

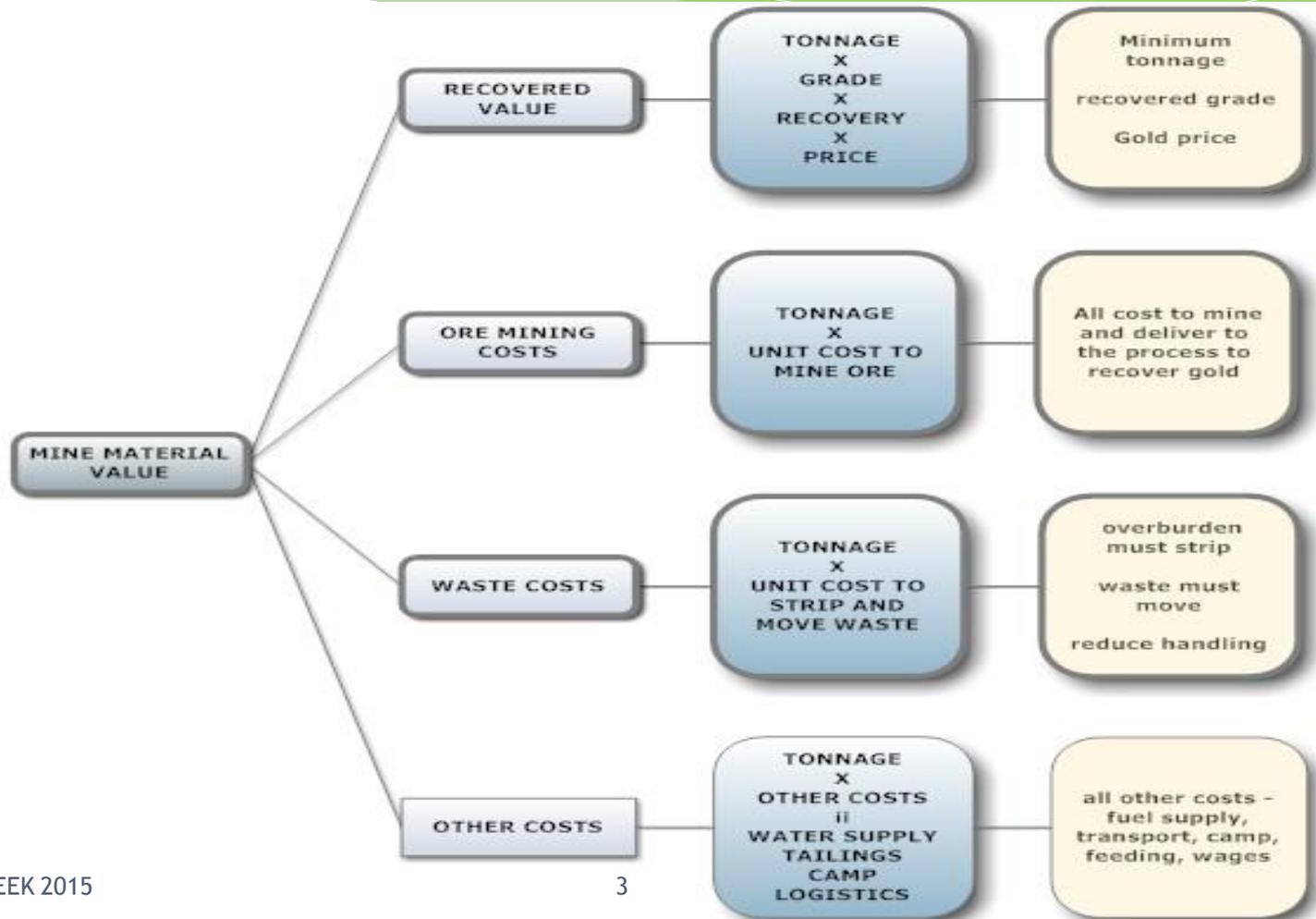
# MINING AND PROCESS IMPROVEMENTS FOR THE GUYANA SMALL SCALE MINER

JO BAYAH  
MINING SPECIALIST

# OUTLINE OF PRESENTATION

- \* Introduction
- \* Mining model for use by the small miner
- \* Address all the elements back to front:
  - \* Processing/recovery and final product
  - \* Water and tailings management
  - \* Mining
  - \* Overburden, ore and waste
  - \* Prospecting
  - \* Other costs
- \* What to do practically

