MSALABS

Novel Technologies for Monitoring on Mining Operations

Nuevas Tecnologías para el Monitoreo en Operaciones Mineras

My Mining Experience

- Director of Global Projects MSALABS
  - Leads the design, construction and operations of onsite and commercial laboratories
  - Built 30+ laboratories
    - geochemical, metallurgical, environmental, tribology

- 25+ years of experience in Mining
  - Guyana Gold Fields
  - First Quantum Minerals – Zambia & Mauritania
  - Rio Tinto – Mongolia
  - Barrick – Bulyanhulu

MSALABS

MSALABS Global Footprint

Note: Current at March 2026

35 Laboratories Worldwide

We design, build, train, and manage any type of facility

PhotonAssay™
Fire Assay
Wet Chemistry
Specialty Assays
Metallurgical Labs

MSALABS

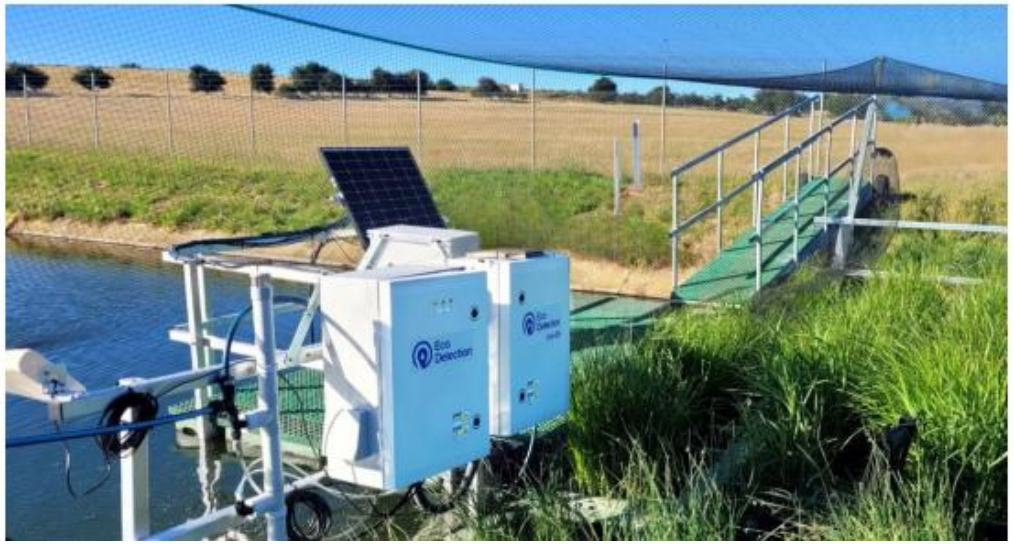
MSALABS's Innovative Technology Partners

CHRYSOS PhotonAssay™
Faster, more accurate gold analysis

Faster, Non-destructive, Environmentally Friendly Au, Ag and Cu Analysis

Eco Detection

Real-Time Onsite Lab Multi-Parameter Water Quality Monitoring



CHRYSOS PhotonAssay™ MSALABS

PhotonAssay™

A Revolutionary X-ray Technology

CHRYSOS CORPORATION

MSALABS

PhotonAssay™ Technology

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CHRYSOS PhotonAssay™

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Traditional Fire Assay vs PhotonAssay™

Ensayo al Fuego vs PhotonAssay™

vs

Lead oxide is used in Fire Assay
Harmful to humans and land

Chemicals-free
No hazardous waste

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PhotonAssay™ vs Fire Assay

PhotonAssay™ vs Ensayo al Fuego

	Ensayo al Fuego	PhotonAssay™
Time per sample	*~3-4 hours*	***~2 minutes***
Sample Size	*10-50 grams (or less)*	***400-650 grams***
Upper Detection Limit	*100 ppm*	***10,000 ppm***
CO_2 per sample[2]	*Up to 0.91 kg*	***0.455 kg***
Hazardous waste per sample	*Up to 0.31 kg*	***0 kg***
Energy use per sample	*~1.3 kWh*	***~0.65 kWh***
Automation	✗	✓

Lower costs
Simple to operate
Minimal consumables
Reduced sample preparation

Faster turnaround
Results in 2 minutes
Quasi real-time analysis
Continuous quality assurance

ESG and Safety
No hazardous waste
Lower CO_2 emissions
Improved OH&S

Non-destructive
Automated process
Opportunity to improve recovery
Additional assay on the same sample

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CHRYSOS PhotonAssay™

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A Sample's Journey Through PhotonAssay™ — Animated Walkthrough

