



Exploration, Mining & Trade

alsglobal.com

Geochemistry

Environmental testing & monitoring

Metallurgy

Mine site laboratories

Analytical geochemistry services to the global mining industry based on:

- ▶ network of over 70 integrated laboratories around the world;
- ▶ consistent quality and dependable client service;
- ▶ extensive on-site mine site service including grade & mill control and metallurgy.

Industry leading capabilities in testing, analysis and monitoring of:

- ▶ ground and surface water, weather, and air quality;
- ▶ acid sulfate, soil, acid mine drainage, air, dust, fuels, gases and fugitive emissions;
- ▶ drilling waste;
- ▶ sites for mining and oil & gas sectors including site assessment, hydrographic field services, and remediation.

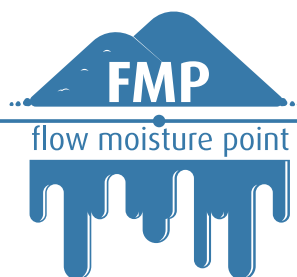
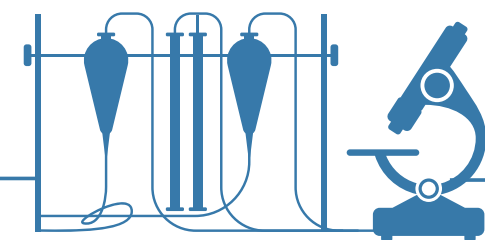
Metallurgical testing and consulting services for mineral process flowsheet development and optimisation. Such as:

- ▶ comminution and flotation;
- ▶ hydrometallurgy;
- ▶ ore and slurry characterisation;
- ▶ gravity, heavy liquid, magnetic, and electrostatic separations;
- ▶ bench scale metallurgical test work;
- ▶ metallurgical testwork for bankable feasibility studies;
- ▶ metallurgical pilot and demonstration plants.

Design, Installation and operation of laboratories for mining and metallurgical process plants regardless of location including:

- ▶ full range of mineral commodities services;
- ▶ ALS proprietary quality oversight systems installed on every site;
- ▶ seamless support for ALS standard methods and client custom requirements from global experts;
- ▶ analytical and metallurgical testing;
- ▶ mine output superintending and party assay.

precious metals • base metals • iron ore • coal • lithium • copper • ores & concentrates • rare earths • bauxite



It's the way we do it:

- ▶ Safety is a priority
- ▶ Belief in our ability
- ▶ People development
- ▶ Doing it better
- ▶ Honesty & integrity
- ▶ Hard work & continuous improvement
- ▶ Exceeding client expectations
- ▶ Celebrating success

Dust control & fogging

A wide range of standard and custom-designed air handling, ventilation, material conveying and dust control systems including:

- ▶ conventional dust collection systems;
- ▶ latest dust suppression technology;
- ▶ dust and air systems for small to large scale dust extraction systems;
- ▶ fogging systems;
- ▶ fume cupboards and scrubbers.

Engineering & consulting services

Engineering investigations and consulting across civil, mechanical, materials, structural disciplines using:

- ▶ finite element analysis (FEA) and strain gauging;
- ▶ optical and scanning electron microscope (SEM) analysis;
- ▶ failure and root cause analysis;
- ▶ maintenance and inspection program optimisation;
- ▶ remaining life assessment;
- ▶ corrosion investigation;
- ▶ failure mode, effects and critical analysis (FMECA);
- ▶ materials selection and advice.

Drill core services

Full spectrum of core services for mine sites, advanced exploration projects and ALS laboratories encompassing:

- ▶ core handling, logistics and warehouse management;
- ▶ core logging at secure and comfortable facilities;
- ▶ hyperspectral core imaging/in-situ analysis;
- ▶ highly-trained core technicians;
- ▶ computerised core sawing and sampling;
- ▶ manual friable core splitting to preserve material in the interval.

Coal quality

Accredited facilities and service capabilities covering the globe providing timely testing, analysis, quality training, and expert advice within your reach including:

- ▶ coal preparation performance testing;
- ▶ coal carbonisation & coke making;
- ▶ coal combustion technology;
- ▶ resource analysis and evaluation programs;
- ▶ sampling, preparation, and analysis of coal and coal-products such as anthracite and coke.

