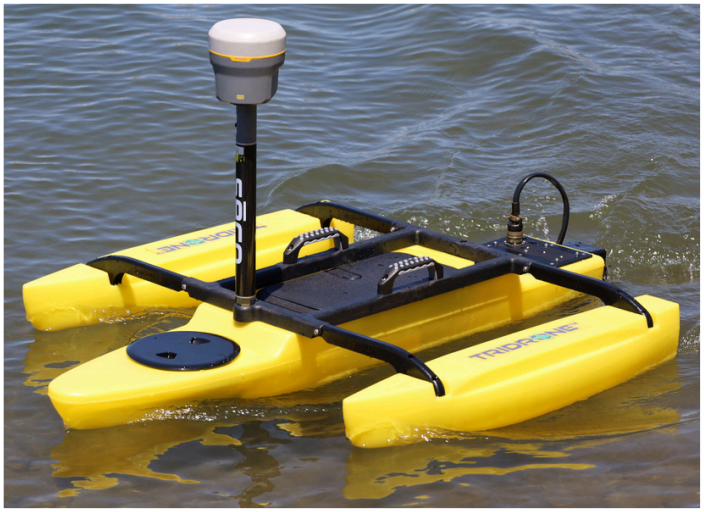
Seafloor™ | Case Study

Rapid Bathymetric Surveying of Tailings Storage Facilities Using Seafloor Systems TriDrone and Trimble GNSS Technology.

High-accuracy, rapid-deployment workflow for safer tailings dam surveys



Modernizing Tailing Dam Survey Safety with Autonomous USVs

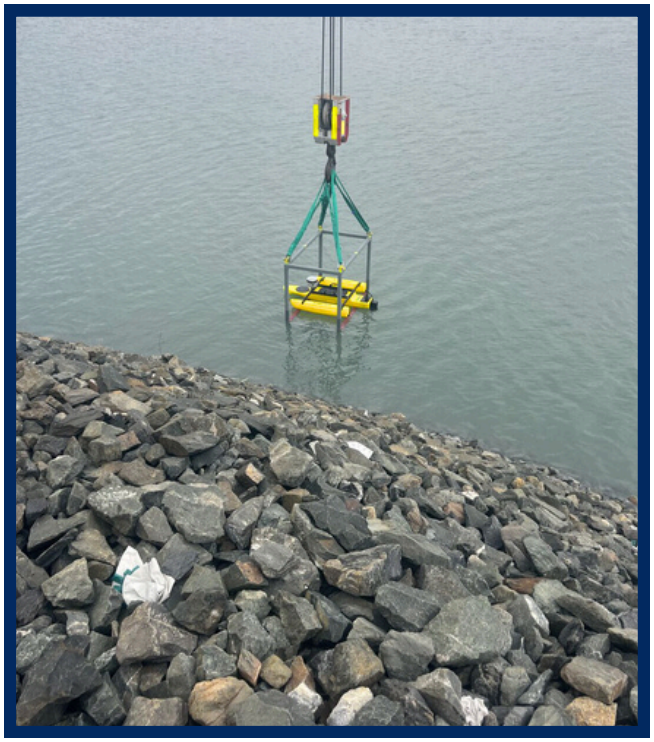
Tailings dams require regular bathymetric surveys for safety and operational efficiency. Traditional methods expose personnel to hazards and take longer. Using the Seafloor Systems TriDrone with Trimble GNSS technology offers a safer, faster, and more accurate solution.

