



KEMENTERIAN SUMBER ASLI
DAN KELESTARIAN ALAM
JABATAN ALAM SEKITAR



Laporan
KUALITI
ALAM SEKELILING
ENVIRONMENTAL QUALITY REPORT
DEPARTMENT OF ENVIRONMENT



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Prakata

PREFACE

Saya amat berbesar hati untuk membentangkan Laporan Kualiti Alam Sekeliling 2025 seperti yang dikehendaki di bawah Seksyen 3(1)(i) Akta Kualiti Alam Sekeliling 1974.

Status kualiti udara di Malaysia ditunjukkan menerusi bacaan Indeks Pencemar Udara (IPU). Pada tahun 2025 bacaan IPU status baik adalah sebanyak 50.4% manakala IPU status baik pada tahun 2024 adalah 35.2%. Bacaan IPU sederhana adalah sebanyak 49.4% dan 0.2% adalah tidak sihat pada tahun 2025 untuk seluruh Malaysia.

Status kualiti air sungai yang ditentukan menerusi Indeks Kualiti Air (IKA) menunjukkan penurunan pada tahun 2025. Sebanyak 1,353 stesen pengawasan kualiti air sungai manual yang merangkumi 672 sungai telah dipantau dalam tahun 2025. Peratus bilangan sungai bersih adalah 69% pada tahun 2025 berbanding 71% pada tahun 2024.

Status kualiti air mengikut stesen sungai juga menunjukkan penurunan kepada kualiti air sungai pada stesen-stesen yang dipantau pada tahun 2025. Bilangan stesen sungai yang dikategorikan sebagai bersih adalah 955 (71%) stesen pada tahun 2025 berbanding 973 (72%) stesen pada tahun 2024. Secara umumnya, penurunan kualiti air yang direkodkan pada tahun 2025 adalah disebabkan oleh peningkatan beban pencemaran pada sungai daripada punca tetap dan punca tidak tetap.

It is my pleasure to present the Environmental Quality Report 2025 as required under Section 3(1)(i) of the Environmental Quality Act 1974.

The air quality status is reported in terms of Air Pollutant Index (API). In 2025 the API ranked good was 50.4% while in year 2024 it was 35.2%. The API ranked moderate and unhealthy were 49.4% and 0.2% respectively, throughout Malaysia in 2025.

The river quality in terms of Water Quality Index (WQI) showed a slight decrease in 2025. A total of 1,353 manual river water quality monitoring stations covering 672 rivers were monitored in 2025. The percentage of clean river is 69% in 2025 compared to 71% in 2024.

There has been a decrease in river water quality status by monitored stations in 2025. The numbers of river stations categorised as clean was 955 (71%) of stations in 2025 compared to 973 (72%) stations in the previous year. In general, the decrease in water quality recorded in 2025 is due to an increase in the pollution load on the river from point sources and nonpoint sources.

Pada tahun 2025, pengawasan kualiti air tanah yang dijalankan menunjukkan bahawa semua stesen berada dalam julat nilai pematuhan Standard Kualiti Air Tanah Bagi Rawatan Air Mentah Secara Konvensional (Air Minuman) kecuali bagi parameter besi (Fe), mangan (Mn), arsenik (As) dan sebatian fenol mempunyai peratusan julat nilai pematuhan Standard Kualiti Air Tanah Bagi Rawatan Air Mentah Secara Konvensional (Air Minuman) yang rendah bagi guna tanah tertentu.

Dalam tahun 2025, daripada 368 stesen pengawasan kualiti air marin bagi pantai, muara sungai dan pulau di negara ini, sebanyak 157 stesen adalah terbaik, 69 stesen baik, 138 stesen sederhana dan empat (4) stesen dikategorikan tercemar. Stesen-stesen tercemar ini berada di kawasan muara sungai.

Sebanyak 5,840,761.85 tan metrik buangan terjadual telah dihasilkan pada tahun 2025. Ini mewakili peningkatan keseluruhan sebanyak 8.58% berbanding 5,378,977.55 tan metrik yang dilaporkan pada 2024.

JAS akan terus mengukuhkan dan melaksanakan strategi, program dan aktiviti dengan berkesan dalam menguruskan alam sekitar secara lestari.

In 2025, the results derived from the groundwater quality monitoring showed that all stations were within the Groundwater Quality Standards for Conventional Raw Water Treatment (Drinking Water) values except for iron (Fe), manganese (Mn), arsenic (As) and phenolics which had a low range of Groundwater Quality Standards for Conventional Raw Water Treatment (Drinking Water) value for certain land use.

In 2025, out of the 368 marine water quality monitoring stations at coastal, estuary and islands in the country, 157 stations were excellent, 69 were good, 138 were moderate while the remaining four (4) stations were categorised as poor. The marine water quality stations categorised as poor were located at the estuary.

A total of 5,840,761.85 metric tonnes of scheduled wastes was generated in 2025. This represents an overall increase of 8.58% as compared to 5,378,977.55 metric tonnes reported in 2024.

DOE will continue to strengthen and implement its strategies, programmes and activities effectively in managing the environment sustainably.

*Alam Sekitar, Tanggungjawab Bersama
Environment, Our Shared Responsibility*

KETUA PENGARAH KUALITI ALAM SEKELILING MALAYSIA

Director-General of Environmental Quality Malaysia

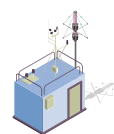




KUALITI UDARA

Air Quality

Stesen pemantauan kualiti udara di seluruh negara /
 Air quality monitoring stations in the country



65

**STESEN
 PEMANTAUAN
 AUTOMATIK**
 Automatic
 Monitoring
 Stations



14

**STESEN
 PEMANTAUAN
 MANUAL**
 Manual
 Monitoring
 Stations



3

**STESEN
 PEMANTAUAN
 BERGERAK**
 Mobile
 Monitoring
 Stations

IPU adalah dikira berdasarkan kepekatan enam (6) bahan pencemar utama /
 The API is calculated based on concentration of six (6) major pollutants:

- » **Ozon di Permukaan Bumi (O₃)**
Ground Level Ozone (O₃)
- » **Karbon Monoksida (CO)**
Carbon Monoxide (CO)
- » **Nitrogen Dioksida (NO₂)**
Nitrogen Dioxide (NO₂)
- » **Sulfur Dioksida (SO₂)**
Sulphur Dioxide (SO₂)
- » **Habuk Halus Bersaiz Kurang dari 10 Mikron (PM₁₀)**
Particulate Matter of Less than 10 Microns in Size (PM₁₀)
- » **Habuk Halus Bersaiz Kurang dari 2.5 Mikron (PM_{2.5})**
Particulate Matter of Less than 2.5 Microns in Size (PM_{2.5})

IPU / API

STATUS KUALITI UDARA / AIR QUALITY STATUS

0-50

» **Baik / Good**



51-100

» **Sederhana / Moderate**



101-200

» **Tidak Sihat / Unhealthy**



201-300

» **Sangat Tidak Sihat / Very Unhealthy**



> 300

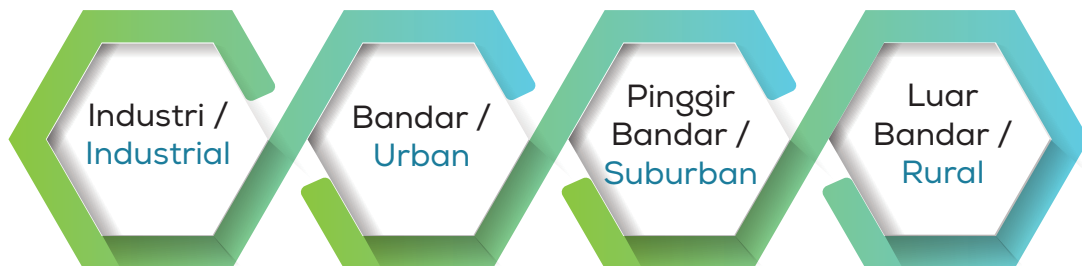
» **Berbahaya / Hazardous**



Indeks Pencemar Udara (IPU) bagi keseluruhan Malaysia pada tahun 2025 menunjukkan peningkatan peratus IPU berstatus baik berbanding tahun 2024

The Air Pollutant Index (API) for Malaysia in 2025 showed an increase in the percentage of API with good status compared to 2024

4 Jenis pengkelasan stesen kualiti udara mengikut guna tanah: Types of classification of air quality stations according to land use:



50.4%

IPU Baik pada tahun 2025 untuk seluruh Malaysia /
Good API throughout Malaysia in 2025

49.4%

IPU Sederhana pada tahun 2025 untuk seluruh Malaysia /
Moderate API throughout Malaysia in 2025

0.2%

IPU Tidak Sihat pada tahun 2025 untuk seluruh Malaysia /
Unhealthy API throughout Malaysia in 2025



PENGAWASAN KUALITI UDARA

Air Quality Monitoring

Program Pengawasan Kualiti Alam Sekitar (EQMP) merupakan program pemantauan kualiti udara, kualiti air sungai dan kualiti air marin di seluruh Malaysia bagi tujuan pelaporan status kualiti alam sekitar negara, selaras dengan usaha Kerajaan untuk memantau, mencegah dan mengawal pencemaran. Sistem pengawasan EQMP juga memainkan peranan sebagai mekanisme amaran awal bagi kejadian pencemaran alam sekitar seperti jerebu, tumpahan minyak di kawasan persisir marin dan pencemaran sungai. Di bawah Program EQMP, terdapat Pusat Data Alam Sekitar yang memaparkan data alam sekitar hampir masa nyata yang dicerap daripada stesen-stesen pengawasan yang dibangunkan oleh JAS.

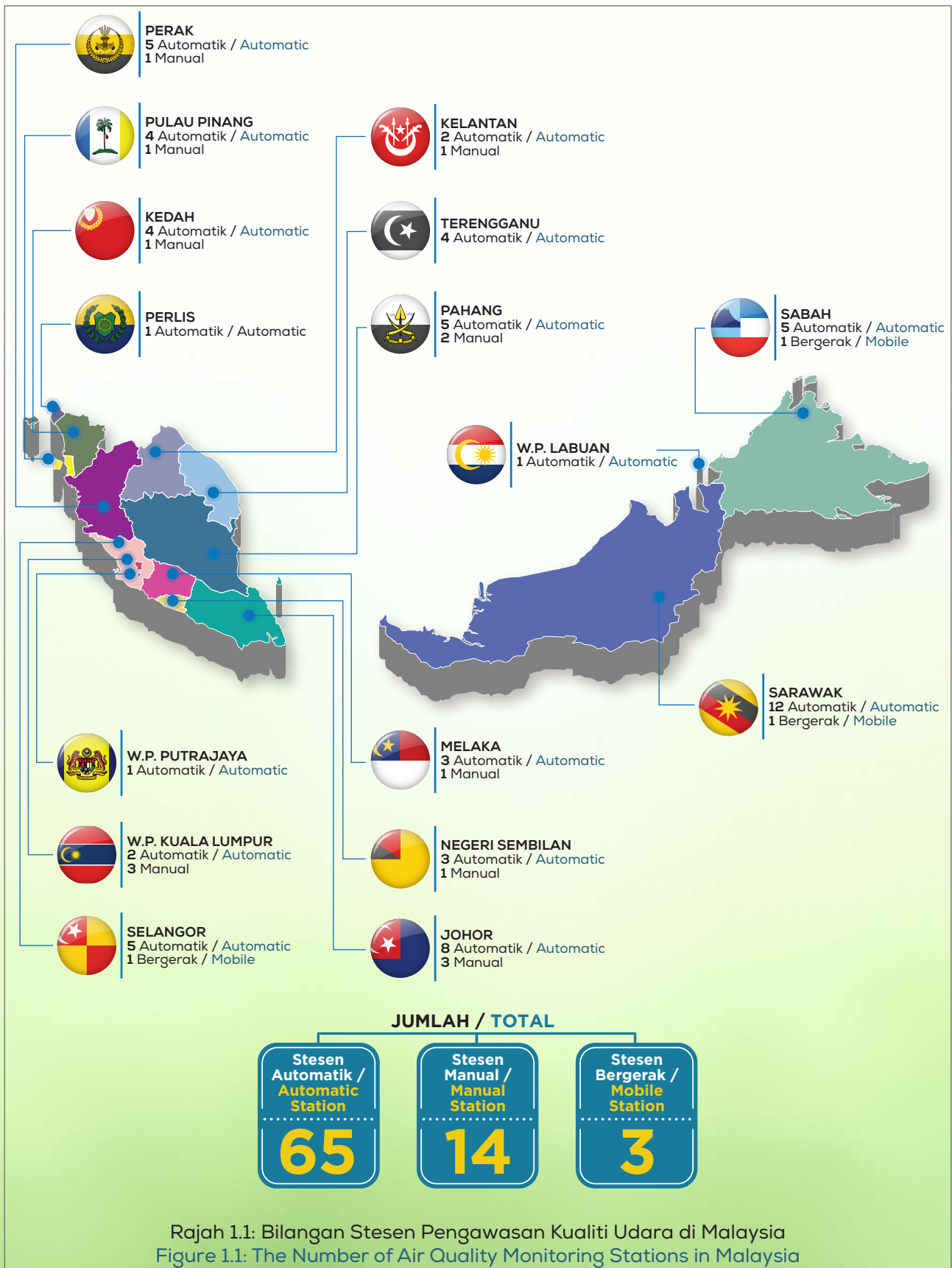
Salah satu komponen di bawah EQMP ialah pengawasan status kualiti udara. Pengawasan status kualiti udara dilaksanakan melalui 65 stesen pengawasan kualiti udara automatik, 14 stesen pengawasan secara manual dan tiga (3) stesen pengawasan kualiti udara bergerak yang masing-masing ditempatkan di Semenanjung Malaysia, Sabah dan Sarawak. EQMP telah memenuhi aspirasi penempatan stesen pengawasan kualiti udara di seluruh negara. **Rajah 1.1** menunjukkan bilangan stesen pengawasan kualiti udara di Malaysia. Lokasi stesen pengawasan kualiti udara seluruh Malaysia pula seperti yang ditunjukkan di dalam **Rajah 1.2**. Perincian rangkaian pengawasan kualiti udara automatik dan manual di seluruh Malaysia adalah seperti yang ditunjukkan dalam **Jadual 1.1**.

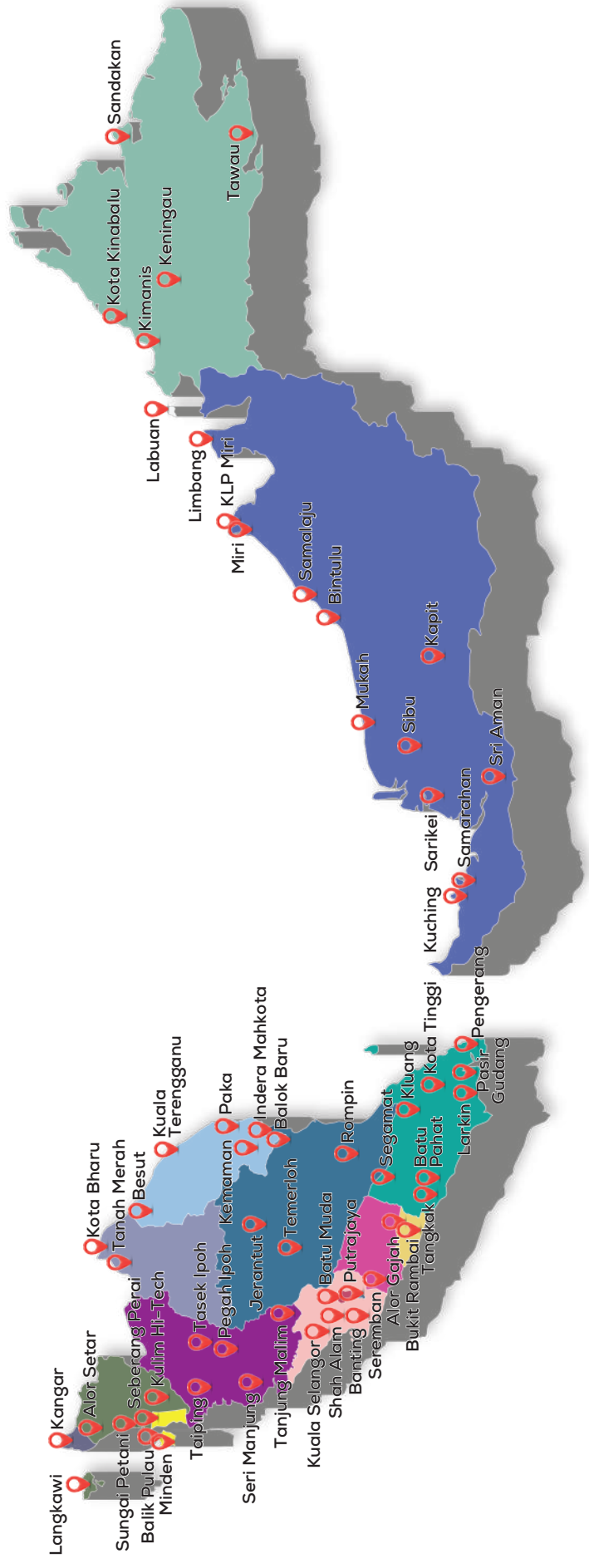
Stesen pengawasan kualiti udara ditempatkan di lokasi yang dikategorikan sebagai kawasan bandar, pinggir bandar, industri dan luar bandar bagi mengesan sebarang perubahan ketara dalam kualiti udara yang berpotensi memberi kesan kepada kesihatan manusia dan alam sekitar. Stesen pengawasan kualiti udara di Keningau, Sabah dikategorikan sebagai stesen latarbelakang yang menjadi penunjuk aras bacaan kualiti udara ambien.

The Environmental Quality Monitoring Programme (EQMP) is a monitoring programme that monitors air quality, river water quality and marine water quality throughout Malaysia for the purpose of reporting the environmental quality status of the country, in line with the Government's efforts to monitor, prevent and control pollution. The EQMP monitoring system also serves as an early warning mechanism for environmental pollution incidents such as haze, oil spills in the coastal areas and river pollution. Under the EQMP Program, there is an Environmental Data Center that displays near real-time environmental data collected from monitoring stations established by the DOE.

