Reducing Mercury Use in ASGM
Technical guidance document introduction

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Nigeria, June 2011

Basis of the Technical Guidance Document

- UNEP Governing Council Decision 25/5, paragraph 4: strengthen and enhance activities related to artisanal and small scale gold mining
- Purpose: to educate miners and those working with them; and to assist national governments with the development of models for programme design to improve national-level public policy
- Steering Group – presenters plus Partnership Area leads (UNIDO + NRDC)

Structure of the Technical Guidance Document

- Relatively short, simple, attractive and functional
- Document will include discussion of:
  - Existing Technologies, with Emphasis on Mercury Controls and Process Improvement Options
    - Access Requirements
    - Operational Requirements
    - Gold Recovery Statistics
  - Untested Technologies with Potential

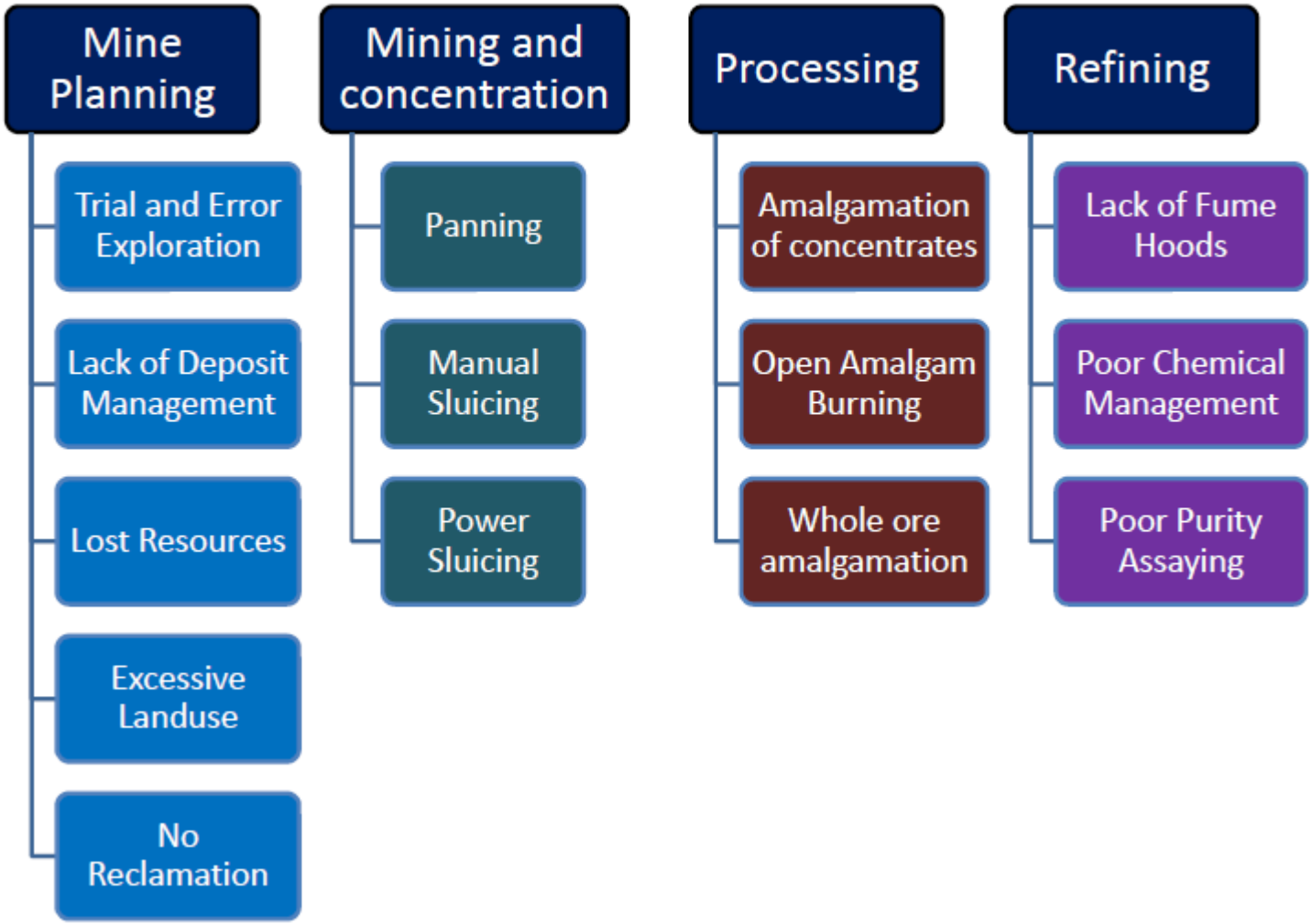
Format and Timing

- June 2011
  - Static document
  - Posted on the web
  - Web based document – Wiki like evolving document
- October 2011
  - Peer Review complete
  - Dissemination Strategy Developed

