranges from 1 to 4 to each external key factor, where 4 = the responds is superior, 3 = the respond is above average, 2 = the respond is average and 1 = the respond is below average. The IE matrix has three major regions that have different strategy implication, as follows:

1. **Region I** – for the firm that fall into cells I, II, or IV that can be described as grow and build strategy. The successful organization will fall into this region.
2. **Region II** – for the firm that fall into cells III, V, or VII that can be described as hold and maintain strategy.
3. **Region III** – for the firm that fall into cells VI, VIII, or IX that can be described as harvest or divest strategy.

E. Business-Level Strategy

Business-level strategy details the goal-directed actions managers take in their quest for competitive advantage when competing in a single product market. A firm's business-level strategy determines its strategic position in a specific product market. A company aims to create a valued and unique position that fits the needs of its customers while simultaneously increasing the gap between the value the firm's product produces and the cost needed to produce it. There are two fundamentally different generic business strategies—differentiation and cost leadership. By offering goods or services with uniqueness while maintaining costs at the same or similar levels, a differentiation strategy aims to increase value for customers over that created by competitors, allowing the firm to charge higher prices to its customers. A cost leadership strategy, in contrast, seeks to create the same or similar value for customers by delivering products or services at a lower cost than competitors, enabling the firm to offer lower prices to its customers. ***F. Capital budgeting***

The process of assessing and choosing long-term investments that are consistent with the business's objective of maximizing owners' wealth is known as capital budgeting. Each year, large companies assess dozens or even hundreds of potential new investment ideas. Financial managers require tools to help them rank competing investments and assess the merits of individual projects in order to make sure the investment projects chosen have the best probability of improving the firm's value. Several techniques are available for performing such analyses, we begin with a look at the three most popular capital budgeting techniques: payback period, net present value, and internal rate of return.

Payback Period: is the time it takes the firm to recover its initial investment in a project, as calculated from cash inflows, the payback period can be found by dividing the initial investment by the annual cash inflow.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

Net Present Value (NPV): Investors demand a return on the capital they invest in businesses, therefore a company should only make an investment if the cash flow it will produce will be worth more in the future than the investment itself would cost. Using the firm's cost of capital, the NPV technique discounts the firm's cash flows. The minimum return required on a project to satisfied the firm's investors is represented by this rate, which also serves as the firm's cost of borrowing.

Internal Rate of Return (IRR): The internal rate of return (IRR) is the discount rate that equates the NPV of an investment opportunity with $0 (because the present value of cash inflows equals the initial investment). It is the rate of return that the firm will earn if it invests in the project and receives the given cash inflows.

IV. RESEARCH METHODOLOGY & FRAMEWORK

Author will be gathered data from both primary and secondary sources in order to get a more thorough view in conducting data analysis. In-depth interviews are conducted with several Pongkor Gold Mine's employees who have a direct or indirect connection to the business in order to collect primary data. The purpose of an in-depth interview is to gain a deeper insight of the company's current state from the management's perspective. The other type of data collection is secondary data collection. It is gathered to support the theories and the analysis. Secondary data collection is conducted through a literature review of papers, company data, journals, books, and other studies.

The methodology used for this research is qualitative and quantitative both from primary or secondary data. Business situation analysis will be explored using framework tools by using qualitative and quantitative approach. The environment analysis will be conducted using PESTLE analysis and Porter's Five Forces analysis as qualitative approach and External Factors Evaluation (EFE) matrix as quantitative approach. While for internal analysis, using VRIO analysis as qualitative approach and internal factor evaluation (IFE) matrix as quantitative approach. The results from business situation analysis will be used as the input of selecting business-level strategies from porter's five generic competitions strategy. This kind analysis using qualitative approach from both primary or secondary data. The most suitable strategy from those frameworks will be used to develop financial feasibility study. In financial feasibility study section, author will use quantitative approach from primary financial data of Antam Pongkor gold mine. In conducting the financial feasibility study author will use payback period, net present value, and internal rate of return as the tools. The analysis outputs from the financial feasibility study will be used as a reference for the implementation of the company's future business-level strategy.