One of the components under the EQMP is the monitoring of air quality status. The monitoring of air quality status is conducted on sixty-five (65) automatic air quality monitoring stations, fourteen (14) manual monitoring stations, and three (3) mobile air quality monitoring stations, each placed in Peninsular Malaysia, Sabah and Sarawak. EQMP has fulfilled the aspiration of having air quality monitoring stations throughout the country. Figure 1.1 shows the number of air quality monitoring stations in Malaysia. The location of air quality monitoring stations throughout Malaysia is shown in Figure 1.2. Details of the automatic and manual air quality monitoring network throughout Malaysia are presented in Table 1.1.

Air quality monitoring stations are located in areas categorised as urban, suburban, industrial and rural areas to detect any significant changes in air quality that may affect human health and the environment. The air quality monitoring station located in Keningau, Sabah is categorised as the background station, which serves as the benchmark for ambient air quality.





Rajah 1.2: Lokasi Stesen Pengawasan Udara Automatik dan Manual di Malaysia
Figure 1.2: The Location of Air Quality Monitoring Stations Throughout Malaysia

Jadual 1.1: Rangkaian Pengawasan Kualiti Udara Automatik dan Manual
Table 1.1: Continuous and Manual Air Quality Monitoring Network

STESEN ID/ STATION ID	LOKASI STESEN/ STATION LOCATION	TEMPAT/ PLACE	NEGERI/ STATE
CA01R	Kangar, Perlis	Institut Latihan Perindustrian (Kangar)	Perlis
CA02K	Langkawi, Kedah	Kompleks Sukan Langkawi	Kedah
CA03K	Alor Setar, Kedah	Sek. Men. Agama Kedah	
CA04K	Sungai Petani, Kedah	Sek. Men. Keb. Tunku Ismail	
CA05K	Kulim Hi-Tech, Kedah	Kulim Hitech (TBC)	
CA06P	Seberang Jaya, P. Pinang	Sek.Keb. Seberang Jaya II	P. Pinang
CA07P	Seberang Perai, P. Pinang	Kolej Vokasional Seberang Perai	
CA08P	Minden, P. Pinang	Universiti Sains Malaysia	
CA09P	Balik Pulau, P. Pinang	Kolej Vokasional Balik Pulau	
CA10A	Taiping, Perak	Sek. Keb. Ayer Puteh	Perak
CA11A	Tasek Ipoh, Perak	Sek. Men. Keb. Jalan Tasek	
CA12A	Pegoh Ipoh, Perak	Sek. Keb. Jalan Pegoh	
CA13A	Seri Manjung, Perak	Pejabat Pentadbiran Daerah Manjung	
CA14A	Tanjung Malim, Perak	Universiti Perguruan Sultan Idris	
CA15W	Batu Muda, KL Zon Persekutuan	Sek. Keb. Batu Muda	W.P. Kuala Lumpur
CA16W	Cheras, KL Zon Persekutuan	Sek. Men. Keb. Seri Permaisuri	
CA17W	Putrajaya, Zon Persekutuan	Sek. Keb. Presint 18	
CA18B	Kuala Selangor, Selangor	Sek. Men. Sains Selangor	Selangor
CA19B	Petaling Jaya, Selangor	Sek. Keb. Bandar Utama	
CA20B	Shah Alam, Selangor	Sek. Keb. TTDI Jaya	
CA21B	Klang, Selangor	Klinik Kesihatan Pandamaran	
CA22B	Banting, Selangor	Kolej Mara Banting	
CA23N	Nilai, N. Sembilan	Sek. Keb. Taman Semarak (Fasa 2)	N. Sembilan
CA24N	Seremban, N. Sembilan	Sek. Men. Teknik Tuanku Jaafar	
CA25N	Port Dickson, N. Sembilan	Pusat Sumber Pendidikan N. Sembilan	
CA26M	Alor Gajah, Melaka	Sek. Men. Keb. Seri Pengkalan	Melaka
CA27M	Bukit Rambai, Melaka	Sek. Keb Tanjung Minyak 2	
CA28M	Bandaraya Melaka, Melaka	Sekolah Tinggi Melaka	

Jadual 1.1: Rangkaian Pengawasan Kualiti Udara Automatik dan Manual
 Table 1.1: Continuous and Manual Air Quality Monitoring Network

STESEN ID/ STATION ID	LOKASI STESEN/ STATION LOCATION	TEMPAT/ PLACE	NEGERI/ STATE
CA29J	Segamat, Johor	Klinik Kesihatan Bandar IOI	Johor
CA31J	Batu Pahat, Johor	MRSM Batu Pahat	
CA32J	Kluang, Johor	Kolej Kejururawatan Kluang	
CA33J	Larkin, Johor	Institut Perguruan Temenggong Ibrahim	
CA34J	Pasir Gudang, Johor	Sek. Men. Pasir Gudang 2	
CA35J	Pengerang, Johor	Sek. Keb. Lepau	
CA36J	Kota Tinggi, Johor	Sek. Men. Agama Bandar Penawar	
CA66J	Tangkak, Johor	Tapak Semaian Majlis Daerah Tangkak	
CA37C	Rompin, Pahang	Sek. Men. Keb. Seri Rompin	Pahang
CA38C	Temerloh, Pahang	Pejabat Meteorologi Temerloh	
CA39C	Jerantut, Pahang	Sek. Men. Keb. Jerantut	
CA40C	Indera Mahkota, Kuantan, Pahang	Sek. Keb. Indera Mahkota	
CA41C	Balok Baru, Kuantan, Pahang	Sek. Keb. Balok Baru	
CA42T	Kemaman, Terengganu	Sek. Men. Keb. Bukit Kuang	Terengganu
CA43T	Paka, Terengganu	Kuarters TNB Paka	
CA44T	Kuala Terengganu, Terengganu	Sek. Keb. Chabang Tiga	
CA45T	Besut, Terengganu	Sek. Keb. Nyiur Tujuh	
CA46D	Tanah Merah, Kelantan	Sek. Men. Tanah Merah	Kelantan
CA47D	Kota Bharu, Kelantan	Sek. Men. Keb. Tanjong Chat	
CA48S	Tawau, Sabah	Pejabat JKR Tawau	Sabah
CA49S	Sandakan, Sabah	Pejabat JKR Sandakan	
CA50S	Kota Kinabalu, Sabah	Sek. Men. Keb. Tansau, Kota Kinabalu	
CA51S	Kimanis, Sabah	Sek. Men. Keb. Bongawan II	
CA52S	Keningau, Sabah	Sek. Men. Keb. Gunsanad	
CA53L	W. P. Labuan, Zon Persekutuan	Kolej Vokasional	W.P. Labuan
CA54Q	Limbang, Sarawak	Dewan Suarah Limbang	Sarawak
CA55Q	Permyjaya, Miri, Sarawak	Institut Latihan Perindustrian Miri	
CA56Q	Miri, Sarawak	Sek. Men. Dato Permaisuri	
CA57Q	Samalaju, Sarawak	Samalaju Industrial Estate	
CA58Q	Bintulu, Sarawak	Balai Polis Pusat Bintulu	
CA59Q	Mukah, Sarawak	Politeknik Mukah	
CA60Q	Kapit, Sarawak	Stadium Tertutup Kapit	

Jadual 1.1: Rangkaian Pengawasan Kualiti Udara Automatik dan Manual
Table 1.1: Continuous and Manual Air Quality Monitoring Network

STESEN ID/ STATION ID	LOKASI STESEN/ STATION LOCATION	TEMPAT/ PLACE	NEGERI/ STATE
CA61Q	Sibu, Sarawak	Ibu Pejabat Polis Sibu	Sarawak
CA62Q	Sarikei, Sarawak	Balai Polis Pusat Sarikei	
CA63Q	Sri Aman, Sarawak	Kompleks Sukan Sri Aman	
CA64Q	Samarahan, Sarawak	Pejabat Daerah Perumahan Samarahan	
CA65Q	Kuching, Sarawak	Depot Ubat Kementerian Kesihatan Malaysia	
MCAQM001	Klang, Selangor	Sek. Keb. Kampung Johan Setia, Selangor	Selangor
MCAQM002	Serian, Sarawak	IPD Serian, Sarawak	Sarawak
MCAQM003	Kota Kinabalu, Sabah	Politeknik Kota Kinabalu, Sabah	Sabah
MA01K	Alor Setar, Kedah	Sek. Men. Keb. Agama Kedah	Kedah
MA02P	Perai, P. Pinang	Pejabat Meteorologi Perai	P. Pinang
MA03A	Ipoh, Perak	Balai Polis Bukit Merah	Perak
MA04W	MRR1, W.P. Kuala Lumpur	Klinik Kesihatan Kuala Lumpur	W.P. Kuala Lumpur
MA05W	Pusat Bandar, W.P. Kuala Lumpur	Taman Pudu Ulu, Cheras	
MA06W	Jalan Raja Laut, W.P. Kuala Lumpur	Bangunan Dewan Bandaraya KL	
MA07N	Senawang, N. Sembilan	Sek. Keb. Senawang	N. Sembilan
MA08M	Bukit Rambai, Melaka	Alam-Con Sdn Bhd. Bukit Rambai	Melaka
MA09J	Batu Pahat, Johor	Universiti Tun Hussein Onn	Johor
MA10J	Gelang Patah, Johor	Sek. Men. Keb. Gelang Patah	
MA11J	Pasir Gudang, Johor	PUSPATRI Pasir Gudang	
MA12C	Kuantan, Pahang	Kuantan Port	Pahang
MA13C	Temerloh, Pahang	Bangunan Majlis Perbandaran Temerloh	
MA14D	Gua Musang, Kelantan	Masjid Gua Musang	Kelantan
MA15M	Jasin, Melaka	Xinyi Energy Glass Sdn Bhd, Jasin Melaka	Melaka

STATUS KUALITI UDARA

Air Quality Status

Status kualiti udara di Malaysia dilaporkan dengan Indeks Pencemar Udara (IPU). Bacaan IPU seluruh negara telah dipaparkan melalui laman sesawang Jabatan Alam Sekitar, *Malaysia Environmental Quality Management System (MyEQMS)*. IPU adalah dikira berdasarkan kepekatan enam (6) bahan pencemar utama, iaitu ozon di permukaan bumi (O_3), karbon monoksida (CO), nitrogen dioksida (NO_2), sulfur dioksida (SO_2), habuk halus bersaiz kurang dari 10 mikron (PM_{10}) dan habuk halus bersaiz kurang dari 2.5 mikron ($PM_{2.5}$). Pengiraan IPU adalah seperti pada **ANNEX I**. Berdasarkan IPU, kualiti udara dikategorikan sebagai baik, sederhana, tidak sihat, sangat tidak sihat dan berbahaya seperti yang dinyatakan dalam **Jadual 1.2**.

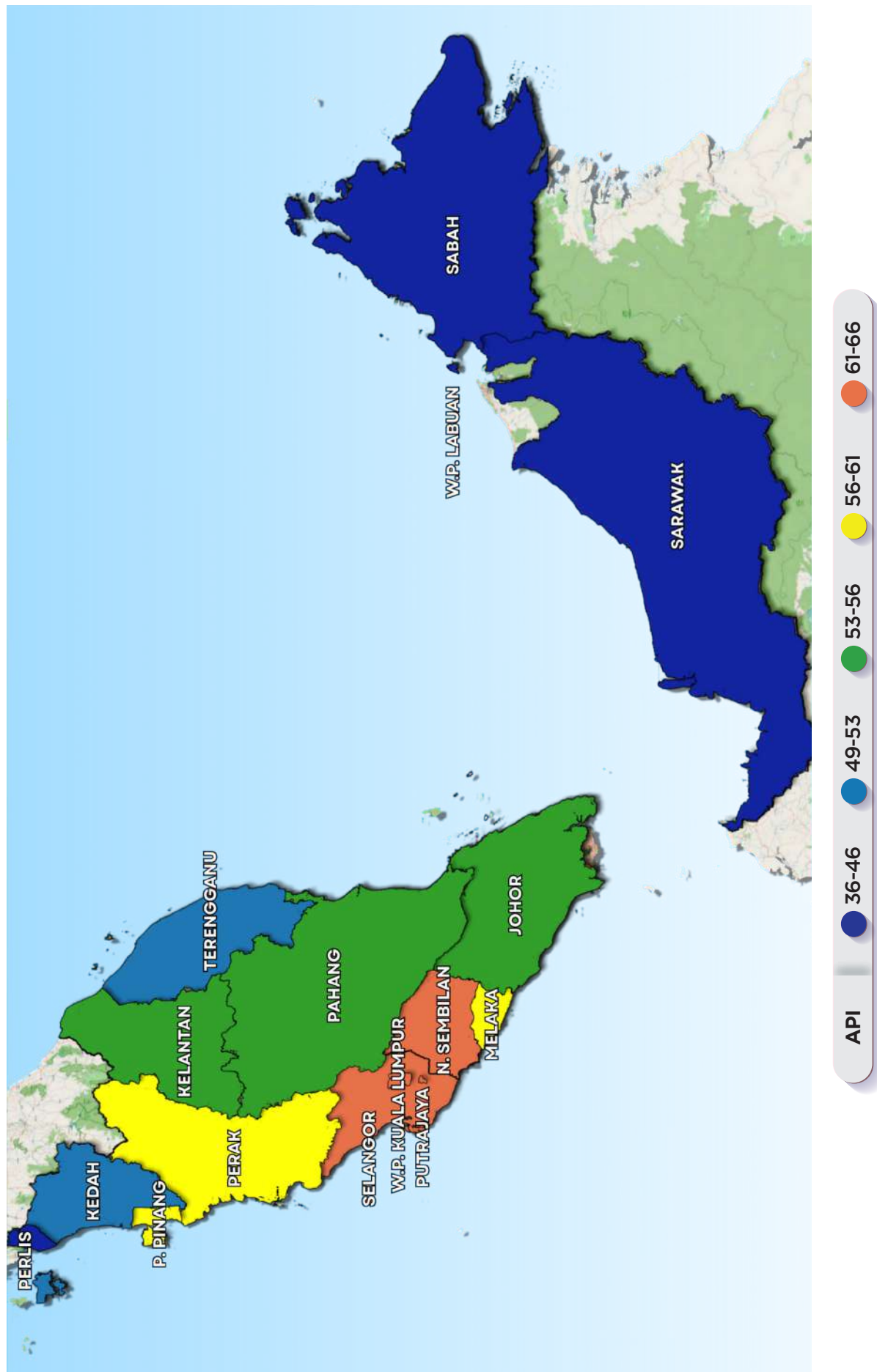
The air quality status in Malaysia is reported using the Air Pollution Index (API). The API for the whole country is displayed on the website of the Department of Environment, Malaysia Environmental Quality Management System (MyEQMS). The API is calculated based on the concentration of six (6) main pollutants, namely ozone at the ground level (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particulate matter less than 10 microns in size (PM_{10}) and particulate matter less than 2.5 microns in size ($PM_{2.5}$). The API calculation is shown in the **ANNEX I**. Based on the API, air quality is categorised as good, moderate, unhealthy, very unhealthy, and hazardous as stated in **Table 1.2**.

Jadual 1.2: Indeks Pencemar Udara (IPU)
Table 1.2: Air Pollutant Index (API)

IPU / API	STATUS KUALITI UDARA / AIR QUALITY STATUS
0 – 50	Baik / Good
51 – 100	Sederhana / Moderate
101 – 200	Tidak Sihat / Unhealthy
201 – 300	Sangat Tidak Sihat / Very Unhealthy
> 300	Berbahaya / Hazardous

Pada tahun 2025, sebanyak 50.4% bacaan IPU berada dalam kategori 'baik', berbanding dengan 35.2% pada tahun 2024. Bacaan IPU yang dikategorikan sebagai 'sederhana' dan 'tidak sihat' adalah sebanyak 49.4% dan 0.2% di seluruh Malaysia pada tahun 2025. **Rajah 1.3** menunjukkan purata bacaan IPU sepanjang 2025 di Malaysia.

In 2025, 50.4% of API readings were in the 'good' category, compared to 35.2% in 2024. The API readings ranked as 'moderate' and 'unhealthy' were 49.4% and 0.2% respectively throughout Malaysia in 2025. **Figure 1.3** shows the average API in Malaysia for the year 2025.



Rajah 1.3: Purata Indeks Pencemar Udara (IPU) 2025 di Malaysia
Figure 1.3: The Average 2025 API in Malaysia

Status Kualiti Udara di Lembah Klang

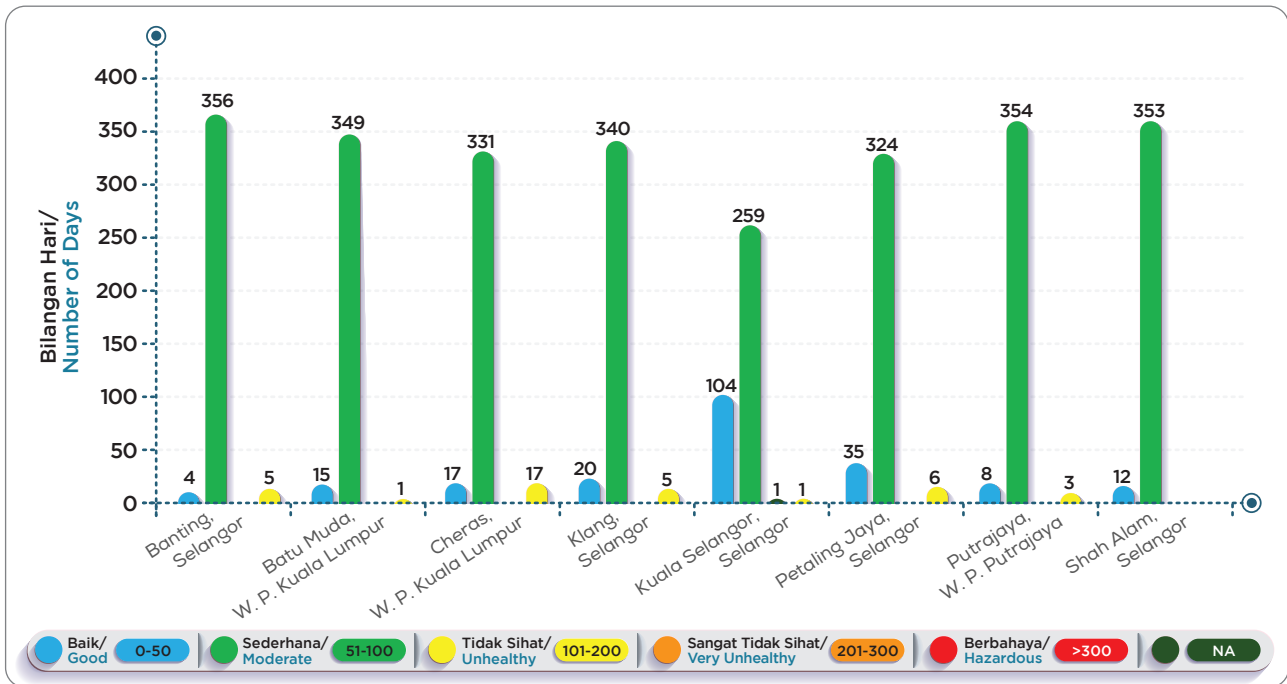
Pada tahun 2025, status kualiti udara di Lembah Klang menunjukkan semua stesen mencatatkan bilangan hari IPU sederhana yang lebih tinggi berbanding hari IPU baik. Status kualiti udara di Lembah Klang secara keseluruhannya ditunjukkan seperti di **Rajah 1.4**. Stesen Kuala Selangor mencatatkan bilangan hari IPU baik yang tertinggi di Lembah Klang iaitu 104 hari manakala Stesen Banting mencatatkan bilangan hari IPU sederhana yang tertinggi iaitu 356 hari.