Reporting-ready analysis

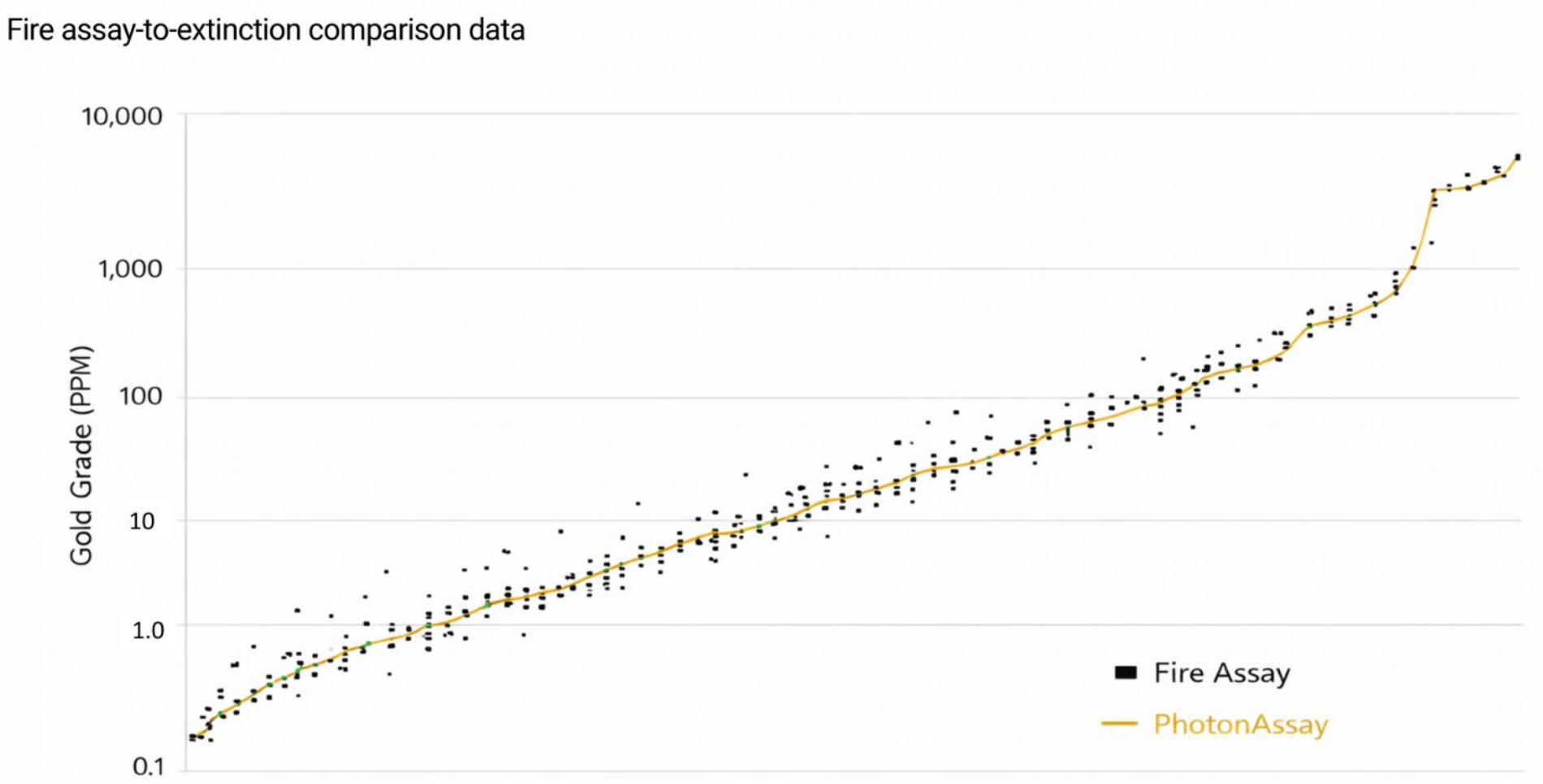
PhotonAssay™ analysis integrates with numerous industry-standard reporting frameworks including:

- JORC
- NI 43-101
- SEC

ISO Accredited

PhotonAssay™ units are operational in multiple laboratories accredited to ISO/IEC 17025 standards.

Larger Samples Lead to Improved Accuracy



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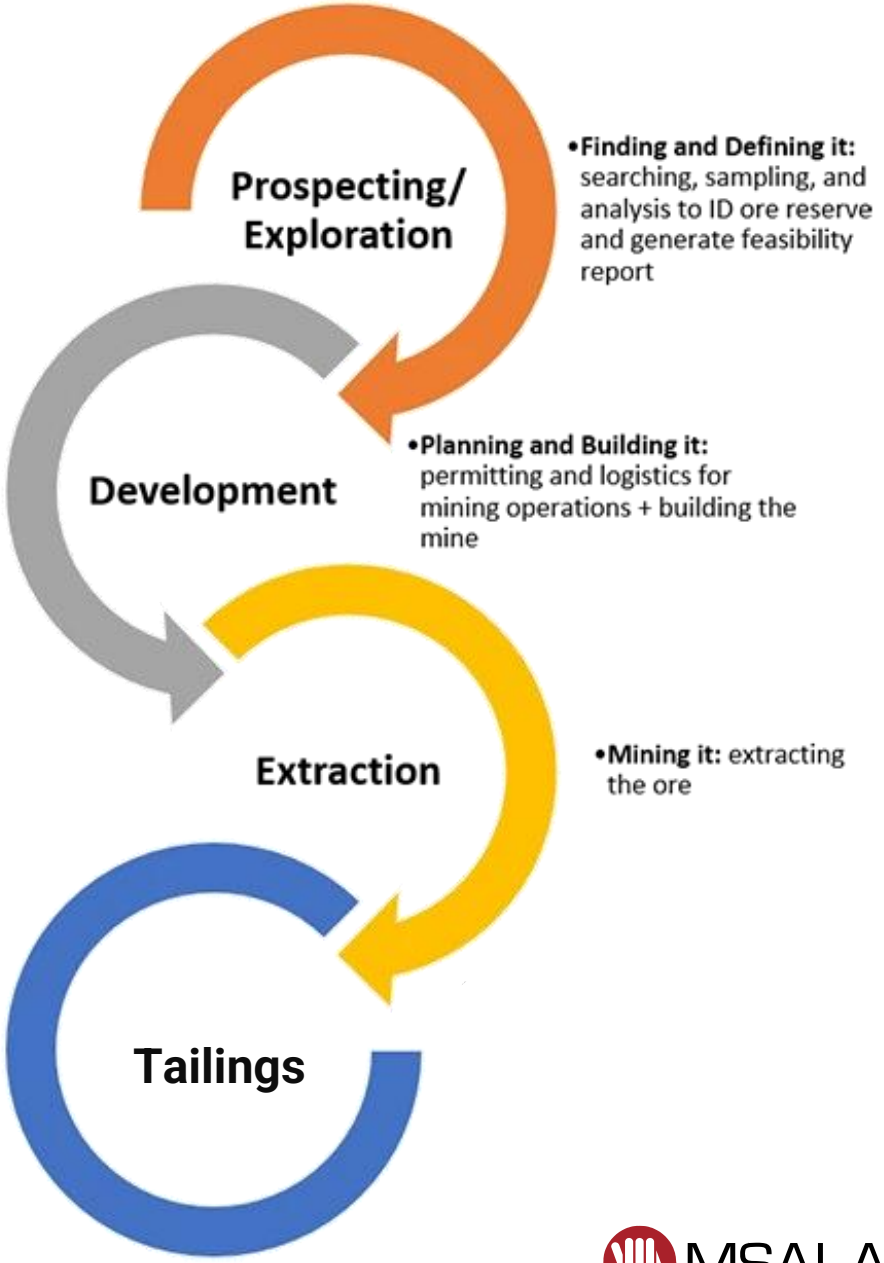
PhotonAssay in all stages of mine operations

