

## **Annex 2 - Guidelines and Formats for Final Mines Feasibility Study (Section 41)**

### **Guidelines for preparing the Project Feasibility Study**

The report shall include at least the information listed below:

#### **1. Salient features**

- Details of the promoter
- Location of mine
- Leasehold area
- Total geological and mineable reserve
- Summary of the report

#### **2. Market analysis**

- Size of market and specifications
- Competition in the market
- Import substitution/export potential
- Value addition potential
- Quality control of products
- Legal and regulatory considerations

#### **3. Geology and reserve**

- Brief description of the exploration programme to determine the reserve and quality of the mineral and the geology
- Geological plans and sections showing necessary geological features
- Detailed findings of the exploration, geological parameters, reserves, quality of mineral etc.

#### **4. Mine development planning**

- Determination of pit boundary and the area required for establishment of infrastructural facilities and waste disposal area
- Access road to the mine area and the mining benches
- Pre-production development works including jungle & bush clearance, initial cut and bench preparation to expose the deposit
- Establishment of infrastructure which include plant and machinery, office and residential buildings
- Provision of ancillary facilities such as power, water, transport facility with and beyond the mine etc.

## 5. Mine design parameters

- Giving justifications for the selection of chosen parameters for,
  - Bench dimensions
  - Blast hole drilling
  - Blasting
  - Haul road and ramp
  - Waste dump
  - Final pit configuration etc.
  
- A mine plan and design including the bench parameters, for operation and abandonment of a mine shall consider the following geotechnical aspects:
  - Impact on slope stability due to geological structures;
  - Shear strength of the rock mass; and
  - Impact on wall stability due to rain water inflow, surface drainage and groundwater pattern.
  
- The maximum vertical height of any bench shall be determined based on above geotechnical aspects to provide adequate margin of safety for persons working in the mining area.
- If any of the benches are left unworked in a mining operation, the height and width of the benches shall be maintained in such a way that the slope does not fail and cause hazard to persons working in the mining area.
- A mine face shall not be excavated, drilled or blasted to create an overhang of the face. If an unconsolidated rock is mined, the mine face and sides must be battered to prevent a collapse.
- A mine face shall not be undercut by the excavation, drilling and blasting operation of a slot at the toe or in any other part of the face.

## 6. Mine production planning

- Year-wise and bench-wise working and production plan giving details of quantity, quality and specification of mineral/rejects/sub-grade mineral and all the consumables;
- Description of the method of operation.

## 7. Mine plan drawings

- Location map in an appropriate scale showing pre-mining landuse in and around the mining lease area and demarcation line of private and state land within the lease-hold boundary;

- Layout plans (in a scale not less than 1:2500) showing lease boundary, pit boundary, infrastructure set-up, access road, locations of top soil/reject rocks/sub-grade dumps, explosives magazine, public facilities such as school, hospital etc. and the index map showing the location of the proposed mine in the region;
- Pre-mining cross-sections at suitable intervals not exceeding 100 meters, along the actual slope of topography with clear plotting of different litho-types
- Pre-production development plan;
- Bench-wise slice plans clearly demarcating different litho-types and grade of mineral in different mining benches;
- Year-wise configuration of the mining pit shown on plans and all X-sections clearly marking the litho-types for five years, for the end of lease period and for end of the mine life;
- Year-wise configuration of the waste disposal site for five years, for the end of lease period and for end of the mine life;
- Ultimate pit configuration on plan and different X-sections.

#### **8. Waste disposal planning**

- Select most suitable site giving justification and due consideration to the cost involved
- Describe in detail the management of waste & tailings, configuration of waste dump and its stability

#### **9. Manpower**

- Details of manpower requirement in executive, supervisory, technical and workers category stating their duties, including organisation charts
- Type of contract work and the contract workers proposed to be involved

#### **10. Project implementation schedule**

- It includes the implementation schedule of various activities in the mine starting from project concept to development, production stage and closure.

#### **11. Capital cost**

- It includes pre-production and preliminary costs, cost of equipment and machinery, infrastructure and mine development costs, utilities costs, working capital, etc.

#### **12. Operational cost:**

- Transportation
- Fuel, water and power

- Labour, health, safety and sanitation
- Service, marketing and promotion
- Land compensation, acquisition
- Government and mineral levies
- Waste disposal, environment management and restoration activities
- Financing, depreciation cost
- Corporate Social Responsibility (CSR)
- Other cost

**13. Financial Analysis:**

- Revenue from sales
- Profitability statement
- Cash-flow analysis
- Rate of return
- Payback analysis
- Break-even analysis