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### Introduction

The Global Industry Standard on Tailings Management – GISTM – is the new international Standard organised by the Global Tailings Review, which sets a precedent towards the goal of zero harm to people and the environment with zero tolerance for human fatality.



Jonathan Knott HMTC to LATAC and Consul General for São Paulo

It was launched in August 2020 and co-convened by the International Council on Mining and Metals (ICMM), United Nations Environment Programme (UNEP) and Principles for Responsible Investment (PRI), which includes the Church of England Pension Board and the Swedish Council of Ethics.

The set of guidelines reinforces current practices in the mining sector by integrating local social, environmental, technical and economic factors, and covers the entire life cycle of tailings dam structures - from site selection, design and construction, through management and monitoring, to closure and post-closure.

Aimed at preventing any harm to people and the environment, the new GISTM sets out significantly more stringent criteria for the industry to achieve sound social, environmental and technical outcomes.

The UK Government in Brazil has been collaborating with Brazil's UNEP office to promote the GISTM to the wider Brazilian audience. This initiative hosted a series of six roundtables throughout 2021 and 2022 to discuss the safety of Brazilian dams from the perspective of the GISTM,

bringing together important stakeholders in the minerals sector, government, academia and civil society to address this decisive theme for the future of mining and the environment.

In order to support mining operations in Latin American in complying with the new Standard, the UK Government have developed this Tailings Management Brochure, which

brings together the best British technologies, equipment and services to contribute to the improvement of the industry, and to become more responsible, transparent, cleaner and safer.

This document is organised by services and solutions according to each GISTM topic, principles and auditable requirements. Committed to supporting the implementation of GISTM principles across Latin American mining companies, and the construction of a safer, cleaner and more responsible sector, the UK Government has the pleasure of presenting this Tailings Management Brochure, showcasing potential UK solutions for mining operators in Latin American to comply with the best practises presented by the GISTM.



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### British Government in Latin America Mining sector

The UK Government, through the Department for International Trade, supports UK companies in achieving success in the global economy.

Our teams in Latin America work to connect investors, companies, universities and researchers with British expertise and products, promoting business opportunities and technical and institutional cooperation.

This brochure is a reference to key services offered by UK companies, with potential for assisting mining operators in applying the Global Industry Standard on Tailings Management (GISTM), and contributing

to a more responsible, cleaner and safer mining sector.

To find out more, please contact our team:

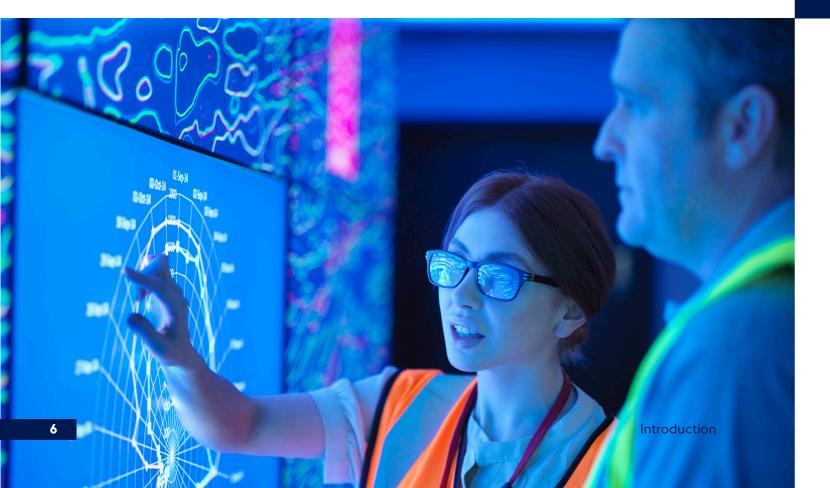
- <u>Jolanta.Polk@fco.gov.uk</u> Chile
- <u>Nathalia.gomide@fcdo.gov.uk</u> Brazil
- Alfredo.Fierro@fco.gov.uk Argentina
- <u>Giorgio.Baglietto@fco.gov.uk</u> Peru
- <u>Martín.Teran@fco.gov.uk</u> Bolivia



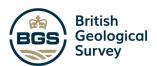
### Department for International Trade Mining Team

The DIT Mining Team LATAC is dedicated to assisting UK companies doing business in the mining sector in Latin America, providing advice on how to do business, explaining the different routes to market and facilitating introductions to key experts in the area.