Exploration
- Core & RC
- Soils

Grade Control
- Blasthole / RC

Process Plant
- Solids
- Solutions
- Carbon



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MSALABS PhotonAssay™ Units


Bulyanhulu, Tanzania

Val D'Or, Canada


Morila, Mali


Bamako, Mali

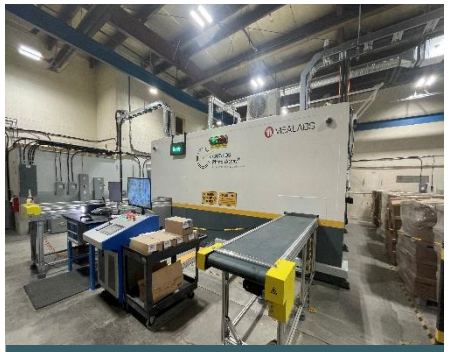

Ivory Coast


Kibali 1, DRC


Kibali 2, DRC

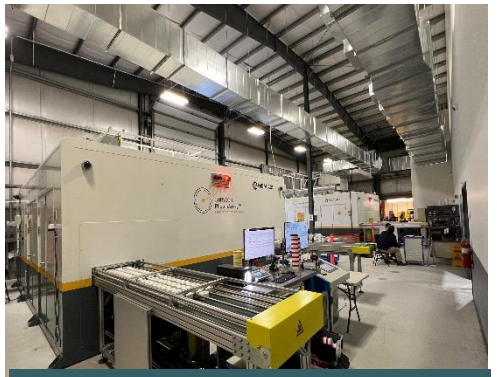
Obuasi, Ghana


Geita, Tanzania


Prince George, Canada


Timmins, Canada (2 units)

Fairbanks, Alaska, USA


Carlin, Nevada, USA


Elko, Nevada, USA

Newfoundland, Canada

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Turn lagging lab results into live operational insights
Eco Detection
Eco Detection

MSALABS's Innovative Technology Partners

Eco Detection

Real-Time Onsite Lab Multi-Parameter Water Quality Monitoring

Ion-Q+ Installation at
Western Junction Wetlands, Tasmania Australia.

- ✓ Tailings monitoring
- ✓ Up and downstream of the site
- ✓ Blasting residue monitoring
- ✓ On-site wastewater treatment
- ✓ Sensitive environmental areas

- ✓ Data at your Fingerprints
- ✓ Environmental baseline and monitoring
- ✓ Early warning
- ✓ EPA Supported
- ✓ Up to 24 Samples/day
- ✓ Solar & Battery powered