Stesen Cheras, Kuala Lumpur mencatatkan bilangan hari IPU tidak sihat yang tertinggi di Lembah Klang iaitu 17 hari diikuti oleh Stesen Petaling Jaya (6 hari), Stesen Klang dan Stesen Banting (5 hari), dan Stesen Putrajaya (3 hari) seperti yang ditunjukkan di dalam **Rajah 1.5**. Bilangan hari IPU tidak sihat yang direkodkan di beberapa stesen di Lembah Klang pada tahun 2025 adalah berpunca daripada insiden jerebu rentas sempadan, pembakaran terbuka di sekitar stesen serta pembentukan O_3 akibat pelepasan gas kenderaan di kawasan trafik tinggi.

Air Quality Status in Klang Valley

In 2025, the air quality status in the Klang Valley showed that all stations recorded higher 'moderate' API days than 'good' API days. The overall status of air quality in the Klang Valley is shown in **Figure 1.4**. Kuala Selangor station recorded the highest number of 'good' API readings in Klang Valley, which was 104 days, while the Banting station recorded the highest number of 'moderate' API readings of 356 days.

The Cheras Station in Kuala Lumpur recorded the highest number of 'unhealthy' API days in the Klang Valley, with 17 days, followed by Petaling Jaya (6 days), Klang and Banting Station (5 days), and Putrajaya Station (3 days), as shown in **Figure 1.5**. The number of 'unhealthy' API days recorded at several stations in the Klang Valley in 2025 was attributed to transboundary haze incidents, open burning activities in surrounding areas, as well as O_3 formation from vehicle emissions in high-traffic areas.

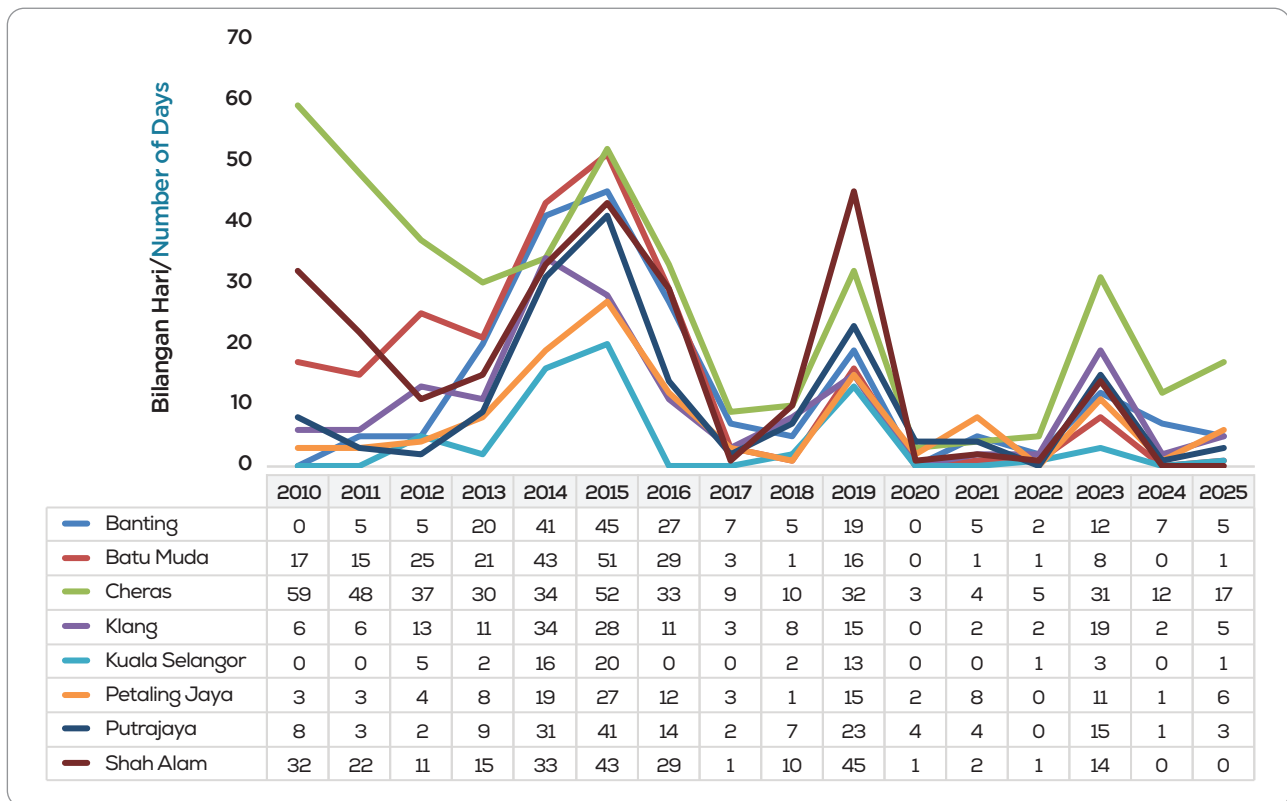


Rajah 1.4: Status Kualiti Udara, Lembah Klang 2025

Figure 1.4: Air Quality Status, Klang Valley 2025

*NA = Tidak Diperoleh; mewakili tempoh data yang tidak diperoleh semasa penyelenggaraan peralatan.

*NA = Not Available; represents data unavailability during equipment maintenance



Rajah 1.5: Bilangan Hari Tidak Sihat, Lembah Klang, 2010 - 2025

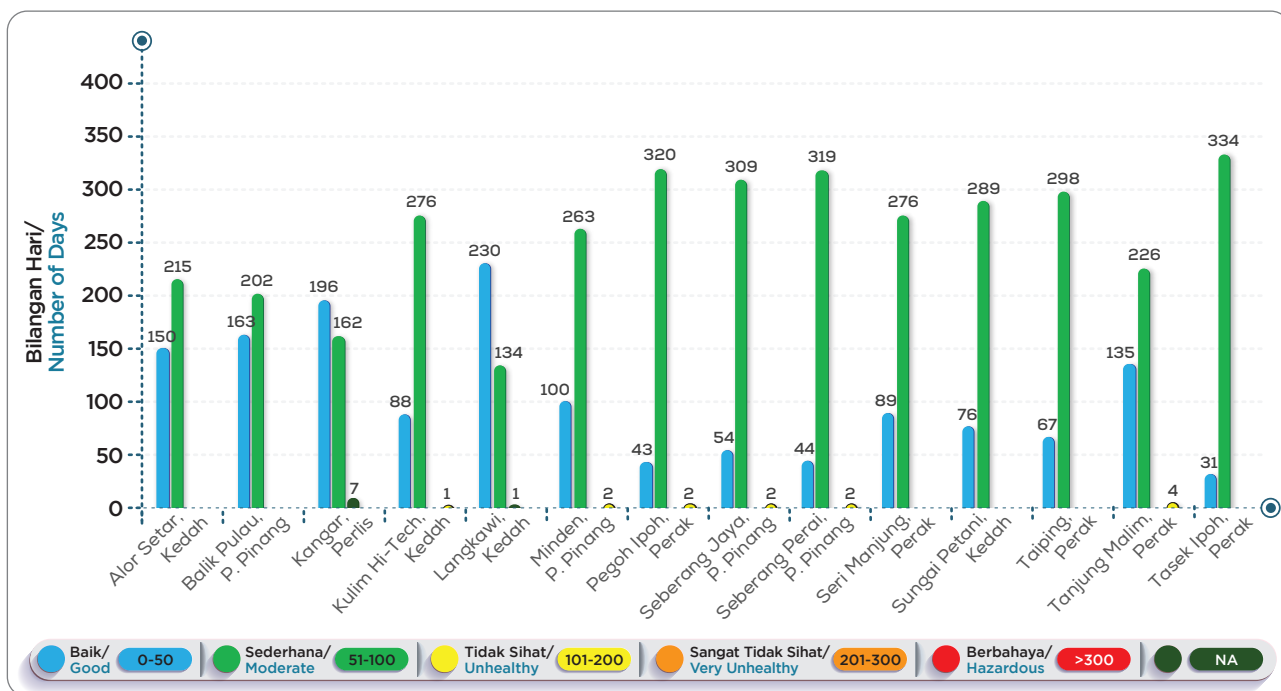
Figure 1.5: Number of Unhealthy Days, Klang Valley 2010 - 2025

Status Kualiti Udara di Wilayah Utara

Secara keseluruhan, status kualiti udara di wilayah utara di pantai barat Semenanjung Malaysia yang meliputi negeri Perlis, Kedah, Pulau Pinang dan Perak berada dalam kategori Baik hingga Sederhana. Stesen Langkawi, Kedah mencatatkan bilangan hari IPU 'baik' yang lebih tinggi (230 hari) berbanding stesen-stesen yang lain, manakala Stesen Tasek Ipoh mencatatkan bilangan hari IPU 'sederhana' tertinggi, iaitu 334 hari. Sebanyak enam (6) stesen mencatatkan bilangan hari IPU 'tidak sihat' di wilayah Utara Pantai Barat Semenanjung Malaysia: Kulim High Tech (1 hari) di Kedah; Minden (2 hari), Seberang Jaya (2 hari) dan Seberang Perai (2 hari) di Pulau Pinang; Pegoh Ipoh (2 hari) dan Tanjung Malim (4 hari) di Perak. Punca utama yang menyebabkan hari 'tidak sihat' ialah insiden jerebu rentas sempadan, habuk halus $PM_{2.5}$ daripada pembakaran terbuka dan peningkatan kepekatan ozon daripada pelepasan asap kenderaan bermotor. Status kualiti udara keseluruhan bagi wilayah utara di Pantai Barat Semenanjung Malaysia adalah seperti yang ditunjukkan di dalam **Rajah 1.6**.

Air Quality Status in Northern Region

Overall, the air quality in the Northern region of the West Coast of Peninsular Malaysia, comprising the states of Perlis, Kedah, Pulau Pinang, and Perak, was within the "Good" to "Moderate" categories. The Langkawi Station in Kedah recorded a higher number of 'Good' API days (230 days) compared to other stations, while the Tasek Ipoh Station in Perak recorded the highest number of 'Moderate' API days with 334 days. A total of six (6) stations recorded 'unhealthy' API days in the Northern region of the West Coast of Peninsular Malaysia: Kulim High Tech in Kedah (1 day); Minden (2 days), Seberang Jaya (2 days) and Seberang Perai in Pulau Pinang (2 days); Pegoh Ipoh (2 days), and Tanjung Malim in Perak (4 days). The main causes of 'unhealthy' days were transboundary haze incidents, $PM_{2.5}$ particulate matter from open burning and increase in ozone concentrations from motor vehicle emissions. The overall air quality status for the northern region of the West Coast of Peninsular Malaysia is as shown in **Figure 1.6**.



Rajah 1.6: Status Kualiti Udara, Wilayah Utara Pantai Barat Semenanjung Malaysia, 2025
Figure 1.6: Air Quality Status, Northern Region of The West Coast of Peninsular Malaysia, 2025

*NA = Tidak Diperoleh; mewakili tempoh data yang tidak diperoleh semasa penyelenggaraan peralatan.

*NA = Not Available; represents data unavailability during equipment maintenance.

Status Kualiti Udara di Wilayah Selatan

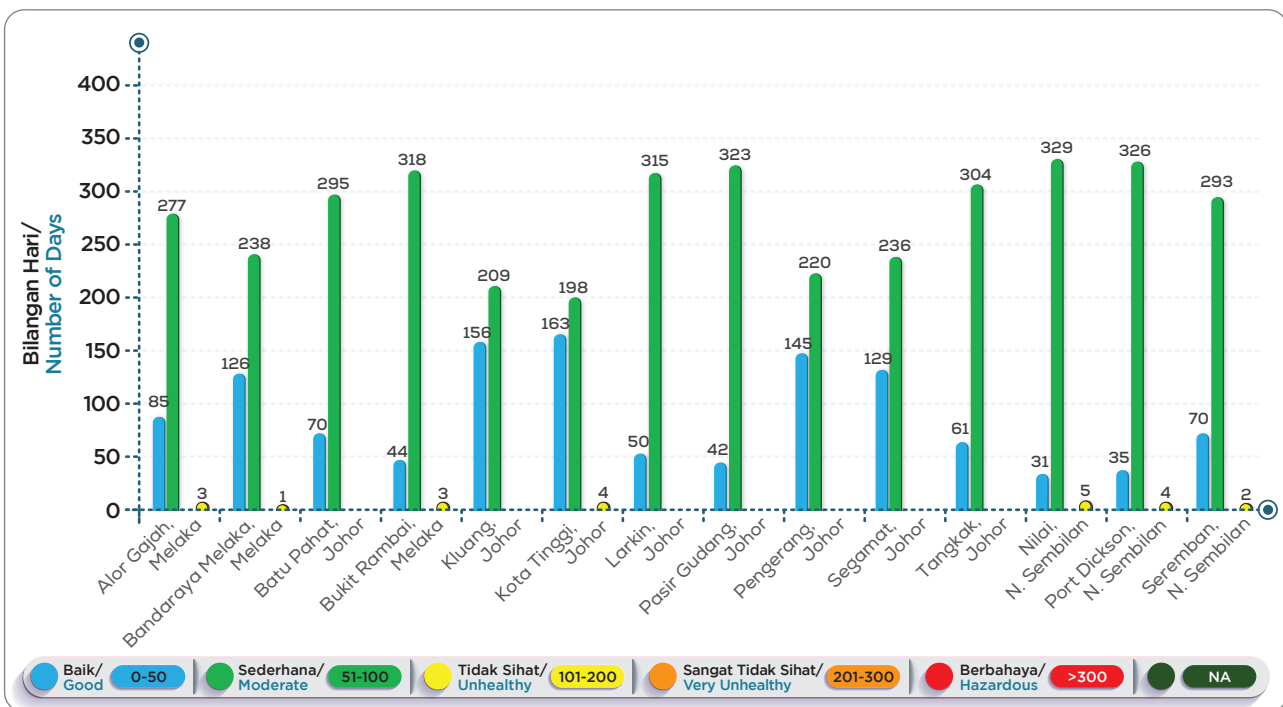
Kualiti udara di Wilayah Selatan Pantai Barat Semenanjung Malaysia meliputi Negeri Sembilan, Melaka dan Johor. Stesen Kota Tinggi, Johor mencatatkan bilangan hari IPU baik yang tertinggi iaitu 163 hari manakala Stesen Nilai mencatatkan bilangan hari IPU sederhana tertinggi iaitu 329 hari. Stesen Alor Gajah, stesen Bandaraya Melaka, stesen Bukit Rambai, stesen Kota Tinggi, stesen Nilai, stesen Port Dickson dan stesen Seremban telah mencatatkan bilangan hari IPU tidak sihat pada tahun 2025.

Kawasan yang merekodkan bacaan IPU tidak sihat tertinggi adalah di Nilai (5 hari) dan Port Dickson (4 hari), Negeri Sembilan dan Kota Tinggi (4 hari), Johor. Peningkatan bilangan hari IPU yang 'tidak sihat' ini adalah disebabkan oleh kejadian jerebu rentas sempadan serta pembentukan O_3 di atmosfera, hasil daripada kepadatan trafik yang tinggi. Status kualiti udara secara keseluruhan bagi wilayah selatan di Pantai Barat Semenanjung Malaysia adalah seperti yang ditunjukkan di dalam Rajah 1.7.

Air Quality Status in Southern Region

The air quality in the Southern Region of the West Coast of Peninsular Malaysia comprises the states of Negeri Sembilan, Melaka and Johor. The Kota Tinggi Station in Johor recorded the highest number of 'good' API days of 163 days while the Nilai Station recorded the highest number of 'moderate' API days of 329 days. Alor Gajah Station, Bandaraya Melaka Station, Bukit Rambai Station, Kota Tinggi Station, Nilai Station, Port Dickson Station and Seremban Station recorded 'unhealthy' API days in 2025.

The areas that recorded the highest 'unhealthy' daily API readings were at Nilai (5 days) and Port Dickson (4 days), Negeri Sembilan and Kota Tinggi (4 days), Johor. This increase in the number of 'unhealthy' API days was due to transboundary haze and O_3 formation in the atmosphere resulting from high-density traffic. The overall air quality status for the Southern Region of the West Coast of Peninsular Malaysia is as shown in Figure 1.7.



Rajah 1.7: Status Kualiti Udara, Wilayah Selatan Pantai Barat Semenanjung Malaysia, 2025
Figure 1.7: Air Quality Status, Southern Region of The West Coast of Peninsular Malaysia, 2025

*NA = Tidak Diperoleh; mewakili tempoh data yang tidak diperoleh semasa penyelenggaraan peralatan.

*NA = Not Available; represents data unavailability during equipment maintenance.

