Understanding the Fundamentals From A Mining Business Perspective

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for

Cave Mining Masterclass 2040

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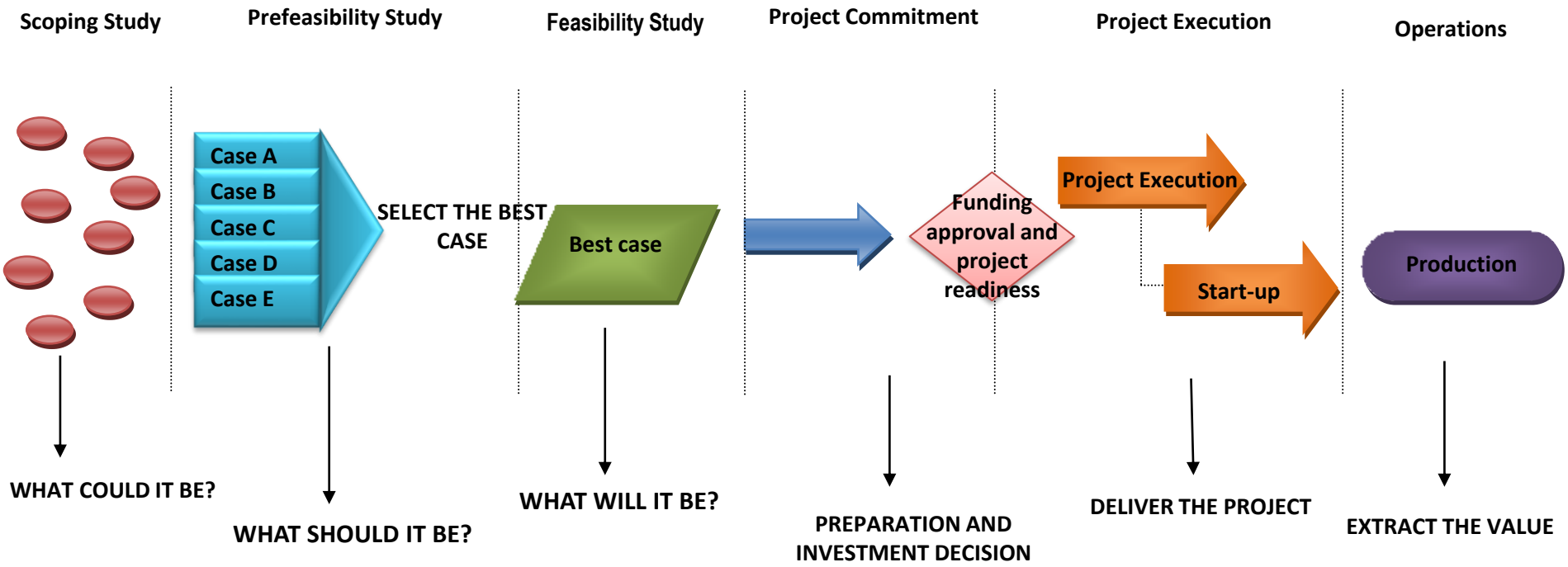
INTRODUCTION

1. Effective capital investment systems
2. Effective due diligence
3. Project Management Processes and Controls
4. Why do projects fail
5. Do we understand the fundamentals?
6. The Three P’s – People, Processes and Platforms
7. Where does innovation fit in?
8. Summary