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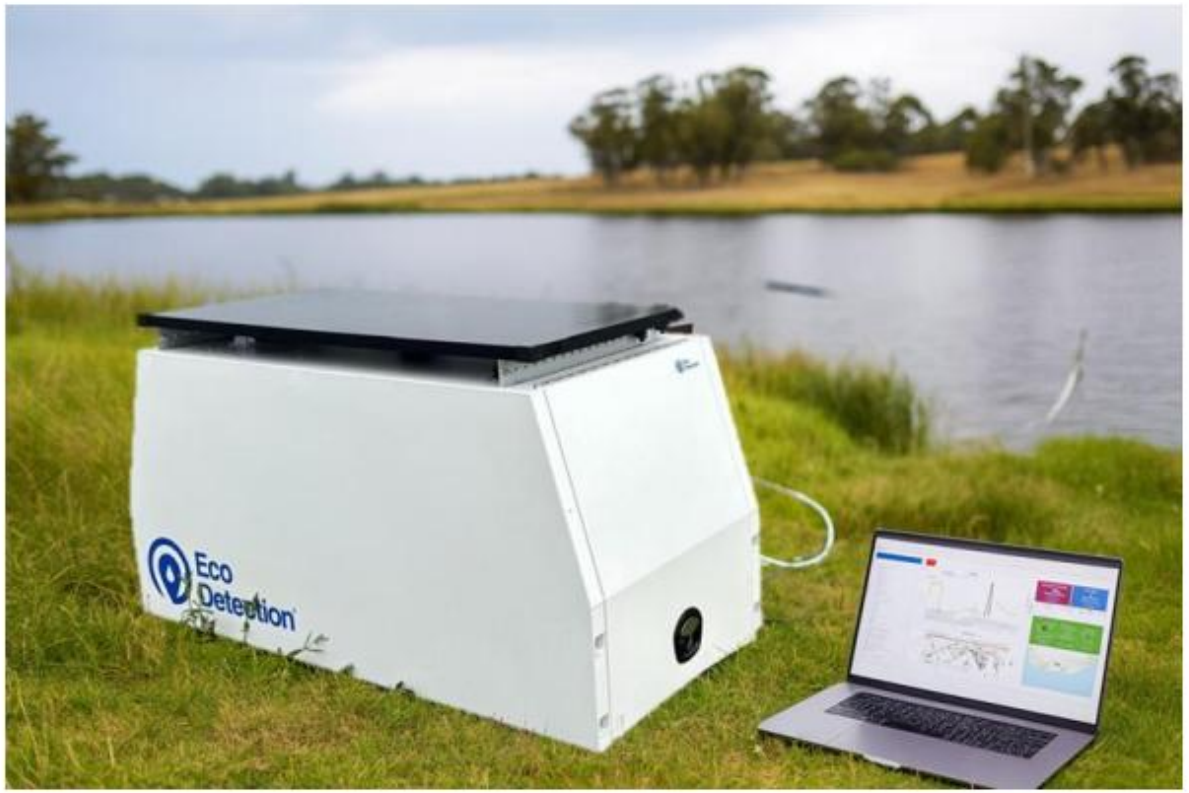
New ION-Q+ Transportable



Introducing the Eco Detection ION-Q+ Mobile Lab!

Our new transportable real-time water monitoring unit is now available to all customers - bringing lab-grade ion analysis to the field.

The ION-Q+ “Mobile Lab” offers greater flexibility, faster insights, and simpler deployment across remote or changing operations.

Ready to take your water monitoring anywhere?

Eco Detection Ion-Q+ Deployments

IONQ+ Analyte range

Current Offering

ANALYTE (13)	RANGE (mg/L)
TOTAL INORGANIC NITROGEN	
Ammonium (NH4-N)	0.1-200
Nitrate as N (No3-N)	0.03-50
Nitrate as N (No2-N)	0.03-50
DISSOLVED REACTIVE PHOSPHOROUS	
Phosphate as P (PO4-P)	0.1-50
OTHER INORGANICS	
Sulphate (SO4)	1.0-200
Potassium (K)	1.0-200
Magnesium (Mg)	1.0-200
Calcium (Ca)	1.0-200
Sodium (Na)	1.0-200
Floride (F)	0.1-10
Chloride (Cl)	1.0-100
Lithium (Li)	1.0-200
Iron (II) (Fe2+)	0.3-100

Additional Probes

Auxiliary sensors that have been integrated with the Ion-Q+ include:

- Turbidity
- Conductivity
- pH
- Temperature
- Flow meters
- Rainfall gauges
- Dissolved oxygen
- Other sensors

Note: Integration is through the Ion-Q+ Modbus interface

Future Roadmap – Next Phase Development

Expanding System Capabilities with Additional Analytes and Probes
Our system is built to evolve with your needs. If your application requires additional analytes or probes, these can be developed or integrated to meet your specific goals. To ensure seamless performance, our team conducts thorough development and validation to fully integrate new components into the system.

The typical development cycle for new features is **approximately 4 to 6 months**. **Pricing and specific timelines** are available upon request and will vary depending on the scope and complexity of the additions.

We are committed to delivering solutions that uphold the highest standards of **quality, accuracy, and reliability**, so your system performs exactly as you need it to.

ANALYTE (New development)	Status
Cyanide (CN)	In Trial
Arsenic (As)	Under Development
Zinc (Zn)	Under development
Mercury (Hg)	Under development
Copper (Cu)	Under development
Chromium (Cr)	Under development
Nickel (Ni)	Under development
Glyphosate (G)	Under Development
Acetate	Under development
Citrate	Under development
Formate	Under development
Oxalate	Under Development
Manganese	Under development

Data Visualisation

LINK EAGLE IO

Data will be provided via our Eagle.io data visualisation platform, which offers a user-friendly, comprehensive dashboard for real-time data display in intuitive graphical formats.

In addition to on-screen visualisation, data can be exported in standard file formats, enabling seamless integration into reports, websites, or operational software.

Key Value Drivers:

- Faster Decisions – Live, real-time dashboards
- Deeper Insight – Multiple analytes in one unified graph
- Operational Efficiency – Automated capture.
- Zero manual handling
- Whole-of-Site Visibility – Multi-site data in a single view
- Seamless Integration – Export-ready for reports and systems
- Scalable Growth – Expands across projects, regions, and data streams

OPERATIONAL DASHBOARDS AND USER INTERFACE

Mining

Eco Detection enables mining operations to monitor water safely and confidently with real-time data across tailings dams and upstream and downstream environments. Continuous monitoring and instant contaminant alerts, including early detection of heavy metals and environmental leaching, ensure water meets safety and regulatory standards before discharge or reuse. This reduces operational and environmental risk, protects surrounding ecosystems, and strengthens community and regulator confidence in responsible mine water management.

HEALTH

- Protect workers and communities by detecting water quality risks early.
- Ensure safe water in and around mining operations.
- Reduce exposure to harmful contaminants (Heavy metals) through continuous monitoring.

