Tailings Management – Phosphate

Phosphate is a critical element in modern agriculture. Phosphate tailings are a by-product of the mining of sedimentary phosphate deposits. Phosphate tailings are generally dominated by clay mineralogy, are extremely fine grained, and have poor drainage characteristics. Nearly all of these tailings have challenging handling properties requiring significant water resources to enable cost effective transport.

The tailings are deposited in dedicate tailings storage facilities usually with a prime purpose of maximising water return to the process with a by-product of elevated final density and strength. Any in-situ management of the tailings is difficult due to the propensity of the materials to “stick” to metal surfaces as well as the uncertain strength available to support safe operations.

Phibion has devised an in-situ process, commonly called Accelerated Mechanical Consolidation (AMC) or more commonly ‘Mud Farming’, where dredged materials are rapidly dewatered using advanced technology, called the MudMaster®. These machines harness the properties of the phosphate tailings to maximise the dewatering benefits. This results in large reductions in phosphate tailings volume, increased water recovery and development of strong, stable foundations.

Phosphate tailings represent a dewatering challenge due to their high clay content, limited drainage and low density. Through innovative and modular design, the MudMaster® can be customised to the specific properties of these materials. This ensures that the maximum operational efficiency and dewatering is achieved under all conditions while delivering a safe, cost-effective and scalable solution.

**Timelapse sequence of AMC managed phosphate tailings**

When applied to phosphate tailings these operations deliver:

- Rapid consolidation to very high density within 5 weeks;
- Final densities > 80% solids with strengths at depth of up to 34 kPa; and
- An increase in water recovery in excess of 16%.

Phibion can provide AMC services to your organisation. We will provide the customised MudMaster®, employ and train local operators, manage maintenance and sparing and monitor performance. Additionally, we will provide all the trial works, strategic planning and reporting so that you can realise maximum value.

Phibion enables you to maximise your performance with no capital expenditure and none of the operational/financial risks of conventional management. Phibion can deliver this performance at a fraction of the cost of other alternatives and allow your operation to realise its potential today, without compromising the future.

**Munro, L.D. and Smirk, D.D. ‘How thick is thick enough?’ Paste 2018, Perth, Australia**