The DIT Mining Team LATAC can match your company to key contacts in Latin American industry and assist in organising events with existing or potential customers and partners in the region.



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# **Companies' Profiles**



# **British Geological Survey**

#### Contact

#### Flavia Villarroel

**Business Development Manager** 



rfvill@bgs.ac.uk

East Midlands, United Kingdom



www.bgs.ac.uk

#### **■** Introduction

The British Geological Survey is a partly publicly-funded body which aims to advance geoscientific knowledge of the United Kingdom landmass and its continental shelf by means of systematic surveying, monitoring and research.

Monitoring / integrated monitoring systems. For new deployments we also offer support to develop bespoke solutions. The two products/services underpinning our solutions are: PRIME and GeoVisionary

PRIME employs a geophysical imaging approach that can be used in long-term monitoring of deterioration processes associated with slope failure.

GeoVisionary is a world-leading geoscientific information system for visualisation and interpretation of geoscience datasets in a virtual reality environment. Geoscientists use a wide variety of software to answer specific questions. Each is usually modelled and visualised in its own package.

#### **†** Target market

Brazil, Chile and Ecuador

#### **≡** Area of focus

#### Topic II: Integrated knowledge base

 Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.

### Topic III: Design, construction, operation and monitoring of the tailings facility

 Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

#### Topic V: Emergency response and longterm recovery

• Prepare for emergency response to tailings facility failures.

British Geological Survey





# **CC Hydrodynamics Ltd**

#### Contact

#### **Mark Cramman**

Director

 $\times$ 

mark@cc-hydro.com

London, United Kingdom

www.cc-hydro.com

view promotional video here

#### **■** Introduction

Numerical modelling house specialising in gis, data processing and the hydraulic modelling of rivers, coastal environments, rapid rainfall-runoff and non-newtonian fluid (tailings), including contaminant transport and mixing.

CCH offers detailed hydrodynamic modelling of tailings dam failures using software and hardware capable of running numerous, large-scale 2d models with varying non-newtonian parameters. CCH has the capability to model a range of events and the effects of tailings mixing with downstream watercourses to allow us to accurately assess risk.

#### **†** Target market

Risk modelling of tailings dam failures including the modelling of non-newtonian fluid flows, mixing and contamination.

Hydraulic modelling of river, coastal and rainfall flooding.

#### **≡** Area of focus

#### **Topic I: Affected communities**

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

· Develop and maintain an interdisciplinary

knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.

 Use all elements of the knowledge base social, environmental, local economic and technical - to inform decisions throughout the tailings facility lifecycle, including closure.

### Topic III: Design, construction, operation and monitoring of the tailings facility

- Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post closure.
- Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.
- Plan, build and operate the tailings facility to manage risk at all phases respect the rights of project-affected.

#### Topic V: Emergency response and longterm recovery

• Prepare for emergency response to tailings facility failures.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

### **CGG**

#### Contact

#### Adam Thomas

Research Principal, Minerals and Mining, UK

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South East, United Kingdom

www.cgg.com

#### **■** Introduction

CGG is a global geoscience technology leader employing around 3,700 people worldwide. The company provides a comprehensive range of data, products and services that enable its clients to responsibly solve the world's most complex natural resource, environmental and infrastructure challenges.

CGG Minerals & Mining provides unique, innovative and responsible products and services to reduce risk and increase knowledge with life-of-mine geoscience solutions. These are primarily based around monitoring programmes that utilise Earth observation, airborne and ground-based geophysics, and environmental analysis. High-end computing capacity and data science expertise take CGG solutions one step further, through the digital transformation and deep analysis of asset and legacy data.

Website: https://www.cgg.com/ industry-applications/energy-transition/ minerals-mining-services

#### **Target market**

Mining companies and operators of tailings storage facilities. Financial services, particularly insurance.

Government and civil society organisations.

