



UKM supports the Sustainable Development Goals

MENU

Water Consumption Tracking

UKM measure the total volume of water used in the university that is taken from mains supply, desalinated, or extracted from rivers, lakes, or aquifers. In UKM, we have two sources of water supply, which are treated water supply by Air Selangor Sdn. Bhd. and alternative water sources such as rainwater harvesting, tube well and retention pond.

The rainwater harvesting tanks have been placed in four locations in the campus and the water collected from this system is used mostly as water supply in the toilets as well as for watering plants, cleaning floors and other external uses. For tube wells, it is used as supplements when UKM has shortages in the main water supply. As for the retention pond, Ghazali Lake is among the water conservation system that is used as a water source for landscaping works.

Consumption of Treated Water

UKM obtains a source of treated water for its students and staff from Air Selangor which is responsible for treating raw water to treated water and supplying it to users in Selangor, Putrajaya and Kuala Lumpur.

Water source for UKM

The main water supply source that supplies the water to the main water tank in UKM is from the Water Treatment Plant in Sungai Semenyih, Selangor.

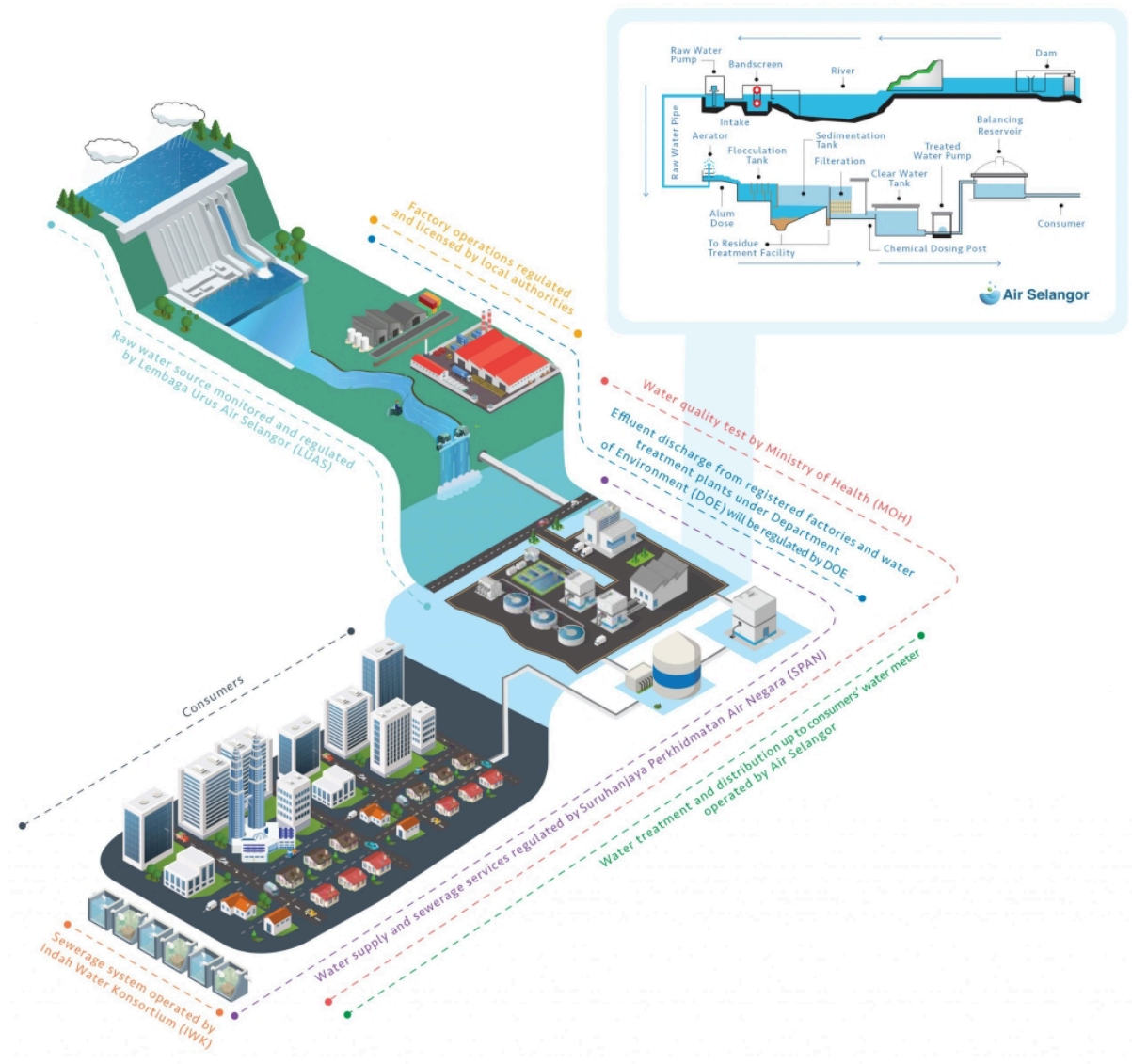


Water treatment plant in Sungai Semenyih, Selangor

Water treatment processes by Air Selangor Sdn Bhd.