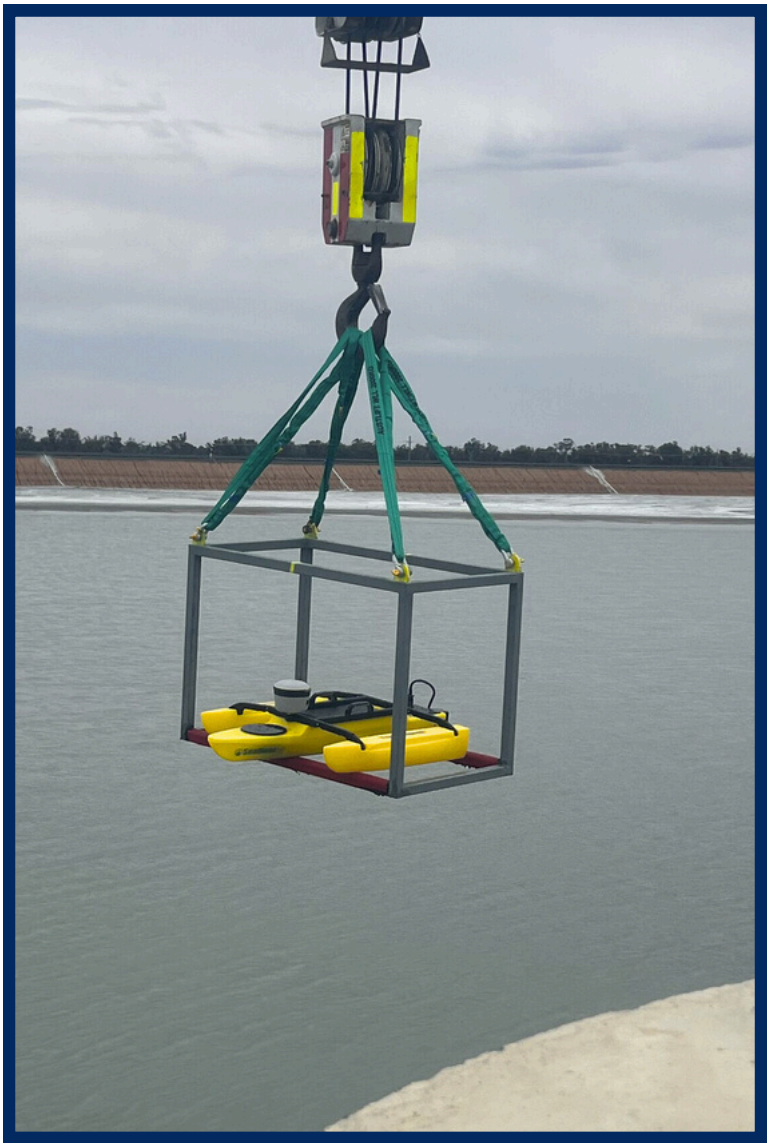
Objective: Accurate, Safe Bathymetric Data Collection

The goal of the survey was to safely and efficiently capture high-resolution depth and positional data across a tailings storage facility to support ongoing tailings management and monitoring programs.

System Configuration

- Platform: Seafloor Systems Tridrone USV
- GNSS Receiver: Trimble R580
- Controller / Software: Trimble TDC6 running Trimble Access
- Connectivity: Shorelink real-time data link
- Operating Environment: Tailings dam, mining site, Central West NSW





Methodology

The Tridrone was deployed from shore and remotely operated across the dam surface. The vessel's compact, stable design enabled safe navigation over soft or hazardous areas where manned access is restricted.

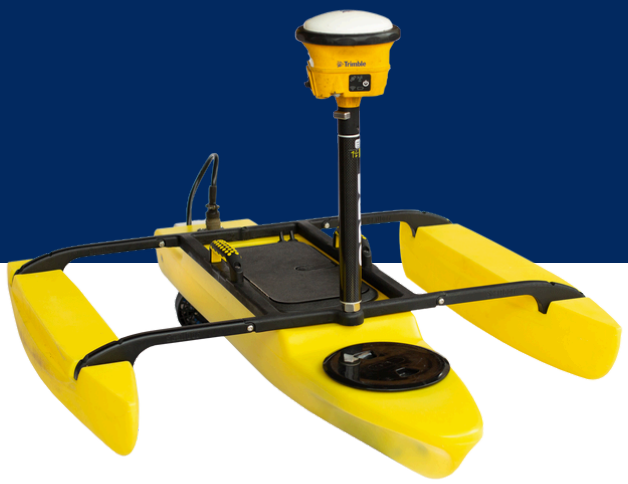
The Trimble R580 provided centimetre-level RTK positioning, seamlessly integrated through Trimble Access on the TDC6 controller. This configuration allowed for real-time depth and position data validation via a shorelink connection, ensuring high-quality results throughout the survey.

Results

- ✓ Rapid Deployment: The system was launched and collecting data within minutes.
- ✓ High-Accuracy Data: Centimetre-level GNSS positioning paired with high-resolution bathymetry delivered precise surface models of the dam.
- ✓ Complete Coverage: Remote operation and reliable connectivity enabled full-area data capture, including regions inaccessible by traditional survey methods.
- ✓ Improved Safety: All survey tasks were performed from shore, reducing exposure to hazardous tailings materials and unstable ground.

Why it Matters

This project highlights how automous USVs paired with precision GNSS are transforming mining-sector workflows. The approach reduces risk, accelerates data acquisition, and delivers the accuracy required for effective tailings management and environmental oversight.



Conclusion

The combination of the Seafloor Systems Tridrone USV and Trimble R580 GNSS receiver proved to be an efficient, accurate, and safe solution for tailings dam bathymetric surveys. This workflow demonstrates how modern robotic survey platforms paired with high-precision GNSS technology can streamline operations, enhance data confidence, and improve safety in mining environments.