Status Kualiti Udara di Pantai Timur

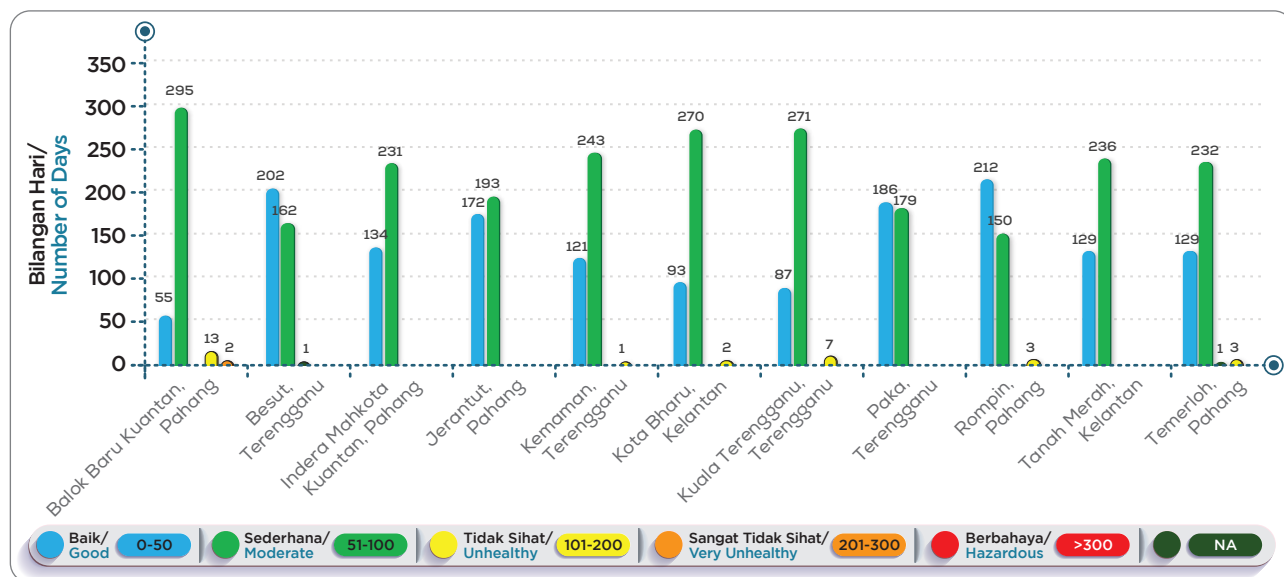
Kualiti udara di Pantai Timur Semenanjung Malaysia merangkumi negeri Pahang, Terengganu dan Kelantan. Stesen Rompin, Pahang mencatatkan bilangan hari IPU baik tertinggi iaitu 212 hari. Stesen Balok Baru Kuantan, Pahang merekodkan bilangan hari IPU sederhana tertinggi iaitu 295 hari. Sebanyak enam (6) stesen di Pantai Timur Semenanjung Malaysia telah merekodkan hari IPU 'tidak sihat' pada tahun 2025. Stesen-stesen ini ialah: Stesen Balok Baru Kuantan (13 hari), Stesen Rompin (3 hari), Stesen Temerloh (3 hari) di Pahang; Stesen Kuala Terengganu (7 hari), Kemaman (1 hari) di Terengganu dan Stesen Kota Bharu sebanyak dua (2) hari di Kelantan. Satu stesen, Stesen Balok Baru Kuantan, merekodkan bacaan IPU 'sangat tidak sihat' untuk dua (2) hari pada tahun 2025.

Pantai Timur Semenanjung Malaysia, khususnya Kelantan dan Terengganu, telah menerima kesan jerebu rentas sempadan pada tahun 2025. Selain itu, Rompin dan Balok turut menerima kesan daripada kebakaran hutan tanah gambut di Pantai Timur Semenanjung Malaysia. Bagi Stesen Balok Baru, bacaan IPU tidak sihat juga dipengaruhi oleh peningkatan kepekatan gas sulfur dioksida (SO₂) yang berpunca daripada kawasan perindustrian berhampiran. Status kualiti udara di Pantai Timur Semenanjung Malaysia secara keseluruhan adalah seperti di Rajah 1.8.

Air Quality Status in East Coast

Air quality in the East Coast of Peninsular Malaysia covers the states of Pahang, Terengganu and Kelantan. The Rompin Station in Pahang recorded the highest number of 'good' API days, totaling 212 days. Meanwhile, the Balok Baru Kuantan Station in Pahang recorded the highest number of 'moderate' API days, at 295 days. A total of six (6) stations in the East Coast of Peninsular Malaysia recorded 'unhealthy' API days in 2025. These stations were: Balok Baru Kuantan Station (13 days), Rompin Station (3 days), and Temerloh Station (3 days) in Pahang; Kuala Terengganu Station (7 days) and Kemaman Station (1 day) in Terengganu; and the Kota Bharu Station with two (2) days in Kelantan. One station, namely the Balok Baru Kuantan Station, recorded 'very unhealthy' API readings for two (2) days in 2025.

The East Coast of Peninsular Malaysia, particularly Kelantan and Terengganu, was also affected by transboundary haze in 2025. In addition, Rompin and Balok were also affected by peat forest fires in the East Coast of Peninsular Malaysia. At the Balok Baru Station, the 'unhealthy' API readings were also influenced by increased sulphur dioxide (SO₂) concentrations originating from nearby industrial areas. The overall air quality status for the East Coast of Peninsular Malaysia is as shown in Figure 1.8.



Rajah 1.8: Status Kualiti Udara, Pantai Timur Semenanjung Malaysia, 2025
Figure 1.8: Air Quality Status, East Coast of Peninsular Malaysia, 2025

*NA = Tidak Diperoleh; mewakili tempoh data yang tidak diperoleh semasa penyelenggaraan peralatan.

*NA = Not Available; represents data unavailability during equipment maintenance.

Status Kualiti Udara di Sabah, Wilayah Persekutuan Labuan dan Sarawak

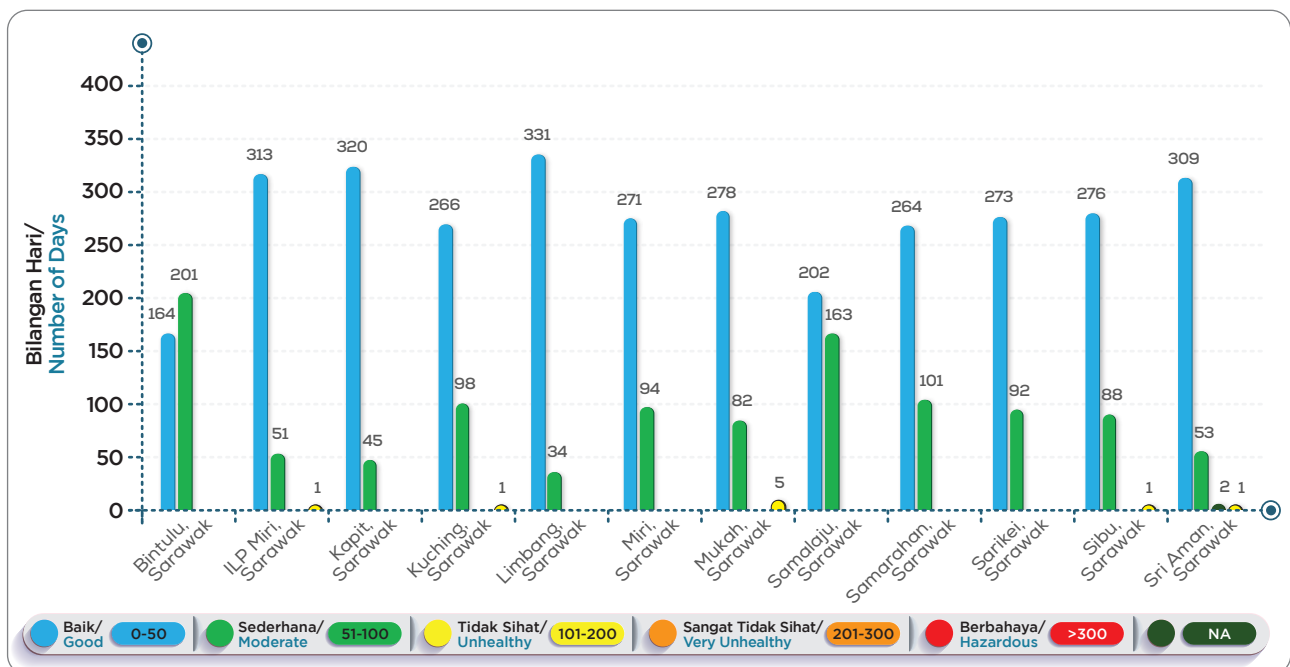
Air Quality Status in Sabah, Federal Territory Labuan and Sarawak

Kualiti udara di Sabah, Wilayah Persekutuan Labuan dan Sarawak adalah pada tahap 'baik' dan 'sederhana' kebanyakan masa bagi tahun 2025 kecuali Stesen Mukah merekodkan lima (5) hari IPU 'tidak sihat', diikuti dengan Stesen ILP Miri, Kuching, Sibul dan Sri Aman di Sarawak, masing-masing merekodkan satu hari IPU 'tidak sihat'. Stesen Limbang merekodkan bilangan hari IPU 'baik' yang paling tinggi di Sarawak iaitu 331 hari, manakala Stesen Kimanis merekodkan bilangan hari IPU 'baik' tertinggi di Sabah iaitu 334 hari. Stesen Labuan melaporkan bilangan hari IPU 'baik' lebih tinggi iaitu 228 hari berbanding hari IPU 'sederhana' sebanyak 137 hari.

Punca utama hari IPU 'tidak sihat' adalah jerebu rentas sempadan serta kebakaran tanah gambut khususnya di Mukah dan Miri, Sarawak. Status kualiti udara di Sarawak secara keseluruhan ditunjukkan dalam Rajah 1.9 dan di Sabah dan Wilayah Persekutuan Labuan ditunjukkan dalam Rajah 1.10.

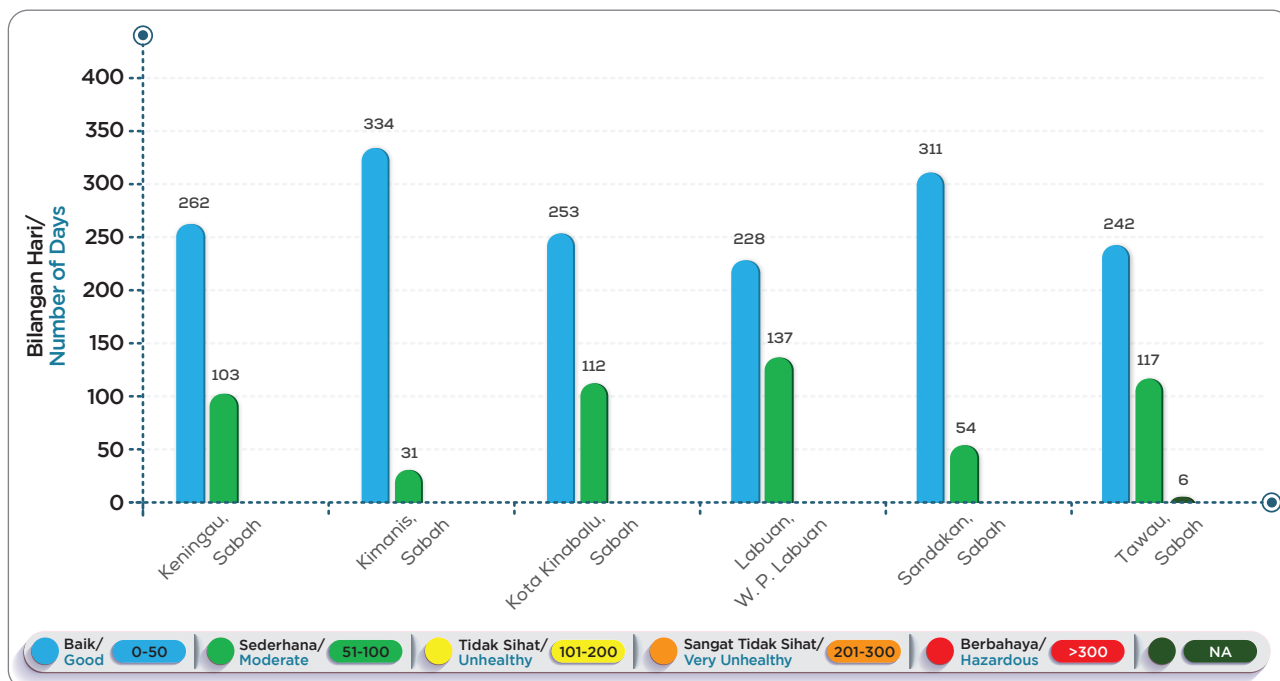
The air quality in Sabah, the Federal Territory of Labuan, and Sarawak was at 'good' and 'moderate' levels for most of 2025, except for the Mukah Station, which recorded five (5) 'unhealthy' API days, followed by the ILP Miri, Kuching, Sibul, and Sri Aman Stations in Sarawak, which each recorded one 'unhealthy' API day. The Limbang Station recorded the highest number of 'good' API days in Sarawak at 331 days, while the Kimanis Station recorded the highest number of 'good' API days in Sabah at 334 days. The Labuan Station reported a higher number of 'good' API days at 228 days compared to 137 'moderate' API days.

The primary cause of 'unhealthy' API days was transboundary haze and peatland fires, particularly in Mukah and Miri, Sarawak. The overall air quality status for Sarawak is shown in Figure 1.9, while the status for Sabah and the Federal Territory of Labuan is presented in Figure 1.10.



Rajah 1.9: Status Kualiti Udara, Sarawak, 2025
Figure 1.9: Air Quality Status, Sarawak, 2025

*NA = Tidak Diperoleh; mewakili tempoh data yang tidak diperoleh semasa penyelenggaraan peralatan.
*NA = Not Available; represents data unavailability during equipment maintenance.



Rajah 1.10: Status Kualiti Udara, Sabah dan Wilayah Persekutuan Labuan, 2025
Figure 1.10: Air Quality Status, Sabah and Federal Territory Labuan, 2025

*NA = Tidak Diperoleh; mewakili tempoh data yang tidak diperoleh semasa penyelenggaraan peralatan.

*NA = Not Available; represents data unavailability during equipment maintenance.

TREND KUALITI UDARA

Air Quality Trends

Enam (6) pencemar udara kriteria iaitu habuk halus berdiameter kurang daripada 10 mikron (PM_{10}), habuk halus berdiameter kurang daripada 2.5 mikron ($PM_{2.5}$), ozon permukaan bumi (O_3), sulfur dioksida (SO_2), nitrogen dioksida (NO_2) dan karbon monoksida (CO) dipantau secara berterusan di 65 lokasi di seluruh negara. Parameter $PM_{2.5}$ mula dipantau pada tahun 2017. Tren kualiti udara dari tahun 2010 hingga 2025 ditentukan dengan mengambil kira purata data kualiti udara tahunan daripada stesen-stesen pengawasan serta merujuk kepada Standard Kualiti Udara Ambien Malaysia seperti yang ditunjukkan dalam Jadual 1.3. Pada tahun 2025, Malaysia mengguna pakai kategori Interim Target-2 (IT-2) di bawah Standard Kualiti Udara Ambien Malaysia sebagai rujukan dalam penetapan dan pemantauan tahap kualiti udara ambien.

Six (6) criteria air pollutants, namely particulate matter with a diameter of less than 10 microns (PM_{10}), particulate matter with a diameter of less than 2.5 microns ($PM_{2.5}$), ground-level ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and carbon monoxide (CO), are monitored continuously at 65 locations nationwide. The $PM_{2.5}$ parameter was first monitored in 2017. Air quality trends from 2010 to 2025 were determined by taking into account the average annual air quality data from all the monitoring stations and by referring to the Malaysian Ambient Air Quality Standard as shown in Table 1.3. In 2025, Malaysia adopted the Interim Target-2 (IT-2) category under the Malaysian Ambient Air Quality Standard as the reference for setting and monitoring of ambient air quality levels.

Jadual 1.3: Standard Kualiti Udara Ambien Malaysia
Table 1.3: Malaysian Ambient Air Quality Standard

PARAMETER	MASA PURATA / TIME AVERAGING	UNIT	GARIS PANDUAN SEDIA ADA / EXISTING GUIDELINES	STANDARD KUALITI UDARA AMBIEN MALAYSIA / MALAYSIAN AMBIENT AIR QUALITY		
				IT-1 (2015)	IT-2 (2018)	IT-3 (2020)
PM ₁₀	1 Tahun	µg/m ³	50	50	45	40
	24 Jam	µg/m ³	150	150	120	100
PM _{2.5}	1 Tahun	µg/m ³	-	35	25	15
	24 Jam	µg/m ³	-	75	50	35
SO ₂	1 Jam	µg/m ³	350	350	300	250
		ppm	0.135	0.135	0.115	0.095
	24 Jam	µg/m ³	105	105	90	80
		ppm	0.040	0.040	0.035	0.030
*CO	1 Jam	mg/m ³	35	35	35	30
		ppm	30.6	30.6	30.6	26.2
	8 Jam	mg/m ³	10	10	10	10
		ppm	8.75	8.75	8.75	8.75
NO ₂	1 Jam	µg/m ³	320	320	300	280
		ppm	0.170	0.170	0.160	0.150
	24 Jam	µg/m ³	75	75	75	70
		ppm	0.040	0.040	0.040	0.037
O ₃	1 Jam	µg/m ³	200	200	200	180
		ppm	0.100	0.100	0.100	0.090
	8 Jam	µg/m ³	120	120	120	100
		ppm	0.060	0.060	0.060	0.050

Nota: *mg/m³ IT-Interim Tier (tahun)

Note: *mg/m³ IT-Interim Tier (year)

Habuk Halus (PM₁₀)

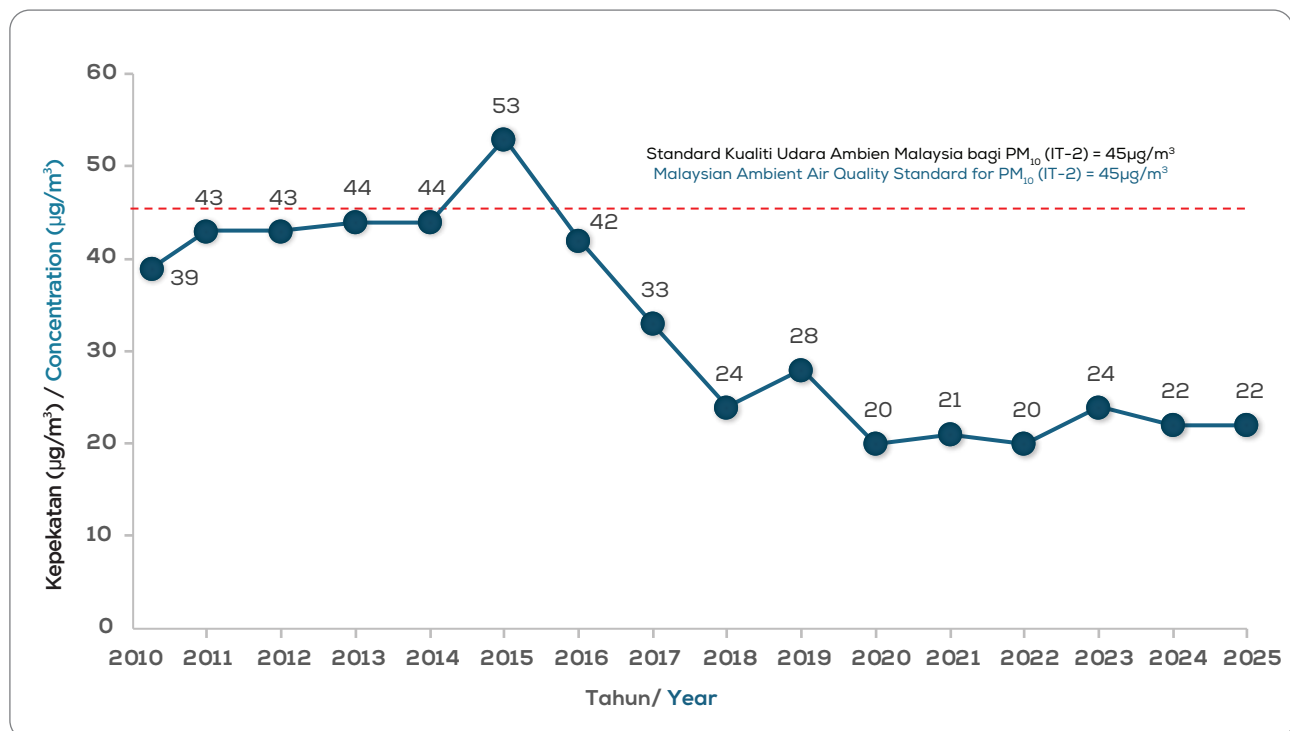
Tren purata kepekatan tahunan parameter PM₁₀ dalam udara ambien bagi tahun 2010 hingga tahun 2025 adalah seperti yang ditunjukkan dalam **Rajah 1.11**. Pada tahun 2025, nilai purata kepekatan tahunan PM₁₀ dalam udara ambien adalah 22 µg/m³, iaitu lebih rendah berbanding dengan tahap standard yang telah ditetapkan dalam Standard Kualiti Udara Ambien Malaysia bagi IT-2, iaitu 45 µg/m³.