The processes to produce clean water by Air Selangor Sdn Bhd start from abstracting raw water and then treating it to produce clean and safe water that is distributed for consumer use.

Read more: www.airselangor.com



Water treatment and distribution of clean water supply by Air Selangor towards users in Selangor, Putrajaya and Kuala Lumpur

Main water reservoirs in UKM

UKM has main water reservoirs in Loop 1 and Loop 2. For Loop 1, there are two tanks, each has the same capacity of 1 million gallons. There are also two tanks in Loop 2, with the capacity of 800,000 and 500,000 gallons respectively.



Water conservation systems in UKM, which includes rainwater harvesting and tube wells

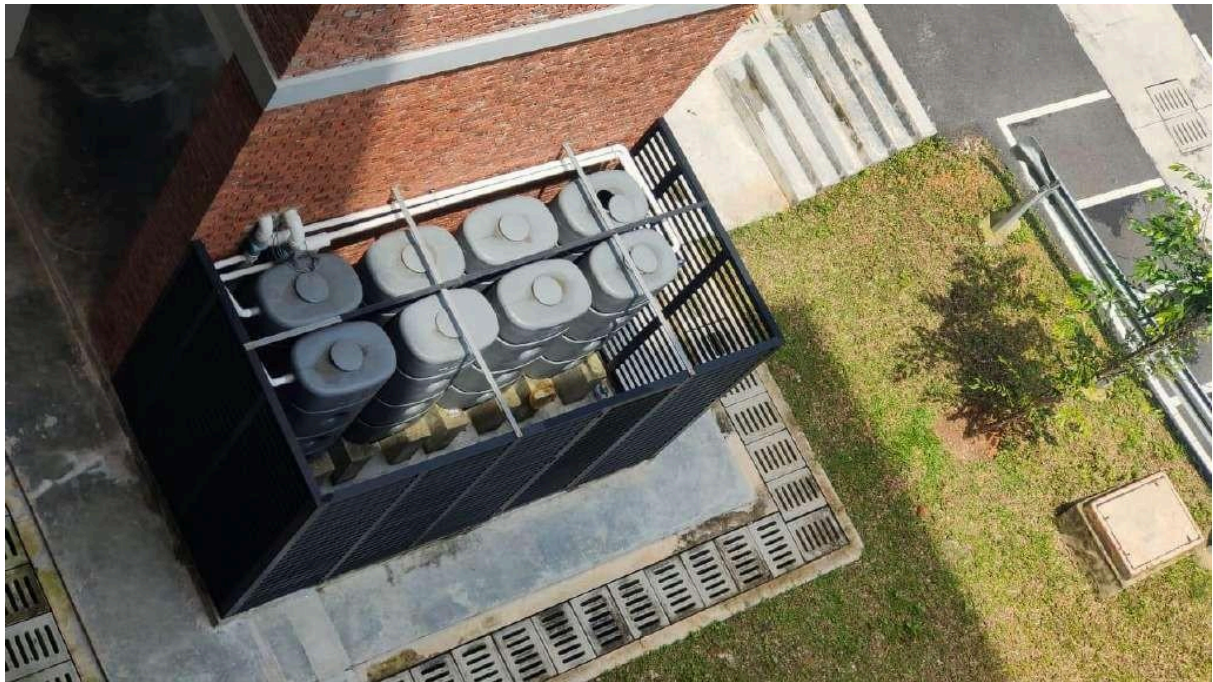
Rainwater harvesting



Faculty of Science and Technology



Research Complex



Faculty of Science and Technology



Institute of Environment and Development (LESTARI)

Tube Well



Institute of Environment and Development (LESTARI)




Aminuddin Baki College





Burhanuddin Helmi College

Retention pond in UKM and its capacity




UNIVERSITI KEBANGSAAN MALAYSIA
The National University of Malaysia



PETUNJUK
 Kawasan Ghazal
 Keluasan = 6,000 m²
 Kawasan Tasik
 Keluasan = 4,000 m²

Skala = 1:50,000

TAJUK:
 KAWASAN TASIK GHAZAL
 UNIVERSITI KEBANGSAAN MALAYSIA

Disediakan oleh
 Jabatan Pembangunan







Ghazali Lake

Faculty of Engineering and Built Environment Lake





UNIVERSITI KEBANGSAAN MALAYSIA
The National University of Malaysia



PETUNJUK

Kawasan Tasik
Kejuruteraan

Keluasan = 20,231.62

Kawasan Bera

Keluasan = 9,614.42

Skala = 1 : 2000

TAJUK:

KAWASAN
TASIK KEJURUTERA
UNIVERSITI
KEBANGSAAN MALAYSIA

Disediakan oleh Unit Infrastruktur
Jabatan Pembangunan Prasarana





Wastewater Treatment

UKM has a process to treat wastewater. Pump Transit Station, Oxidation Catchment Pond System, Extended Aeration System, Hi-Kleen Tank System, Imhoff Tank Pump System, and Hybrid Septic Tank System are the six types of Sewage Treatment Plant (SWTP) stations operated by a mechanical pump system in 27 locations in UKM. For this treatment, the SWTP Extended Aeration Station, Oxidation Pool, Hi Kleen Tank System, and Imhoff Tank Pump System at UKM produce effluent at the end of the treatment process at the station and will be released into the nearest waters through drains and creeks only after it meets the requirements set by the Local Authorities (PBT). Every six months, a data reading analysis test of effluent sample of each SWTP station is carried out at a laboratory recognized by Malaysian Laboratory Accreditation Scheme (SAMM) to assess whether the quality of the effluent produced reach the acceptable conditions of sewage discharge of standards A and B

Wastewater Treatment@UKM

Involving physical, chemical, and biological treatment methods to separate the waste materials from the sewage solid waste and then produce wastewater that is free from pollution and does not pose a threat to Malaysian waters and life around it.