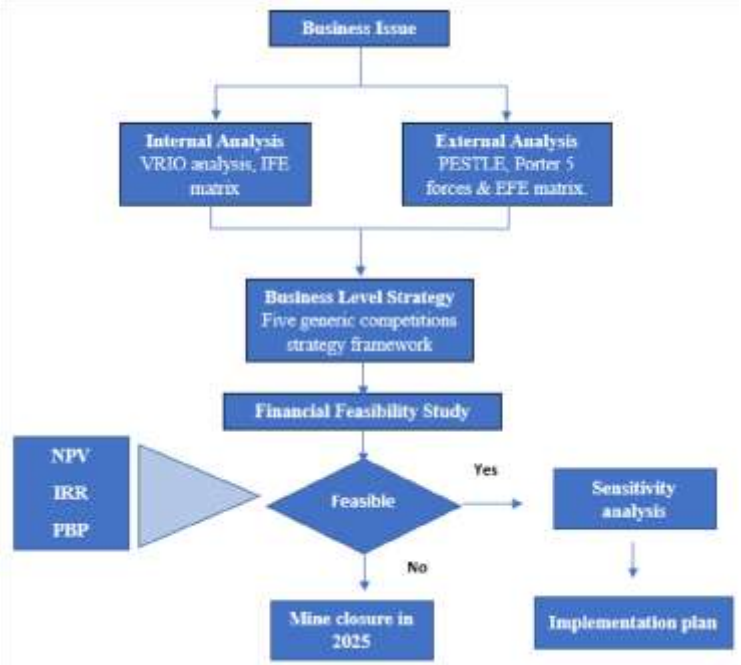


Figure IV. 1. Research Methodology

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

V. RESULT AND DISCUSSION

A. Business Situation Analysis Internal Analysis

Based on the Author analysis by combining data from in-depth interview and analysis using VRIO framework, here is the summary of internal analysis as shown in table below. According to the table IFE matrix, Pongkor Gold Mine's score is in average area.

Table V. 1 Internal Analysis

Key Internal Factors		Weight	Rating	Weighted Score
Strengths				
1	Well established mining and processing facility	0.08	4	0.32
2	Well established management system	0.07	4	0.28
3	Matured Organizations Structure	0.06	4	0.24
4	Experienced and well-trained labor	0.08	4	0.32
5	Strong culture in safety, health and environment	0.05	4	0.2
6	Well-known brands and good reputation	0.06	4	0.24
7	Well established supply chain relationships	0.05	3	0.15
8	Mastering gold mining and processing technology	0.05	3	0.15
Weakness				
1	Project financing is from internal (NRR only)	0.08	2	0.16
2	Small economical reserves	0.07	1	0.07
3	High labor cost (mining based)	0.06	1	0.06
4	New Investment is limited due to mining lifetime	0.08	2	0.16
5	Low-grade gold ore can't be mined due to economic issue	0.05	2	0.1
6	high risk industry (sensitive to the safety, health, and environment issue)	0.06	2	0.12
7	Gold production is declining but production cost remain the same	0.05	2	0.1
8	Many organic employees are entering retirement age	0.05	1	0.05
Total		**1**		**2.72**

External Analysis

Based on the Author analysis by combining data from in-depth interview and analysis using PESTLE and Porter five forces analysis, here is the summary of external analysis as shown in table below. According to the table EFE matrix, Pongkor Gold Mine's score is in average area.

Table V. 2 External Analysis

Key External Factors		Weight	Rating	Weighted Score
Opportunities				
1	Possibility of gold price is in an uptrend	0.08	3	0.24
2	Privileged as state owned company in tax imposition and permit	0.07	2	0.14
3	Known as environmental-friendly mining	0.06	3	0.18
4	Effective CSR program to inhibit illegal miners activity	0.08	2	0.16
5	Non substitution products	0.05	4	0.2
6	Located in Java Island with many alternative suppliers	0.06	2	0.12
7	Since pandemic Covid 19, buying powers of gold has been increased	0.05	3	0.15
8	Possibility to find another economic resource in near existing area	0.05	2	0.1
Threats				
1	Higher operating cost between others gold mining industry in Indonesia	0.08	3	0.24
2	Fluctuate in fuel and raw material prices	0.07	2	0.14
3	Possibility of gold price is in a downtrend	0.06	1	0.06