#### **≡** Area of focus

#### Topic II: Integrated knowledge base

- Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.
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### Topic III: Design, construction, operation and monitoring of the tailings facility

Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

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### **Concrete Canvas**

#### Contact

Wales,
United Kingdom

www.concretecanvas.com

#### **■** Introduction

Founded in 2009, and awarded as the fastest growing Exporting Company to +80 Countries. Produces a cementitious mat with a 3D fibre matrix and a special mix that, upon hydration, hardens in less than 24 hrs and is ready for use. Requires 1/5 of normal labour, -65% Carbon Footprint.

Channel lining for tailings, specially prepared cementitious mat for tough soil base conditions, limited use of heavy equipment, and easy layup to help tailing drainage control, rainwater directed to channel vs, tailings spill. Product sale and install offered. Fast, easy to install, very clean operations site and can operate in the rain.

#### **Target market**

Mining slopes, canal, erosion control etc. Rail - channel and slope lining. Agro canal lining, irrigation.

#### **≡** Area of focus

#### **Topic I: Affected communities**

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#### Topic II: Integrated knowledge base

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#### Topic V: Emergency response and longterm recovery

• Prepare for long-term recovery in the event of catastrophic failure.

### Coomtech

#### Contact

### Christopher Every Chief Commercial Officer & Founder

- North West, United Kingdom
- www.coomtech.com

#### **■** Introduction

Coomtech is a privately-owned engineering technology developer focusing on the drying of bulk solids materials. Coomtech has brought to market a surface moisture removal technology – Coomtech SMR – and has further developments under way to address trapped and inherent moisture in products. The objective is to assist in selling directly to territories, initially to support and select licensee partners in building a business thereafter.

Coomtech SMR is a bulk solids drying technology designed to remove surface moisture using managed, turbulent air to shear moisture from particles. Particle size target is 5mm and below. Air does all the work, no moving parts in the drying system. System air is at 85C to optimise moisture retention and separation throughout the process plant. Particles pass through in 0.75 of a second. Energy requirements are up to 75% lower and emissions are also up to 75% below thermal drying. Modular systems can be containerised, demountable, integrated or stand-alone, are robust with few moving parts.

#### **Target market**

Chile, Peru and Argentina.

#### **≡** Area of focus

#### Topic I: Affected communities

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

- Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.
- Use all elements of the knowledge base social, environmental, local economic and technical - to inform decisions throughout the tailings facility lifecycle, including closure.

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- Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post closure.
- Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.
- Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

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- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
- Appoint and empower an engineer of record.
- Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure.
- Develop an organisational culture that promotes learning, communication and early problem recognition.
- Establish a process for reporting and addressing concerns and implement whistleblower protections.

#### Topic V: Emergency response and longterm recovery

- Prepare for emergency response to tailings facility failures.
- Prepare for long-term recovery in the event of catastrophic failure.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

### **EHS Data Ltd**

#### Contact

#### Henrik Frijs

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- **Q** East Midlands, United Kingdom
- www.ehsdata.com

#### **■** Introduction

IT company supplying the international mining industry with world-leading Environmental data management software – MonitorPro, used to manage all environmental data and compliance.

MonitorPro manages ALL types of environmental data and compliance. Thus mining companies can add their tailings dam data, connect that to their groundwater and other environmental data. Environmental permits and other limit requirements can be added to the software, so MonitorPro will warn if any data is in breach or close to breaching the limit set.

MonitorPro is an advanced warning system that checks not only tailings dam management data but also surrounding environmental data to track any traces of issues. By also looking at ground- and freshwater quality, the company can identify potential problems much more quickly.

#### **Target market**

Chile, Brazil and Argentina.

#### **≡** Area of focus

#### Topic I: Affected communities

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

 Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.

### Topic III: Design, construction, operation and monitoring of the tailings facility

 Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

#### Topic IV: Management and governance

 Establish a process for reporting and addressing concerns and implement whistleblower protections.

Coomtech EHS Data Ltd





# **Exocyte Limited**

#### Contact

#### **Graeme Frith**

Chief Executive Officer

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South East England, United Kingdom

#### **■** Introduction

Exocyte is a technology developer and consultancy-based business. We specialise in real-time multiplexed diagnostics for applications in the natural resource, environmental and investor-support sectors.