Berdasarkan kategori guna tanah, kawasan bandar merekodkan purata kepekatan PM₁₀ yang lebih tinggi berbanding dengan guna tanah yang lain seperti ditunjukkan dalam **Rajah 1.12**. Keadaan cuaca panas dan kering pada bulan Mac dan Julai telah meningkatkan bilangan titik panas di rantau ini, sekali gus menyumbang kepada peningkatan kepekatan PM₁₀ seperti yang diperhatikan pada tahun sebelumnya.

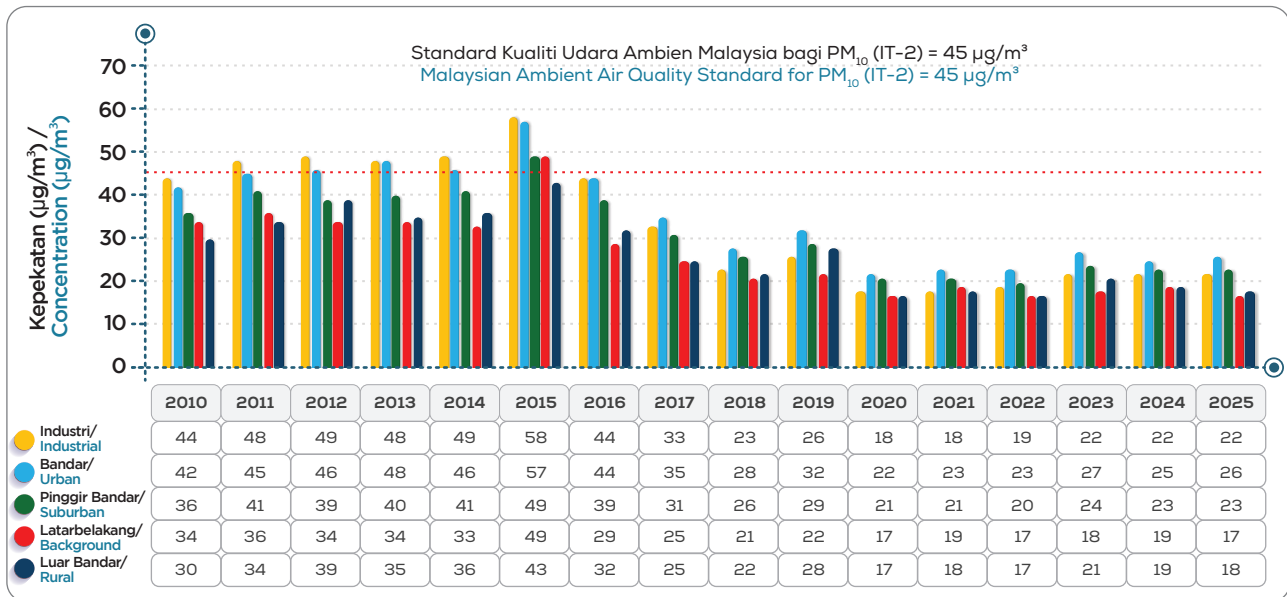
Particulate Matter (PM₁₀)

The trend of the annual average concentration of PM₁₀ parameters in the ambient air for the years 2010 to 2025 is as shown in **Figure 1.11**. In the year 2025, the average annual concentration of PM₁₀ in the ambient air was 22 µg/m³ which is lower than the designated Malaysian Ambient Air Quality Standard for IT-2 which is 45 µg/m³.

Based on the land-use category, urban areas recorded a higher average concentration of PM₁₀ than other land-use categories as shown in **Figure 1.12**. Hot and dry weather conditions in March and July increased the number of hotspots in the region, which in turn contributed to higher PM₁₀ concentrations as observed in the previous year.



Rajah 1.11: Purata Kepekatan Tahunan Habuk Halus (PM₁₀), 2010 -2025
 Figure 1.11: Annual Average Concentration of Particulate Matter (PM₁₀), 2010 -2025



Rajah 1.12: Purata Kepekatan Tahunan Habuk Halus (PM₁₀) Mengikut Guna Tanah, 2010 -2025
Figure 1.12: Annual Average Concentration of Particulate Matter (PM₁₀) Based on Land-use, 2010 -2025

Habuk Halus (PM_{2.5})

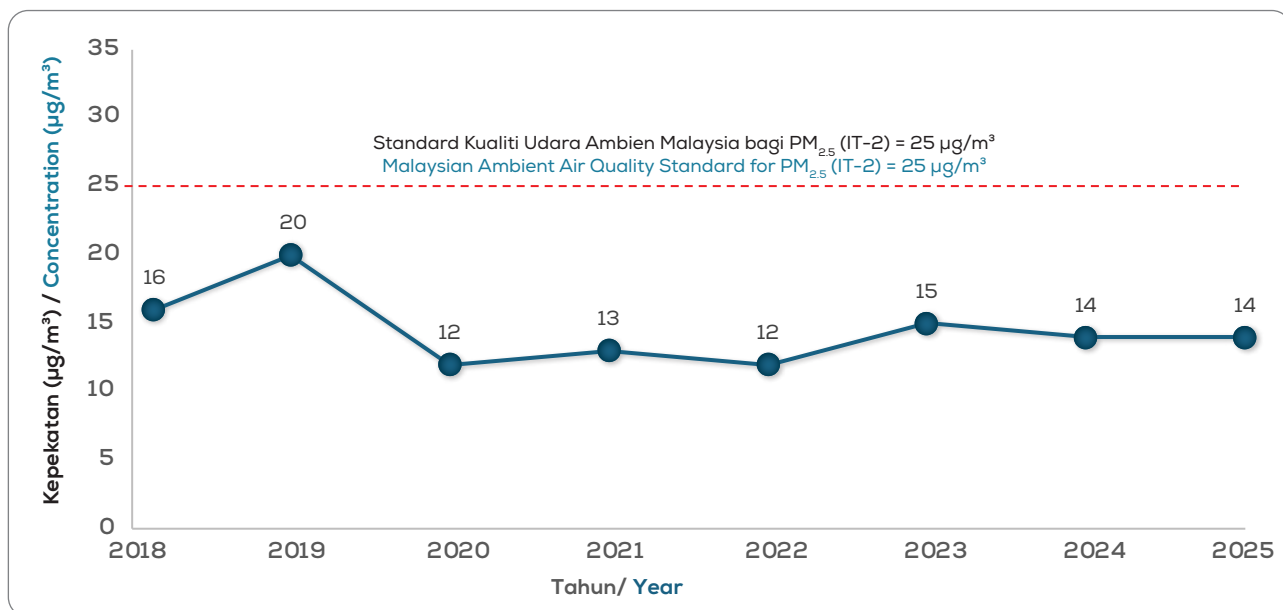
Pengukuran dan analisa parameter PM_{2.5} telah bermula pada pertengahan tahun 2017 dan mula dilaporkan di dalam Laporan Kualiti Alam Sekeliling bermula pada tahun 2018. Nilai purata tahunan PM_{2.5} dalam udara ambien bagi tahun 2025 adalah 14 µg/m³, iaitu sama dengan tahun 2024. Nilai purata ini berada di bawah had yang ditetapkan dalam Standard Kualiti Udara Ambien Malaysia bagi IT-2 iaitu sebanyak 25 µg/m³ seperti yang ditunjukkan di dalam **Rajah 1.13**.

Berdasarkan kategori guna tanah, nilai purata kepekatan tahunan PM_{2.5} tertinggi adalah di kawasan guna tanah bandar iaitu 17 µg/m³ dan diikuti dengan guna tanah pinggir bandar (14 µg/m³), industri (12 µg/m³) dan kawasan luar bandar (11 µg/m³) seperti yang ditunjukkan dalam **Rajah 1.14**. Peningkatan kepekatan PM_{2.5} di udara adalah disebabkan oleh jerebu, pembakaran bahan api daripada kenderaan bermotor, aktiviti kerja tanah serta pembakaran terbuka di kawasan perladangan dan tapak pelupusan sampah.

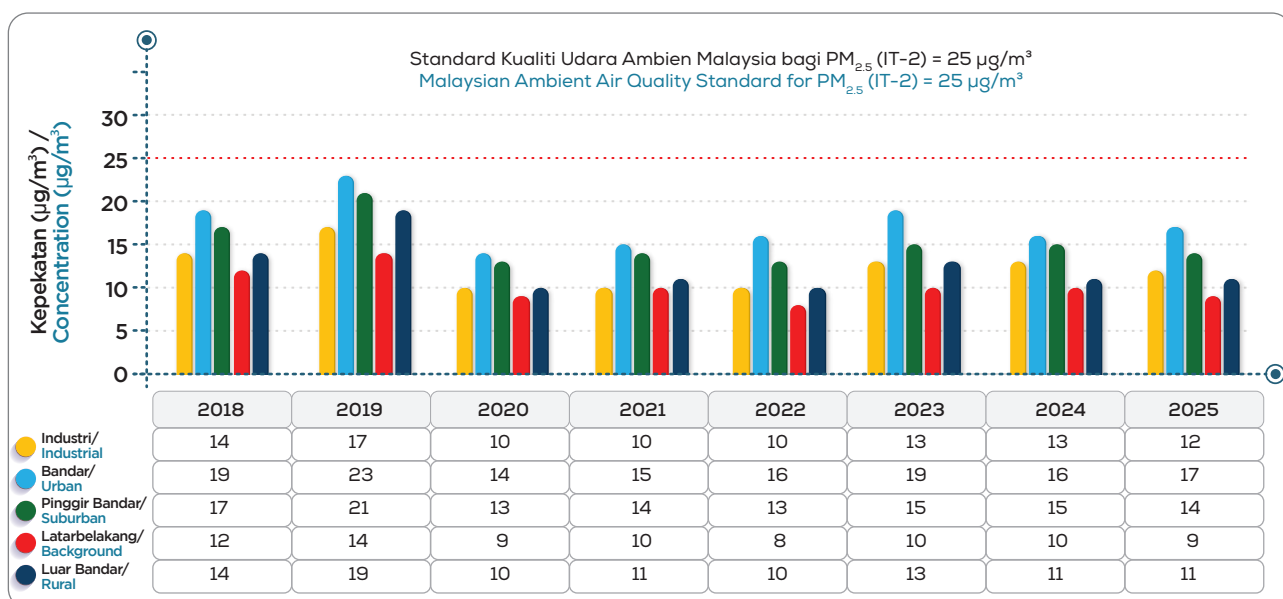
Particulate Matter (PM_{2.5})

The measurement and analysis of PM_{2.5} parameters began in mid-2017 and were first reported in the Environmental Quality Report starting from 2018. The annual average value of PM_{2.5} in the ambient air for the year 2025 was 14 µg/m³, which is the same as in 2024. This average value is below the limit established in the Malaysian Ambient Air Quality Standard for IT-2, which is 25 µg/m³, as shown in **Figure 1.13**.

Based on land-use categories, the highest annual average PM_{2.5} concentration was recorded in urban land-use areas at 17 µg/m³, followed by suburban land-use (14 µg/m³), industrial (12 µg/m³), and rural areas (11 µg/m³), as shown in **Figure 1.14**. The increase in PM_{2.5} concentrations in the air was due to haze, fuel combustion from motor vehicles, earthworks activities as well as open burning in plantation areas and landfill sites.



Rajah 1.13: Purata Kepekatan Tahunan Habuk Halus (PM_{2.5}), 2018-2025
 Figure 1.13: Annual Average Concentration of Particulate Matter (PM_{2.5}), 2018-2025



Rajah 1.14: Purata Kepekatan Tahunan Habuk Halus (PM_{2.5}) Mengikut Guna Tanah, 2018 -2025
 Figure 1.14: Annual Average Concentration of Particulate Matter (PM_{2.5}) Based on Land-use, 2018 -2025

Ozon (O₃) di Permukaan Bumi

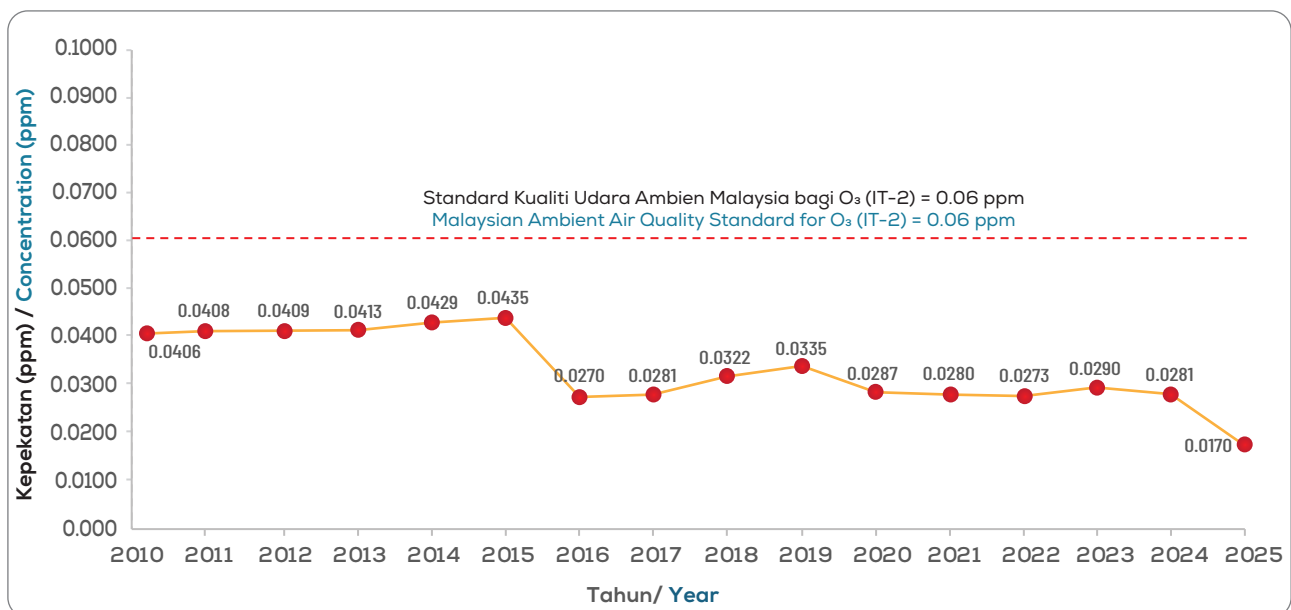
Pada tahun 2025, purata tahunan kepekatan maksimum harian O₃ di permukaan bumi didapati lebih rendah berbanding dengan tahun 2024 dengan bacaan 0.0170 ppm. Secara keseluruhannya, tren purata tahunan kepekatan maksimum ozon bagi tempoh lapan (8) jam dalam udara ambien adalah mematuhi had sebanyak 0.060 ppm seperti yang ditetapkan dalam Standard Kualiti Udara Ambien Malaysia IT-2 (**Rajah 1.15**).

Rajah 1.16 menunjukkan kepekatan O₃ permukaan bumi bagi pelbagai kategori guna tanah dari tahun 2010 hingga 2025. Kawasan bandar mencatatkan bacaan O₃ yang lebih tinggi disebabkan oleh kepadatan trafik yang tinggi dan keadaan atmosfera yang sesuai bagi pembentukan O₃. Peningkatan bacaan O₃ permukaan bumi juga ketara di beberapa kawasan pinggir bandar disebabkan oleh pergerakan angin yang membawa pencetus pencemar ozon, iaitu nitrogen oksida (NO_x) dan sebatian organik meruap (VOC), yang kebanyakannya berpunca daripada kenderaan bermotor dan pelepasan gas daripada aktiviti industri.