OPERATIONAL

- Real-time alerts enable rapid response to emerging water issues.
- Streamline compliance reporting and reduce manual sampling.
- Enhance process control for tailings, discharge, and site water balance.

ENVIRONMENT

- Prevent harmful releases and environmental incidents.
- Track key parameters to protect rivers, groundwater, and ecosystems.
- Support sustainable water stewardship and responsible resource development

ECONOMIC VALUE

- Avoid costly shutdowns, fines, and remediation events.
- Improve water efficiency to reduce treatment and operational costs.
- Strengthen social licence and regulatory confidence through transparent, real-time data

Stormwater Catchment

Eco Detection enables municipalities to safely and confidently reuse stormwater by providing real-time water quality data. This ensures the water meets safety and regulatory standards before use, reducing reliance on costly scheme water, conserving resources and building community trust in sustainable local water management.

From runoff to resource - real-time insight for a sustainable water future

HEALTH

- Risk of exposure to pathogens or chemicals in reused water
- Potential contamination of public spaces
- Long-term community health risks

OPERATIONAL

- Manual sampling may miss rapid changes during rainfall
- Staff exposed to unsafe conditions during high flows
- Delayed results create blind spots for water safety

ENVIRONMENT

- Polluted stormwater can harm waterways and biodiversity
- Undetected events increase nutrient and sediment loads
- Reduced trust in sustainable water reuse programs.

ECONOMIC VALUE

- Cuts costs from treatment, retesting and infrastructure damage
- Reduces reliance on expensive scheme water
- Protects social licence and community confidence

Wastewater Treatment Plants

Eco Detection provides real-time water quality monitoring for wastewater treatment plants, enabling rapid detection of issues, optimizing treatment processes, reducing environmental risks and ensuring regulatory compliance -all while cutting operational costs.

HEALTH

- Rapidly detect harmful contaminants
- Protect workers and surrounding communities
- Ensure compliance with health regulations

OPERATIONAL

- Optimize treatment processes in real time
- Reduce manual sampling and labour costs
- Minimize downtime with predictive insights

ENVIRONMENT

- Prevent untreated water from entering waterways
- Reduce chemical and energy usage
- Support sustainability and reporting goals

ECONOMIC VALUE

- Avoid regulatory fines and penalties
- Lower operational and maintenance costs (optimising power and chemical usage)
- Protect reputation and social license to operate

Proven technology, Growing Customer List

A growing network of ongoing, lab-grade measurements from high frequency data at government, industrial & environmental sites

Wastewater treatment plants

Water recycling treatment plants

Drinking water supplies

Pulp mills

Fish hatcheries

Vineyards

Council landfills

Agricultural runoff

Municipal stormwater

Selection of customers & stakeholders

Fonterra · Greater Western Water · GHD · Tasmanian Government · Derwent Estuary Program

EPA Victoria · Coliban Water · TasWater · Norske Skog

Dunedin City Council · kaunihera a-rohe o Ōtepoti · Huon Salmon · tassal · Hydro Tasmania

University of New England · University of Tasmania · The University of Melbourne · University of Canberra · Inland Fisheries Service

La Trobe University · Armidale Regional Council · Monash University · Absolutely Positively Wellington

EPA Tasmania · intelligent water networks · SMARTSAT Cooperative Research Centre · Griffith University

Sydney Water · The University of Sydney · MSALABS · USGS science for a changing world

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Eco Detection

MSALABS's Innovative Technology Partners

Eco Detection

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We look forward to hearing from you!

www.msalabs.com

Ashok Kumar
Director of Global Projects
ashok.kumar@msalabs.com

Barrick’s MSALABS Onsite Laboratories

A Story of Success

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Barrick & MSALABS Global Partnership for PhotonAssay™ Onsite Labs

Our partnership with Barrick represents a step-change in how ore is analyzed across global operations.

By deploying Chrysos **PhotonAssay™** technology, starting at Bulyanhulu, we've introduced a **faster, chemical-free** alternative to traditional fire assay.

For **Pueblo Viejo** this is an opportunity to accelerate decision-making and modernize the assay process — bringing both performance and sustainability to the forefront.

Location	Facility Includes	MSA Built	MSA Operated	Year	Lab Capacity (s/d)	ISO 9001:2015	ISO 17025:2017
Bulyanhulu, Tanzania	Sample prep, Fire Assay, Wet Chemistry, XRF, AAS, LECO, PhotonAssay	✓	✓	2021	1,500	✓	-
Kibali, Congo	Sample prep, Fire Assay, Wet Chem, XRF, AAS, LECO, PhotonAssay	✓	✓	2023	1,500	✓	✓
Nevada Gold Mines, USA	Sample prep, PhotonAssay	✓	✓	2024	2,000	✓	In progress
MBCC, Saudi Arabia	Sample prep, Fire Assay, Wet Chem, AAS	✓	✓	2025	300	✓	In progress

CHRYSOS CORPORATION MSALABS CAPITAL

FOR IMMEDIATE RELEASE
31 October 2023

MSALABS Limited & Capital Limited
("MSALABS" & "Capital")

Chrysos Corporation, Barrick Gold and MSALABS form global partnership for deployment of PhotonAssay™

MSALABS is pleased to announce that it has forged a partnership with one of the world's largest gold miners, Barrick Gold, and Chrysos Corporation (Chrysos), to deliver PhotonAssay™ technology to Barrick mine sites across four continents. The partnership will commence with the deployment of three MSALABS contracted PhotonAssay™ units to the Nevada Gold Mines (NGM) complex in the United States of America (USA), with the potential deployment of up to 10 more PhotonAssay™ units to other Barrick projects by the end of 2025, subject to finalising due diligence. The partnership is an extension of an already successful relationship between the three companies at Barrick's Bulyanhulu mine in Tanzania and its Kibali operations in the Democratic Republic of the Congo (DRC).