We develop real-time multiplexed diagnostic platforms for applications in mine tailings monitoring and reporting to support mine owners, investors and regulatory authorities.

#### **Target market**

Real-time multiplexed detection and monitoring, metal iron recovery from mine tailing sites and digital certificate-based tailings investments.

#### **≡** Area of focus

#### **Topic I: Affected communities**

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

 Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.

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- Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

#### Topic IV: Management and governance

- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
- Develop an organisational culture that promotes learning, communication and early problem recognition.

#### Topic V: Emergency response and longterm recovery

- Prepare for emergency response to tailings facility failures.
- Prepare for long-term recovery in the event of catastrophic failure.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

## **Global Trust Ltd**

#### Contact

≥ info@globaltrustgrp.com

South East, United Kingdom

www.globaltrustgrp.com

#### **■** Introduction

GlobalTrust is a British innovative geospatial analytics company that utilises the power of satellite data and advanced analytics to enable organisations to develop and deliver sustainability strategies. GlobalTrust provides independent and trusted information on ESG metrics across numerous industries. By providing organisations and their associated supply chains with ESG intelligence, we encourage them to make socio-environmentally based decisions.

GlobalTrust's products and services can support TSF management by tackling some of its main operational, environmental and social challenges. The MineTrust service actively monitors the stability of TSFs, using satellite measurements to produce regular millimetric movement results. As each TSF is different, they need a bespoke technical approach to achieve relevant and reliable information. MineTrust's multi-algorithmic method accounts for this variability, producing valuable information across each facility. GlobalTrust's holistic approach also includes tools to monitor leaching and seepage, identifying the presence of local communities or monitoring local land changes.

#### **Target market**

Brazil, Colombia and Chile.

#### **≡** Area of focus

#### Topic II: Integrated knowledge base

 Use all elements of the knowledge base social, environmental, local economic and technical - to inform decisions throughout the tailings facility lifecycle, including closure.

### Topic III: Design, construction, operation and monitoring of the tailings facility

- Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.
- Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

#### Topic IV: Management and governance

 Develop an organisational culture that promotes learning, communication and early problem recognition.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

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# Goodwin International/Pumps



#### Contact

### **George Kew**Director

- West Midlands, United Kingdom
- www.goodwininternational.co.uk

#### **■** Introduction

We supply a wide range of high quality products for use by numerous industry sectors. Our supply ranges from concept design and procurement through to fully compliant, tested and certified products and projects. By working closely with, and involving our clients throughout the project lifecycle, we are in the enviable position of calling some of the most prestigious, world-renowned engineering companies in the world not only customers, but long-term partners.

Outstanding durability, strength and reliability is what makes Goodwin submersible pumps different from the rest.

Created for the most extreme environments, Goodwin pumps are world leaders in submersible slurry pumping technology.

#### **†** Target market

Heavy solids pumping systems. Tailings dam mineral recovery for reprocessing. Large volume of solids transfer per day. Dewatering tailings dams for enhanced safety. Submersible pumps for mining slurry with up to 65% solids.

#### **≡** Area of focus

#### **Topic I: Affected communities**

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

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- Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post closure.
- Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure.

# **HR Wallingford**

#### Contact

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- South East London, United Kingdom
- www.hrwallingford.com

#### **■** Introduction

HR Wallingford is an independent civil engineering and environmental hydraulics organisation. We deliver practical solutions to the complex water-related challenges faced by our international clients. Our unique mix of know-how, assets and facilities includes state of the art physical modelling laboratories, a full range of numerical modelling tools and, above all, enthusiastic people with world-renowned skills and expertise.

DAMSAT (Dam Monitoring from SATellites) provides continuous, remote monitoring of dams and automatic alerts of anything untoward. The system uses EO and Global Navigation Satellite System technologies to offer a practical solution that can be seamlessly integrated with existing on site systems.

We provide information to help users to develop emergency plans and improve understanding of risks downstream if a dam failure occurs. We simulate the breaching of the structure, the spread of material downstream, and how it impacts people living in the area.