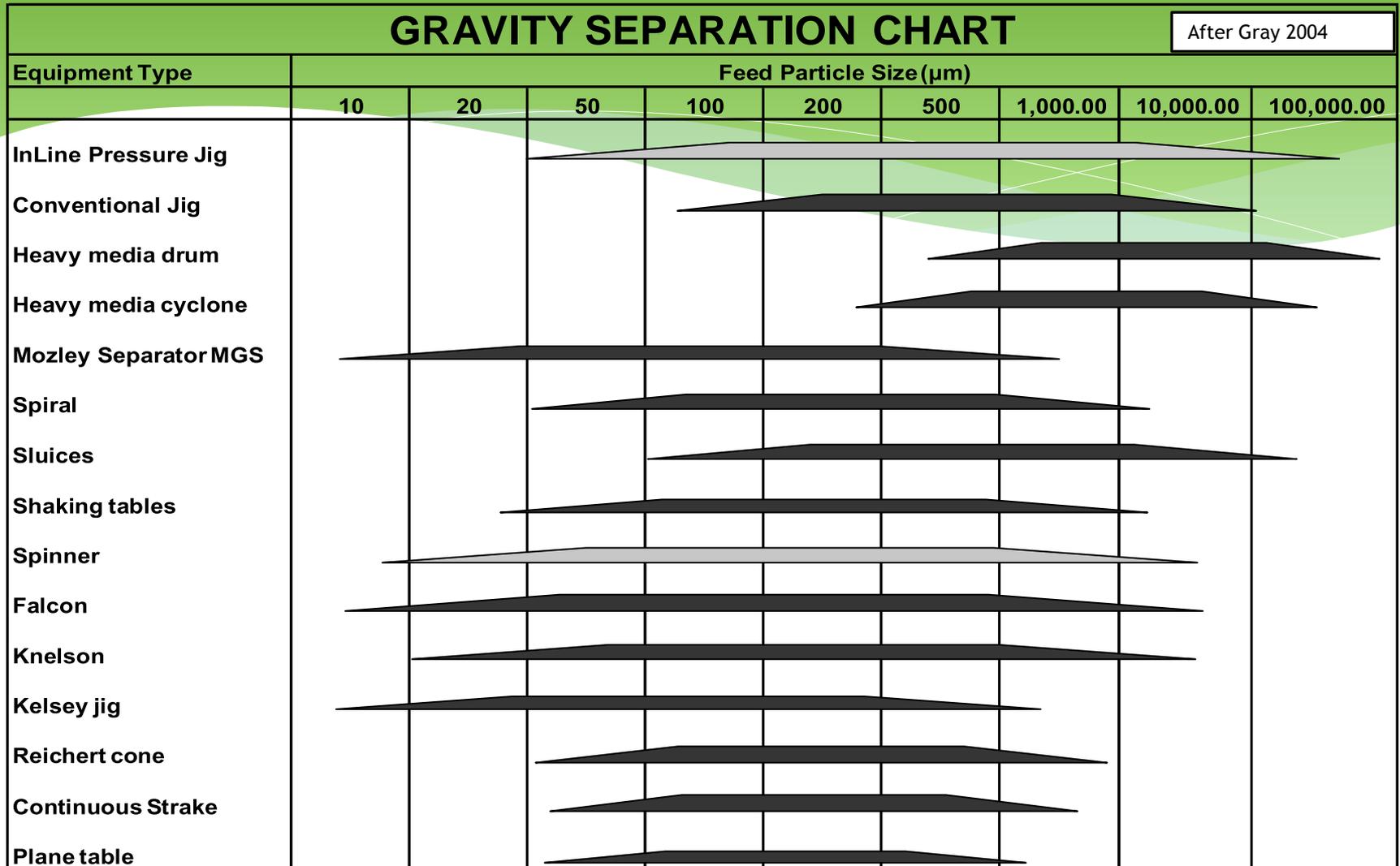
# SMALL MINE MODEL



# RECOVERY

- \* Important aspect of the operation.
- \* Maximise recovery on already sunk costs - use of equipment and time
- \* Use as many recovery systems as possible
- \* Material preparation is key to proper recovery
  - \* Pulp, screen/sizing, treating fractions separately
  - \* Size distribution is not appreciated.....
- \* See chart next - understand where your values are so you do not lose out.
- \* **The sluice is the dominant recovery tool.**
- \* Look at the capability of the sluice box! What are you missing?

# Use multiple techniques



# Water and tailings management

- \* Water is an important input to mining and can add significant cost in pumping
- \* After water slurries with materials and gold is recovered, this tailing must be disposed of properly - another cost area is in tailings impoundments and water clarification.
- \* Know how much water you need for tonnage you wish to treat so you can plan your pumping needs.
- \* With that information you will know what storage your tailings pond should be.
- \* **Very little organised water and tailings management is practiced. Current practices are ad hoc.**

# Mining

- \* Mining must be conducted to achieve value objectives - refer to model.
  - \* Tonnage/grade/recovery/price maximised
- \* Plan mine for efficiency and safety so block is removed within a specified time.
- \* Safe mining means respecting best practices for bench heights and slopes, allowing for safe entry and exit into pits and not endangering workers.
- \* **Current mine planning is poor - results in pit failures in saprolitic material.**

# Stripping and waste removal

- \* Ore may be covered by material not worth mining - overburden. This must be moved.
- \* Waste in the block should also be moved.
- \* Where you place them is important to your operation
- \* **Current practice in Guyana - rolling of overburden which is very expensive.**
- \* Define a waste dump where you will deposit this material once and for all.
