
PHIBION

- Phibion is an innovative company that provides Tailings Management Solutions as a Service in the form of Accelerated Mechanical Consolidation.
- **Accelerated Mechanical Consolidation (AMC)**: The mechanical disturbance of an emplaced material to accelerate the consolidation process. This is achieved by deploying the use of Phibion's patented MudMaster®
- MudMaster® operations increase the density of deposited tailings and either reduce the size of the facility required or increase its operational life. A single mining operation can generate many millions of tonnes of tailings every year and are usually many hundreds of hectares in size. One MudMaster® can manage up to 35 Ha so they are usually deployed in operational fleets that work together in sequenced operations to achieve the desired result.
- When applied correctly, AMC matches the performance of conventional and capital-intensive processes like tailings filtration, centrifuge and flocculation systems but at a fraction of the cost.

Phibion manufactures it's own patented MudMaster®, an amphibious screw tractor that is designed to manipulate tailings with deliberate outcomes.

Over the years the MudMaster® has undergone subtle design changes. Today, Phibion can analyse data that is produced and collected by the MudMaster® at a frequency of 1 data sample per second. The analysis of this data gives Phibion the ability to make firm predictions on outcomes of the AMC process.

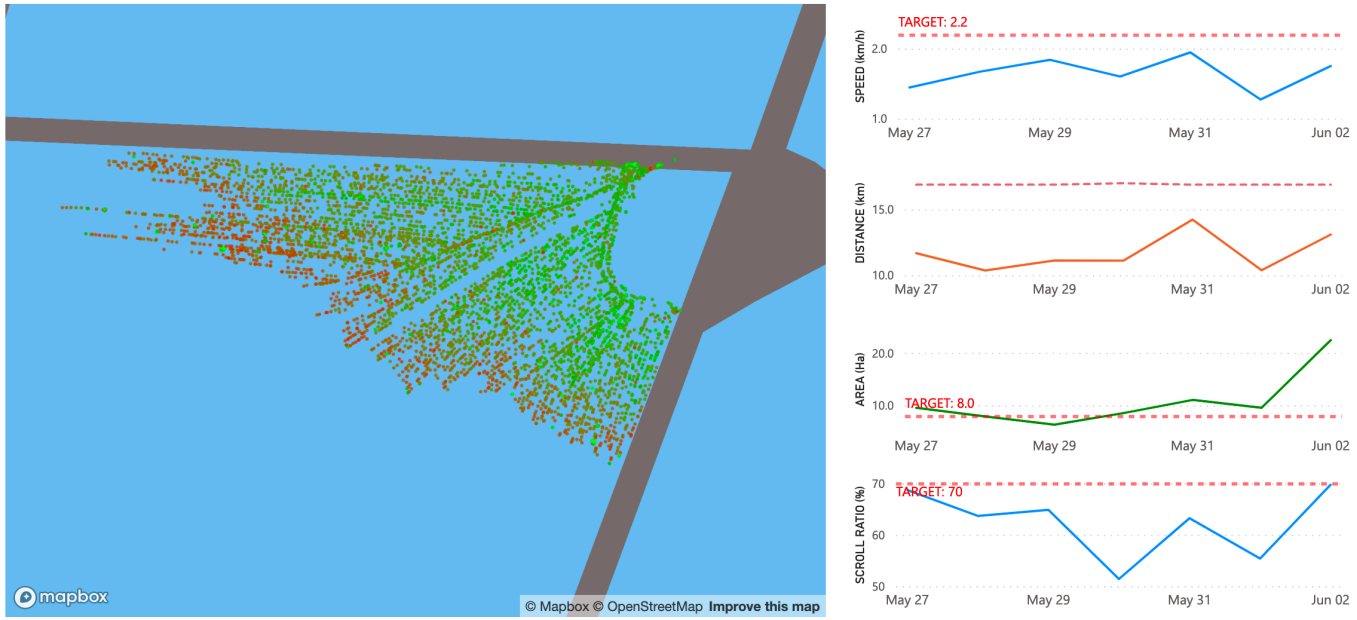

Figure 1.
Operational data with associated heatmaps relating to machine torque

Continuous Improvement has always been embedded in Phibions' strategy. One of the areas identified in this process is the need to understand how much entrained water exists in the tailings in any given location and at any given point in time.

This has. dual benefit:

1. Provide the client with real-time data for process monitoring
2. Provide Phibion with the ability to analyse the material in real-time, providing detailed predictability

Phibion and the University of Queensland have partnered in a research program with a very clear objective.