#### **Target market**

Mining companies and public institutions responsible for dam monitoring. Institutions responsible for disaster management (including dam failure and flood risks). Companies and institutions involved in marine infrastructure.

#### **≡** Area of Focus

Topic III: Design, construction, operation and monitoring of the tailings facility

 Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

#### Topic V: Emergency response and longterm recovery

• Prepare for emergency response to tailings facility failures.





### Intasite Ltd

#### Contact

≥ enquiries@intasite.com

North East,
United Kingdom

www.intasite.com

#### **■** Introduction

Intasite provides cloud-based software to improve the health & safety of secure and hazardous sites. Our software allows sites to induct visitors and contractors remotely, prior to arrival, to ensure they understand how to work safely.

We also have the capability to create induction and training videos and animation.

Company product description

Our online software includes the following site health & safety features:

- Online inductions with questions to test competency
- A Contractor management module allowing contractors to upload certificates and qualifications prior to arrival
- · Toolbox talks and safety briefings online
- Instant safety alerts
- Management of sub-contractors and their documentation
- Visitor sign-in / -out of site

We can also create professional induction and training videos. We use a combination of film, drone and animation to create tailored videos, which can then be delivered to visitors on our online platform.

#### **†** Target market

High hazard and secure sites, such as mining, oil & gas, petrochemical. High traffic sites such as ports & shipping, logistics.

#### **≡** Area of focus

#### Topic IV: Management and governance

- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
- Develop an organisational culture that promotes learning, communication and early

### **Micon International Ltd**

#### Contact

#### Karen Nash

Senior Environmental and Social Specialists

knash@micon-international.co.uk

- **Q** East of England, United Kingdom
- www.micon-international.com

#### **■** Introduction

Micon is an independent employee-owned firm of senior geological, mining, metallurgical and environmental consultants headquartered in Toronto, ON, Canada, with fully integrated offices in Vancouver, BC, Canada and Norwich, UK, as well as retaining full-time consultants based in Russia and France, providing consulting services to the global mining industry since 1988.

The firm's clients include major and junior mining companies, major banks and investment houses and a large number of financial institutions and export credit agencies. Micon's technical, due diligence and valuation reports are accepted by regulatory agencies such as the US Securities and Exchange Commission, Ontario Securities Commission, Australian Stock Exchange and the London Stock Exchange. Our VP was a member of the Expert Panel to develop the Global Industry Standard on Tailings Management and has shared a deep understanding of the requirements and their implications for industry and stakeholders alike for the integrated management of existing and new tailings facilities.

#### **Target market**

Brazil, Honduras and Dominican Republic.

#### **≡** Area of Focus

#### Topic I: Affected communities

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

- Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.
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Intasite Ltd Micon International Ltd 21



- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
- Develop an organisational culture that promotes learning, communication and early problem recognition.
- Establish a process for reporting and addressing concerns and implement whistleblower protections.

#### Topic V: Emergency response and longterm recovery

- Prepare for emergency response to tailings facility failures.
- Prepare for long-term recovery in the event of catastrophic failure.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

### **Oretech Ltd**

#### Contact

info@oretech.co.uk

**Q** Greater London, United Kingdom

www.oretech.co.uk

#### **■** Introduction

Oretech sustainable water technology innovation reduces water, energy and operating costs, increases productivity and helps to preserve the environment.

The water technology improves soil capillarity and enables water and sulphuric acid to penetrate the soil more efficiently and reach the copper deposits faster. The treated water increases the leaching of copper oxide minerals resulting in higher copper production per tonne of ore.

Company product description

Oretech sustainable water technology innovation reduces water, energy and operating costs, increases productivity and helps to preserve the environment.

The water technology improves soil capillarity and enables water and sulphuric acid to penetrate the soil more efficiently and reach the copper deposits faster. The treated water increases the leaching of copper oxide minerals resulting in higher copper production per tonne of ore.

#### **Target market**

Chile, Mexico and Peru.