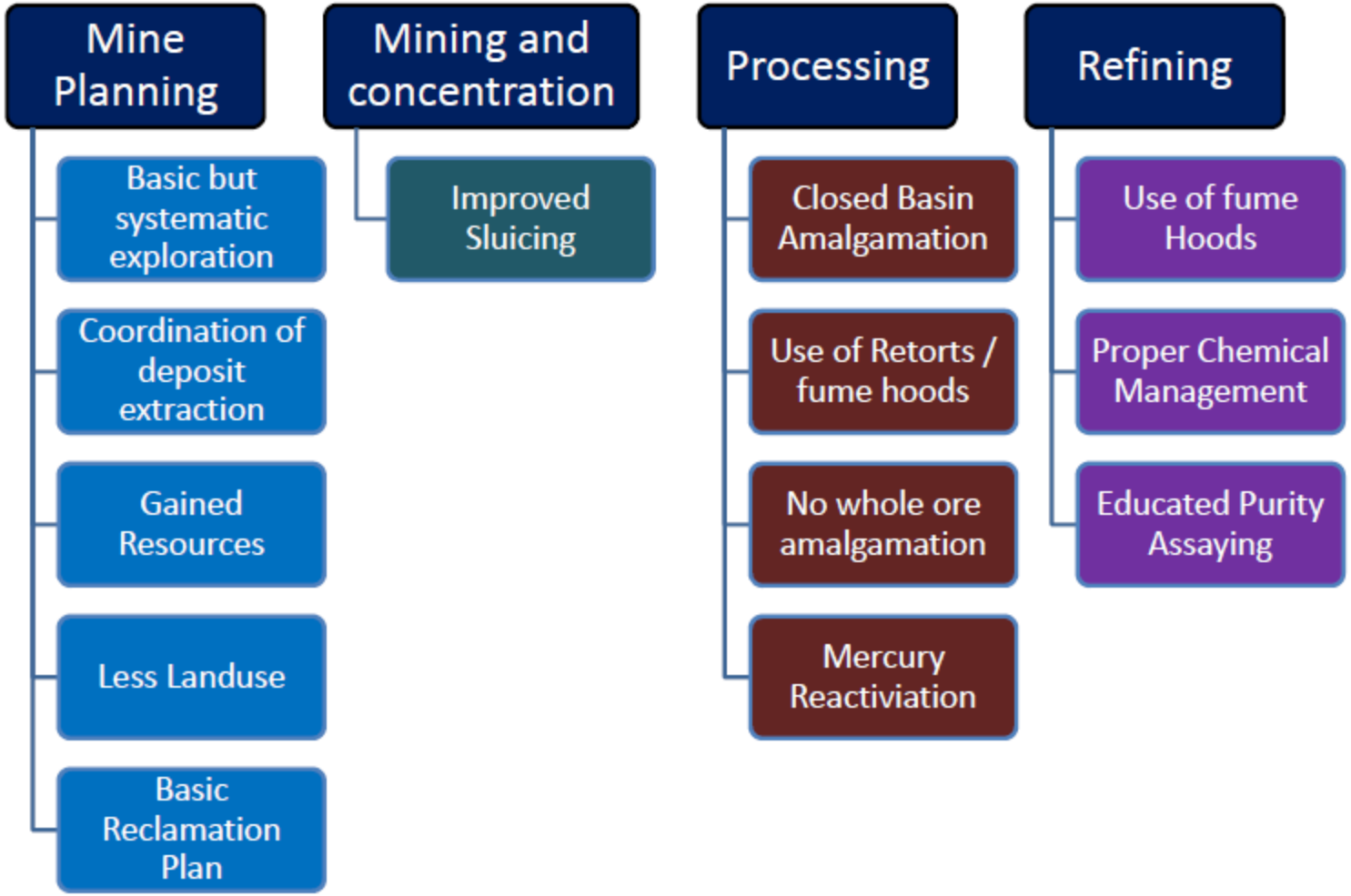
Field Testing

- Ghana – zero mercury (direct smelting)
- Tanzania – vapour capture

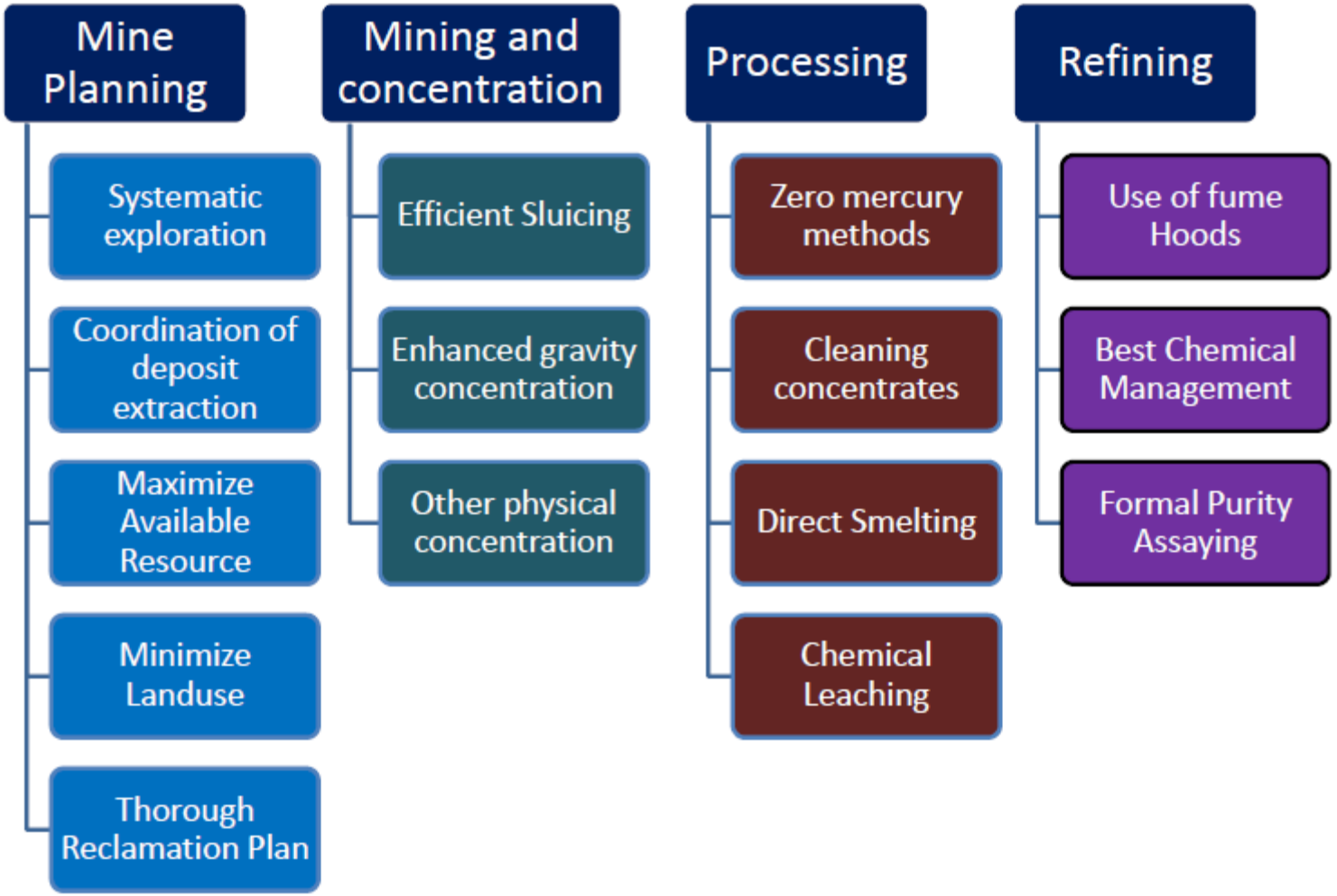
