Lessons Learned For Successful Project Delivery



Listening with Care.

Designing with Purpose.

Delivering beyond Expectation.

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## **MDM Overview & Profile**



- MDM is a South African based minerals process engineering and project management company
- Originally established 24 years ago in 1989 as Metallurgical Design and Management (Pty)
   Ltd
- Reformed in 2006 and named MDM Engineering
- Listed in London on AIM in May 2008
- Capabilities include feasibility studies, plant design, construction and commissioning (EPC & EPCM)
  - Recognised leader in the delivery of fit for purpose metallurgical plants, particularly in the precious metals sector
- Completed 74 bankable feasibility studies and constructed over 55 metallurgical plants
- MDM is now delivering multiple execution projects in excess of \$650m in value for Tier 1 clients
- Headcount of approx. 271 personnel

# **MDM** Culture and Strategy



#### MDM is proudly focussed on the design and delivery of African resources projects

- Culture built on rich history of executing projects in Africa
- Proud of our technical expertise in design and process engineering
  - > Every plant designed and built by MDM has achieved or exceeded nameplate throughput
- Appreciation of African construction risk and country specific risk
- We target studies from scoping all the way through to BFS/DFS
- Strong focus on studies achieving project financing (c. 95% historic financing rate)
- Targeted strategy of converting studies into execution projects
  - Strong source of execution work
  - Detailed project knowledge ensures execution risk is mitigated
  - > Repeat work

## **Commitment to Safety**



### Our Site Safety Record – Focus on Zero Harm!

Project	Man-hours	LTI	LTIFR
Company-to-Date	20,414,230	15	0.15

#### Calendar Year 2013

Period	Man-hours	LTIs	LTIFR
Jan 2013 – Dec 2013	6,346,870	4	0.13

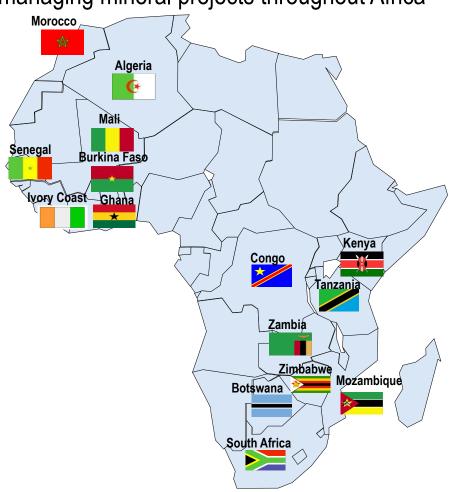
Statistics based on 200,000 Man-Hours Worked.

No Fatalities have been recorded on MDM Sites.

## MDM's Geographic Reach



- MDM has deep experience in managing mineral projects throughout Africa
- MDM has delivered projects across a range of commodities, namely:
  - gold,
  - copper,
  - platinum,
  - cobalt,
  - zinc,
  - uranium,
  - chromite and
  - manganese





## **Process Engineering Design**

- Process design informs all other engineering disciplines
- Need to freeze the process design early in the study or project cycle
- Changes to the process design always leads to engineering design changes
- Changes to the process design always leads to project delays



#### **External Consultants**

- External process or engineering consultants, should the client elect to employ them, should be appointed early in the study or project cycle
- Late appointment leads to late changes to the design
- Late design changes result in:
  - Study or project schedule delays
  - Study or project cost overruns



#### **Client Teams**

- The client team should be established and maintained at the outset of the study or project
- Changes to the team or late introduction of the client team to the project can be disruptive and causes delays or redesign
- Separate client project and client operations teams can be problematic



### Logistics

- Accurate estimation of the cost and time required to complete infrastructure refurbishment, particularly public roads, is essential
- Correct and accurate shipping documentation is essential to avoid lengthy delays at borders and ports
- Congestion at borders and ports must be taken into account when scheduling the project
- Particular attention must be paid to the capacity of the borders and ports to process shipments during the peak of transport for the project



### **Geotechnical Investigations**

- The geotechnical investigation of the plant and key infrastructure is critical
  to the success of the project and should be completed during the BFS or at
  latest at the start of the project execution
- Late completion of the geotechnical investigation is a mistake made by both majors and juniors
- Late completion of the geotechnical investigation can lead to:
  - Relocation of the plant or infrastructure
  - Redesign of the earthworks and civil works
  - Significant schedule delays
  - Significant cost overruns



### **Aggregate and Sand Availability**

- Aggregate and sand supply for construction can be problematic in some locations
- It may be necessary to undertake geological studies to locate a source for aggregate production
- It may be necessary to apply for a quarry permit
- It may be necessary to develop a remote quarry with an imported crushing plant to produce aggregate, trucking the aggregate to the project site
- The source for these must be clearly established during the BFS to avoid significant cost and schedule implications during the project execution



## **Local Skills and Capabilities**

- Establish the skills and capability of local and regional companies and personnel, preferably during the BFS
- Employ as many local or regional companies during project execution as is economically viable
- Ensure that the project schedule takes into account the productivity of local or regional skills and companies



### **Community Relations**

- Set, maintain and deliver to reasonable community expectations in terms of benefits from the project
- Explain to the community the phases of the project, in particular the employment opportunities and their duration for the short term construction and longer term operations
- Ensure that servitudes, relocation and land and crop compensation are clearly defined at the outset of the project
- Communicate clearly with both the community and the construction contractors to avoid costly (and potentially dangerous) disruptions to construction



#### **Climate Considerations**

- Extremely hot conditions require planning for:
  - Potable water supply for maintaining workforce hydration
  - Working hours and breaks during temperature peak times
- Extreme lightning prior to rain storms:
  - Remove people temporarily from heights and high terrain
  - Warning systems that detect electrostatic atmosphere and alert sirens
- Extremely wet conditions require planning for:
  - Timing of key activities to minimize impact of rainy seasons
  - Reduced construction capacity during heavy or prolonged rain events



### **Operational Readiness**

- Ensure clarity of responsibility between contractor and client for commissioning and operations during commissioning
- Establish key client operations personnel in project early enough for them to be able to achieve operational readiness
- Determine skills level of local and regional personnel early in the project
- Plan and budget for training of operators prior to commissioning