3. Capital Investment System

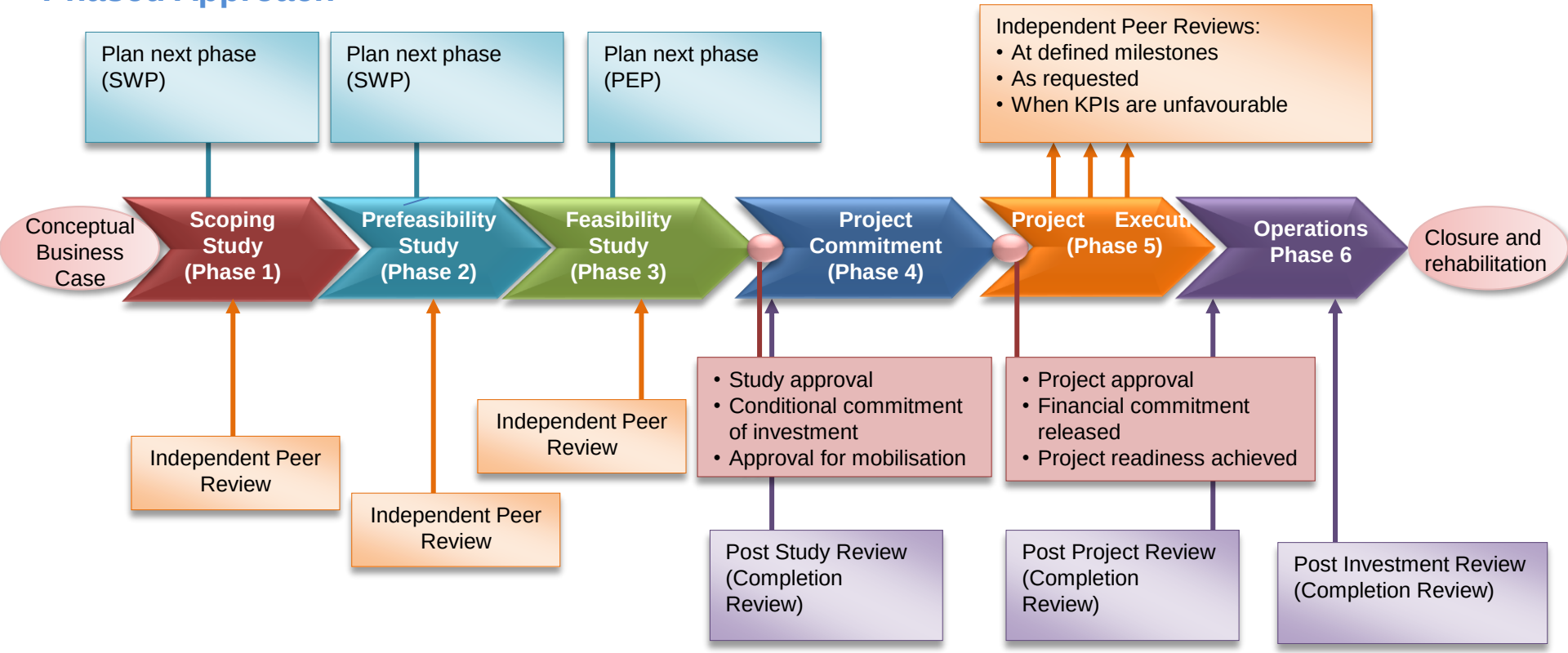
Key Principles

Considered and developed in a phased approach



3. Capital Investment System

Phased Approach



3. Capital Investment System

What makes up the CIS?

- Common understanding / language
- Consistent approach
- Sets standards of content, quality and accuracy

Policies | Policy Manuals | Minimum Standards | Toolkits | Knowledge Portal | Archive Reports