#### **≡** Area of focus

#### **Topic I: Affected communities**

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Micon International Ltd Oretech Ltd Oretech Ltd



### Silixa Ltd

#### Contact

Saman Alkhaffaf Business Development Manager, Mining



saman.alkhaffaf@silixa.com

**Q** Greater London, United Kingdom

www.silixa.com/sectors/mining/ dampulse-tailings-dam-monitoring/

#### **■** Introduction

Silixa is a global leader of data-driven solutions for challenging applications via distributed acoustic, temperature, and strain fibre optic sensing (DAS, DTS and DSS). Offers best performance in the industry with actionable insight & reliable services to make early decisions, optimise production and maximise value, endorsed across the entire mine lifecycle.

Silixa's DamPulse™ Tailing Storage Facility (TSF) monitoring solution is based on distributed fibre-optic sensing technologies (iDAS, DTS and DSS). These technologies offer sub-surface insight into seepage, deformation, subsidence, and seismic event detection with time and location(s) alerts.

The GISTM outlines the principles to avoid future disasters and achieve zero harm to people and the environment. We at Silixa share these principles and believe DamPulse™ to be a fully automated integrity monitoring solution, with advanced measurement capabilities, which will play a key role in helping mining operators address issues of dam stability, public safety, and environmental protection.

#### **Target market**

Large Mining Operations. Partnership with local industrial instrumentation.
Partnership with Academic & Research institutes and Engineering Consultancies.

#### **≡** Area of Focus

#### **Topic I: Affected communities**

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- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
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- system for all phases of the tailings facility lifecycle, including closure.
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Silixa Ltd Silixa Ltd 29





# **Surewave Technology Ltd**

#### Contact

#### Philip Shaw

MD and Scientist

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- North West,
  United Kingdom
- www.surewavetechnology.co.uk

#### **■** Introduction

Advanced micro seismic mine monitoring solutions to enable real-time information on the movement of liquid and dam stability. General mine monitoring and trapped miner solutions.

Tailings dam monitoring system to provide live data on liquid ingress into tailings and strata stress build-up. In one mine, over 18 weeks' notice was given of an impending roof collapse. This is mature technology ready for deployment.

#### **Target market**

Real-time multiplexed detection and Brazil and Chile.

#### **≡** Area of focus

Topic III: Design, construction, operation and monitoring of the tailings facility

 Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

### **Tantallon Ltd**

#### Contact

#### **Steve Street**

**Chief Executive Office** 

★ steve.street@tantallon.com

www.tantallon.com

#### **■** Introduction

Tantallon is a Cyber Security & Risk Management consultancy that has adapted its risk management platform to allow customers to perform a wide range of Mining risk assessments, from identifying training gaps through to a full implementation of the recent ICMM GISTM standards.

Our highly innovative risk management platform is already used within Fortune-1000 companies on a global basis to digitise existing and new tasks/ assessments & audits, with significant benefits ranging from cost reduction through safety management to regulatory compliance, with significant ROI.

Our platform can digitise any existing tailings process manual with immediate benefits, and we have also recreated the ICMM Conformance Protocols requirements on top of our platform, which will allow any Regulator or Operator to fully assess

#### **Target market**

Peru, Chile and Brazil.

#### **≡** Area of Focus

#### Topic I: Affected communities

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

- Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.
- Use all elements of the knowledge base social, environmental, local economic and technical to inform decisions throughout the tailings facility lifecycle, including closure.

### Topic III: Design, construction, operation and monitoring of the tailings facility

- Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post closure.
- Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.

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- Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure.
- Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
- Appoint and empower an Engineer of Record.
- Establish and implement levels of review as part of a strong quality and risk management

- system for all phases of the tailings facility lifecycle, including closure.
- Develop an organisational culture that promotes learning, communication and early problem recognition.
- Establish a process for reporting and addressing concerns and implement whistleblower protections.

#### Topic V: Emergency responde and longterm recovery

- Prepare for emergency response to tailings facility failures.
- Prepare for long-term recovery in the event of catastrophic failure.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

### **Turner & Townsend**

#### Contact

#### Maurício Lambertucci

Associate Director - Mining & Metals



- Yorkshire and the Humber, United Kingdom
- www.turnerandtownsend.com

#### **■** Introduction

Turner & Townsend is an independent professional services company specialising in programme, project and cost & commercial management and advisory services across the real-estate, infrastructure and natural resources sectors.

