

OPTIMISING TAILINGS THICKENER IN A COPPER-SULPHIDE PROCESSING PLANT

WITH THE HELP OF A SMARTDIVER®, OPERATORS

✓ **REDUCED FLOCCULANT DOSAGE BY 42%**

✓ **INCREASED UNDERFLOW SOLID DENSITY**

CHALLENGE

A Tailings Thickener in a Copper-Sulphide Processing Plant in Asia faced:

- Two bogging incidents led to production losses totalling 55.2 equivalent hours.
- Existing instrumentation controls and monitoring systems were inadequate in maintaining stable operations.



SOLUTION

The Site requested a trial of the SmartDiver®. The continuous real-time bed-level profiling detects rising mud levels, solids breakthroughs, and other early indicators of potential issues – well before they impact operations.

The SmartDiver® provided real-time density profiles of various suspended solid zones within the Thickener. By synchronising its dives with rake rotation and utilising an ultrasonic sensor, the SmartDiver® generated valuable data that was integrated into the plant's Distributed Control System (DCS) and Expert System.

- Spot early warnings before Clarity issues or Mud Carryover occur.
- Proactively adjust Flocculants to maintain optimal conditions.
- Reduce shutdowns, flare events, or product contamination.

TIMELINE

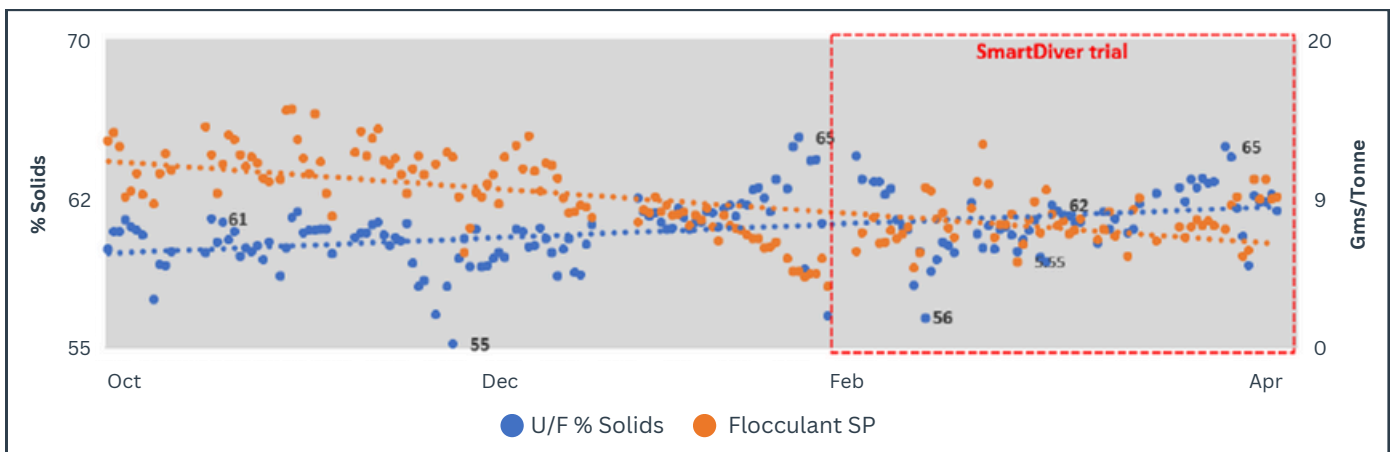
- Late 2022: SmartDiver® commissioning
- April 2023: Performance evaluation completed

