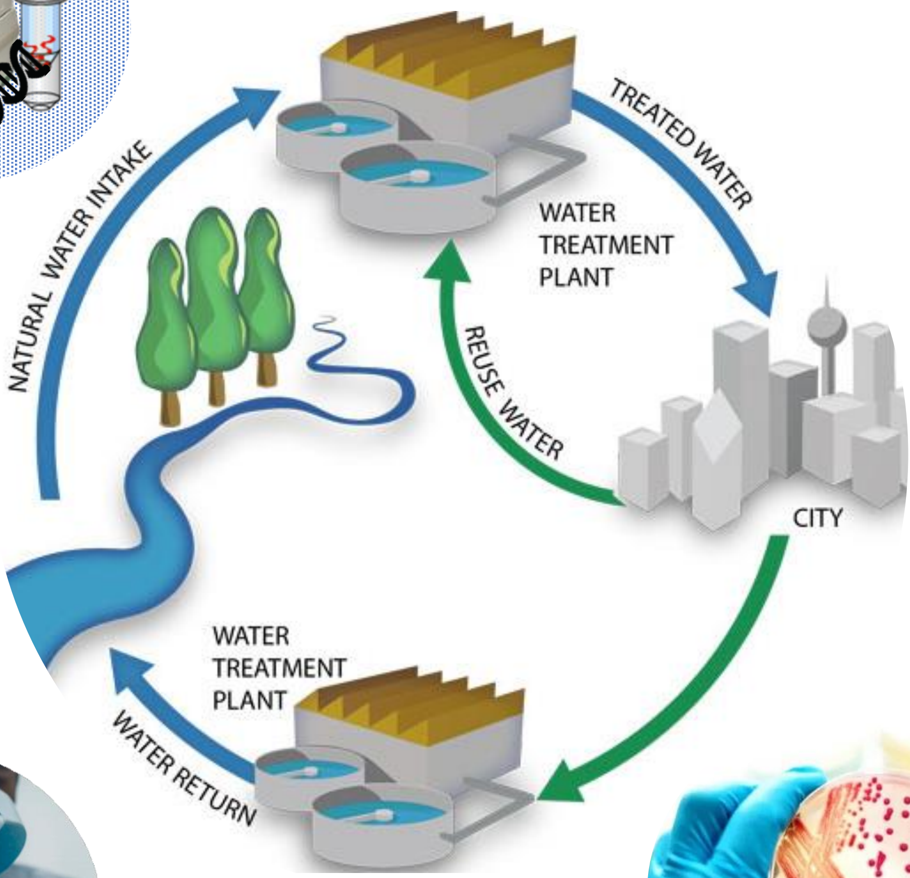
right solutions.
right partner.

Biological Contaminants in Water



Our global scale

70+ Countries | **400+** Offices | **40+** Years | **18,000+** Staff Worldwide | **40M+/yr.** Samples Processed | **AU$2B** Global Revenue

MISSION : We leverage the power of data-driven insights to solve complex challenges for a safer, healthier world.

PURPOSE : Using science as our North Star, we are a trusted partner in leveraging technological expertise, sustainability and empathetic practices to help make the world a better place.

CULTURE : We are deeply committed to providing positive employee experiences where team members explore solutions in a safe, inclusive and respectful environment. To ensure this, we employ top talent, enriched by ongoing training and professional development, and operate with the highest levels of integrity at all times.

Health, safety, environment & sustainability

Health, safety & the environment : Our responsibility is to provide a safe and healthy workplace for all employees, contractors and visitors as essential to our long-term success. We strive for continual improvement of its health, safety and environmental performance with the goal of eliminating work- related injury or illness.

Engaging with our communities : We strongly believe in being a positive influence in the community and we encourage all our employees across the globe to contribute to their local communities.

Reducing waste & managing risk : Our internal sustainability intranet site, where relevant information on environmental management programs are monitored and reported on by our employees to include Energy, Waste and Water.

Biological Contaminants in Water

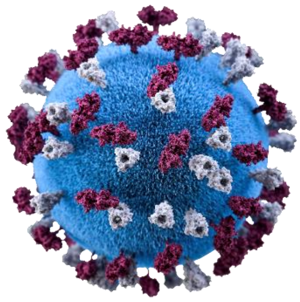
Water is an essential component of life. Microbial contamination can affect the quality and safety of your drinking water. Most people know that drinking water from untreated sources such as ponds, lakes, and rivers can result in life-threatening gastrointestinal illnesses.

The three main classes of biological contaminants are :

- **Bacteria**
- **Viruses**
- **Protozoan**

Public health professionals refer to dangerous organisms in water as waterborne pathogen contamination. This contamination can enter water supplies through animal activity, agricultural runoff, sewage leaks, or natural disasters that compromise water sources.