There are 19 Sewage Treatment Plant (SWTP) stations operated by a mechanical pump system within UKM. All of these SWTP stations are regulated in their monthly maintenance and development by UKM's Infrastructure Development Department (JPP). Involving works such as 'housekeeping' of the SWTP station, inspections of the control panel, inspections of the pump system complete with accessories, inspection-cleaning of filters, inspection of SWTP station pipelines and inspection-cleaning of chambers or tanks done by a panel contractor appointed by the UKM Tender Committee.



Effluent Production

by Extended Aeration, Oxidation Catchment Pond System, Hi-Kleen Tank System, and Imhoff Tank Pump at the end of treatment.



Effluent Quality Analysis

Must meet the requirement set by Local Authorities (PBT) such as PBT of the Department of Environment (JAS) and the National Water Services Commission (SPAN)



Effluent Release to Water

Through drains and creeks only after meeting the requirement set by the Local Authorities (PBT)



Effluent Quality Analysis

Every six months, the sample is brought to a laboratory recognized by the Malaysian Standards Department through Malaysian Laboratory Accreditation Scheme.

Purpose

To carry out data reading analysis test to assess whether the quality of the effluent produced passes by reaching standard A and B.

Parameter (1)	Unit (2)	Standard	
		A (3)	B (4)
(a) Suhu	°C	40	40
(b) Nilai pH	—	6.0-9.0	5.5-9.0
(c) BOD ₅ pada 20°C	mg/L	20	50
(d) COD	mg/L	120	200
(e) Pepejal Terampai	mg/L	50	100
(f) Minyak dan Gris	mg/L	5.0	10.0
(g) Nitrogen Ammonia (badan air yang terkepong)	mg/L	5.0	5.0
(h) Nitrogen Ammonia (sungai)	mg/L	10.0	20.0
(i) Nitrogen Nitrat (sungai)	mg/L	20.0	50.0
(j) Nitrogen Nitrat (badan air yang terkepong)	mg/L	10.0	10.0
(k) Fosforus (badan air yang terkepong)	mg/L	5.0	10.0

Nota: Standard A terpakai kepada pembuangan ke dalam mana-mana perairan pedalaman dalam kawasan tadahan yang disenaraikan dalam Jadual Ketiga, manakala Standard B terpakai kepada mana-mana perairan pedalaman yang lain atau perairan Malaysia.