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

4	Protest and demonstration from local community	0.08	2	0.16
5	Lack of implemented advancing technology	0.05	4	0.2
6	Possibility of water pollution from leaking system in tailing management	0.06	1	0.06
7	Competition in gold mining industry is tight	0.05	3	0.15
8	threat of new entrants coming from medium scale gold mining company	0.05	3	0.15
Total		**1**		**2.45**

Pongkor gold mine has IFE and EFE total weighed scores in 2,72 and 2.45. Based on IE matrix Pongkor gold mine located in Region V which hold and maintain strategies are appropriate. The appropriate strategy is keeping the continuity and profitability of production with reduction cost strategy that will be described later in creating business strategy section.

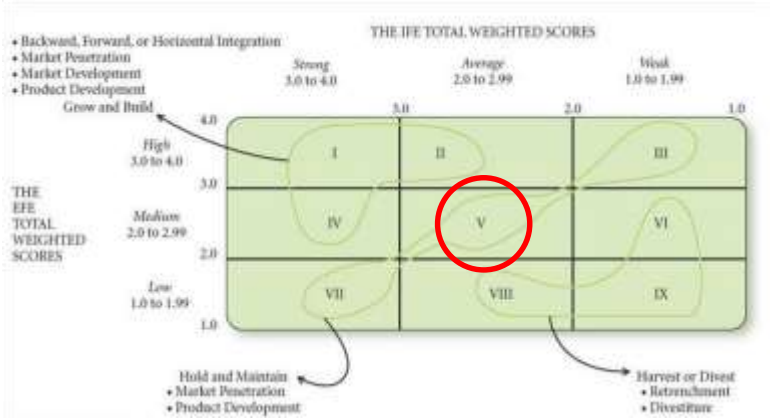


Figure V. 1. Pongkor Position in IE Matrix Region

B. Business Strategy Formulation

Pongkor gold mine as one of unit business of PT. Antam tbk develop and decided their strategy until business-level strategy while PT. Antam tbk (head office) maintain the corporate-level strategy to aligned with the vision and mission of PT. Antam tbk in general. In formulating business-level strategy for Pongkor gold mine, author adopt and use porter generic competitive advantage framework, the framework consists of differentiation and cost leadership strategy. These strategies depend on the target market that will be faced, if the target market is broad cross-section of buyers, then broad differentiation or overall lowcost strategies will be selected, vice versa with narrow market. In Pongkor gold mine case, they have narrow market which is business to business market with other business unit of PT. Antam tbk (Logam Mulia refinery business unit). Since commodity price especially gold is decided by global supply and demand, then Pongkor gold mine doesn't have the power to determine prices. Furthermore, based on business situation analysis (internal and external analysis), Pongkor gold mine more suitable in cost leadership strategy that will be described later. Based on the Author analysis by combining data from in-depth interview and analysis using Porter generic competitive advantage framework, here is the summary of proposed business strategy as shown in table below.

Table V. 3 Proposed Business Strategy

No	Business Strategy	Cost Drivers
1	Implement a cost reduction program every year	Learning and Experience
2	Increase Capacity Utilization	Capacity Utilization
3	Substitute retired organic workers (Permanent Employee) with outsourced or contracted workers	Outsourcing
4	Limiting investment only to things that have a direct impact on revenue	Input Cost
5	Long Term Contract in Heavy Equipment	Supply Chain Efficiencies

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

C. *Financial Feasibility Study*

Basic Assumptions

a. Dates and Timing

Existing feasibility study of Pongkor Gold Mine is limited until 2025, while the mine permit valid until 2031. There is gap within 2026-2031, if Pongkor conduct the mine closure in 2025. In order to maximize mining permit, author suggest to extension until 2031 by processing 1.9 million low-grade gold grade ore. b. Working Capital

- Account receivable is 20 days
- Account payable is 60 days

c. Economic Assumption

The inflation assumption (both Indonesian and US) used is rounded off from the average inflation published by Bank Indonesia, meanwhile, the exchange rate is the annual value in 2022.