We routinely provide testing services for the microbiology contamination in water or water sources via conventional culture, microscopy and molecular diagnostics method. Our laboratory offer client requested custom methods and scientific papers reference methods for research purposes.

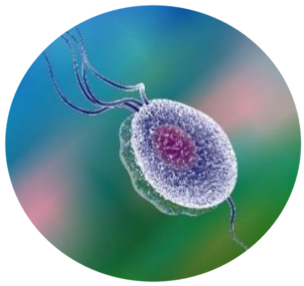


Laboratory Methods

- **Culture Method**
    - Method of multiplying microbial organisms in predetermined culture medium
    - APHA, ISO, US-FDA BAM

- **Microscopy**
    - Identification of microbes using a microscope.
    - APHA

- **Molecular (DNA)**
    - Polymerase Chain Reaction (PCR / Real-Time PCR)
    - Next-generation sequencing (NGS)



MALAYSIAN STANDARD
FDA U.S. FOOD & DRUG ADMINISTRATION
APHA
EPA
British Pharmacopoeia
ASTM INTERNATIONAL Standards Worldwide
AOAC INTERNATIONAL
ISO International Organization for Standardization
usp
EN EUROPEAN STANDARDS
GB
JIS 日本工业标准调查会
GMP+ Feed Safety Assurance

Water Quality Standards and Guidelines

ALS Malaysia provides testing services to meet national and international regulatory guidelines :

Potable / Drinking Water

- National Standard for Drinking Water Quality (MOH, 2nd version 2004)
- Code of Practice on Drinking Water Sampling and Safety Plans (1st Apr 2019)
- 25th A Schedule of the Food Act 1983 (Standard for Water)
- 25th Schedule of the Food Act 1983 (Standard for Packaged Drinking Water and Vended Water)
- WHO Guidelines for Drinking Water Quality (4th Edition, 2017)
- Singapore Drinking Water Quality (Jul 2020 – Jun 2021)
- Singapore Code of Practice on Drinking Water Sampling and Safety Plans (Apr 2019)
- National Primary Drinking Water Regulation (May 2009)

Environmental Water

- National Lake Water Quality Criteria and Standards (NLWQS, 2015)
- National Groundwater Quality Standard (2019)
- National Quality Standard for Natural Recreation Water and Monitoring Guideline for Natural Water Quality (Marine and Freshwater) (Jun 2017) - NAHRIM (Jun 2017)
- Malaysian Marine Water Quality Standards and Index
- National Water Quality Standard (EQR 2006)
- Guidance Document on Performance Monitoring of Sewage Treatment System (2017)
- Guidance Document on Performance Monitoring of Industrial Effluent Treatment System (2017)

Treated / Reclaimed Water

- SPAN Technical Standard for Use of Reclaim Water – TS (R) 02-1:2020

Pharmaceuticals and Industry-Specific Requirements

- The National Haemodialysis Quality Standards (2018) - MOH/P/PAK/395.18(QAP)
- Industry Code of Practice on Indoor Air Quality – 2010 (DOSH Malaysia)

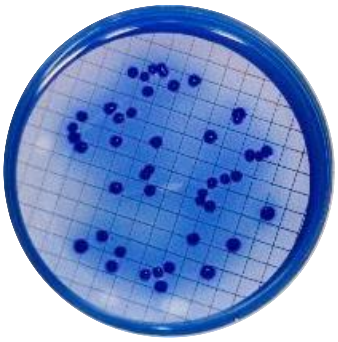
Microbiology – Water – *Routine*

- E. coli & Total Coliforms
- E coli and Thermotolerant Coliforms
- Thermotolerant coliforms and total Coliforms
- Total Plate Count / Heterotrophic Plate Count
- *Salmonella*
- *Legionella spp, Legionella pneumophilia*
- Fecal Streptococci
- Clostridia
- Clostridia perfringens
- Enterococci
- Campylobacter
- Pseudomonas aeruginosa
- Total Faecal Coliform Count
- Sulfite-reducing Anaerobes

Microbiology – Water – *Non-Routine*

- Listeria spp.
- Aeromonas spp.
- Campylobacter spp.
- Yeast and Mold
- Klebsiella
- Bacillus cereus
- Shigella spp. / EIEC
- Vibrio spp.
- Yersinia enterocolitica
- Iron-reducing bacteria (IRB)
- Sulphate-reducing bacteria (SRB)
- Clostridium difficile toxin B