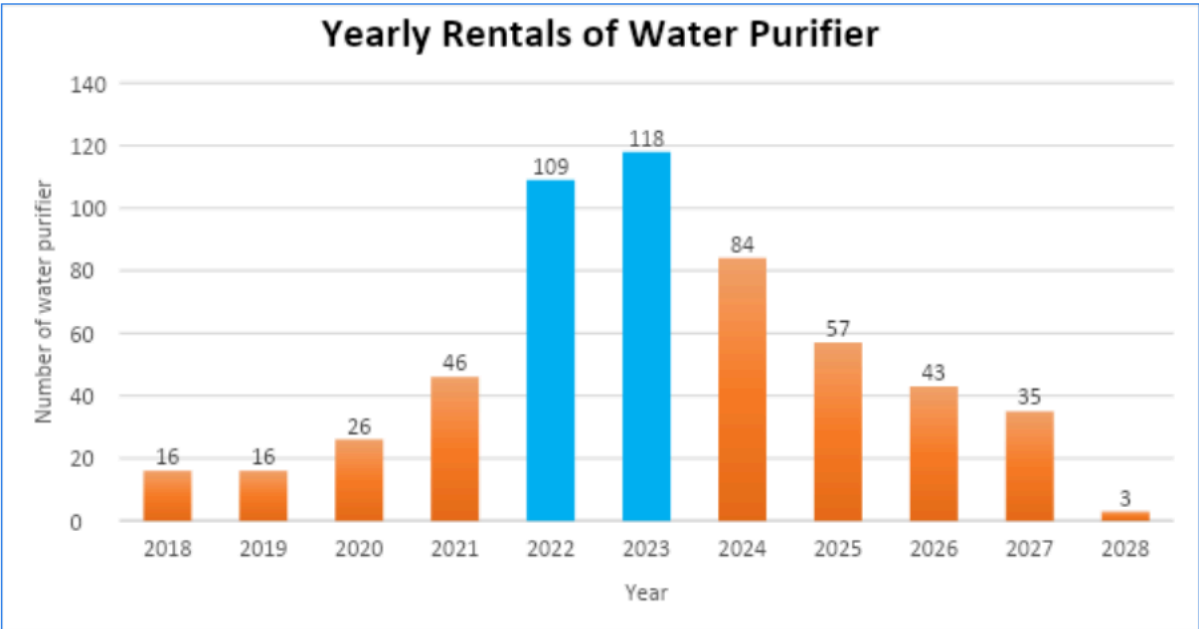
Preventing Water System Pollution

UKM have processes to prevent polluted water entering the water system, including pollution caused by accident and incidents at the university. UKM fully implements the policy and programs for water pollution control, and regularly monitors the water quality on the campus as we comply to Environmental Quality Act 1974 – Act 127 from the Department of Environment to prevent water pollution in campus. UKM also has an internal policy that is stated in UKM Bangi Campus Physical Development Master Plan 2007-2020 and Sustainability Strategic Plan 2030 that focuses on water source management in which the water source in the campus must be preserved so that the campus water supply is sufficient and of good quality for the use of all campus residents. UKM also has Water Analysis and Research Center (ALIR) that analyses and observes the water quality in UKM, as well as offering high quality and efficient analysis services in water research to UKM.

Read more: [Water Pollution Control](#)

Free Drinking Water Provided

UKM provide free drinking water for all in the campus. In 2022, UKM had provided 109 water drinking machine for students, staff and visitors, as we subscribe annually to water purifiers suppliers that provides clean, safe and healthy drinking water that fits to World Health Organization (WHO) standards.



The chart shows the number of water filter machine rentals from 2018 to 2028



Institute of Climate Change (IPI)



Faculty of Engineering and Built and Environment (FKAB)



Faculty of Science and Technology (FST)



Information Technology Center (PTM)



Faculty of Information Science & Technology (FTSM)

Water-Conscious Building Standards

All buildings in UKM adhere to green building standards for renovations and construction and have implemented water efficiency system. UKM adheres to the Government Green Procurement Guidelines (GGP), which specify that the selection of products and services for procurement in the public sector should be based on criteria encompassing financial considerations, adherence to standards, environmental impact, and the presence of local suppliers.

As a testament to our commitment to these guidelines, UKM has taken measures to exclusively install water-efficient appliances, including rainwater harvesting system for toilet flush and using water-saving appliances which are dual-flush toilet and hand-washing taps. 40% of water-efficient appliances have been installed in UKM buildings and will be progressively upgraded from time to time.



Hand washing tap



Dual flush toilet

Water Conscious Planting

UKM plant landscapes to minimise water usage by planting drought-tolerant plants around UKM. Among the drought-tolerant plants that we have planted is rosemary and aloe-vera in our Taman Ilmu and STEM, Media and Language Research Laboratory, respectively. Other approaches that we apply to minimise water usage is by implementing vertical landscaping design, for example we planted aloevera in vertical landscaping design at the STEM, Media and Language Research Laboratory.



Rosemary planted in the Taman Ilmu, Chancellery UKM



Vertical landscaping of aloe-vera in STEM, Media, and Language Research Laboratory
UKM



Bougainvillea in Bulatan Ilmu, Faculty of Engineering and Built Environment



Fucreae plant in front of Dataran Gong



Cycas trees at Bulatan Ilmu near UKM Mosque



Yucca plant in front of the Faculty of Engineering and Built Environment, UKM



Ixora plant at Lebuh Ilmu, Jalan Nik Ahmed Kamil



Pygmy screwpine at Lebuh Ilmu, Jalan Nik Ahmed Kamil

Water Reuse Policy

Yes, UKM has a policy to maximize water reuse across the university, in which UKM has published the Sustainability Strategic Plan 2030, which includes five sustainability pillars, one of which is Sustainable Campus, which aims to diversify the use of water resources by strengthening management of treated water, rainwater, and reservoir water.

By regularly controlling and monitoring the quality of the water supply system and establishing policies on water usage and conservation, UKM also tends to optimize water consumption and lower the rate of pollution. Thus, we have repurposed the college and faculty used water that gathered in the Faculty of Engineering and Built Environment Lake, a water catchment area, for campus landscape irrigation.