- Economic Growth (%YoY): 5.00%
- US Inflation: 3.00%
- Exchange Rate IDR to US$: Rp.14.762 / US$
- Debt to Equity Ratio: 100% Equity

d. Discount factor

Assumptions for discount factor is using real WACC = Cost of Equity e.

Tax Assumption

- Corporate tax income (CIT) : 22%

(Based on UU no 7/2021)

- Tax on interest income: 15%
- Royalty rate for Gold and Silver (based on PP no 81/2019), gold: 6.00% and silver: 3.25% f. Depreciation & Amortization

The depreciation period used is 6 years according to the remaining life of the mining permit. As of December 31, 2025, the remaining Book Value of Assets is assumed to be zero because it has been depreciated in the calculation of the previous feasibility study.

g. Gold and Silver Price

Gold and silver prices for 2026-2031 use the average price in 2022, with gold price: 1,802 US$/toz and silver price: 21.82 US$/toz (assuming constant gold and silver prices for the next 5 years).

Production Cost

In the calculation, production cost, author adjusted the labour cost by substitute organic workers with outsourcing or contract workers and put cost reduction program as the business strategy that mentioned earlier. The details of production costs per year for the Pongkor gold mine can be seen in the table below. Since mining development considered as investment, then the mining development cost is zero. Instead of labour cost, production cost is dominated by variable cost which proportional with the volume of mined ore. Calculation is done by projecting costs in the previous year multiplied by the tonnage and adjusted for the inflation rate.

Table V. 4 Estimated Production Cost for 2026-2031

A	Cost of Good Sold	Unit	2026	2027	2028	2029	2030	2031
1	Mine Development	US$	-	-	-	-	-	-
2	Mining Operation	US$	5,570,601	8,716,959	8,716,959	8,716,959	8,716,959	5,761,445
3	Cost of Processing Consumables	US$	3,091,686	4,837,916	4,837,916	4,837,916	4,837,916	3,197,605
4	Cost of Electricity	US$	2,919,728	4,568,833	4,568,833	4,568,833	4,568,833	3,019,756
5	Labor	US$	9,405,560	8,719,849	8,211,915	7,450,015	6,815,097	6,205,577
6	Maintenance cost	US$	1,330,140	2,081,422	2,081,422	2,081,422	2,081,422	1,375,709
7	Refining Cost	US$	222,147	347,619	347,619	347,619	347,619	229,757
8	Gold Royalty	US$	1,922,913	3,009,003	3,009,003	3,009,003	3,009,003	1,988,791

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

9	Silver Royalty	US$	88,662	138,740	138,740	138,740	138,740	91,700
10	Mine Closure	US$	204,733	204,733	204,733	204,733	204,733	204,733
11	Enviro management	US$	183,052	286,442	286,442	286,442	286,442	189,323
12	Community Dev	US$	260,844	408,173	408,173	408,173	408,173	269,781
13	Safety	US$	126,423	197,828	197,828	197,828	197,828	130,754
14	Security	US$	1,163,757	1,821,063	1,821,063	1,821,063	1,821,063	1,203,626
15	Insurance	US$	387,878	606,958	606,958	606,958	606,958	401,167
16	Cost Reduction Program	US$	-33,793	-33,793	-33,793	-33,793	-33,793	-33,793
Total Cost of Good Sold		US$	26,844,331	35,911,747	35,403,813	34,641,913	34,006,995	24,235,931
Total Cost of Good Sold		US$/Toz	1,509	1,290	1,272	1,245	1,222	1,317

Average Pongkor Gold Mine production cost in 20216-2021 is 38,621,152 US$, compared with the estimated production cost for 2026-2031, the production cost is relatively lower than historical cost. It means the strategy in minimizing the labour cost effectively affected to the total production cost.

Depreciation & Amortization

Depreciation is a cost incurred as a result of the decline in asset value over its useful life (economic life). Amortization is an accounting procedure that gradually reduces the value of costs and assets (intangible assets), with a limited economic life through periodic charging to income based on production units. As mentioned in the basic assumptions, the remaining book value of assets is assumed to be zero, then the depreciation cost is limited to the investment value that will be made to support the 2026-2031 operations. Details of the depreciation and amortization are shown in table 4.25, while depreciation and amortization calculation can be seen in appendix.