3. Capital Investment System

Key Components – Minimum Standards

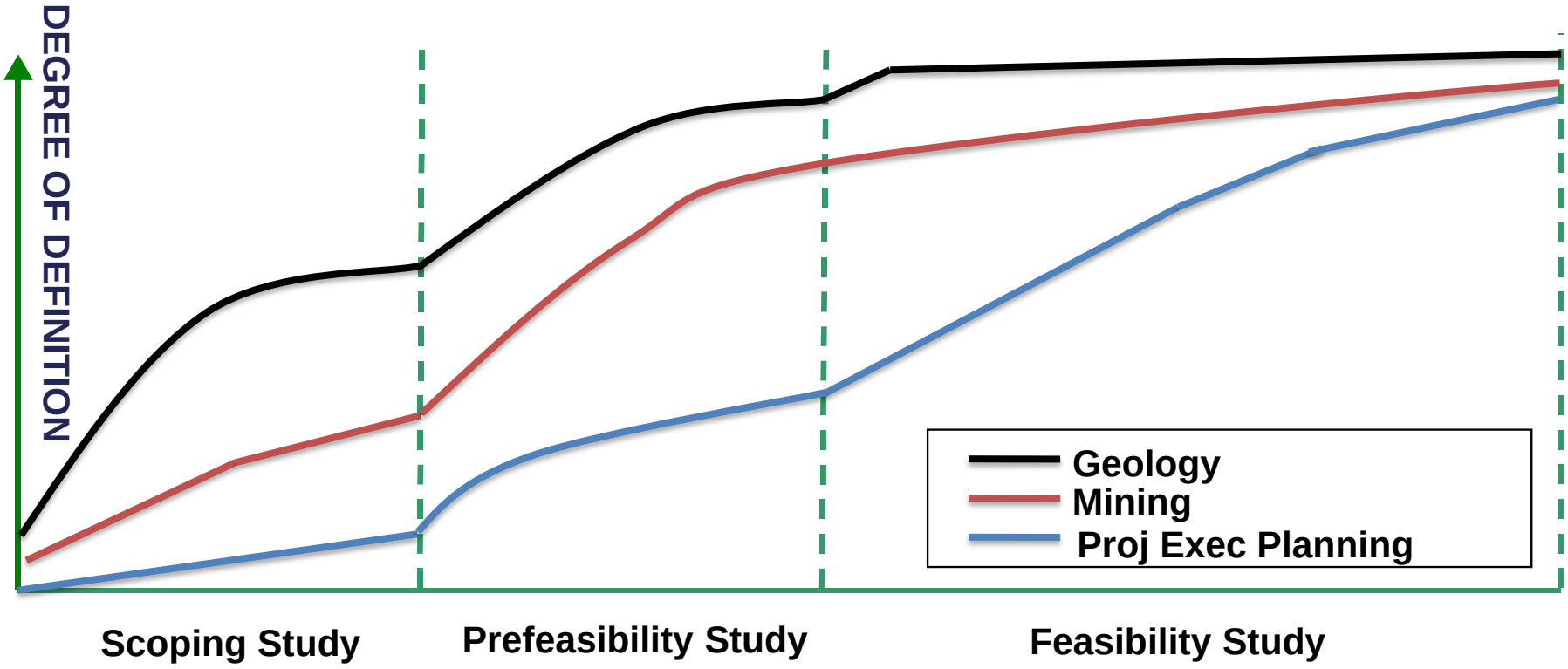
Define the content, quality and accuracy for:

- Scoping, Prefeasibility And Feasibility Studies
- Study Work Plans
- Project Execution Plans
- Minor Capital Projects
- Cost Estimates
- Project Commitment
- Due Diligence And Data Rooms