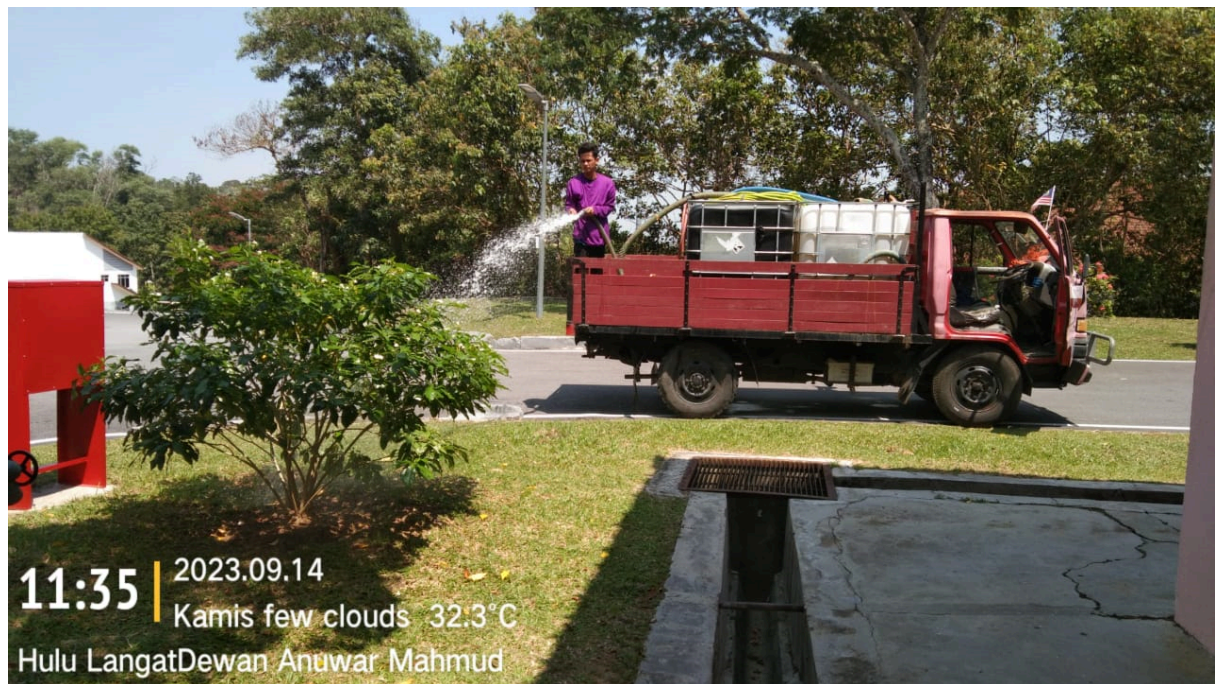
Workers are pumping water from the lake water at Faculty of Engineering and Built Environment (FKAB) into the tank for landscape irrigation.



Landscape irrigation on campus is being carried out.



Water from the river is pumped into the tanks, filling them to capacity for the specific purpose of irrigating the campus landscape.



The workers use this water to irrigate plants across the campus and in the colleges.



This action helps conserve treated water for non-drinking applications.

Alur Ilmu River Water Usage in the Faculty of Science and Technology

Water Management Educational Opportunities

UKM provide educational opportunities for local communities to learn about good water management. In July 2022, UKM with collaboration with Etika Sdn Bhd had organized “It’s Time for Our River” that focused on promoting river water quality treatment through an engaging exhibition with a biological approach, while educating community members on the importance of sustaining the water resources.

In December 2022, Denai Alam Day with “Sustaining Environment” themed was organized as a joint tree-planting initiative between Universiti Kebangsaan Malaysia (UKM) and Angkatan Koperasi Kebangsaan Malaysia Berhad (ANGKASA), in collaboration with the Institute of Climate Change (IPI), Friends of Rivers Malaysia (FORM), the UKM-YSD Chair for Sustainability, and Koperasi Unikeb Berhad. This program involved the tree planting activities of various

species and the cleaning of the UKM Alur Ilmu Trail area involving more than 100 volunteers with the local community.

Promoting Conscious Water Usage

UKM actively promotes conscious water usage on campus, and in the wider community. UKM has distributed water efficiency campaign posters around UKM to promote the efficient and effective water resources management to the UKM community. The water efficiency campaign poster includes the facts and ways to conserve water such as preventing tap water from flowing continuously, reducing shower time, and harvesting rainwater for watering plants, and washing cars.

Since UKM follows Government Green Procurement Guidelines (GGP) in its building standards, UKM has taken measures to exclusively install water-efficient appliances to encourage water efficiency usage towards the community inside and outside UKM, including rainwater harvesting system for toilet flush and using water-saving appliances which are dual-flush toilet and hand-washing taps. Until 2022, 40% of water-efficient appliances have been installed in UKM buildings and will be progressively upgraded from time to time.

Off-campus Water Conservation Support

UKM supports water conservation off campus. Close to UKM Bangi campus, there is Sungai Langat which is an alternative water source for UKM residents and the local community in Bandar Baru Bangi. The Langat River's water conservation efforts are carried out together with the Department of Environment and the National University of Malaysia. The main purpose of this

conservation is to ensure that the biodiversity and water quality found in the river is at a satisfactory level and can be used for daily use.