Commodity trade & inspection

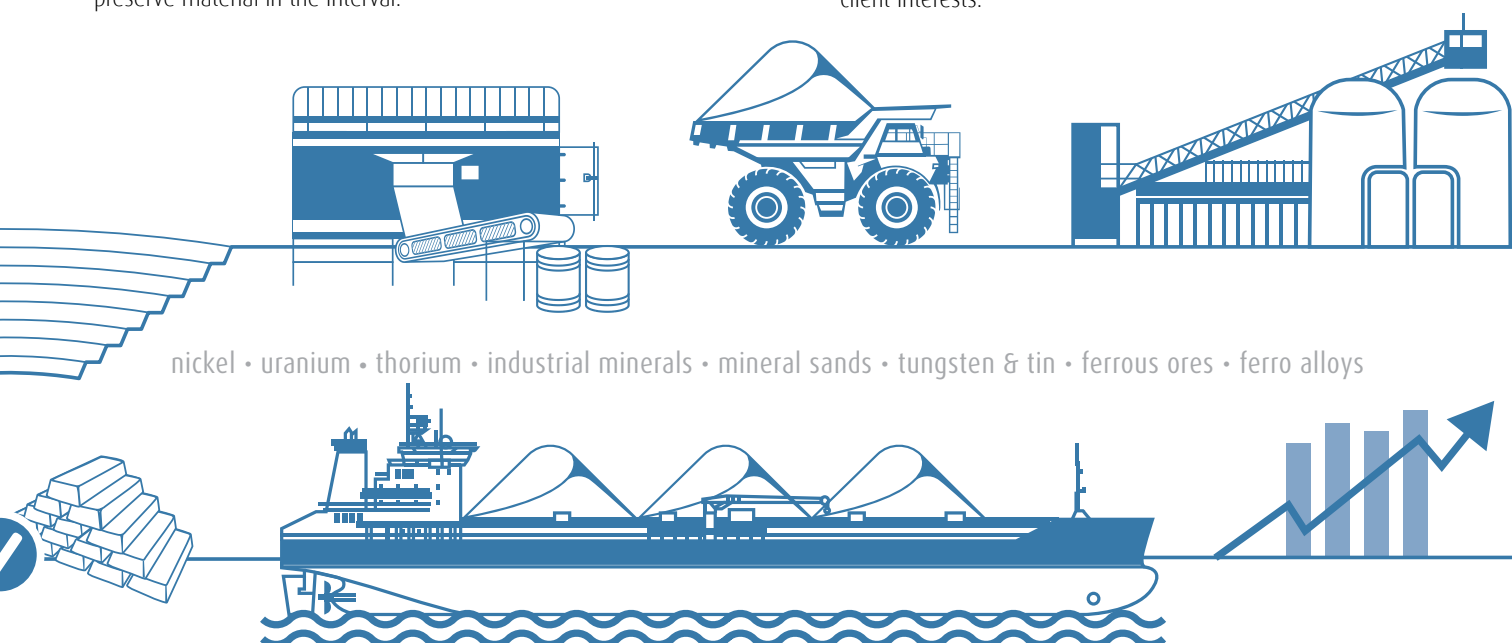
Inspection services for metals, minerals, ores, ferroalloys and solid fuels including:

- ▶ weighs and samples inspection;
- ▶ commodities' quantity and quality analysis and reports;
- ▶ findings for final commercial settlement;
- ▶ accurate cargo weights calculations;
- ▶ determination of storage and handling methods suitability;
- ▶ vessel condition evaluation prior to and during loading to protect client interests.

Industrial hygiene testing

Industrial hygiene laboratories throughout the world providing testing services and analytical packages with relevant to each operational process and area accreditations (NELAP, CALA, AIHA-LAP, LLC, DOD, and other location-specific programs) for:

- ▶ safer living and working environments;
- ▶ industrial hygiene monitoring;
- ▶ workplace health and safety;
- ▶ indoor air quality evaluation;
- ▶ ambient air quality.



Testing, inspection & condition monitoring

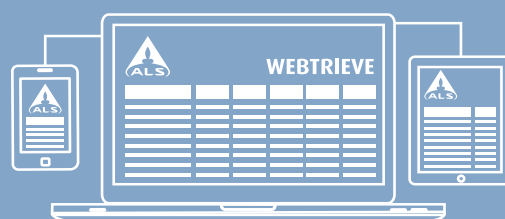
Assessment techniques for your asset's health including:

- ▶ acceptance testing;
- ▶ advanced and traditional non-destructive testing (NDT);
- ▶ risk-based inspection (RBI);
- ▶ non-intrusive inspection (NII);
- ▶ condition monitoring;
- ▶ plant inspection (tanks, vessels, piping, structures, coatings);
- ▶ materials testing (all materials);
- ▶ weld inspection and testing;
- ▶ access through drone/UAV/RPA, rope access, ROV.