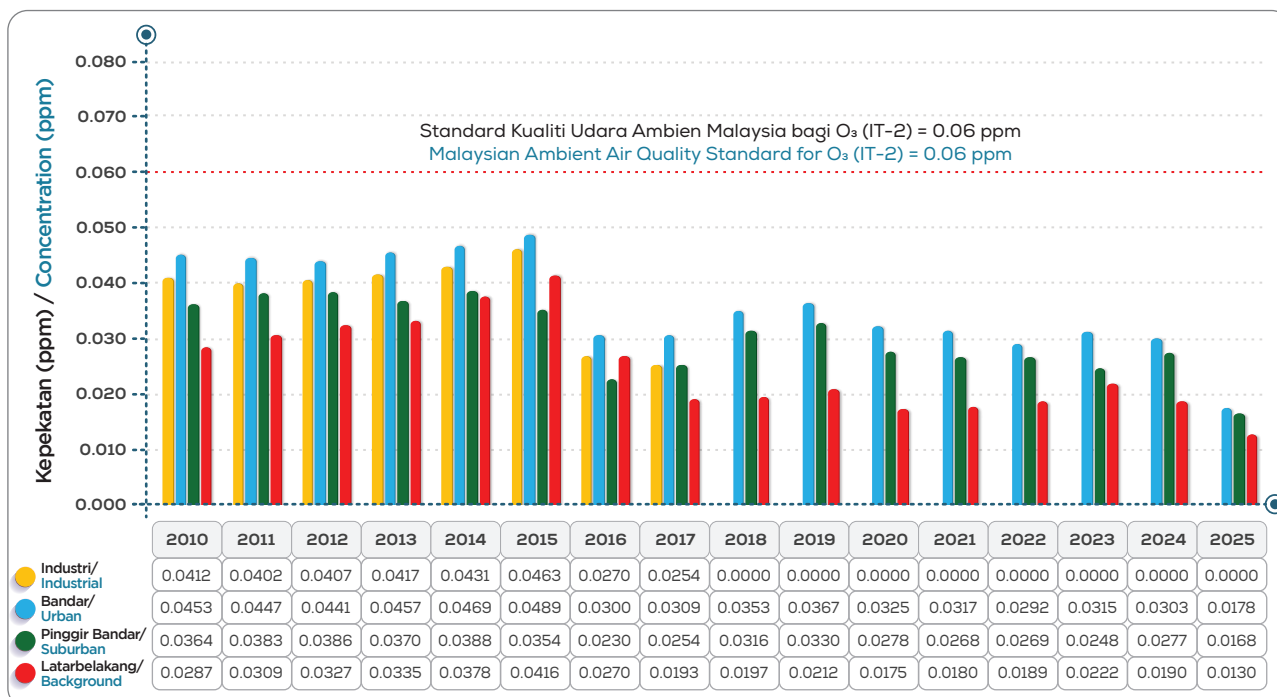
Ground Level Ozone (O₃)

In 2025, the annual average daily maximum O₃ concentration at the ground level was found to be lower compared to 2024, with a reading of 0.0170 ppm. Overall, the annual average trend of maximum ozone concentration for an eight (8) hour period in the ambient air complies with the limit of 0.060 ppm as established in the Malaysian Ambient Air Quality Standard IT-2 (**Figure 1.15**).

Figure 1.16 shows the ground level O₃ concentrations for various land-use categories from 2010 to 2025. Urban areas recorded higher O₃ readings due to high traffic density and atmospheric conditions that are suitable for O₃ formation. The increase in the ground level O₃ readings is also significant in several suburban areas due to wind movements that carry ozone precursor pollutants, namely nitrogen oxides (NO_x) and volatile organic compounds (VOC), which mostly stem from motor vehicles and gas emissions from industrial activities.



Rajah 1.15: Purata Kepekatan Tahunan Ozon Permukaan Bumi (O₃), 2010 -2025
Figure 1.15: Annual Average Concentration of Ground Level Ozone (O₃), 2010 -2025



Rajah 1.16: Purata Kepekatan Tahunan Permukaan Bumi Ozon (O_3), Mengikut Guna Tanah 2010-2025
 Figure 1.16: Annual Average Concentration of Ground Level Ozone (O_3) Based on Land-use, 2010-2025

Sulfur Dioksida (SO_2)

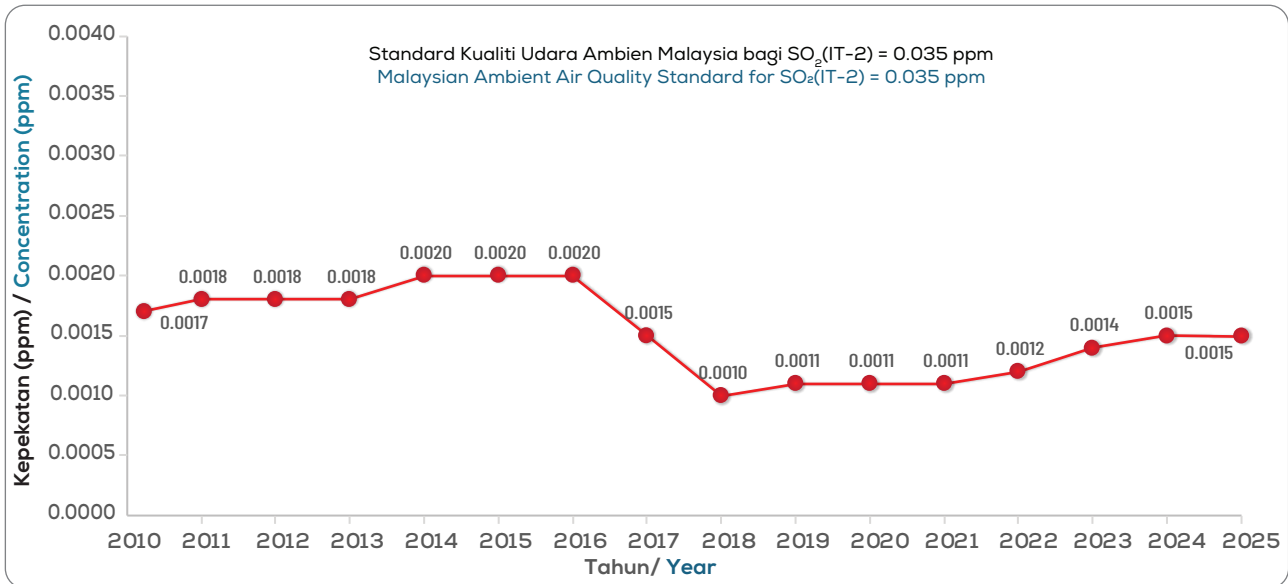
Sulphur Dioxide (SO_2)

Purata kepekatan tahunan SO_2 yang direkodkan pada tahun 2025 adalah 0.0015 ppm, sama seperti yang dilaporkan pada tahun 2024. Bacaan ini masih berada di bawah had yang ditetapkan dalam Standard Kualiti Udara Ambien Malaysia (IT-2), iaitu 0.035 ppm (**Rajah 1.17**). JAS dan beberapa agensi berkaitan telah melaksanakan pelbagai strategi dalam mengawal pelepasan gas SO_2 di Malaysia. Antara strategi tersebut ialah menggalakkan penggunaan bahan api yang lebih bersih serta penggunaan gas asli dalam proses industri dan kenderaan. Mulai Januari 2020, bahan api petrol EURO 4M RON95 yang mengandungi kandungan sulfur kurang daripada 50 mg/l telah dilaksanakan, manakala pada 1 April 2021, EURO 5 Diesel yang mengandungi kandungan sulfur kurang daripada 10 mg/l pula telah diperkenalkan di pasaran.

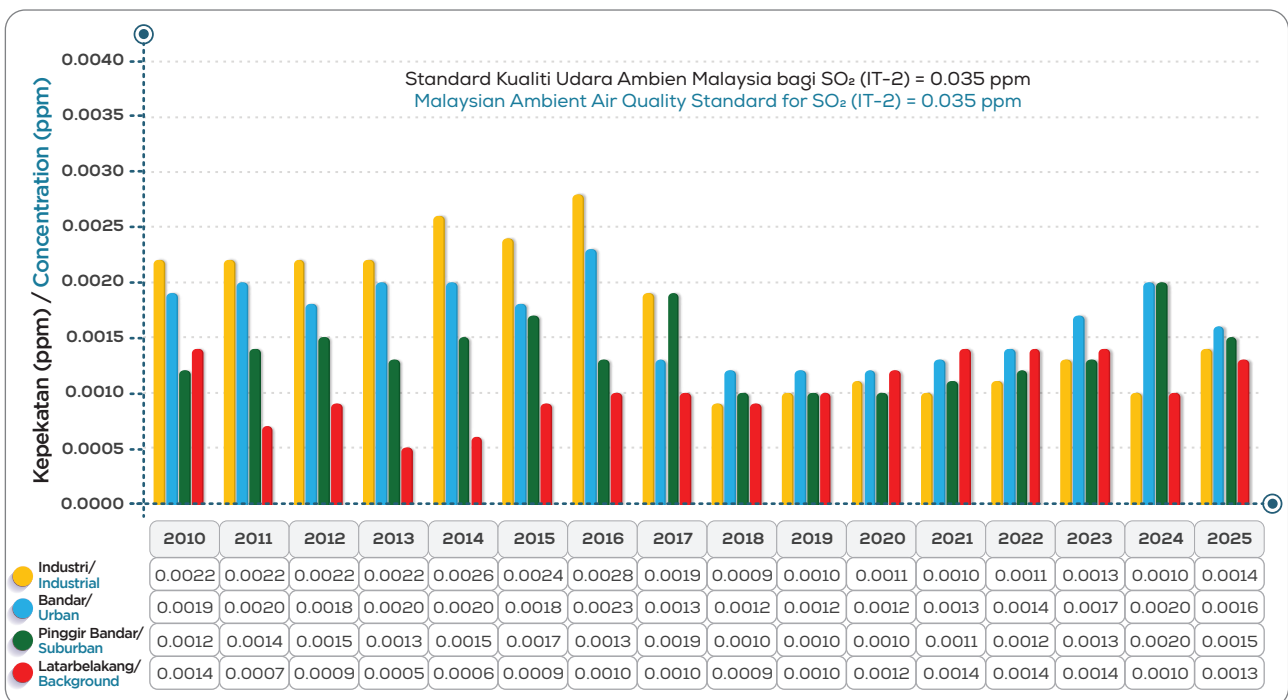
The annual average SO_2 concentration recorded in 2025 was 0.0015 ppm, the same as reported in 2024. This reading remains below the limit established in the Malaysian Ambient Air Quality Standard (IT-2), which is 0.035 ppm (**Figure 1.17**). DOE and several related agencies have implemented various strategies to control SO_2 emissions in Malaysia. Among the strategies are the promotion of cleaner fuels as well as the use of natural gas in industrial processes and vehicles. Starting January 2020, EURO 4M RON95 petrol fuel containing less than 50 mg/l of sulphur was implemented, while on April 1, 2021, EURO 5 Diesel containing less than 10 mg/l of sulphur was introduced to the market.

Rajah 1.18 menunjukkan kepekatan purata tahunan bagi SO_2 mengikut kategori guna tanah. Berdasarkan kepada rajah tersebut, purata kepekatan SO_2 di kawasan bandar masih melaporkan kepekatan SO_2 tertinggi pada tahun 2025 berbanding dengan guna tanah lain. Walau bagaimanapun, kepekatan SO_2 , khususnya di Kawasan bandar dan pinggir bandar adalah lebih rendah berbanding dengan tahun 2024.

Figure 1.18 shows the annual average concentration of SO_2 by land-use category. Based on the figure, the average SO_2 concentration in urban areas still reported the highest SO_2 concentration in 2025 compared to other land-uses. However, SO_2 concentrations, particularly in urban and suburban areas were lower compared to 2024.



Rajah 1.17: Purata Kepekatan Tahunan Sulfur Dioksida (SO_2), 2010-2025
Figure 1.17: Annual Average Concentration of Sulphur Dioxide (SO_2), 2010-2025



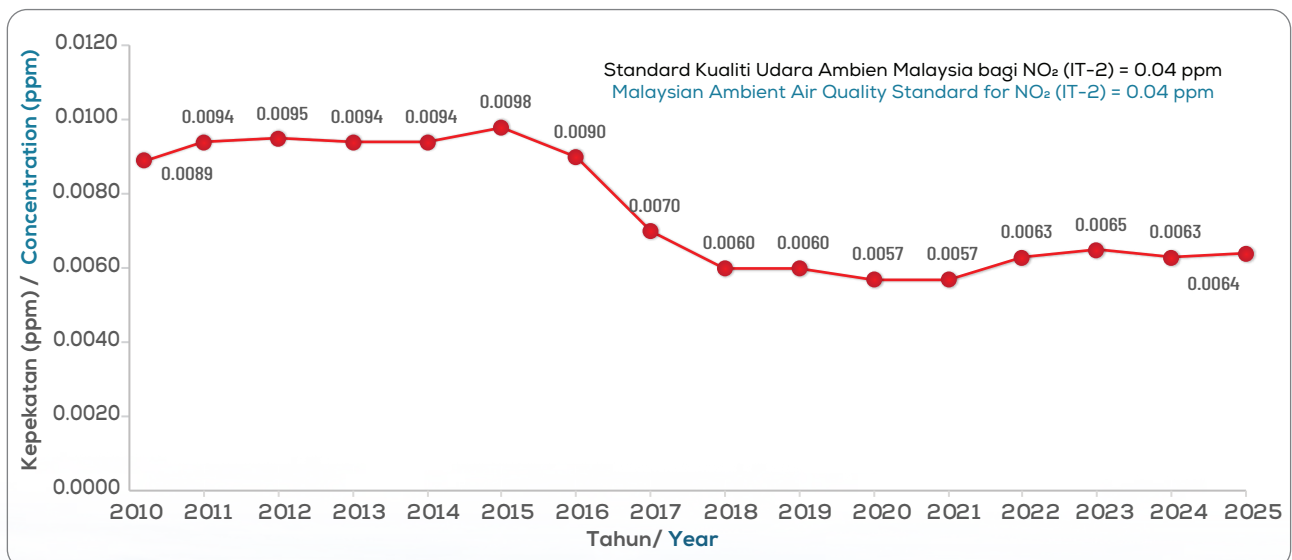
Rajah 1.18: Purata Kepekatan Tahunan Sulfur Dioksida (SO_2) Mengikut Guna Tanah, 2010-2025
Figure 1.18: Annual Average Concentration of Sulphur Dioxide (SO_2) Based on Land-use, 2010-2025

Nitrogen Dioksida (NO₂)

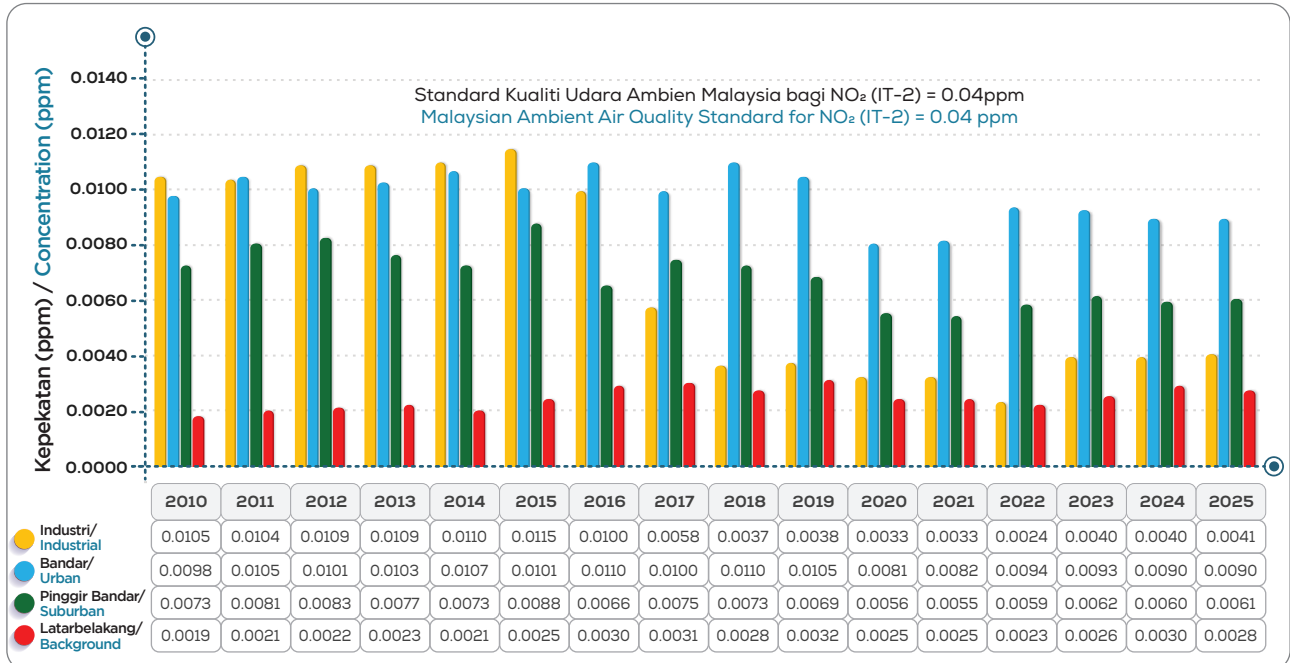
Pada tahun 2025, kepekatan purata tahunan NO₂ adalah hampir sama seperti tahun 2024 iaitu dengan bacaan 0.0064 ppm dan jauh berada di bawah had yang ditetapkan dalam Standard Kualiti Udara Ambien Malaysia IT-2 seperti yang ditunjukkan di dalam **Rajah 1.19**. Kepekatan NO₂ tinggi di kawasan bandar seperti yang ditunjukkan di dalam **Rajah 1.20**. Ini mungkin berpunca daripada pelepasan asap kenderaan bermotor yang mempunyai bilangan kenderaan yang amat tinggi di kawasan bandar.

Nitrogen Dioxide (NO₂)

In 2025, the annual average concentration of NO₂ was approximately the same as in 2024, with a reading of 0.0064 ppm and remained well below the limit set by the Malaysian Ambient Air Quality Standard IT-2 as shown in **Figure 1.19**. The concentration of NO₂ is high in urban areas as shown in **Figure 1.20**. This may be due to smoke emissions from motor vehicles, given the extremely high number of vehicles in the urban areas.