- \* Place facilities at places where you do not interfere with your mining planning - ore movement, waste movement and tailings deposition

# Prospecting

- \* Prospecting is key to your definition of ore to work.
- \* Helps remove the “mining blind” phenomenon
- \* Helps you to plan your work
- \* What do you do?
  - \* Test work ground in a systematic way to know whether you have value worth working
  - \* Tools are available to do this exercise at all levels:
    - \* Trenching and augers for quick shallow assessment
    - \* Drilling - banka for alluvials or RC/DD for saprolite and rock
    - \* Pits for bulk testing
- \* Properly document results so you can use for mining support.
- \* **Very little systematic prospecting is conducted.**

# Other cost areas

- \* Other important cost areas for an operation include:
  - \* Fuel and lube oils supply
  - \* Repair and maintenance of equipment
  - \* Logistics support costs
  - \* Camp accommodations and subsistence
  - \* Wages and contractor payments
- \* **Cost are reportedly high but are poorly quantified.**
- \* Proper documentation and tracking is needed to effect better management and implement cost reduction exercises.

# What to do? 1

- \* Use more than one recovery method depending on your ore and sizes - sluice may be letting you down. What is your back up?
  - \* Ore preparation and proper sizing must be done. Equipment for these steps are available and may be fabricated locally.
- \* Water and tailings management understanding and implementation needed for a successful operation.
- \* Mine planning must be based on solid information and best practice

# What to do? 2

- \* Overburden and waste must be moved once and properly. Rolling movements are costly
- \* Systematic prospecting will help in better mine planning.
  - \* Tools are available and technicians are available to help and execute.
  - \* **This exercise may be your best investment! May need about G\$20M in exploration on a PMMS.**
  - \* Lessons are being offered at the Mining School.
- \* Track your costs to know where most of your money is going to plan optimisation strategies.