Oil, fuel and coolant analysis

Equipment reliability and maintenance practices optimisation through oil, fuel and coolant analysis in construction, transportation, equipment manufacturing, lubricants supply, mining and exploration industries, including:

- ▶ oil, fuel, coolant, metalworking fluids testing services;
- ▶ trending analysis and management reports for asset health and fluid integrity;
- ▶ training and online data reporting.



The digital difference

Our data service meets extensive QA/QC auditing standards for confidence in geochemical and assay results.

Webtrieve™

Secure, real-time access to on-going laboratory job status, historical data, and extensive QA/QC auditing functionality.

CoreViewer™

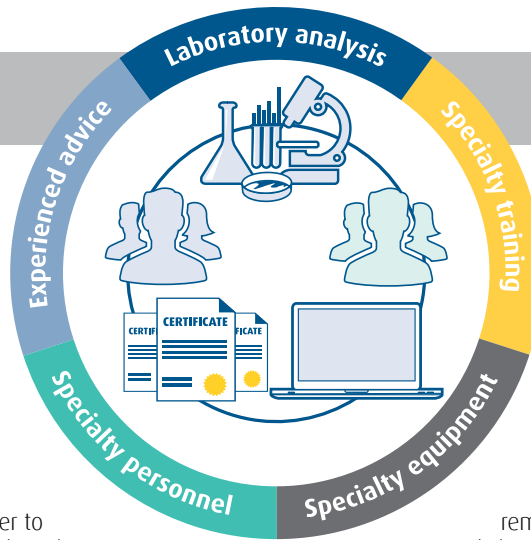
Fast, secure, interoperable core photo archive and downhole data visualization tools.

Global footprint

For more than 40 years ALS has been providing services around the world, helping clients make better, more informed decisions.

Our state-of-the-art technical solutions are tailored to meet our clients' needs and ensure their businesses operate in the most efficient, environmentally and socially responsible, market competitive way possible.

ALS has built its reputation around technical innovation, quality, a deep understanding of the industry by being a true technical services partner to many companies across a broad spectrum of end markets covering most geographies.