Table V. 5 Estimated Depreciation for 2026-2031

Description	Unit			2026	2027	2028	2029	2030			2031
Depreciation	Million US$	10.48	5.24	7.57					4.95	5.82	0.87
Amortization	Million US$	1.21	1.21	1.21					1.21	1.21	0.00
Total	**Million US$**	**11.69**	**6.45**	**8.77**					**6.15**	**7.03**	**0.87**

The Pongkor gold mine has undergone two extension periods, after being rumoured to be post-mining in 2021, then continuing until 2025. This has an impact on the depreciation value of Pongkor mining assets, a higher depreciation value occurred in the 2017- 2021 while in 2021-2025, the depreciation value is smaller because it is only to depreciate the investment value made for the extension of 2022-2025. Average Pongkor Gold Mine depreciation cost in 20216-2021 is 8.42 million US$, compared with the average estimated depreciation cost for 2026-2031, the depreciation cost is relatively lower than historical cost. It means the strategy in minimizing the Limiting investment only to things that have a direct impact on revenue. Meanwhile for amortization, due to the higher ore volume in 2026-2031 than previous period, then increase the operating hours for heavy equipment, amortization cost looks higher. However, compared with short-term contract, still the long contract giving lower cost with same ore volume for production planning in 2026-2031.

Profit/Loss Calculation

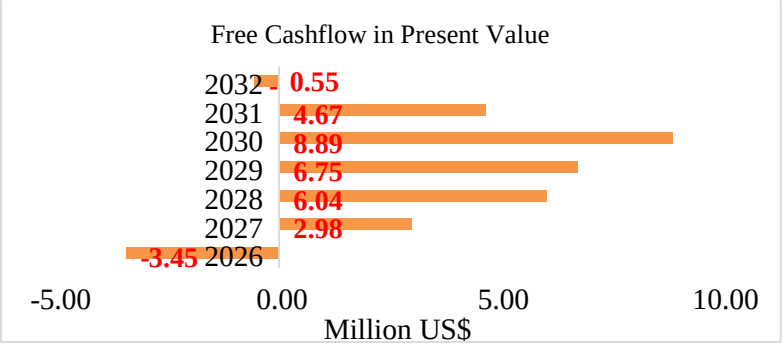
The projected profit and loss of the Pongkor Gold Mine can be seen in the following table. with several strategies carried out, then simulated in financial modelling, the Pongkor Gold Mine still records profits for the next 6 years, until the permit period expires.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

Table V. 6 Estimated Depreciation for 2026-2031

Income Statement	Unit	2026	2027	2028	2029	2030	2031
Production							
Gold Product	Toz	17,786	27,832	27,832	27,832	27,832	18,396
Silver Product	Toz	125,371	196,182	196,182	196,182	196,182	129,666
Gold Product	Kg	553	866	866	866	866	572
Silver Product	Kg	3,899	6,102	6,102	6,102	6,102	4,033
Revenue							
Gold Selling	Million US$	32.05	50.15	50.15	50.15	50.15	33.15
Silver Selling	Million US$	2.73	4.27	4.27	4.27	4.27	2.82
Sales Revenue	**Million US$**	**34.78**	**54.42**	**54.42**	**54.42**	**54.42**	**35.97**
Operating Cost							
Cost of Goods Sold	Million US$	26.84	35.91	35.40	34.64	34.01	24.24
Operating Expenses	Million US$	1.54	2.38	2.38	2.38	2.38	1.59
EBITDA	**Million US$**	**6.40**	**16.12**	**16.63**	**17.39**	**18.03**	**10.14**
Depreciation		10.48	5.24	7.57	4.95	5.82	0.87
Amortization	Million US$	1.21	1.21	1.21	1.21	1.21	0.00
Total Depreciation & Amor	Million US$	11.69	6.45	8.77	6.15	7.03	0.87
EBIT	**Million US$**	**-5.29**	**9.68**	**7.86**	**11.24**	**11.00**	**9.27**
Debt Interest	Million US$	0.00	0.00	0.00	0.00	0.00	0.00
Earning Before Tax	**Million US$**	**-5.29**	**9.68**	**7.86**	**11.24**	**11.00**	**9.27**
(-) Tax	Million US$	0.00	2.13	1.73	2.47	2.42	2.04
Profit/Loss	**Million US$**	**-5.29**	**7.55**	**6.13**	**8.77**	**8.58**	**7.23**