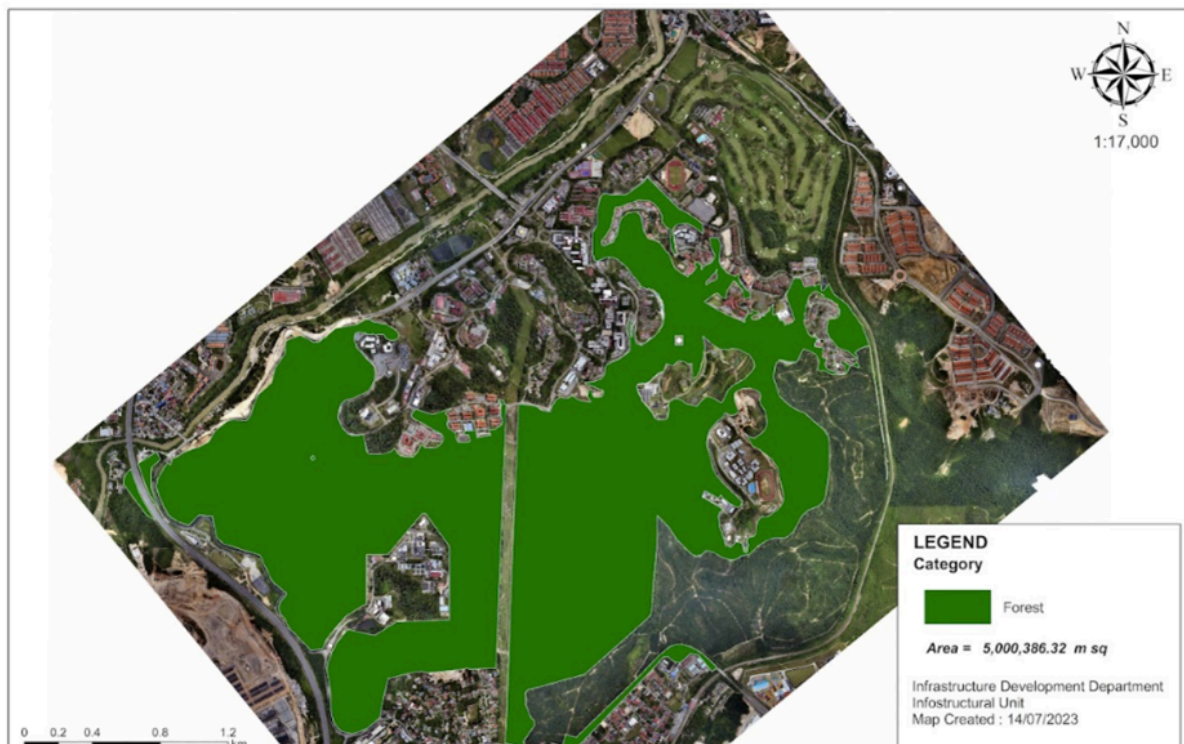
UKM has a forest reserve with an area of 5,000,386.32 m² and is rich in flora and fauna biodiversity as well as natural water sources from underground. The natural underground water source found in the UKM Forest Reserve can be an alternative source of water for local citizens and communities.





Credit: Berita Harian

UNIVERSITI KEBANGSAAN MALAYSIA CAMPUS BANGI RESERVE FOREST



UKM Reserve Forest

Sustainable Water Extraction on Campus

UKM utilise sustainable water extraction technologies on associated university grounds on and off campus. In the campus, UKM has implemented tube well technologies that extracts underground water as supplementary water supply for the residential colleges (Evidence 1) when UKM has shortages of the main water supply.

UKM has also built the tube well off campus, in As-Syakirin Mosque, Baru Lanjut Village, Salak Tinggi Sepang, as UKM received charitable donation of RM297,500 from Etiqa General Takaful Berhad.

ALIR

ALIR was established officially in 2006, has core members and a panel of consultants from the university specialized in various fields related to water analysis, chemistry, environmental health and treatment. ALIR is an excellent centre at Faculty of Science and Technology, Universiti Kebangsaan Malaysia. There are three divisions under ALIR, which are Training, Research and Laboratory Testing. ALIR also has SAMM Accredited, MS ISO 17025 since 2015.

Vision


Aspire to be an international centre of excellence in water research, analytical services and capacity building.

Mission

Enhance the quality of water through research, training, consultancy and analytical services.

UKM also provide program water analysis to water quality analysis. Makmal ALIR is one of the laboratories at UKM that has obtained the MS ISO

17025:2017 Accreditation Certificate since 2015. We offer quality and efficient analysis services in water research to FST researchers in particular.

<div>  <p> PUSAT PENYELIDIKAN DAN ANALISIS AIR (ALIR) UNIVERSITI KEBANGSAAN MALAYSIA 03-89214268 alir@ukm.edu.my https://www.ukm.my/alir/ </p> </div>			
<p align="center">LIST OF PARAMETERS ANALYSED BY MAKMAL ALIR</p> <p align="center">MS ISO 17025</p>			
WATER ANALYSIS			
No.	PARAMETERS	METHOD	UNIT PRICE (RM)
1	pH *	APHA - 4500-H B	10.00
2	Turbidity	APHA - 2130B	10.00
3	Temperature	APHA - 2550B	10.00
4	Colour	APHA - 2120B	10.00
5	Conductivity*	APHA - 2510B	10.00
6	Salinity*	APHA 2520 B	10.00
7	Total Dissolved Solids	APHA - 2540C	30.00
8	Total Suspended Solids*	APHA - 2540D	30.00
9	Total Solids	APHA - 2540B	30.00
10	Biochemical Oxygen Demand @ 20°C for 5 Days	APHA - 5210B	40.00
11	Chemical Oxygen Demand*	HACH, Method 8000	40.00
12	Ammoniacal Nitrogen as N	HACH, Method 10023	40.00
13	Nitrate Nitrogen as N	HACH, Method 10020	40.00
14	Nitrite Nitrogen as N	APHA - 4500NO2- B	30.00
15	Nitrogen (Organic) as N	APHA - 4500Norg B	30.00
16	Total Nitrogen as N	APHA - 4500NO2- B	30.00
17	Total phosphorus	HACH, Method 8190	40.00
18	Sulphate	HACH, Method 10227	40.00
19	Gross α	Counting	400.00
20	Gross β	Counting	
21	Argentum as Ag	ICP-MS	30.00
22	Aluminium as Al		30.00
23	Arsenic as As		30.00
24	Barium as Ba		30.00
25	Calcium as Ca		30.00
26	Cadmium as Cd		30.00
27	Chromate as Cr		30.00
28	Copper as Cu		30.00

