**Terraflowing™ - An innovative and flexible process for tailings management**

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**Keywords:** tailings, dewatering, tailings storage facility, stacking, paste

**ABSTRACT**

The mining industry has moved to reduce water in metallurgical tailings, driven by two considerations: safety and the environment. These two factors are key to managing the societal perspective of mining and its social license.

Weir Minerals has developed a new dewatering process called “Terraflowing™” to address these challenges by:

1. Dewatering tailings and thus reducing their ability to flow in the case of a dam failure
2. Recovering more water from tailings which can be reused throughout the mine
3. Flexibly dewatering tailings into a suitable size fraction to construct tailings storage facility embankments or manufacture structural concrete products

The process incorporates a two-stage cyclone dewatering process followed by centrifugation of the final stage of cycloning overflow. In this process three dewatered tailings streams are produced; a primary cyclone underflow, a secondary cyclone underflow and a centrifuge pulp. These three streams can be combined or used in different configurations.

By varying the cyclone and centrifuge configurations and operation in this 3-stage system, the Terraflowing™ process can deal with feed variations in particle size distribution (PSD) and mineralogy while delivering variations in PSD, tailings solids concentrations and recoveries.

This flexibility further allows for optimisation of power utilisation, as the degree of dewatering can be varied in response to local conditions.

Two main Terraflowing™ process outcomes are:

- A maximum solids recovery at maximum solids concentration of the two cyclone and centrifuge streams – this offers up to 85% water recovery a with 78wt% solids concentration final tailings product, transportable by positive displacement pumps, conveyors or trucks.
- A recovery of a tailings stream for TSF embankment construction with the remaining cyclone and centrifuge streams being combined for deposition within the TSF, transportable through centrifugal pumps. The water recovery in this process is up to 75%.

This paper explores the Terraflowing tailings handling process.