

## EXECUTIVE SUMMARY

In the pulp and paper industry significant concentrations of suspended solids are present in the effluent of these mills. Large volumes of these effluents are then disposed of into the environment where they can lead to widespread environmental damage. Suspended solids in the effluent of pulp and paper mills are comprised of both less dense particles (mainly fibres) and denser particles such as clay.

Modern dissolved air flotation (DAF) cells have been installed at a number of local mills. These achieve improved suspended solids removal, especially of the lighter organic fraction that do not easily settle. They are however, not effective at removing the denser inorganic solids. These solids tend to settle out in the flotation units and this leads to operational and maintenance problems.

The full scale application of conventional settling or clarification as a treatment process ahead of flotation is not economical. In addition, the sedimentation ahead of flotation can lead to anaerobic conditions in the settling tank.

In order to address these concerns, this project investigated, at pilot scale, the use of a compact inclined plate settler integrated ahead of a flotation cell. The advantage of this configuration is the high rate of sedimentation coupled to the shorter solids retention time within the unit.

The most significant conclusions of this study are that high percentages of removal for suspended solids can be obtained with the combined SEDIDAF process; the settling stage of the process contributes most to the overall removal of solids from the effluent; effective suspended solids removal can be obtained with settling in an inclined plate settler at surface loading rates as high as 10.9 m/h; improved suspended solids removal is obtained at lower flotation zone velocities in the DAF stage; the DAF stage does not only remove the organic fraction of the suspended solids but also inorganic particles; and, the settling stage does not only remove the inorganic fraction of the suspended solids, but also organic particles.