Minimum Standards

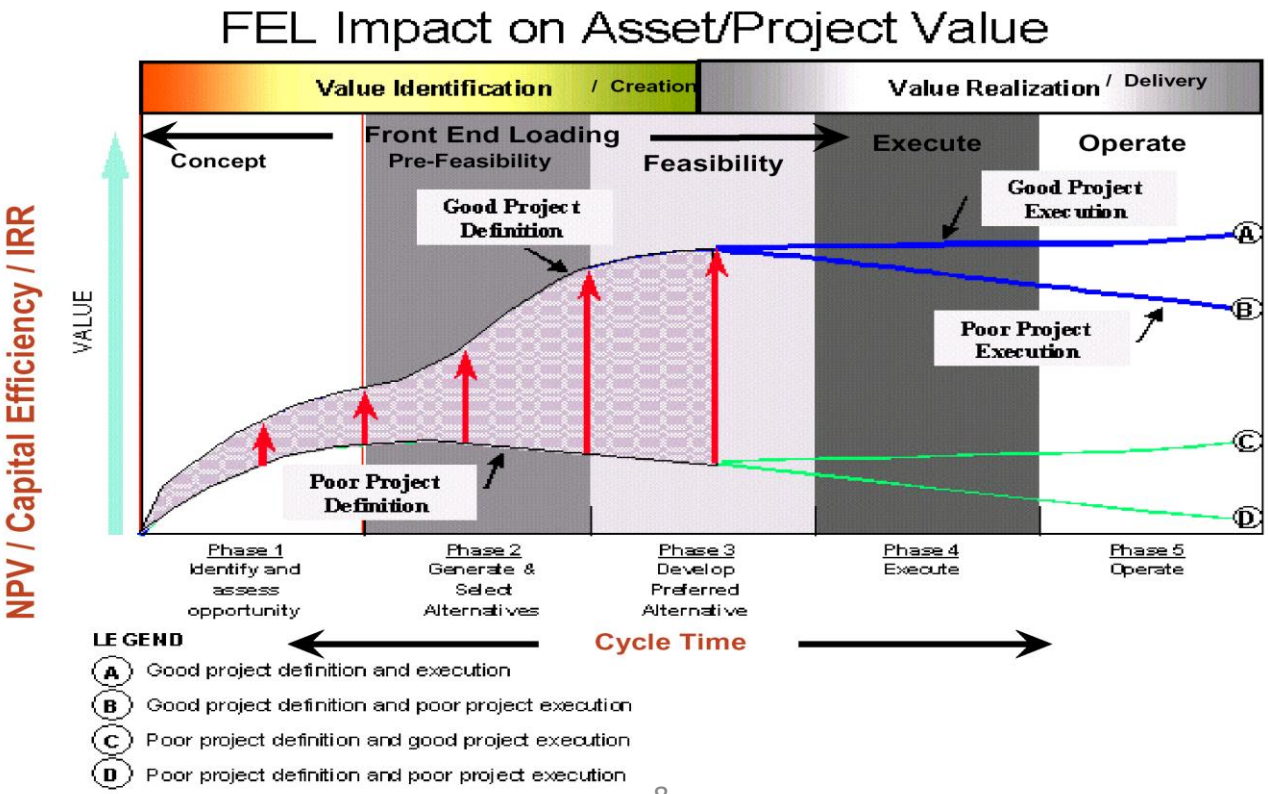
3. Capital Investment System

Level of Effort and Definition



3. Capital Investment System

Graph showing level of effort and definition



2. Effective Due Diligence

Ranking of Issues

Critical risk	A risk that has one or more of the following impacts: ◆ Represents more than 10% of NPV ◆ Likely impact of more than 10% on company share price ◆ Fatalities of more than one person ◆ Serious impact to the company's reputation that impedes operations and is unlikely to be able to be corrected ◆ Serious impact on the environment that cannot be mitigated ◆ Material impact on the schedule, resource requirements or other major component of the investment, making a successful outcome unlikely (judged to be +6 months)
Major risk	A risk that has one or more of the following impacts: ◆ Represents between 5%-10% of NPV ◆ Likely impact of between 5%-10% on company share price ◆ Serious injury to more than one person ◆ Major impact on the company's reputation, however it will not impede operations and is likely to be able to be corrected ◆ Major impact on the environment that can only be mitigated by placing a material burden on cost, schedule and/or resources ◆ Significant impact on the schedule, resource requirements or other major component of the investment, that can possibly be mitigated to achieve a successful outcome (3 to 6 months)

2. Effective Due Diligence

Ranking of Issues (Continued)