OBJECTIVE

Devise a method to analyse and quantify the entrained water in a tailings deposit.

This is an Innovation Connection project between Phibion and the University of Queensland.

This project aims to develop a method of quantifying in real time the density of soil waste and soft soil based on electromagnetic measurement results to improve TSF management and safety;

This portion of the research will be staged into three components:

- Stage 1: Laboratory – controlled environment
- Stage 2: Workshop – controlled environment using material provided by the Port of Brisbane
- Stage 3: Field Testing – MudMaster® deployed in one of Port of Brisbane's ponds

OBJECTIVE

Stage 1: A specifically designed RF (radio frequency) equipment (include the contactless dielectric probe) in the theoretical level will be developed and deployed in the EM simulation and laboratory environment;

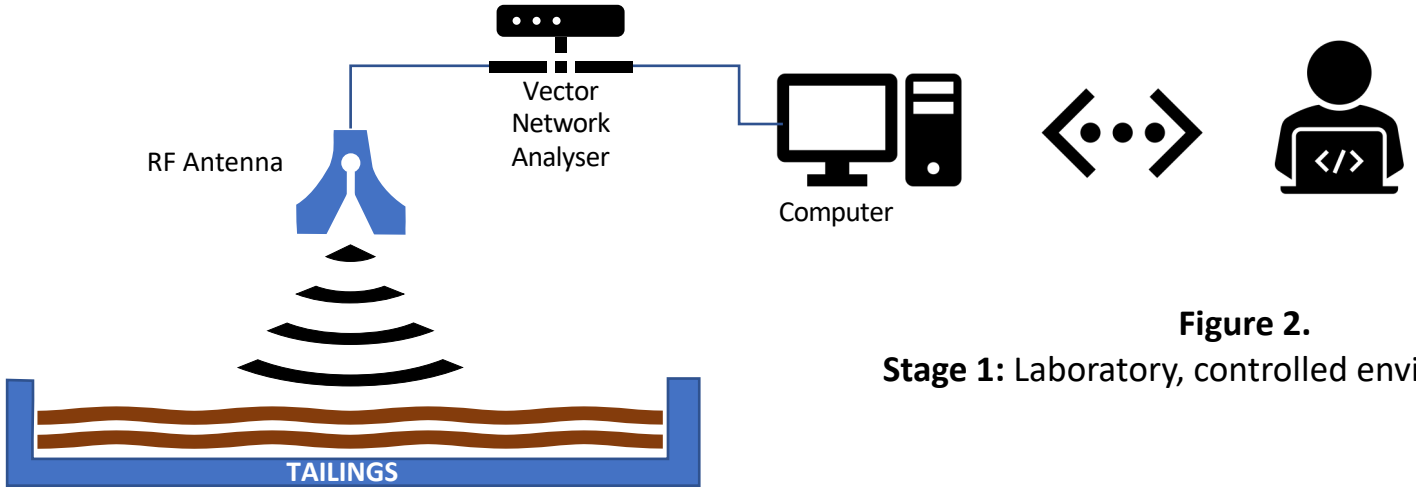

Figure 2.
Stage 1: Laboratory, controlled environment

OBJECTIVE

Stage 2: A proof-of-concept prototype as a minimum viable product (MVP) will be built and tested in the Phibion workshop, fitted to a MudMaster® and tested in a small container of material (provided by the Port of Brisbane). This will provide the necessary observations to account for the MudMaster infrastructure as part of the resident data which is ultimately calibrated within the VNA;