- Microbial identification via
  - *culture*
  - *biochemistry*
  - *microscopy*
  - *pure culture sequencing or Next Generation Sequencing method*



Microbiology – *Cooling Towers*

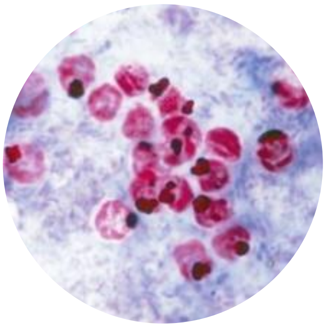
- Legionella spp & Legionella pneumophilia
- Total plate count
- Algae

Microbiology – *Protozoans*

- Giardia lamblia
- Cyclospora cayetanensis
- Entamoeba histolytica
- Cryptosporidium spp.
- Dientamoeba fragilis
- Blastocystis hominis

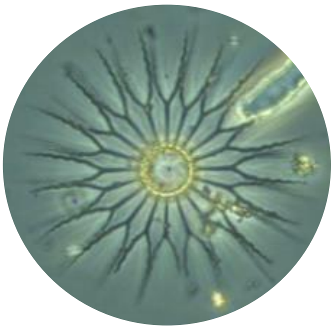
Microbiology – *Aquatic Taxonomy*

- Phytoplankton Identification
- Zooplankton Identification
- Benthic
- Algae
- Chlorophyll a, b, c



Microbiology – *Specialist Micro*

- SARC-CoV-2
- Rotavirus
- Astrovirus
- Sapovirus
- Adenovirus
- Norovirus GI
- Norovirus GII
- Enterovirus

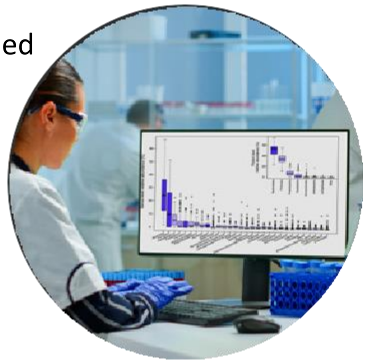


- **Specialist services**

Next Generation Sequencing (NGS)
  - **Microbiology Metabarcoding**
  - **Bacteria metabarcoding**
  - **Fungal metabarcoding**
  - **eDNA**

Service approach & value adds

Our growth has been built on long-term relationships. Our clients are accustomed to receiving high quality data, technical support and open communication. This approach includes project and client managers, skilled and qualified client services teams, access to technical experts and a management team committed to service delivery.



Standard offering

Our clients have access to a number of value-add services

- Results reported electronically in a secure PDF format
- Leading tailored electronic data delivery formats (EDD)
- Full Chain of Custody Protocols including receipt acknowledgement (SRN)
- Expert technical advice and support on scientific issues
- Laboratory inspections and tours
- Technical newsletters
- Webtrieve™

Technical bulletins

These publications are designed to communicate technical developments and act as an educational resource.
Regulatory, analysis, new technologies and key industry information are routinely featured.

Webtrieve™ service approach & value adds online data access & mobile apps

Real-time results to save you time and money
WebTrieve™ is a secure, internet-based application that provides real-time access to your laboratory data with the following convenient features:

- Internet access to view validated results
- Exclusive, complimentary service to our clients
- Export results to MS-Excel
- Security protection against
- Reports emailed directly to your address
- Multiple levels of access available
- Compare results to guidelines
- Data access 24 hrs/day, 7 days/wk, 365 days/yr
- Online request for quotes and bottle orders
- Online communication with ALS



Quality management system

The integrity of our test results is of paramount importance, allowing our clients to make informed decisions. Clients work with us safe in the knowledge that their results are reliable, repeatable and meet regulatory requirements.

Regulatory compliance

ALS laboratory achieves premium service levels through continued investment in quality systems and technology to guarantee ongoing compliance. ALS laboratories host more than 100 audits.

- National Accreditation Bodies (ISO 17025)
- National Regulatory Agencies (GMP, GLP)
- US-FDA
- International pharmaceutical companies

ALS welcomes clients to visit and/or audit our laboratories. In addition to external audits, we have our internal, independent quality department, which undertakes a programme of self-inspection.

Certifications & accreditations

ALS global laboratory network holds and maintains a number of certifications and accreditations.

Locations and Contact Information :

Headquarter :

ALS Technichem (M) Sdn Bhd

Wisma ALS, 19 & 21, Jalan Astaka U8/84,
Section U8, Bukit Jelutong, 40150 Shah Alam,
Selangor Malaysia
T : +603 7845 8257 WhatsApp : +6012 6987 256
F : +603 7845 8258
E: marketing.my@alsglobal.com