Medium risk	A risk of one or more of the following impacts: ◆ Represents more than minimal and less than 5% of the project NPV ◆ Unlikely to impact company share price ◆ Injury to one or more persons	◆ Impact to the company's reputation but with efforts can be mitigated but not eliminated ◆ Impact to the environment but with efforts can be mitigated but not eliminated ◆ Impact of nature that cannot be mitigated to the schedule and resource requirements of the project.
Minor risk	A risk that has one or more of the following impacts: ◆ Minimal impact on NPV and company share price ◆ Possible injury to more than one person ◆ Minor impact on the company's reputation, however it can be mitigated	◆ Minor impact on the environment that can easily mitigated ◆ Causes an impact on the schedule, resource requirements or other major component of the investment, that can be mitigated to achieve a successful outcome
Complies	A risk that has one or more of the following impacts: ◆ No impact on NPV and company share price ◆ No risk to personnel safety or environment ◆ Minimal to no impact on the company's reputation	◆ Causes an impact the schedule, resource requirements or other major component of the investment that will not change the investment outcome

2. Effective Due Diligence

Study Appraisal - Conformance to Minimum Standards

1	Executive Summary and Project Overview	🟢	10	Operating Cost	🟢
2	Project Background and Country Profile	🟢	11	Human Resources	🟢
3	Geology	🟢	12	Marketing – Outside scope of IPR	
4	Mineral Resource Evaluation	🟢	13	Legal	🟠
5	Mining	🟡	14	HSEC and Sustainable Development	🟢
6	Process and Metallurgy	🟢	15	Financial Evaluation – Outside scope of IPR	
7	Processing Facilities and Material Handling	🟢	16	Risk Analysis	🟠
8	Site and Infrastructure	🟢	17	Project Implementation Plan	🔴
9	Capital Estimate	🔴			

Critical Risk 🔴 🟠 🟡 ⚪ 🟢 Complies

2. Effective Due Diligence

IPR Evaluation of the Objectives of a Feasibility Study

Objectives of a Feasibility Study	IPR assessment Requirements achieved in green text, not achieved in red text
Demonstrate the technical and economic viability of the business opportunity based on the proposed project as presented in the Feasibility Study	**Technical viability well demonstrated.** Economic viability not reviewed
Develop only one configuration and investment case, and make a clear recommendation for the Project Execution phase	**One configuration case presented.**
Define the scope, quality, cost and time of the proposed project	**Scope quality well defined.** Cost and time not adequately defined for the Implementation Strategy. Preproduction Mining Costs not defined sufficiently.
Demonstrate that the project scope has been fully optimised to ensure the most efficient and productive use of the capital invested, the mineral resource, and the human resources applied to the project	**Project has been fully optimised and improvements now relate to Implementation.** Risk levels not consistently defined. Mitigation plans not included in cost estimates yet. Project schedule does not address operational start-up or project mobilisation.
Quantitatively assess the risk profile of the proposed project	**Risk profile fully defined,** with exception of Implementation risks
Ensure no residual or future issues could significantly impact the assessment set out in the Feasibility Study	Implementation strategy and some costs and time issues remain residual risks not able to be assessed.

4. Project Management Processes and Controls

An Introduction to Project Management Processes and Controls

- Objectives of a Project Cost Control System
- What are Project Controls?
- Project Controls Systems
- Cost Control Fundamentals
- Cost Control vs Financial Control
- Cost Control System and Finance System Interface
- How has Project Controls worked on GAP

4. Project Management Processes and Controls

What are Project Controls?

Skilled personnel using proven systems and processes to deliver predictable project outcomes

- Cost Control
- Cost Estimating
- Schedule Control
- Reporting
- Trend & Change Management
- Document Control

4. Project Management Processes and Controls

The Magical World of Project Controls Systems ...

The Cost System will not do your job for you!