Current Practices - Alluvial



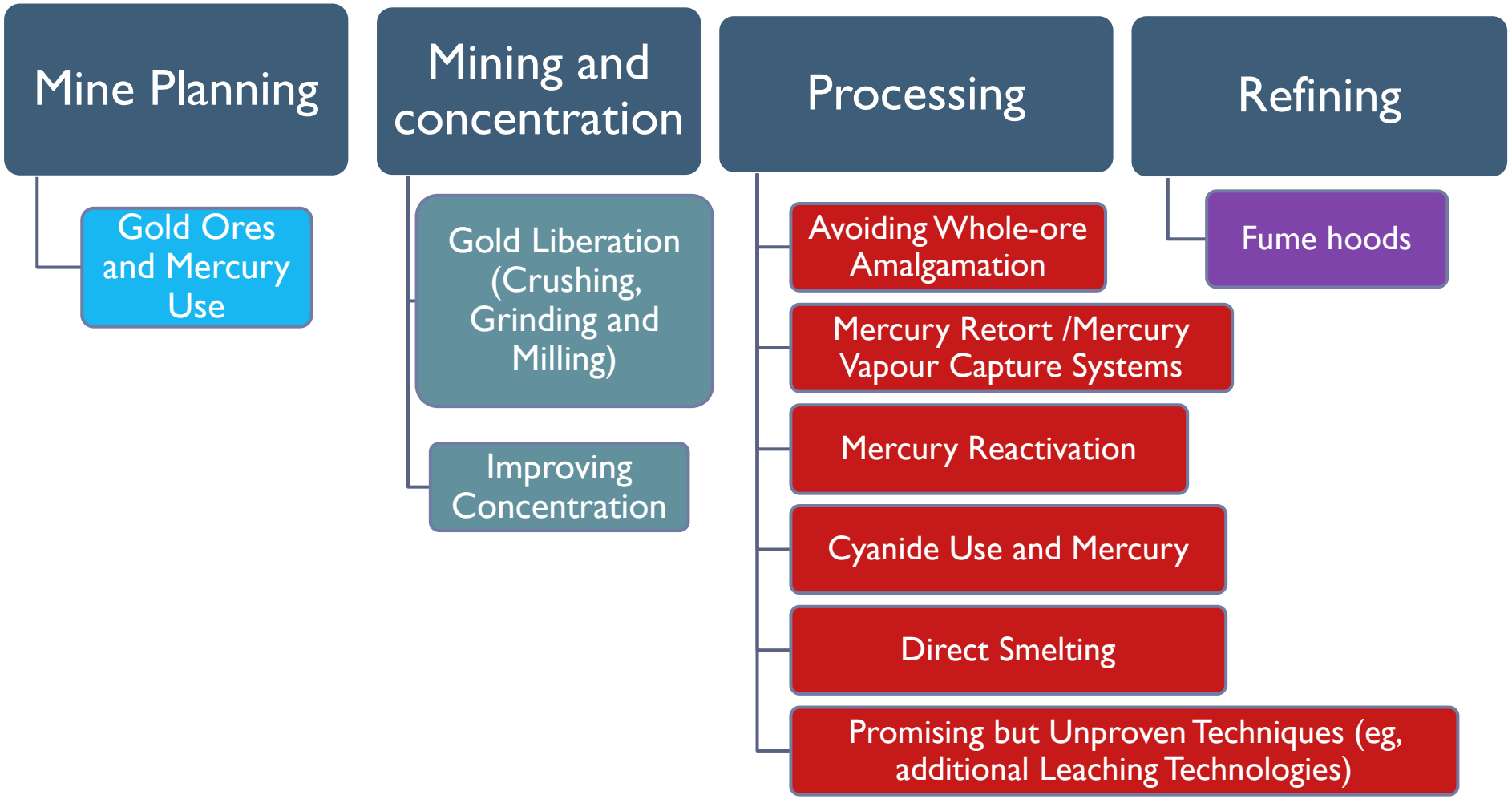
Better Practices



"Best" Practices



Technical Document Contents



Reduction of Intensive Mercury Use Eliminating Whole-Ore Amalgamation

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Reduction of Intensive Mercury Use Eliminating Whole-Ore Amalgamation