Rajah 1.19: Purata Kepekatan Tahunan Nitrogen Dioksida (NO₂), 2010 -2025
 Figure 1.19: Annual Average Concentration of Nitrogen Dioxide (NO₂), 2010 -2025



Rajah 1.20: Purata Kepekatan Tahunan Nitrogen Dioksida (NO₂) Mengikut Guna Tanah, 2010 -2025
Figure 1.20: Annual Average Concentration of Nitrogen Dioxide (NO₂) Based on Land-use, 2010 -2025

Karbon Monoksida (CO)

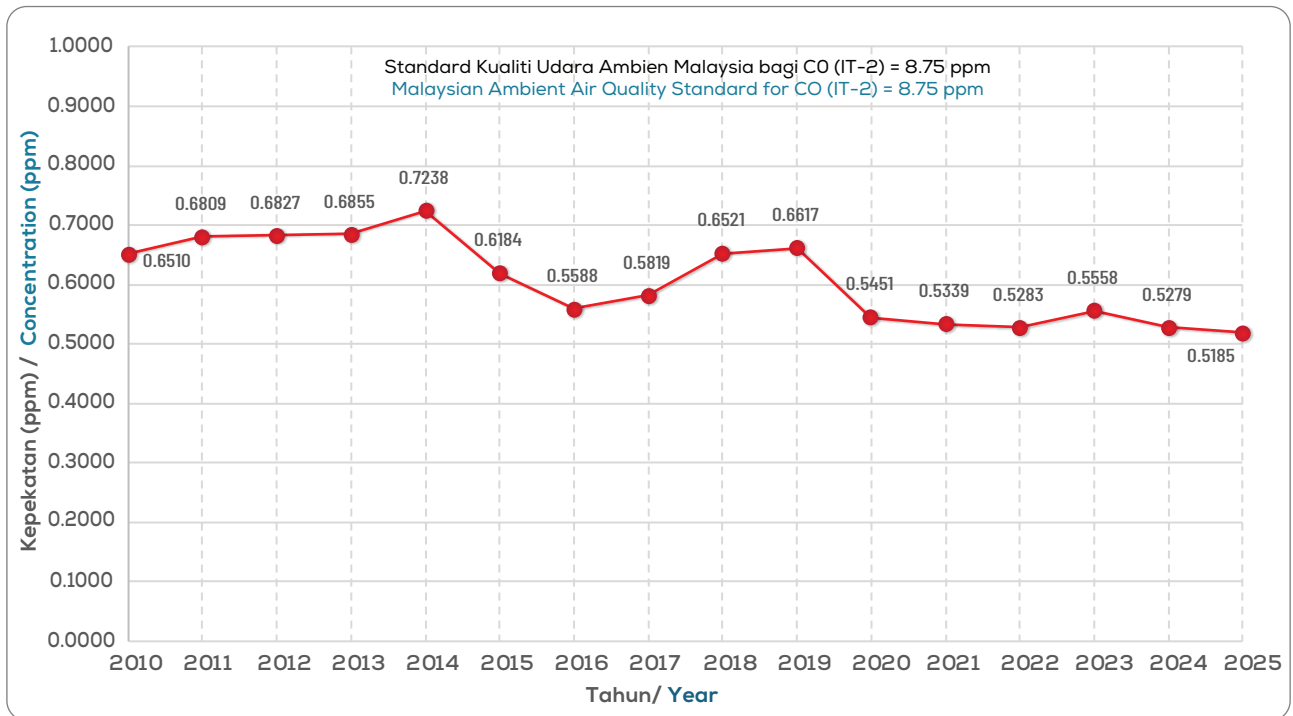
Pada tahun 2025, kepekatan purata tahunan CO menunjukkan tren penurunan berbanding tahun 2024 iaitu dengan bacaan 0.5185 ppm, mematuhi Standard Kualiti Udara Ambien Malaysia IT-2 (**Rajah 1.21**). **Rajah 1.22** menunjukkan kepekatan CO untuk pelbagai kategori guna tanah di mana kawasan pinggir bandar merekodkan bacaan purata tahunan CO tertinggi berbanding dengan kawasan guna tanah yang lain.

Carbon Monoxide (CO)

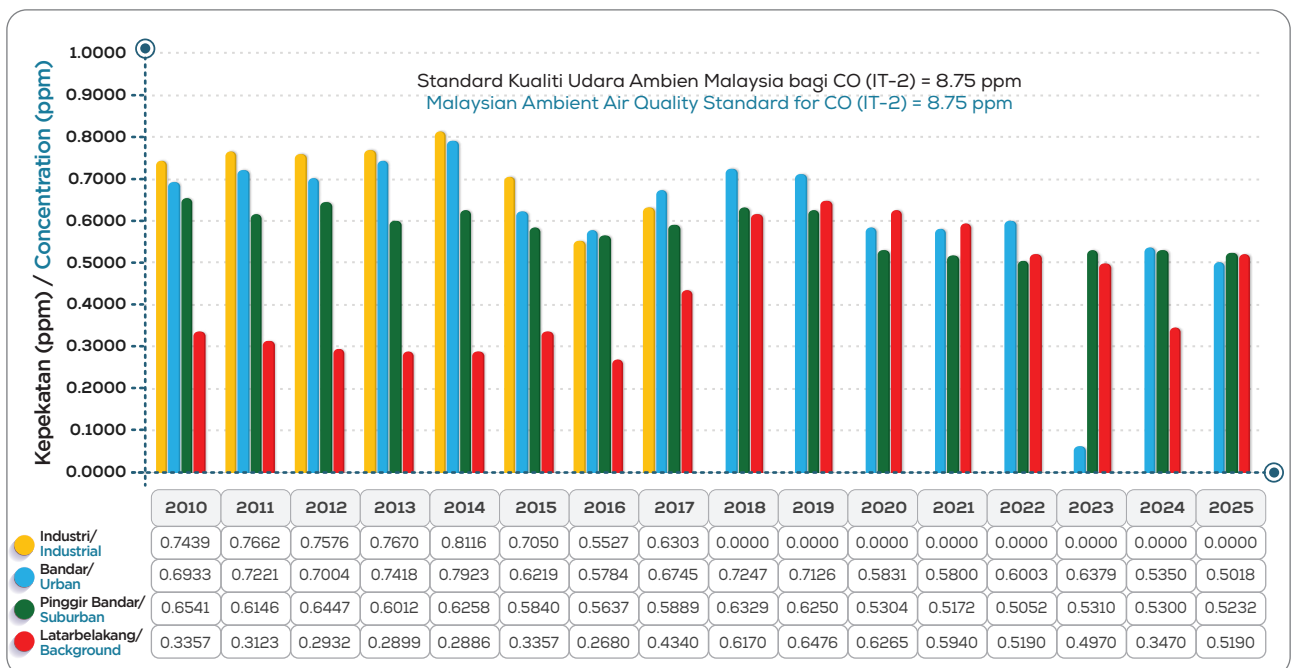
In 2025, the annual average concentration of CO showed a downward trend compared to 2024, with a reading of 0.5185 ppm, complying with the Malaysian Ambient Air Quality Standard IT-2 (**Figure 1.21**). **Figure 1.22** shows the CO concentration for various land-use categories, where suburban areas recorded the highest annual average CO readings compared to other land-use areas.



Sawah di Kota Marudu, Sabah



Rajah 1.21: Purata Kepekatan Tahunan Karbon Monoksida (CO), 2010 -2025
 Figure 1.21: Annual Average Concentration of Carbon Monoxide (CO), 2010 -2025



Rajah 1.22: Purata Kepekatan Tahunan Karbon Monoksida (CO) Mengikut Guna Tanah, 2010 -2025
 Figure 1.22: Annual Average Concentration of Carbon Monoxide (CO) Based on Land-use, 2010 -2025



Air Terjun Lata Kinjang,
Perak





2

**BAB/
CHAPTER**

KUALITI AIR SUNGAI

River Water
Quality

PENGAWASAN KUALITI AIR SUNGAI MANUAL

Manual River Water Quality Monitoring

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SUNGAI
River



**DIPANTAU OLEH
JABATAN ALAM
SEKITAR**
Monitored
by the
Department of
Environment

55

STESEN
Stations



**PEMANTAUAN
DI HULU MUKA
SAUK**
Upstream
Water Intakes
Monitoring

1353

STESEN
Stations



**STESEN
PENGAWASAN
KUALITI AIR
SUNGAI MANUAL**
Manual River Water
Quality Monitoring
Stations

8118

PERSAMPELAN
Sampling



**PERSAMPELAN
KUALITI AIR
SUNGAI**
Sampling of
River Water
Quality



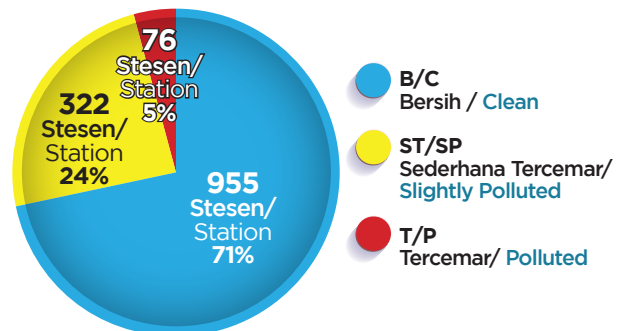
PENGAWASAN KUALITI AIR SUNGAI AUTOMATIK

Continuous River Water Quality Monitoring



STATUS KUALITI AIR MENGIKUT STESEN / WATER QUALITY STATUS BY STATION

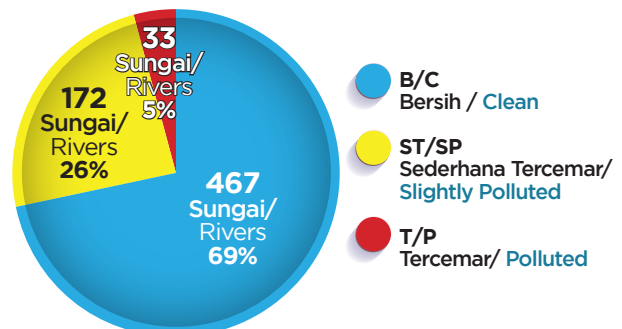
KELAS I / CLASS I	280 Stesen / Station	21%
KELAS II / CLASS II	773 Stesen / Station	57%
KELAS III / CLASS III	278 Stesen / Station	20%
KELAS IV / CLASS IV	22 Stesen / Station	2%
KELAS V / CLASS V	0 Stesen / Station	0%



INDEKS KUALITI AIR MENGIKUT STESEN WATER QUALITY INDEX BY STATION

STATUS KUALITI AIR MENGIKUT SUNGAI / WATER QUALITY STATUS BY RIVER

KELAS I / CLASS I	131 Sungai / Rivers	19%
KELAS II / CLASS II	396 Sungai / Rivers	59%
KELAS III / CLASS III	134 Sungai / Rivers	20%
KELAS IV / CLASS IV	11 Sungai / Rivers	2%
KELAS V / CLASS V	0 Sungai / Rivers	0%



INDEKS KUALITI AIR MENGIKUT SUNGAI WATER QUALITY INDEX BY RIVERS

PENGAWASAN KUALITI AIR SUNGAI MANUAL

Manual River Water Quality Monitoring

Jabatan Alam Sekitar (JAS) meneruskan program pengawasan kualiti air sungai pada tahun 2025 bagi menentukan kualiti air sungai dan mengesan perubahan ke atas kualiti air sungai. Sampel-sampel air sungai diambil daripada stesen-stesen yang telah ditetapkan dan diukur kualitinya secara in-situ serta dihantar ke makmal untuk dianalisis bertujuan menentukan kriteria dari segi fizik-kimia dan biologi. Indeks Kualiti Air (IKA) digunakan untuk mengukur tahap pencemaran dan kesesuaian jenis guna air seperti yang digariskan dalam Standard Kualiti Air Kebangsaan (NWQS). NWQS merupakan standard ambien untuk melindungi kepelbagaian biologi akuatik sebagai penanda aras untuk penetapan jenis guna air bagi sungai tertentu.

IKA adalah julat indeks daripada 0 hingga 100 di mana julat ini dibahagi kepada tiga (3) kategori iaitu bersih, sederhana tercemar dan tercemar. Indeks ini berdasarkan kepada enam (6) parameter iaitu oksigen terlarut (DO), keperluan oksigen biokimia (BOD), keperluan oksigen kimia (COD), amoniakal nitrogen (AN), pepejal terampai (SS) dan pH.

Pada tahun 2025, sebanyak 1,353 stesen pengawasan kualiti air sungai manual yang merangkumi 672 sungai telah dipantau di negara ini. Frekuensi persampelan bagi setiap stesen pengawasan kualiti air sungai manual dijalankan sebanyak enam (6) kali setahun dengan jumlah persampelan adalah sebanyak 8,118.

Status kualiti air dilaporkan melalui dua (2) pendekatan iaitu:-

- i. Status kualiti air mengikut sungai; dan
- ii. Status kualiti air mengikut stesen

The Department of Environment (DOE) continued the river water quality monitoring program in 2025, which is done to determine the status of river water quality and to detect changes in river water quality. Water samples were collected from designated stations for in-situ measurement and sent to the laboratory as well, for analysis aimed at determining the criteria based on physicochemical and biological. The Water Quality Index (WQI) is used to indicate the level of pollution and the suitability for beneficial water uses according to the National Water Quality Standards for Malaysia (NWQS). NWQS is an ambient standard to protect aquatic biodiversity and used as a benchmark for the setting of uses for certain rivers.

WQI is an index ranging from 0 to 100, divided into three (3) categories of clean, slightly polluted and polluted. The index is derived based on six (6) parameters, which are dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), ammoniacal nitrogen (AN), suspended solids (SS) and pH.

In 2025, a total of 1,353 manual river water quality monitoring stations covering 672 rivers were monitored in this country. The sampling frequency for each manual river water quality monitoring stations is carried out six (6) times a year with a total sampling of 8,118.

Water quality status is reported in two (2) approaches:-

- i. Water quality status by river; and
- ii. Water quality status by station

Bagi pelaporan status kualiti air mengikut sungai, penentuan IKA adalah menggunakan pengiraan secara median di mana median IKA bagi keseluruhan data yang dicerap di setiap stesen untuk mendapatkan IKA sungai tersebut. Pelaporan status kualiti air mengikut sungai adalah menggambarkan status kualiti air bagi keseluruhan sungai berdasarkan jumlah stesen yang dipantau.

Manakala bagi pelaporan status kualiti air mengikut stesen, penentuan IKA adalah berdasarkan pengiraan secara median bagi enam (6) IKA di stesen tersebut. Pelaporan status kualiti air mengikut stesen adalah menggambarkan status kualiti air di stesen tersebut sahaja (**ANNEX II**).

For water quality status reporting by river, the WQI determination is based on the median calculation where the median WQI for the entire data observed at each station to obtain the river WQI. The reporting of water quality status by river reflects the quality status of the entire river based on the number of stations monitored.

While for water quality status reporting by station, the WQI determination is based on the median of the six (6) WQI values recorded at the station. The reporting of water quality status by station reflects the quality status at the station only (**ANNEX II**).

STATUS KUALITI AIR MENGIKUT SUNGAI

Water Quality Status by River

Status kualiti air bagi 672 sungai telah dipantau pada tahun 2025. Daripada 672 sungai yang dipantau, sebanyak 467 (69%) sungai dikategorikan sebagai bersih, 172 (26%) sungai dikategorikan sebagai sederhana tercemar dan 33 (5%) dikategorikan sebagai tercemar. IKA bagi tempoh lima (5) tahun di 672 sungai yang dipantau adalah seperti di dalam **Jadual 2.1**. Tren bagi kualiti air sungai yang dipantau adalah seperti dalam **Rajah 2.1**.

Bagi pengelasan IKA, sebanyak 131 (19%) sungai di dalam Kelas I, 396 (59%) sungai di dalam Kelas II, 134 (20%) sungai di Kelas III, dan 11 (2%) sungai di Kelas IV.

Petunjuk utama yang diambil kira untuk menentukan kualiti air sungai berdasarkan parameter BOD, AN dan SS. Punca kemerosotan kualiti air disebabkan oleh pelepasan beban bahan pencemar sama ada daripada punca tetap atau punca tidak tetap.

Punca tetap beban pencemaran air adalah punca-punca yang mempunyai takat pelepasan yang boleh dikenalpasti dan tidak berubah dalam masa yang singkat seperti sektor industri, ternakan, sistem rawatan kumbahan dan sebagainya.

The water quality status of a total of 672 rivers was monitored in 2025. Out of the 672 rivers monitored, the water quality of 467 (69%) rivers was indicated as clean, 172 (26%) rivers were indicated as slightly polluted and 33 (5%) rivers were indicated as polluted. The WQI over five (5) year period for the 672 monitored river is as shown in **Table 2.1**. The trend in water quality of the monitored rivers is shown in **Figure 2.1**.

For WQI classification, as many as 131 (19%) rivers are in Class I, 396 (59%) rivers are in Class II, 134 (20%) rivers are in Class III, and 11 (2%) rivers are in Class IV.

The main indicators were considered to determine the quality of river water based on the parameters of BOD, AN and SS. The cause of the deterioration of water quality is due to the discharge of the pollution load either from a point source or from a nonpoint source.

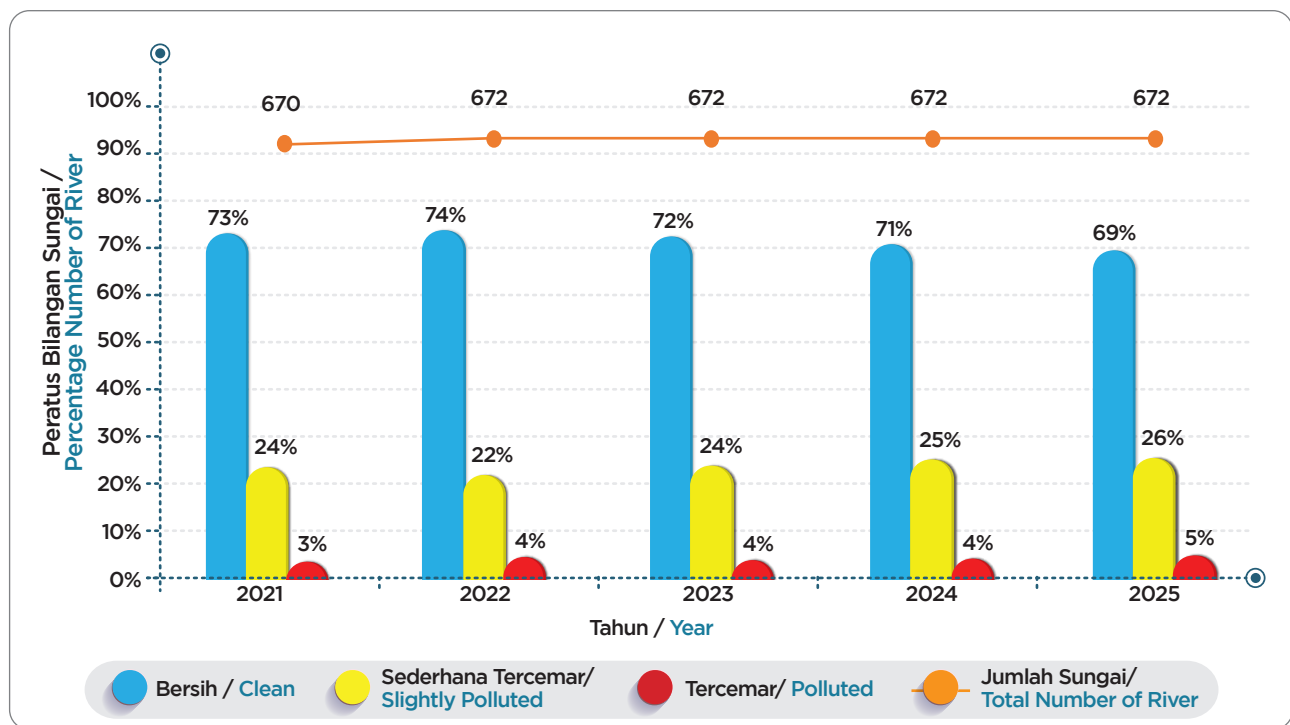
Point sources refer to pollution sources with identifiable discharge points which are unchanged over time. Sectors such as industry, livestock and sewage treatment systems fall under this category.

