Opportunities for Engineers in Mining industry

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Some general categories of employers:

- Clients/investors: Barrick, Ivanhoe, Vale, BHP Biliton
- Consultant Engineering: Fluor, AMEC, Hatch, SNC Lavalin
- Design & Manufacturing: Polysius, ITT Goulds, Flowserve, FLSmidth Minerals
- Entrepreneurs/Start-up: Motion Metrics
- Others: WBM (audit company)

Geology/Civil

- Initial studies on the site conditions
- Geotech report
- Excavation/Land Filling
- Roads
- Tailing Ponds

Process/Material

- Process:

- Typically the front-runner and ahead of other disciplines
- Developing the procedures toward obtaining the desired product
- Typically with chemical engineering background
- Must have a good knowledge of mechanical equipment, material and I&C concepts
- Most important deliverables: PFD and P&ID
- PFD and P&ID: Backbone of each plant, heart of technology
- Confidentiality of PFDs and P&IDs

- Material:

- Responsible for selection & verification of MOC
- Metal (steel, alloy), non-metal (rubber), paint
- Review & approval of WPS & PQR

Material Handling/Mechanical

- Material Handling:
  - Anything which is related to handling and transferring the material.
  - Stationary: Belt conveyors, stack ers/reclaimers, ship loaders, unloaders, gantry cranes, chutes, bins.
  - Mobile: trucks, forklifts
  - Often mechanical engineering background
- Mechanical:
  - Design/Engineering of Mining Equipment
  - Manufacturing engineer
  - Package engineer
  - Stress engineer
  - Specialists (pump, tank, etc)

Building (Mechanical) Services

- HVAC
- Fire protection/Fighting
- Dust suppression

Structural

- Concrete & foundation
- Buildings (offices, industrial)
- Platforms of mechanical equipment
- Seismic calculations, wind & snow loads
- Safety issues (fall arrest; design of stairways, walkways, ladders)

Plant Design Group (PDG)

- Responsible for laying the equipment and their interfaces such as piping
- 3D models and GA drawings
- Building the 3D models of plant using special softwares such as PDS, EDMS, Autoplant
- Running the models to determine the interferences & inconsistencies
- Working closely with other disciplines, specially mechanical and structural

Piping

- “Line class” and “Piping Specification”
- Main input: temperature and pressure, chemical compositions of flowing medium, acidity and abrasiveness
- Main output: MOC, thickness, schedule
- Other components: valves, spools, sleeves, knees, fittings

Electrical

- Electrical
  - Power supply of plant, including the buildings, equipment, miscellaneous components
  - Motors of mechanical equipment
  - MCC, electrical room
  - Others: cable trays, junction boxes
  - Wiring diagrams

Instrument & Control (I&C)

- Establishing the plant control philosophy (DCS or not, PLC and so forth)
- Providing input to the P&IDs on the control and instrument aspects
- Developing the requirements for the instrumentation and valves of the plant (be it supplier's scope or not)
- Control panels

Architectural

- Envelope of the buildings
- Insulation and cladding
- Doors, emergency exits, egresses
- Close cooperation with Mechanical Services