Concentration

- The most important step in reducing mercury usage is concentration
- Concentration of gold from ores into smaller masses either
  - reduces the amount of mercury needed; or
  - allows a zero mercury technology to be employed – such as direct smelting
- Good concentration requires good gold liberation (milling) followed by appropriate concentration technology
- Both require adequate capital – often a function of community stability/legality

Improving Concentration

- Sluicing
- Panning
- Vortex
- Spiral Concentrators
- Centrifuges
- Shaker Tables
- Flotation Circuit

Improved Sluicing

- Constant flow of water
- Proper capture material (carpet, fleece)
- Incline of the sluice
- Uniform grain size (proper milling)

- YouTube - Blue Bowl

- YouTube - Sifts gold flakes out of debris - Desert Fox Gold Wheel running -


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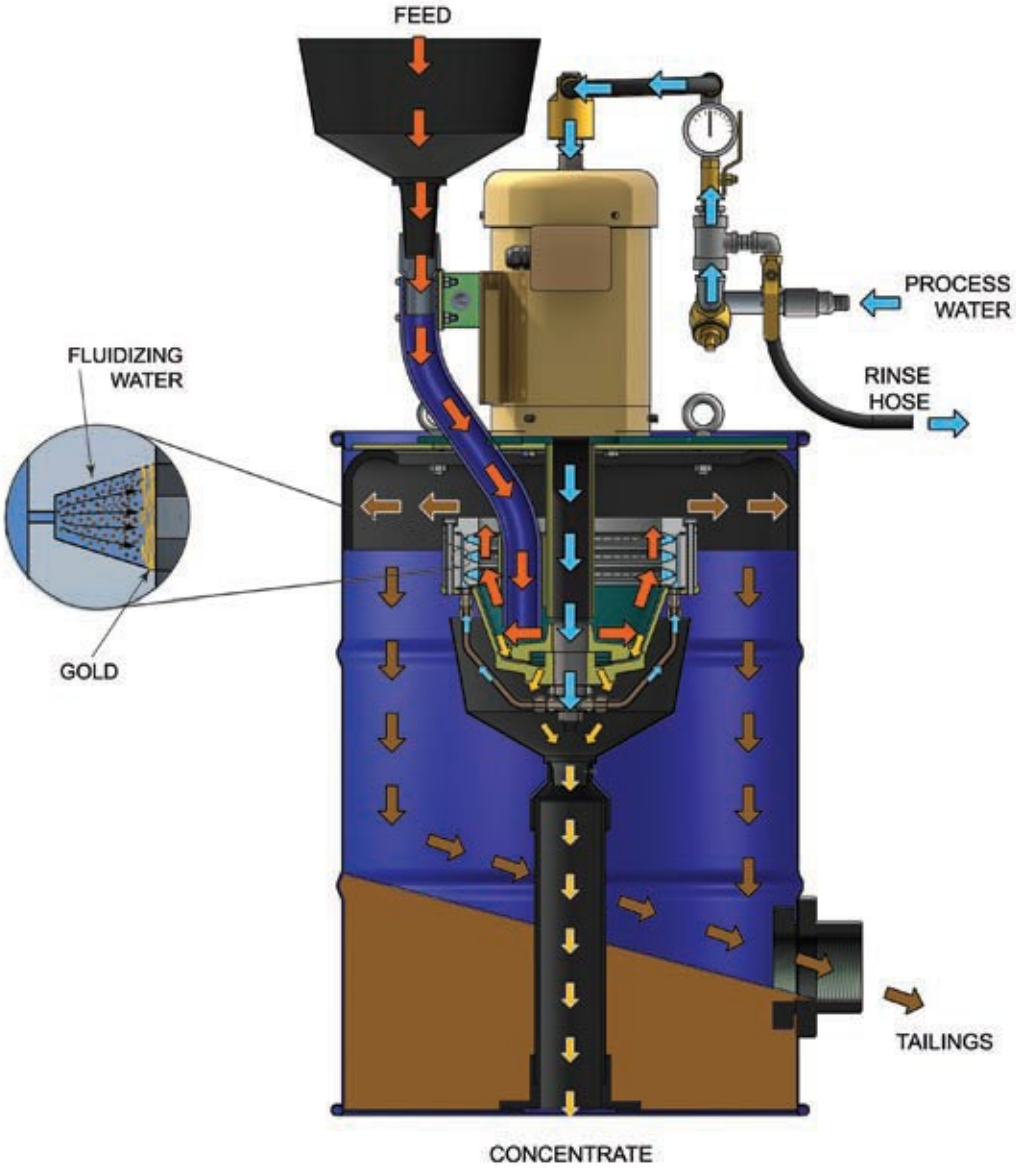

