

# DE BEERS TECHNOLOGIES

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## Technology Support - Process Services

*Process Services is part of the DBT-SA, Technology Support division. The unit aims to merge a multitude of specialised metallurgical skills and services that translate to enhanced process efficiencies, operational effectiveness and, ultimately, improved revenue.*

The list of services includes: metallurgical analytical studies; operational support; training and plant audits, among others. These services can be targeted during capital projects for improved conceptual flow sheet design that is fit for purpose or for operational optimisation and troubleshooting. Service offerings can be divided into the following categories, which can be customised to client needs:

### TECHNICAL CONSULTING

#### Sample Audits for plant assurance

*The objectives of Sample Audits are to:*

- Establish performance and/or diamond recovery efficiencies of unit processes and/or various streams which will include identifying and reporting on areas of potential diamond misplacement.
- Identify improvement opportunities.

*Recovery Sample Audits could consist of a:*

- Full Technical investigation comprising of process equipment interrogation including tracer tests as well as inspections.
- Snap shot full mass balance including concentrates and tailings which are collected simultaneously for full stream efficiency calculations.
- Tailings “Snap shot” sample auditing as an indicator e.g. determining diamond loss possibilities through recovery treatment of plant tailings under extremely sensitive laboratory conditions.
- Composite Tailings samples which entail longer-term collection of one or more streams using sampling tools.

#### Characterisation and treatment services

*The objectives of Characterisation studies are to:*

- Establish changes in ore properties and their impact on the overall process plant; and to recommend, in collaboration with the different process specialists, solutions for anticipated challenges.
- Support appropriate equipment selections and operation parameters with meaningful data, hence increasing plant effectiveness and diamond recovery efficiency.
- Facilitate recommendations for flow sheet enhancements and throughput optimisations.
- Characterise typical metallurgical properties, including densimetric analysis, magnetic susceptibility, luminescence intensity, shore hardness, t10, ta, etc..



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## **Metallurgical simulation**

*Allowing “what if” scenarios, without tampering with production processes, as a planning and predictive tool to:*

- Implement smarter and more proactive process control.
- Reducing risk related to tuning online equipment.
- Providing quick analysis prior to construction; saving time and capital.
- Allowing design and engineering refinements.
- Evaluating the entire process; hence providing a global picture.
- Identifying problems in advance and timeously applying corrective measures.
- Identifying potential bottlenecks in the process through capacity constraints of certain equipment components.
- Trade off studies, e.g. the evaluation of tonnage vs revenue.

## **Ore dressing studies (ODS) for plant design, upgrade or optimisation**

Ore dressing studies allow for better Metallurgical understanding of ore which yields decisions fit for purpose enabling: ease of material treatability, enhanced plant utilisation, lower plant maintenance and operational budgets implying a higher return of capital employed. Design disappointments will be minimised with prior knowledge of the ore properties.

*An ODS can answer the following questions:*

- What are the comminution characteristics?
- What DMS yields should be expected?
- Should it be a single or split DMS?
- Is the ore luminescent for X-ray recovery or will alternate technology be required?
- What are the downstream effects?
- Will the thickener circuit maximise water recovery?

Upfront answers increase plant design quality.