4. Project Management Processes and Controls

Features of a Successful Project Controls System

- Right people with defined roles and responsibilities
- Effective change management – **No Surprises**
- Consistency across studies and projects – reporting, processes and procedures
- Effective definition of coding structures to link common data
- Link cost, schedule, document control, engineering and project management processes

4. Project Management Processes and Controls

Cost Control vs Financial Control Systems

- A Cost Control System is NOT a Financial Control System.
- Both are required and information is shared / transferred between the systems.
- Cost Control system must focus on leading indicators, commitments, estimate to complete and constantly forecasting indicated final cost.
- *Commitments (what we have awarded) plus Estimate To Complete (what we have not awarded) = Indicated Final Cost*
- Financial system typically is focused on historical data - budgets and payments.

4. Project Management Processes and Controls

Where we have been vs Where we are going…

So Why Do Projects Still Fail?

3. Why Do Projects Fail?

Even successful projects could be better(?)

Top 10 Features of Successful Projects

- Prefeasibility – considers alternatives to select optimum case
- Feasibility – defines business investment opportunities
- Clearly defined execution plan, organisation roles and accountabilities
- Regular stakeholder involvement
- Realistic budget and schedule
- Timely approvals and provision of funding
- Clear appreciation of risk and mitigation strategies
- Experienced Project Teams
- Schedule driven behaviour, with costs respected as shareholder funds
- Plan, Plan, Plan

1. Why Do Projects Fail?

1. Failing to adequately establish the core technical aspects of geology, mining, metallurgy at the study phases
2. Ignoring the sustainability and licence to operate aspects
3. Failing to perform prefeasibility studies to rigorously find the best investment case
4. Thinking bigger will be better- chasing economics by only upsizing the project
5. Assuming that optimistic commodity prices for the life of mine
6. Producing flawed feasibility studies in the rush to get into production
7. Not integrating studies at technical, project and business levels
8. Inadequate project implementation planning
9. Assuming project management should not be difficult
10. Not conducting good quality reviews during the study and implementation phases
11. Failures in project controls leading to surprises for company directors
12. Believing that things go smoothly with a project

1. Why Do Projects Fail?

1. Capital cost overruns and schedule delays are only part of why project fail

2. Other economic factors include:
   a. Commodity forecasts
   b. Head Grades achieved
   c. Recovery rates
   d Operating costs
   e Exchange rates
   in addition to
   f. Schedule
   g. Capital costs

3. Is the new project robust and sustainable enough? For example orebody knowledge(?)

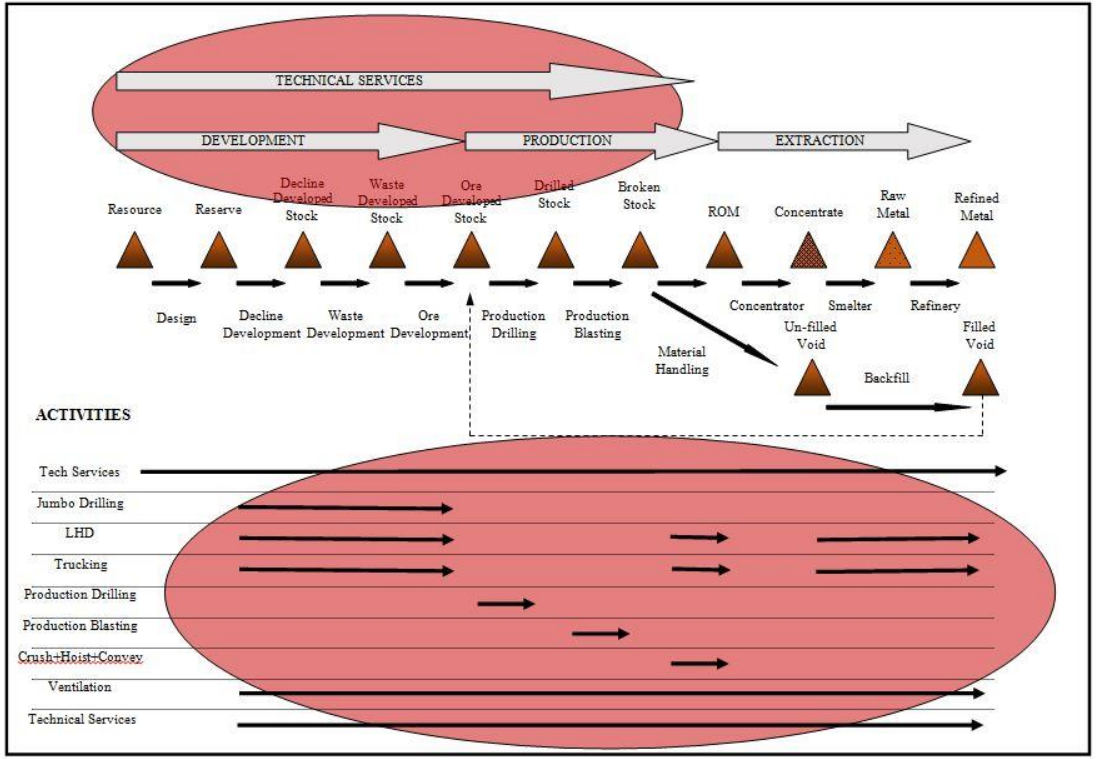
4. Sensitivity to commodity prices, product tonnages forecast, exchange rate changes then potentially capital cost overruns and schedule delays may be minor issues.