Cashflow Calculation



FigureV. 1. Free Cashflow in Present Value

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

Figure 4.8 showed the number of free cashflow in present value, in the beginning Pongkor Gold Mine extension project valued in negative due to the initial investment for tailing dam construction and tunnelling activity for mining development project. The extension project will be profitable in second year or after 21 months of the project.

NPV, IRR & Payback Period

This financial feasibility study is conducted based on the concept of discounted cash flow (discounted cash flow analysis). As a basis for analysis, the components of capital costs, operating costs, ore production levels and product sales estimates are the main inputs. The main indicators used to determine economic feasibility are "Net Present Value" (NPV) and Internal Rate of Return (IRR). Indicators will show that a project is feasible to if the NPV prospect is positive and the IRR is greater than the Minimum Attractive Rate of Return (MAROR). With WACC equals cost of equity (WACC = 9.17%) summary of NPV, IRR and PBP can be seen in table below.

Table V. 7 NPV, IRR & PBP

Project:		
Net Present Value (NPV)	Million USD	25.33
Modified Internal Rate of Return	%	52.2%
Payback Period	Month	20.4

D. Sensitivity Analysis

Sensitivity analysis is conducted to determine the effect of changes in project feasibility parameters to profitability. The parameters to be considered include: Gold Price Vs Production Cost (COGS) and Production Capacity

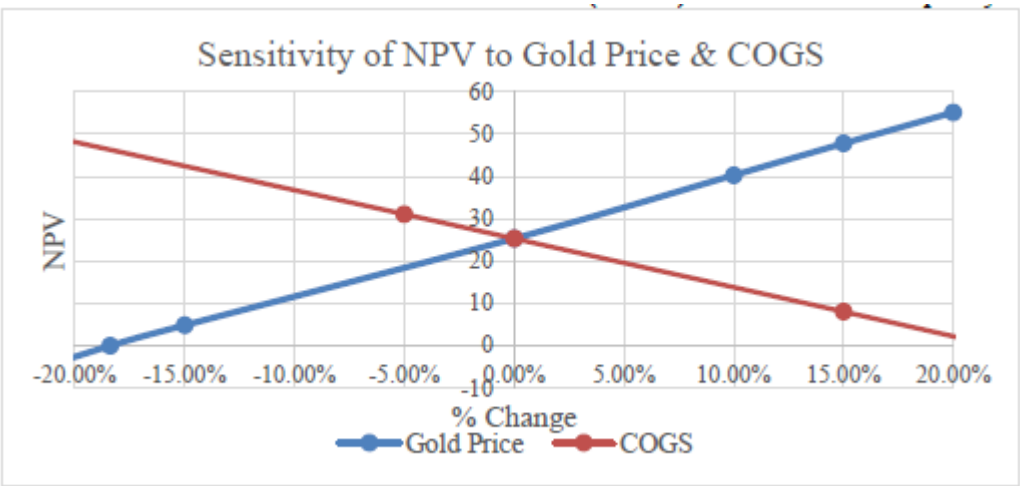


Figure V. 2. Sensitivity of NPV to Gold Price & COGS

The results of the sensitivity analysis in the variable price of gold and production costs (COGS) on feasibility study parameters can be seen in figure above. In general, changes in the two parameters (gold prices and production costs) will have a significant effect on changes in the NPV value. A little change to these parameters will affect the feasibility level of Pongkor. Declining in the price of gold up to 18.40% from the base case, still providing a positive NPV. Likewise, increased production costs (COGS) of up to 22% from the base case which still makes the project attractive because it provides a positive NPV.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 06 Issue 07 July 2023
DOI: 10.47191/ijcsrr/V6-i7-83, Impact Factor: 6.789
IJCSRR @ 2023
www.ijcsrr.org