The single largest gold-mining complex in the world, NGM is 61.5% owned and operated by Barrick, and 38.5% owned by the world's largest gold miner, Newmont. The assets at the complex include 10 underground mines, 12 surface mines as well as multiple related facilities.

Chrysos Managing Director and CEO Dirk Treasure commented: "Barrick's global adoption of our technology is a watershed moment for us, underlining PhotonAssay's superiority to outdated and hazardous fire assay methods. Together with the team at MSALABS, we look forward to bringing the same operational and environmental benefits being delivered at Bulyanhulu and Kibali in Africa to more of Barrick's gold mines."

Striking a similar tone, Barrick Mineral Resource Management & Evaluations Executive Simon Bottoms, said: "PhotonAssay has already been delivering faster, safer, more accurate and environmentally-friendly analysis to our African operations, so we are more than pleased to broaden the partnership with Chrysos and MSALABS to take advantage of this innovative technology in our global operations."

On leveraging PhotonAssay's previous successes, Stuart Thomson, MSALABS CEO, enthused: "This partnership reflects the teamwork that's driven the highly successful integration of PhotonAssay technology into Barrick's mine sites since the first hybrid lab commissioned in Bulyanhulu in 2021. MSALABS' holistic approach including design, construction and process components has resulted in seamless transitions from fire assay to PhotonAssay at Bulyanhulu and Kibali. Development has continued with copper assaying and innovations in sample logistics and robotics, extending the capability, safety and productivity of the entire system."

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Barrick Bulyanhulu
Au-Cu Dual-mode Onsite Lab

Dual-mode: PhotonAssay™ and Fire Assay

Full Range of Sample Types

- Exploration
- Grade Control
- Mill Samples
  - CIL
  - Flotation
- Metallurgical Test Work
- Trade (shipment) Concentrates
- Environmental

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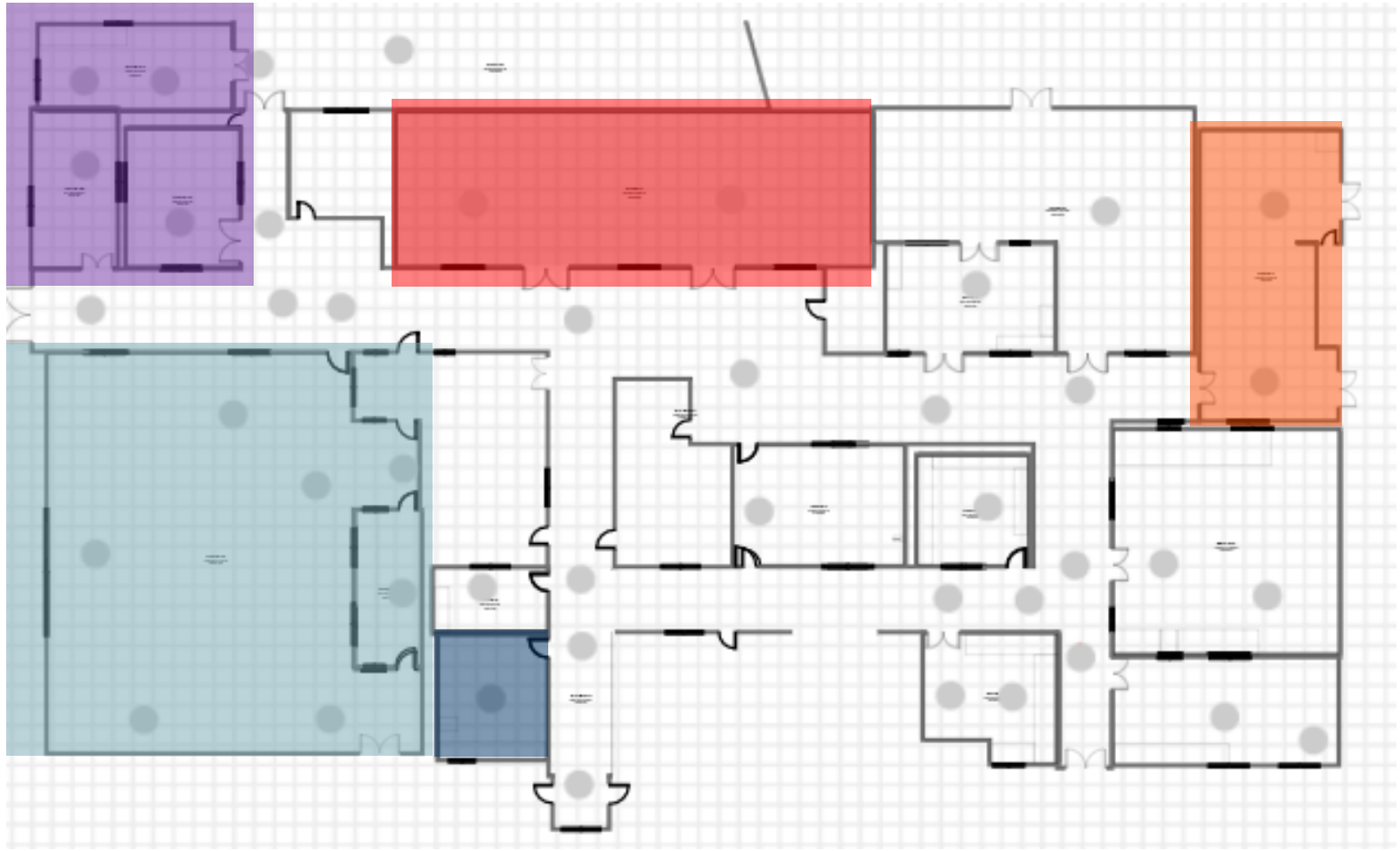
MSALABS Design Philosophy - Zones