You must adopt a holistic approach to all projects

So What Is The Common Cause for Sub-Optimal Projects?

7. Do we really understand the fundamentals?

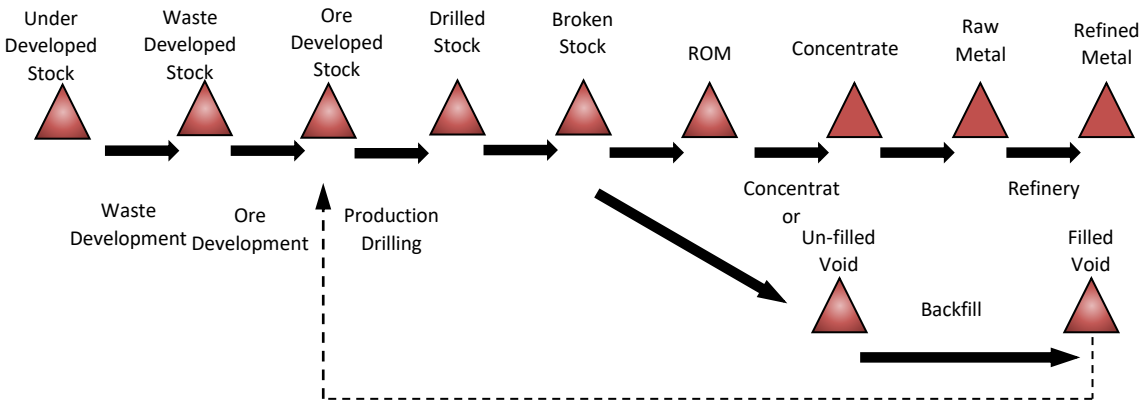
Mining is a process



Does the operational strategy link with the Execution Plan?