Certificate of Accreditation

**STANDARDS**
MALAYSIA

Certificate of Accreditation

No: SAMM 717

Accredited since: 08 June 2015

This is to certify that

PUSAT PENYELIDIKAN DAN ANALISIS AIR (ALIR)
UNIVERSITI KEBANGSAAN MALAYSIA
BANGI, SELANGOR
MALAYSIA



Scan this QR Code or visit
www.ism.gov.my/cab-directories
for the current scope of
accreditation

has been granted accreditation in respect of the scope of accreditation described in the schedule, subject to the terms and conditions governing the *Skim Akreditasi Makmal Malaysia* (SAMM), the Laboratory Accreditation Scheme of Malaysia.

Laboratories accredited under SAMM meet the requirements of MS ISO/IEC 17025. This Malaysian Standard is identical with ISO/IEC 17025 published by the International Organization for Standardization (ISO).



(DATUK FADILAH BAHARIN)
Director General
Department of Standards Malaysia

Date of issue: 02 July 2018

Issuance of this Certificate is governed by Section 16 Subsections (2) and (3) of Standards of Malaysia Act, 1996 (Act 549)

Water Sampling in Tasik Chini



Water Sampling in Tasik Belum

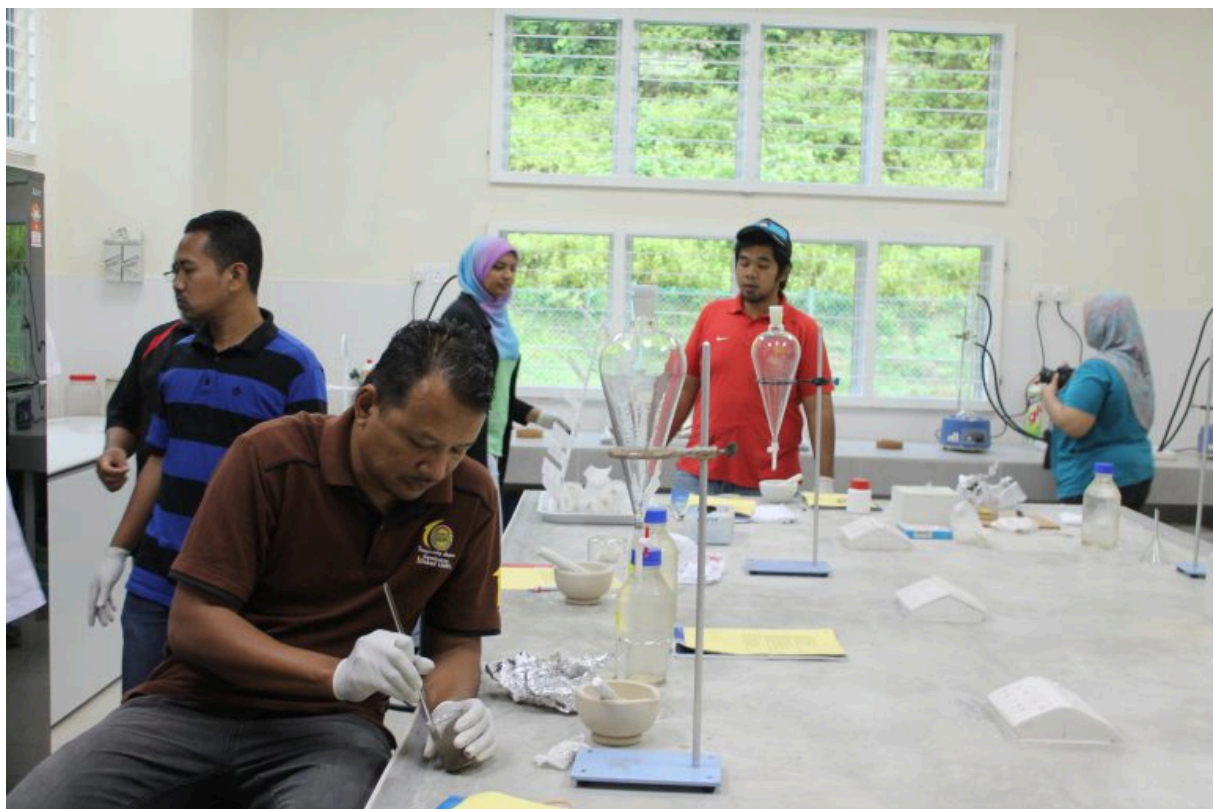


Hydrocarbon Sampling and Analysis Workshop, Langkawi









Workshop on BOD and COD Analysis



Environmental Quality ACT 1974

UKM applied Environmental Quality ACT 1974 – ACT 127 from Department of Environment to prevent water pollution in campus. Prasarana UKM responsible for monitoring water pollution in the campus. There is three section regarding water pollution in the Environmental Quality Act 1974 which is Section 25 Restrictions on pollution of inland waters, Section 27 Prohibition of discharge of oil into Malaysian waters and Section 29 Prohibition of discharge of wastes into Malaysian waters.