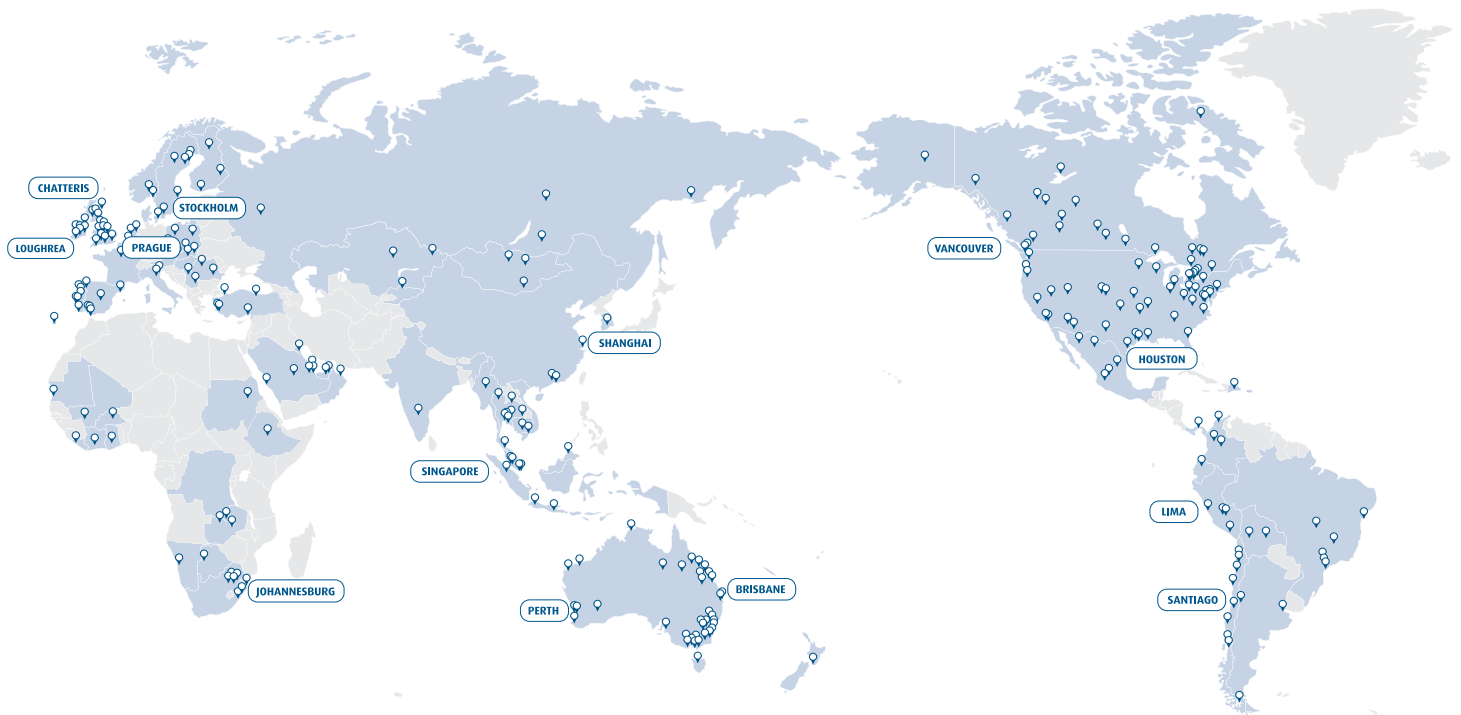


Local service

We are committed to deliver high quality testing services to our clients by embracing the very latest in technology and bespoke innovative methodologies.

Our clients' confidence in decision making based on the data we provided and their businesses' highest possible cost-effectiveness are the top priorities of our service.

Despite being a global scale company ALS remains agile enough to provide local expertise and client service at any level. We pride ourselves on providing personalised solutions to each and every client.



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Reliability, Independence and Integrity

ALS inspects, weighs, samples, analyses and reports on the quantity and quality of commodities to produce findings that can be used for final commercial settlement purposes. ALS Inspection has an extensive expertise in Ferrous materials.

Inspection Capability for Ferrous in SSA

Materials

- **Chrome Ore**
- Manganese Ore
- Iron Ore
- Magnetite
- **Low Carbon Ferro Chrome**
- **Medium Carbon Ferro Chrome**
- **High Carbon Ferro Chrome**
- Silicon Manganese
- Ferro Manganese
- Ferro Silicon

Locations

- **Richards Bay**, South Africa – sampling and analysis laboratory;
- **Johannesburg**, South Africa – sampling and analysis laboratory;
- **Durban**, South Africa – sample preparation laboratory for ferrous materials;
- **Maputo**, Mozambique – sample preparation laboratory;
- Madagascar
- Dar es Salaam, Tanzania.

Service Coverage

- Visual Inspection,
- Supervision of Weighing
- Draft Survey,
- Sampling while Discharge/ Loading,
- Stockpile Sampling,
- Bulk Sampling,
- Container Loading Sampling,
- Moisture Determination,
- Size Testing,
- Supervision of Transshipment,
- Commercial analysis (party/ umpire).

Upgraded sample preparation facility inside Maputo Port



Operating
24hrs per day



10 years' experience



Supported by SANAS
17025 accredited
laboratory in Richards Bay

Completely containerised
sample preparation and office
units enabling:

- full weight determination;
- sampling;
- sample preparation;
- moisture determination; and
- sizing.

Core commodities

- **Chrome Ore**
(concentrate,
lumpy & ROM)
- **Ferrochrome**
- **Magnetite**

- › **Quick, onsite TAT** for moisture determination testing and preparation of final quality samples for analytical testing.
- › **Enhanced accuracy and consistency** due to global standardised SOP
- › **Ability to process large volumes** of different bulk commodities within the MPDC port environment



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All sampling and sample preparation operations are undertaken to the highest of international standards and all laboratories are ISO 17025:2005 accredited.

Teams of surveyors are strategically located in major ports, smelters, refineries, steelworks, and warehouses.

Samples are despatched to primary analytical laboratories in the UK, Sub Sahara Africa and China with analytical results being used for commercial exchange purposes between buyers and sellers.

The main Sub Sahara Africa hub office in Johannesburg with additional branch offices are covering inspection services in South Africa as well as Madagascar, Mozambique and Tanzania.

**Contact us if you
have an upcoming
project you would
like to discuss:**

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