With 110 offices in 45 countries, we draw on our extensive global and industry experience to manage risk while maximising value and performance during the construction and operation of our clients' assets.

Company service description

Driving better performance at every stage of your project.

In today's complex and ever-changing world, our clients want to see results that make a difference. From the inception of a project through to completion and beyond, we help to deliver the outcomes that matter to you, with services covering the full spectrum of consultancy, project delivery and post-project operations.

#### **Target market**

Vale, Gerdau and Usiminas.

#### **≡** Area of focus

Topic I: Integrated knowledge base

- Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.
- Use all elements of the knowledge base - social, environmental, local economic and technical - to inform decisions throughout the tailings facility lifecycle, including closure.

Topic II: Design, construction, operation and monitoring of the tailings facility

- Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post closure.
- Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure.

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- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
- · Appoint and empower an Engineer of Record.
- Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure.
- Develop an organisational culture that promotes learning, communication and early problem recognition.
- Establish a process for reporting and addressing concerns and implement whistleblower protections.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

# **University of Reading**

#### Contact

#### **Mark Tibbett**

**Professor** 

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- South East England, United Kingdom
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#### **■** Introduction

Research-intensive university with a focus on environmental management and monitoring.

Company service description

Driving better performance at every stage of your project.

Research and education in the area of tailings and mine closure. We provide advice and conduct studies on the geoecotechnology of tailings storage facilities. World leader in mine closure research.

#### **Target market**

Chile. Peru and Brazil.

#### **≡** Area of Focus

#### **Topic I: Affected communities**

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

 Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.

Use all elements of the knowledge base - social, environmental, local economic and technical - to inform decisions throughout the tailings facility lifecycle, including closure.

### Topic III: Design, construction, operation and monitoring of the tailings facility

Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post

#### Topic IV: Management and governance

 Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure.

#### Topic V: Emergency response and longterm recovery

• Prepare for long-term recovery in the event of catastrophic failure.

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### Wood

#### Contact

#### **Mary Lovett**

Senior Marketing Coordinator, Mining

- Scotland, United Kingdom
- www.woodplc.com

#### **■** Introduction

Wood is a global leader in consulting and engineering across energy and the built environment, helping to unlock solutions to some of the world's most critical challenges. We provide consulting, projects and operations solutions in more than 60 countries, employing around 40,000 people.

Wood is a leader in modern tailings disposal system development, design and construction offering innovative tailings management technologies and customized solutions to meet project-specific requirements. We have the experience and professionals to handle all phases of tailings work.

#### **†** Target market

Santiago, Peru and Brazil.

#### **≡** Area of focus

#### Topic I: Affected communities

 Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.

#### Topic II: Integrated knowledge base

- Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.
- Use all elements of the knowledge base social, environmental, local economic and technical - to inform decisions throughout the tailings facility lifecycle, including closure.

### Topic III: Design, construction, operation and monitoring of the tailings facility

 Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post closure.

- Develop a robust design that integrates the knowledge base and minimises the risk of failure to people and the environment for all phases of the tailings facility lifecycle, including closure and post-closure.
- Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure.
- Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure.

#### Topic IV: Management and governance

- Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.
- Appoint and empower an Engineer of Record.
- Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure.
- Develop an organisational culture that promotes learning, communication and early problem recognition.
- Establish a process for reporting and addressing concerns and implement whistleblower protections.

#### Topic V: Emergency response and longterm recovery

- Prepare for emergency response to tailings facility failures.
- Prepare for long-term recovery in the event of catastrophic failure.

### Topic VI: Public disclosure and access to information

 Publicly disclose and provide access to information about the tailings facility to support public accountability.

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#### **Department for International Trade**

The UK's Department for International Trade (DIT) has overall responsibility for promoting UK trade across the world and attracting foreign investment to our economy. We are a specialised government department with responsibility for negotiating international trade policy, supporting business, as well as delivering an outward looking trade diplomacy strategy.

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