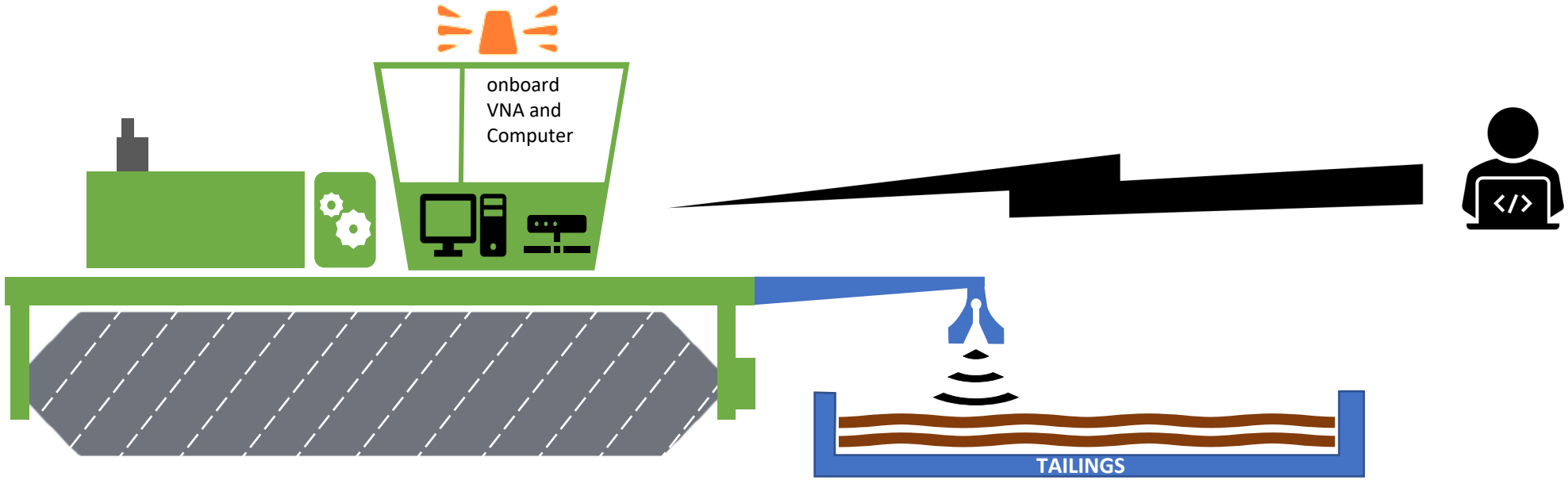

Figure 3.
Stage 2: Workshop, controlled environment

OBJECTIVE

- Stage 3: The prototype will be installed and tested in the field for data collection. This, in turn, will be formatted into the form representing the dielectric properties of the soil wastes.

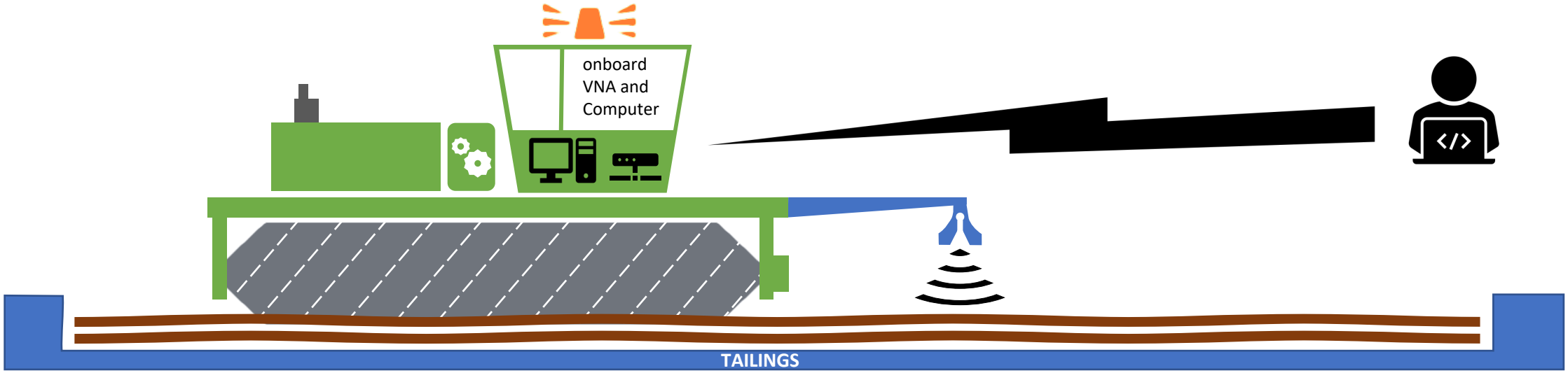

Figure 4.
Stage 3: Port of Brisbane, field testing

- We require approx. 600 kg of wet dredged materials for use in our Phase 2 testing?
- Upon success of the tests conducted in phase 2, **Phibion and the UQ team would like the opportunity to conduct field testing using the ponds at the Port of Brisbane.**
- These tests require the deployment of a MudMaster® in a vacant pond for 1 week duration;
- All personnel involved in the tests will have passed the necessary inductions for conducting any work at the Port of Brisbane;
- All safety precautions and rules will be strictly adhered to whilst conducting work at the Port of Brisbane;
- No cost to Port of Brisbane, Phibion is responsible for all operations, re-fuelling and deployment costs