- High Grade: Plant and Cons
- Medium Grade: Grade Control
- Low Grade: Exploration
- Chrysos PhotonAssay™
- Environmental

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Bulyanhulu Design & Build Timeline – 2021

Day 0, Jan. 21
Letter of intent

March
Design, drawings, approval

May
Procurement Complete

Structures Installed

August
Interior & Utilities Completed

September
Installation of PhotonAssay Completed

October
Site Acceptance Tests

October
Commissioning & First Samples

Total Days: 212





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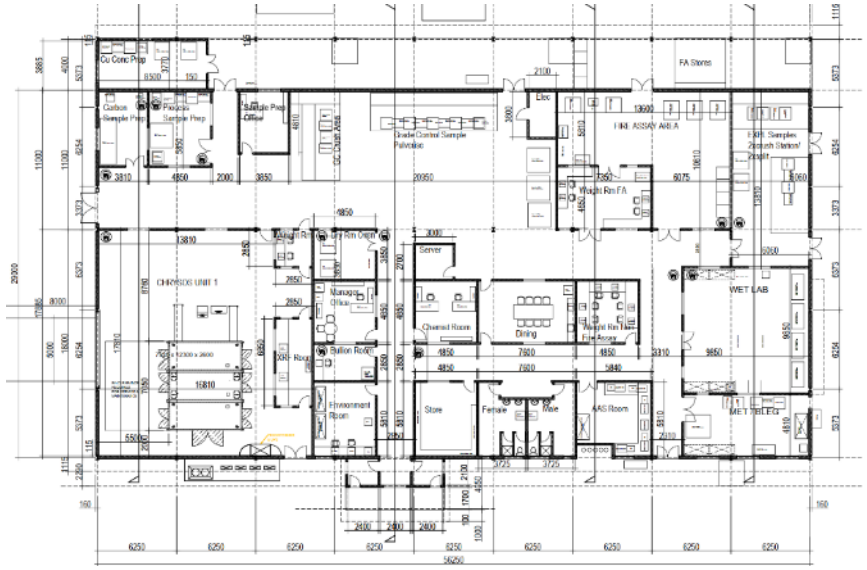
Barrick Bulyanhulu Dual-mode Laboratory Construction commences March 2021



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World's Most Advanced Gold Mine Site Laboratory Commissioned: Oct. 2021

BARRICK

NYSE : GOLD TSX : ABX

PRESS RELEASE

All amounts expressed in US dollars unless stated otherwise.

Barrick Commissions Africa's First PhotonAssay Laboratory

Bulyanhulu Gold Mine, Tanzania, October 10, 2021 – Barrick Gold Corporation (NYSE:GOLD) (TSX:ABX) in partnership with MSALABS Ltd has successfully installed a Chrysos PhotonAssay™ laboratory at its Bulyanhulu mine in Tanzania – the first in Africa and in its global operations.

TECHNOLOGY This kind of laboratory, which will be managed by Canadian firm MSA Lab, was only used in Australia

Barrick to install modern testing lab

The $3.7 million laboratory gives more accurate analyses of gold, silver and complementary elements

momentum with plant performance ahead of expectations and recover-

owns 16 percent in the company.

Mr Bristow also said that

Barrick Gold CEO Mark Bristow (R) with the deputy minister for Minerals,

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Bulyanhulu – Dual-mode Laboratory 2021

Bulyanhulu –Tanzania – Photon Assay™

Bulyanhulu –Tanzania – Fire Assay

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Mega Lab Kibali Gold Mine – DR Congo 2023

Kibali - DRC

Perhaps the largest onsite laboratory in Africa

MSALABS

Mega Lab Kibali Gold Mine – DR Congo
2023



Kibali Onsite Lab - 3D Elevation

Kibali Onsite – PhotonAssay™


Kibali Onsite – Sample Prep

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Onsite Labs in Nevada Gold Mines
Nevada, USA, 2024 -2025

Carlin, Nevada, USA - Phase#1

Carlin, Nevada, USA - Phase#1

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MBCC (Ma'aden-Barrick Copper Co.) - Jabal Sayid Mine Saudi Arabia, 2025

MBCC – Saudi Arabia

MBCC- Saudi Arabia

MSALABS

The Feedback Speaks for Itself

BARRICK
BULYANHULU

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Mail.bulyanhulu@barrick.com
www.barrick.com

20th April, 2023.

MSA Laboratories(T) Ltd
Bains Singh Avenue Msasani Peninsula
Plot No 1403/1, P.O. Box 79651
Dar Es Salaam
Tanzania

To Whom It May Concern

We are writing this letter to express our total satisfaction with MSALABS for their Project coordination & Management Services, which includes design, construction, and commissioning of a world class hybrid laboratory. Laboratory includes Chrysos Photon Assay & Fire Assay laboratory at Bulyanhulu Gold mine site on time with a high level of professionalism and quality. We commend MSALABS for their exemplary performance on this new assay laboratory project. We express our gratitude for a job well done.