RESULTS

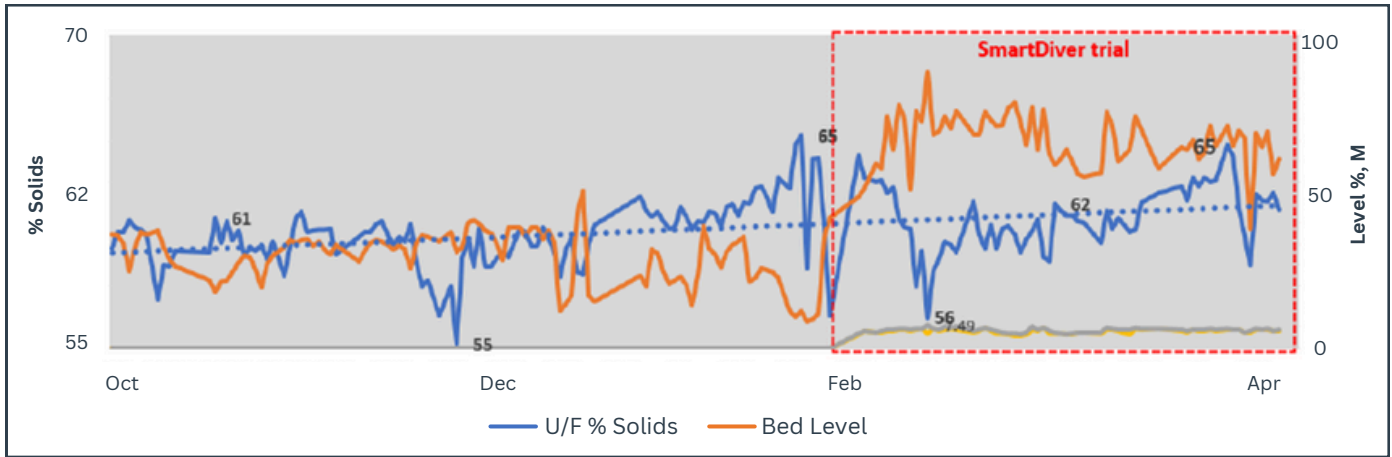
The SmartDiver® provided real-time density profiles of various suspended solid zones within the Thickener. By synchronising its dives with rake rotation and utilising an ultrasonic sensor, the SmartDiver® generated valuable data that was integrated into the plant's Distributed Control System (DCS) and Expert System.

The key data points collected were:

- 1. Flocculant Optimisation:** The integration of SmartDiver® data with the expert system control led to a gradual decrease and optimisation of flocculant dosing rates. The average Flocculant dosage was as high as about 12 gms/tonne before the trial and reduced to an average of about 7 gms/tonne or about 42% lesser Flocculant consumption.



Data Set 1: Underflow Density vs Flocculant Grams/Tonne



Data Set 2: Underflow Density vs Bed Level

2. **Underflow Density:** Since the trial, the underflow density consistently achieved a minimum sustainable average of 62% solids. This improvement was attributed to increased operator confidence in managing key operating parameters such as bed mass, torque, bed level, and underflow density.

3. **Bed Mass Management:** The bed mass (material inventory) in the Thickener was gradually increased from 50% to 67%, resulting in greater mass compression at the bottom layer of the Thickener.

4. **Torque Control:** With the SmartDiver® providing real-time visibility of bed mass increase, the operators managed to gradually increase the torque pressure from 30% to 35%, to maximise solids compaction and underflow density while working within the Thickener's designed operating parameters.

CONCLUSION

The SmartDiver® implementation on this Tailings Thickener based in Asia successfully met the trial's primary objectives. The SmartDiver® provided reliable data, particularly in detecting compacted mass in the Thickener, enabling operators to make timely corrective actions and optimise Tailings Thickener operations.

This resulted in significant improvements, including increased underflow density, better overflow water clarity, optimised flocculant consumption, and enhanced rake torque control. The readings from the SmartDiver® allowed for effective management of flocculant dosing rates and reduced operator intervention, improving overall operational efficiency.

In the client's final report, the plant management recommended purchasing the trial device, as well as provisions for expanding its implementation to additional Thickeners at the site.



SCAN HERE TO SCHEDULE AN INTRODUCTION MEETING TO DISCUSS HOW THE SMARTDIVER® CAN HELP TO OPTIMISE YOUR THICKENER OPERATIONS.