UNDANG-UNDANG MALAYSIA

AKTA 127

AKTA KUALITI ALAM SEKELILING, 1974

mengandungi pindaan terkini - Akta A1102/2001

Tarikh Persetujuan Diraja :	8 Mac 1974
Tarikh diterbitkan dalam Warta :	16 Mac 1974
Tarikh mula berkuatkuasa ditetapkan:	15 April 1975 (P.U. (B) 11375)

SUSUNAN SEKSYEN

[Tajuk Panjang & Mukadimah](#)

BAHAGIAN I - PERMULAAN

Seksyen 1. [Tajuk ringkas, pemakaian dan mula berkuatkuasa.](#)

Seksyen 2. [Tafsiran.](#)

BAHAGIAN II - PENTADBIRAN

Seksyen 3. [Ketua Pengarah dan lain-lain pegawai.](#)

Seksyen 4. [Pensyukan Majlis Kualiti Alam Sekeliling.](#)

Seksyen 5. [Tempoh jawatan dan kelayakan untuk dilantik semula.](#)

Seksyen 6. [Hilang kelayakan, meletakkan jawatan dan mengosongkan jawatan.](#)

Seksyen 7. [Memanggil mesyuarat, koram, pengundian, acara dan minit.](#)

Seksyen 8. [Pegawai yang mempengerusikan mesyuarat-mesyuarat Majlis.](#)

Seksyen 9. [Saraan.](#)

Rainwater Harvesting

UKM measures the consumption of water supplied from the main supplier or from underground water sources. Each faculty and college, water use will be monitored for every month. The main reservoir of treated water in UKM located

in Neighborhoods 1 and 2. The water supply is treated by LUAS and it is a source of clean water supply for UKM citizens.

In addition, UKM applies technological membrane treatment. Recycling cooperation and reuse water with UKM-YSD (Sustainability) (Sime Darby Foundation) Membrane treatment seems to be one of the most effective used as a technology in wastewater treatment systems and a relatively high recovery rate height. Furthermore, to further improve the water quality up to the standard can be reused and recycled, it is suggested that the process membrane (nanofiltration/reverse osmosis – NF/RO) with appropriate pretreatment used to further treat the effluent after the previous process uses algae.





Water Recycle and Reuse

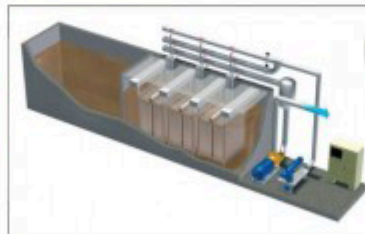
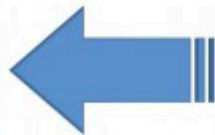


Aims

To develop technology for water recycle and reuse by combining biofilm/bioreactor and membrane technologies

Impacts

- Zero effluent
- Water recycling and reuse
- Reduced water footprint



Deliverables

- Integrated system for water treatment and purification for proof of concept
- Pilot scale testing

SDG 6 Poster

WATANIKA
FACULTY OF
SCIENCE &
TECHNOLOGY

DIVERSITY OF WATER SOURCES ON EARTH

SDG7 AFFORDABLE AND CLEAN ENERGY

- Geoscientists can assist in identifying and designing systems that use renewable energy sources in an environmentally responsible manner.

SDG1 (NO POVERTY)

- Geoscience can both contribute to end water scarcity and be a potential solution.
- The use of geophysics methods can provide useful information for potential underground water resources.

SDG6 CLEAN WATER AND SANITATION

- Access to clean water and sanitation is essential for health and social well-being.
- Geoscientists can contribute significantly by understanding the link between potential polluting activities at the surface water and groundwater quality.

SDG2 (ZERO HUNGER)

- Geoscientists can also contribute to reducing hunger by improving agricultural productivity.
- This works by advising on how to avoid soil degradation, improve soil structure and profiles, retain soil moisture, and sustainably manage land.

Geothermal
RENEWABLES SDN BHD
GAM-STARTUP COMPANY

c/o Strategy-UKM Centre
Office of Pro-Vice
Chancellor
Level 3, Chancellory
Building
Universiti Kebangsaan
Malaysia
43600 UKM Bangi,
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Tel No: 03-8921 3857

Email:

tpestrategi4@ukm.edu.my

Social Media

Last updated on: **7 August
2025**



Office Hour

Monday - Thursday 08:00 -
17:00

(13:00-14:00 Closed)

Friday 08:00 - 17:00

(12:15-14:45 Closed)

Weekend / Public Holiday
Closed

ILMU, MUTU DAN BUDI

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