Sincerely,

Victor Lule
Acting General Manager

BARRICK
BULYANHULU GOLD MINE LIMITED
P. O. Box 891
KAHAMA – SHINYANGA
Operations Manager
Name .....
Signature .....
Date 22/04/2023

KIBALI GOLD MINE

KIBALI GOLDMINES SA
4239, Avenue Tombal Baye
3eme Etage de l'Immeuble
Le Prestige, Commune de la Gombe
Ville de Kinshasa
République Démocratique du Congo
Company registration: CD/KIN/RCCM/14-B-3832
Fiscal registration: A0702049L

Kinshasa Office
Tel +243 812 532 441
+243 990 511 006

Kibali Mine Office
Tel +618 6365 44 41

1st April, 2023.

MSALABS DRC SAS,
Democratic Republic of Congo.
Letter of Recommendation

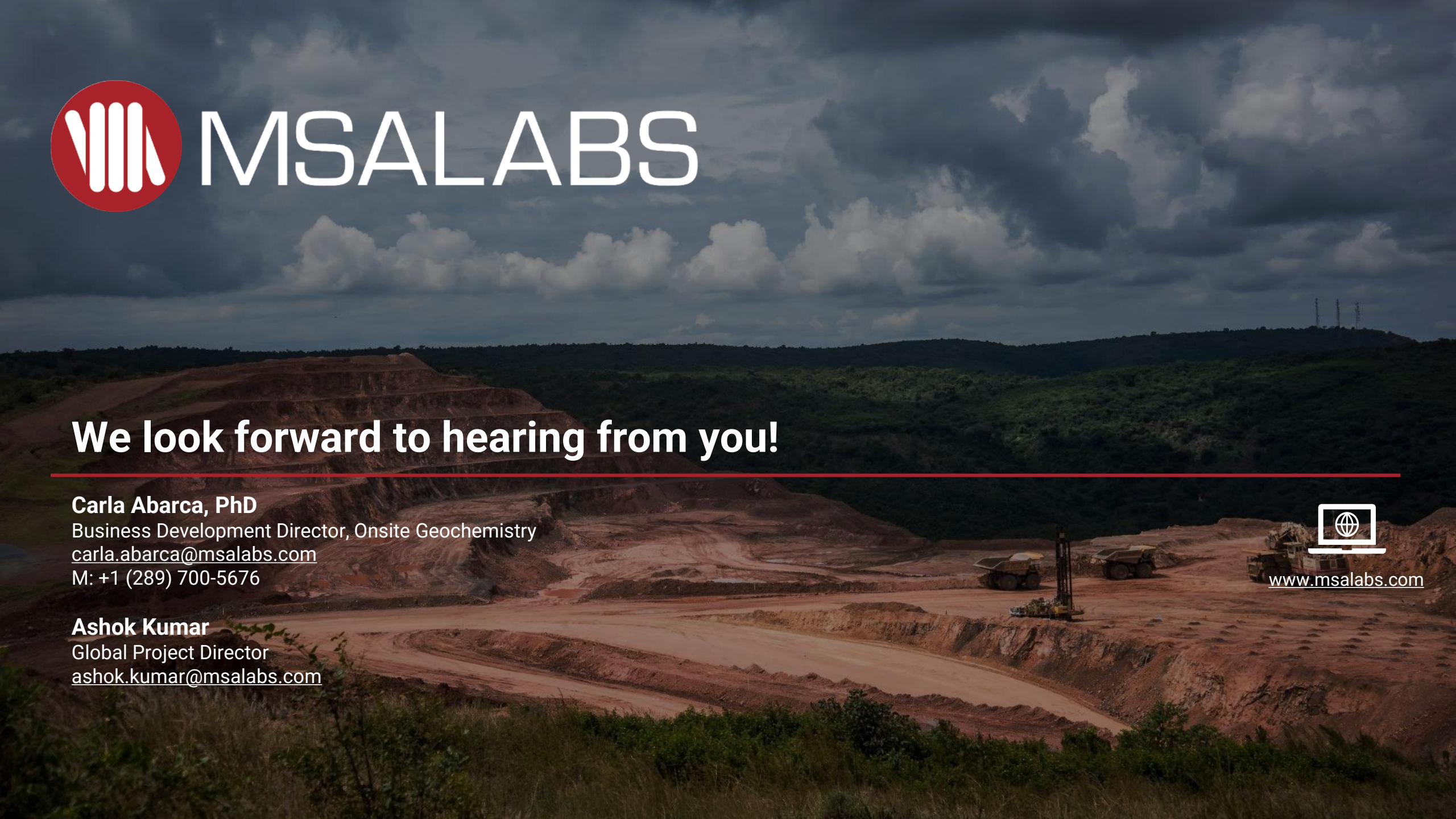
To Whom It May Concern

We are writing this letter to express our total satisfaction with MSALABS for their Project Management Services, includes design, project & construction management and successful commissioning of Chrysos Photon Assay Laboratory at Kibali Gold mine site on time with a high level of professionalism and quality.
We commend MSALABS for their exemplary performance on this project and continuing support for ongoing project of building of Fire Assay Laboratory. We express our gratitude for a job well done.
We hope that this would be the start of our continuous relationship and future success.

Sincerely,

KIBALI GOLD MINE
DIRECTION GENERALE

MSALABS



We look forward to hearing from you!

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