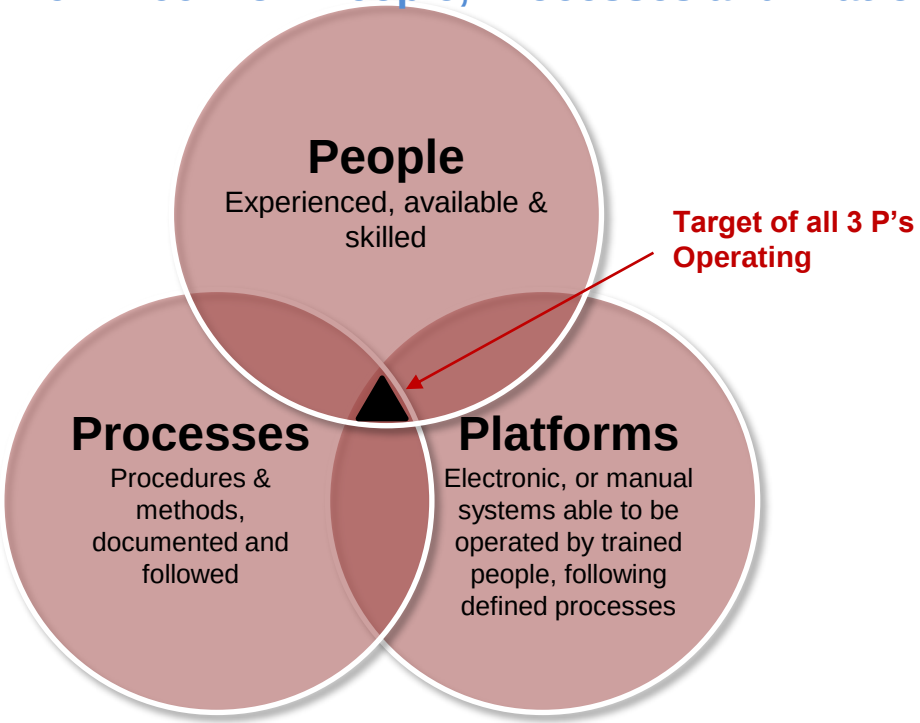
7. Do we really understand the fundamentals?

Holistic approach to the mining process?



7. Do we really understand the fundamentals?

What Can You Control: The Three P's – People, Processes and Platforms?



Do we really understand the fundamentals?

- Corporate objectives
- Orebody knowledge
- Technical and economic viability
- Risk and reward
- Must have a business approach
- Must have a holistic approach
- Cash is king

So Where Does Innovation Fit Into This Equation?

Where does innovation fit into the equation?

Some key considerations

- Innovation is not technology
- Technology can form part of innovation
- Value add not to be presented in silos
- Must have a business case
- Business case must fit in overall business plan
- Capital v risk v reward
- How can the innovation be phased?
- Are you a leader or good second follower?

Where does innovation fit into the equation?

An Example: Rock cutting (key benefits?)

Rock cutting = no Drill & Blast =

- Selective mining (less dilution)
- Automation/shift configuration/safety
- Less ventilation and re-entry time
- Sizing and not crushing
- Pneumatic conveying, underground processing
- Does this opportunity have a business case?

Where does innovation fit into the equation?

So what does innovation mean to this workshop?

- Impact to the whole mining process
- Understand the fundamentals
- Business case for the whole business
- Capital v risk v reward
- Think laterally to phase implementation
- Remember the 3 P’s
- Return to shareholders

Where does innovation fit into the equation?

Holistic business thinking

- Prevent silo thinking?
- Can you sell the concepts?
- Multiple applications?
- Are we a business producing metal or rock factories?
- Innovation for innovations sake?
- SMART objectives

Where does innovation fit into the equation?

Examples of Innovation for Innovation's sake

- Space Biro
- Bunnings
- Geographical demographics

8. SUMMARY

Setting the scene for this workshop

We are here to hear

10 key principals for this workshop:

1. All ideas are good ideas - Be supportive and not judgemental
2. We have the systems but projects still fail
3. Remember the 3P's and implementation
4. Holistic approach to the mining process
5. Understand the fundamentals (multiple applications)
6. Business case within a business plan
7. Capital v risk v reward – phased approach
8. Think laterally but have SMART objectives
9. Are we leaders or good second followers
10. Innovation for innovation's sake

Example to Finish Off

Innovative voice recognition system

https://www.youtube.com/watch?v=5FFRoYhTJQQ&list=RD5FFRoYhTJQQ