FEED
PROCESS WATER
RINSE HOSE
FLUIDIZING WATER
GOLD
TAILINGS
CONCENTRATE

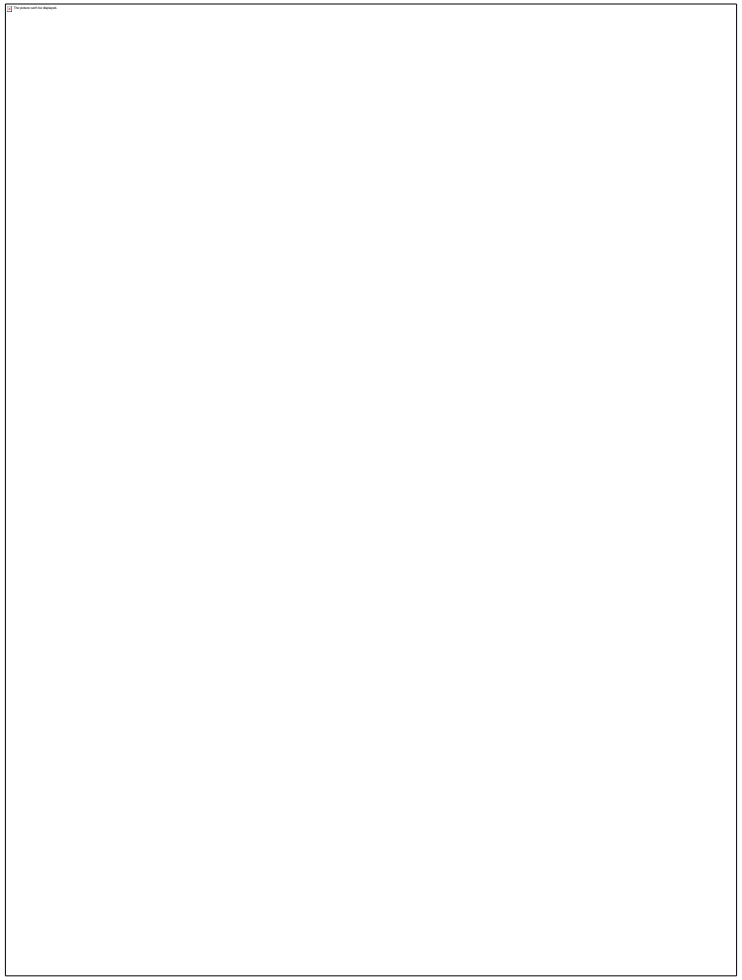
Existing Mercury Reduction/Elimination Technologies For Processing

- Moving away from mercury whole-ore amalgamation
- Reducing open burning
  - Retort use
  - Vapour capture (gold shops)
- Reactivation of mercury
- Avoiding combining mercury and cyanide
- Zero mercury processing by direct smelting

Reducing Open Burning
Retort Use

Reducing Open Burning
Retort Use

Reducing Mercury Consumption Reactivation of Mercury



Reducing Open Burning
Vapour Capture

Reducing Mercury Emissions & Releases Avoiding Mercury and Cyanide

Reducing Mercury Emissions & Releases
Avoiding Mercury and Cyanide

Zero Mercury Use
Direct Smelting

Discussion

- Questions
- Discussion
- Recording
- Reporting Back