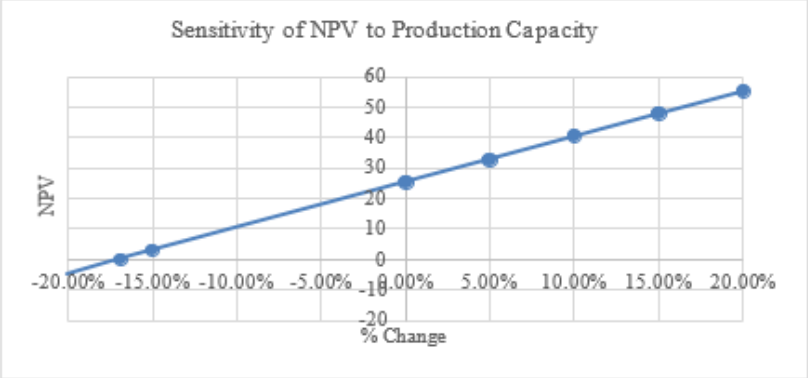


Figure V. 3. Sensitivity of NPV to Production Capacity

Meanwhile, the results of the sensitivity analysis for changes in the Production Capacity can be seen in Figure above. Production Capacity is sensitive to the rate of change in profits as well. A little change in production capacity will affect the feasibility of the mining project extension. Decreasing in production capacity to more than 16.94% of the base case will make the project unprofitable.

From the findings, it can be concluded that the implementation of the business-level strategy will have a positive impact on the financial feasibility of processing low grade gold ore. It's indicated in Net Present Value (NPV), Internal Rate of Return (IRR) and payback period (PBP) of the extension project. The results showed, Pongkor Gold Mine earned 25.33 million dollars on NPV, IRR with a value of 52.2% and payback period (PBP) in 21 months. Sensitivity analysis is conducted with the parameters of Gold Price, Cost of Goods Sold (COGS) and production capacity to find out how sensitive these parameters to the NPV value. The results showed that the extension project is feasible if the gold price not declined more than 18.4% from the base, production cost (COGS) not increased more than 22% COGS and the productivity not decreased more than 16.94% from the base.

REFERENCES

1. Apriyanto, Andi, 2021, Assessing the creation of spv in the integration of Antam's marginal and minority-interest gold Mines to optimize antam's gold business sector, Bandung, Institut Teknologi Bandung.
2. Alkadrie, Syarif Faisal, 2021, Transfiguring Nickel Downstream Strategy For Antam – a State Owned Mining Company in Sustaining Future Business, Bandung, Institut Teknologi Bandung.
3. Gitman, J. Lawerence & Zutter, Chad J., 2015, Principle Of Managerial Finance 14th edition, Edinburgh, Pearson Education.
4. Jauch, L. R., Glueck, W. F., 1988, Business Policy and Strategic Management, 4th Ed, McGraw-Hill, Inc.
5. Perdana, Faisal Angga, 2021, Business strategy for pt halliburton indonesia to Increase its performance in the oil and gas service Industry, Bandung, Insititut Teknologi Bandung.
6. PT ANTAM Tbk, 2022, 2021 Annual report: Strengthening Core Business for Sustainable Growth, PT ANTAM Tbk.
7. PT ANTAM Tbk, 2022, 2021 Revisi Studi Kelayakan 2022 - 2025, UBPE Pongkor PT ANTAM Tbk.
8. Rothaermel, F.T., 2017, Strategic Management 3e, New York, McGraw-Hill education.
9. Thompson A.A et al, Crafting & Executing Strategy; the quest for competitive advantage 20th edition, 2016, New York, Mc Graw Hill.
10. Tatiane Marin et al, Economic feasibility of responsible small-scale gold mining, 2016, Sao Paulo, University of Sao Paulo.

Cite this Article: Hoppy Adi Putra, Raden Aswin Rahadi (2023). Financial Feasibility Study on Antam Pongkor Low-Grade Gold Ore Mine After Implementing Business-Level Strategy. International Journal of Current Science Research and Review, 6(7), 4670-4681