Manakala punca tidak tetap seperti aktiviti pertanian, kerja tanah, perlombongan dan kumbahan bukan najis (air cucian dapur dan bilik air selain kumbahan) tidak mempunyai takat pelepasan yang tetap dan sering berubah-ubah yang menyukarkan anggaran pelepasan beban pencemaran dibuat. Kajian berkaitan beban pencemaran di bawah kategori ini di Malaysia masih terhad dan maklumat rujukan yang tersedia juga adalah terhad.

BOD adalah jumlah oksigen yang diperlukan oleh bakteria atau mikroorganisma yang lain untuk menguraikan bahan organik. Kepekatan BOD yang tinggi kerap kali dikaitkan dengan pelepasan efluen yang berterusan daripada industri. AN adalah dikaitkan dengan aktiviti penternakan haiwan berkaki dan pelepasan kumbahan domestik, manakala SS dikaitkan dengan kerja-kerja tanah yang tidak teratur dan aktiviti pembukaan tanah yang tidak terkawal.

Meanwhile non-point sources such as agricultural activities, earthworks, mining, and sullage (domestic wastewater other than sewage including kitchen and bathroom wastewater) do not have specific identifiable discharge points and the locations are varied over time. This makes it difficult to estimate the amount of released pollution loads. Studies on pollution load under this category in Malaysia and availability of reference information data is still limited.

BOD is the amount of oxygen required by bacteria or other microorganisms to decompose organic matter. High BOD concentrations are often associated with continuous discharge of effluents from industries. AN is associated with livestock farming activities and domestic sewage, while SS is caused by improper earthworks and uncontrolled land clearing activities.



Rajah 2.1: Tren Kualiti Air Sungai, 2021-2025
Figure 2.1: Trend of River Water Quality, 2021-2025

Jadual 2.2 menunjukkan kualiti air sungai yang dikategorikan sebagai tercemar berdasarkan sub-indeks BOD, AN dan SS pada tahun 2025. Daripada 33 sungai yang dikategorikan sebagai tercemar, sebanyak 22 sungai adalah berada di Kelas III manakala 11 sungai adalah di Kelas IV.

Berdasarkan sub-indeks BOD, sebanyak empat (4) sungai berada di Kelas II, dua (2) di Kelas III, 14 sungai di Kelas IV dan selebihnya 13 sungai adalah di Kelas V.

Dari segi sub-indeks AN pula, sebanyak dua (2) sungai berada di Kelas II, dua (2) sungai di Kelas III, tiga (3) di Kelas IV dan selebihnya 26 sungai adalah di Kelas V.

Dari segi sub-indeks SS, 22 sungai yang berada di Kelas I dan 11 sungai di Kelas II.

Table 2.2 shows the quality of river water categorised as polluted based on the BOD, AN and SS sub-indexes in 2025. Out of the 33 rivers categorised as polluted, 22 rivers were in Class III while 11 rivers were in Class IV.

Based on the BOD sub-index, four (4) rivers were in Class II, two (2) rivers in Class III, 14 rivers in Class IV and the remaining 13 rivers were in Class V.

In terms of sub-index AN, two (2) rivers in Class II, two (2) rivers in Class III, three (3) rivers in Class IV and the remaining 26 rivers were in Class V.

In terms of SS sub-index, 22 rivers were in Class I and 11 rivers in Class II.

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Perlis	Sg. Perlis	Sg. Arau	89	88	89	90	88	B/C
		Sg. Empangan Timah Tasoh	95	96	95	95	90	B/C
		Sg. Jarum	91	89	88	90	88	B/C
		Sg. Jernih	93	95	94	95	93	B/C
		Sg. Kok Mak	87	88	86	85	88	B/C
		Sg. Korok	76	74	79	75	79	ST/SP
		Sg. Ngulang	92	93	88	87	90	B/C
		Sg. Pelarit	96	96	96	97	97	B/C
		Sg. Perlis	77	78	81	70	76	ST/SP
		Sg. Serai	86	90	86	89	85	B/C
		Sg. Terusan Mada	91	91	92	90	92	B/C
Kedah	Sg. Kedah	Sg. Wang Kelian	97	97	97	97	96	B/C
		Sg. Ahning	96	95	94	97	96	B/C
		Sg. Changlun	88	87	86	87	87	B/C
		Sg. Janing	97	97	97	97	96	B/C
		Sg. Kedah	77	76	73	67	69	ST/SP
		Sg. Napoh	89	90	88	87	89	B/C
		Sg. Padang Terap	93	91	92	95	91	B/C
		Sg. Pedu	95	94	95	94	96	B/C
		Sg. Pendang	82	85	85	82	79	ST/SP
		Sg. Sintok	96	95	92	90	90	B/C
		Sg. Tekai	94	93	91	92	91	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Kedah	Sg. Kedah	Sg. Temin	89	89	87	86	87	B/C
		Sg. Terusan Lengkuas	92	92	93	95	93	B/C
		Sg. Terusan Mada Selatan	92	90	91	90	92	B/C
		Sg. Terusan Tengah	93	93	94	96	94	B/C
	Sg. Kisap	Sg. Kisap	97	97	96	97	98	B/C
	Sg. Kuah	Sg. Kuah	79	81	69	79	77	ST/SP
	Sg. Merbok	Sg. Bakar Arang	69	66	58	60	70	ST/SP
		Sg. Batu	64	59	65	52	56	T/P
		Sg. Bongkok	75	71	74	69	71	ST/SP
		Sg. Bukit Merah	92	89	95	92	93	B/C
		Sg. Bukit Nanas	97	97	98	97	98	B/C
		Sg. Korok	71	66	64	70	75	ST/SP
		Sg. Merbok	81	81	82	83	86	B/C
		Sg. Petani	68	64	53	65	59	T/P
		Sg. Tok Pawang	95	94	96	94	95	B/C
		Sg. Tupah	97	97	98	98	97	B/C
	Sg. Muda	Sg. Chepir	91	92	90	93	92	B/C
		Sg. Gunung Inas	93	95	96	89	96	B/C
		Sg. Jerong	78	71	74	75	73	ST/SP
		Sg. Karangan	91	83	87	84	83	B/C
		Sg. Ketil	93	91	93	96	95	B/C
		Sg. Muda	92	91	92	94	91	B/C
		Sg. Pegang	97	97	97	97	98	B/C
		Sg. Sedim	92	92	93	94	91	B/C
	Sg. Ulu Melaka	Sg. Tawar	89	94	91	89	95	B/C
		Sg. Chenang	84	77	84	76	73	ST/SP
		Sg. Melaka	92	93	93	92	93	B/C
		Sg. Petang	97	98	97	97	97	B/C
		Sg. Saga	92	88	85	90	92	B/C
P. Pinang/ Kedah	Sg. Perai	Sg. Tuba	96	97	96	96	96	B/C
		Sg. Air Melintas	57	60	64	59	54	T/P
		Sg. Jarak	73	72	73	74	74	ST/SP
		Sg. Keladi	81	82	82	78	80	ST/SP
		Sg. Kereh	62	57	60	55	56	T/P
		Sg. Kubang Semang	66	68	74	63	71	ST/SP
		Sg. Kulim	92	92	88	92	92	B/C
		Sg. Perai	70	62	66	65	67	ST/SP
		Sg. Pertama	69	52	63	63	60	ST/SP
		Sg. Seluang	67	65	64	57	58	T/P
		Sg. Seluang Bawah	71	67	63	61	59	T/P

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
P. Pinang	Sg. Bayan Lepas	Sg. Bayan Lepas	74	69	71	74	64	ST/SP
		Sg. Tiram	74	76	68	70	75	ST/SP
	Sg. Jawi	Sg. Chempedak	41	36	55	42	55	T/P
		Sg. Jawi	52	57	54	52	56	T/P
		Sg. Junjong	60	63	66	64	61	ST/SP
		Sg. Machang Bubok	72	68	73	65	63	ST/SP
		Sg. Tengah	58	47	63	55	57	T/P
		Sg. Ara	77	75	77	75	78	ST/SP
	Sg. Juru	Sg. Juru	69	68	63	62	56	T/P
		Sg. Kilang Ubi	71	72	65	70	66	ST/SP
		Sg. Pasir	75	66	63	63	69	ST/SP
		Sg. Permatang Rawa	75	77	74	70	76	ST/SP
		Sg. Rambai	59	56	57	53	55	T/P
	Sg. Kluang	Sg. Ara	90	88	89	87	90	B/C
		Sg. Dua Besar	68	67	63	63	62	ST/SP
		Sg. Kluang	68	52	58	45	51	T/P
		Sg. Relau	68	69	65	73	64	ST/SP
	Sg. Pinang	Sg. Air Itam	79	69	69	76	74	ST/SP
		Sg. Air Terjun	97	97	97	97	97	B/C
		Sg. Batu Feringghi	94	92	94	95	94	B/C
		Sg. Dondang	77	65	66	70	70	ST/SP
		Sg. Jelutong	65	68	63	72	72	ST/SP
		Sg. Pinang	71	64	50	58	46	T/P
		Sg. Satu	97	97	97	98	97	B/C
		Sg. Titi Kerawang	75	63	57	57	42	T/P
P. Pinang/ Kedah/Perak	Sg. Kerian	Sg. Kechil	89	89	89	88	92	B/C
		Sg. Kerian	88	88	87	88	88	B/C
		Sg. Selama	89	89	90	91	93	B/C
		Sg. Semang	80	81	72	80	90	B/C
		Sg. Serdang	80	83	89	92	91	B/C
		Sg. Terusan Bagan Serai	93	93	94	94	94	B/C
Perak	Sg. Bruas	Sg. Bruas	94	95	95	96	96	B/C
		Sg. Dandang	94	95	95	95	95	B/C
		Sg. Licin	97	97	97	97	97	B/C
		Sg. Rotan	93	92	93	93	86	B/C
	Sg. Kurau	Sg. Air Hitam	98	97	96	97	97	B/C
		Sg. Ara	96	96	96	97	97	B/C
		Sg. Kurau	87	85	85	87	87	B/C
	Sg. Perak	Sg. Batang Padang	90	90	91	91	91	B/C
		Sg. Behrang	97	98	97	98	96	B/C
		Sg. Berok	97	97	96	97	97	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Perak	Sg. Perak	Sg. Bidor	87	89	88	90	91	B/C
		Sg. Chenderiang	94	94	91	96	95	B/C
		Sg. Chepor	97	96	97	97	97	B/C
		Sg. Cuar	96	95	95	96	94	B/C
		Sg. Ibol	97	96	97	97	96	B/C
		Sg. Kampar	95	95	93	94	94	B/C
		Sg. Kangsar	93	94	96	96	95	B/C
		Sg. Kepayang	84	78	84	86	90	B/C
		Sg. Kerbau	96	95	96	95	95	B/C
		Sg. Kerdah	82	81	82	79	80	ST/SP
		Sg. Kinjang	97	97	97	97	97	B/C
		Sg. Kinta	85	83	85	85	86	B/C
		Sg. Klah	95	90	92	94	93	B/C
		Sg. Klian Baru	84	77	79	85	88	B/C
		Sg. Klian Gunong	97	96	97	97	96	B/C
		Sg. Kuang	88	85	88	87	92	B/C
		Sg. Manong	97	97	98	98	97	B/C
		Sg. Nyamok	77	74	73	72	69	ST/SP
		Sg. Pari	82	86	89	86	84	B/C
		Sg. Pelus	90	88	89	87	92	B/C
		Sg. Perak	92	94	93	94	93	B/C
		Sg. Pinji	76	77	79	80	76	ST/SP
		Sg. Pulau	97	97	97	97	96	B/C
		Sg. Raia	90	90	91	91	92	B/C
		Sg. Rui	95	89	92	95	95	B/C
		Sg. Seluang	62	62	66	68	66	ST/SP
		Sg. Serokai	77	81	83	85	80	ST/SP
		Sg. Sintang	72	67	64	68	65	ST/SP
		Sg. Sungkai	94	92	90	92	91	B/C
		Sg. Sungkai Mati	81	84	87	74	80	ST/SP
		Sg. Tapah	97	96	97	97	97	B/C
		Sg. Teja	88	85	81	83	86	B/C
		Sg. Tesong	97	97	97	97	96	B/C
		Sg. Tumboh	73	76	76	78	77	ST/SP
		Sg. Woh	97	98	97	97	97	B/C
	Sg. Raja Hitam	Sg. Derhaka	79	75	74	77	74	ST/SP
		Sg. Manjong	87	86	88	86	87	B/C
		Sg. Nyior	97	97	98	98	97	B/C
		Sg. Raja Hitam	80	75	73	81	75	ST/SP
	Sg. Sepetang	Sg. Batu Tegoh	93	91	91	92	93	B/C
		Sg. Jana	84	84	88	87	89	B/C
		Sg. Lidin	86	84	86	84	79	ST/SP
		Sg. Limau	96	96	96	96	94	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Perak	Sg. Sepetang	Sg. Malai	80	76	74	77	74	ST/SP
		Sg. Nyior	97	97	97	95	97	B/C
		Sg. Sepetang	81	79	79	82	81	B/C
		Sg. Temerloh	95	94	94	91	94	B/C
		Sg. Trong	96	97	97	96	96	B/C
	Sg. Wangi	Sg. Deralik	74	74	75	75	78	ST/SP
		Sg. Wangi	76	69	82	81	78	ST/SP
Selangor/ Perak	Sg. Bernam	Sg. Bernam	91	88	90	89	88	B/C
		Sg. Dusun	95	95	95	95	96	B/C
		Sg. Gelinting	96	96	97	92	97	B/C
		Sg. Inki	97	97	97	97	98	B/C
		Sg. Slim	94	92	92	92	91	B/C
		Sg. Trolak	96	95	96	95	96	B/C
Selangor	Sg. Buloh	Sg. Buloh	56	51	54	67	54	T/P
	Sg. Selangor	Sg. Air Hitam	80	77	73	75	80	ST/SP
		Sg. Batang Kali	96	93	91	90	95	B/C
		Sg. Guntong	81	83	82	78	76	ST/SP
		Sg. Kanching	96	93	94	94	93	B/C
		Sg. Kerling	97	96	97	97	95	B/C
		Sg. Kundang	71	77	77	77	68	ST/SP
		Sg. Rangkap	96	97	97	96	97	B/C
		Sg. Rawang	81	81	82	82	74	ST/SP
		Sg. Selangor	91	91	90	91	90	B/C
		Sg. Sembah	83	82	81	83	82	B/C
		Sg. Serendah	96	95	95	95	94	B/C
	Sg. Sepang	Sg. Sepang	82	84	88	84	81	B/C
	Sg. Tenggi	Sg. Tenggi	91	89	88	88	91	B/C
Selangor/ W. P. Kuala Lumpur	Sg. Klang	Sg. Air Busuk	40	52	42	46	45	T/P
		Sg. Ampang	66	72	70	73	74	ST/SP
		Sg. Anak Air Batu	89	80	81	82	86	B/C
		Sg. Batu	71	79	73	73	70	ST/SP
		Sg. Belongkong	73	65	78	74	71	ST/SP
		Sg. Bunos	76	71	68	70	66	ST/SP
		Sg. Damansara	76	69	66	69	66	ST/SP
		Sg. Gombak	74	83	82	74	77	ST/SP
		Sg. Jinjang	71	70	68	67	61	ST/SP
		Sg. Kerayong	62	59	58	57	50	T/P
		Sg. Keroh	69	68	65	70	64	ST/SP
		Sg. Klang	67	70	69	63	65	ST/SP
		Sg. Kuyoh	69	68	68	66	64	ST/SP
		Sg. Penchala	80	76	71	68	70	ST/SP
		Sg. Pusu	80	78	75	74	73	ST/SP

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Selangor/ W. P. Kuala Lumpur	Sg. Klang	Sg. Rasau	87	93	94	91	87	B/C
		Sg. Rumpit	97	95	97	97	97	B/C
		Sg. Semelah	87	90	91	84	85	B/C
		Sg. Toba	69	63	53	60	45	T/P
		Sg. Untut	73	78	64	65	59	T/P
Selangor/ W. P. Putrajaya/ N. Sembilan	Sg. Langat	Sg. Anak Chuau	94	94	94	94	93	B/C
		Sg. Balak	70	71	74	68	65	ST/SP
		Sg. Batang Benar	74	76	84	63	61	ST/SP
		Sg. Batang Labu	82	84	82	80	80	ST/SP
		Sg. Batang Nilai	81	79	80	77	79	ST/SP
		Sg. Beranang	87	85	84	82	83	B/C
		Sg. Buan	83	85	82	78	77	ST/SP
		Sg. Chuau	94	94	94	94	92	B/C
		Sg. Jijan	82	88	88	86	86	B/C
		Sg. Langat	82	82	83	78	79	ST/SP
		Sg. Limau Manis	75	82	75	82	82	B/C
		Sg. Pajam	68	74	72	74	73	ST/SP
		Sg. Rinching	94	90	95	89	90	B/C
		Sg. Semenyih	87	86	86	84	86	B/C
		Sg. Sering	72	80	81	83	80	ST/SP
N. Sembilan	Sg. Lukut	Sg. Lukut	73	80	79	79	74	ST/SP
N. Sembilan/ Selangor	Sg. Sepang	Sg. Rambai	25	60	64	61	57	T/P
N. Sembilan/ Melaka	Sg. Baru	Sg. Baru	70	75	79	78	77	ST/SP
	Sg. Linggi	Sg. Batang Penar	93	90	90	86	89	B/C
		Sg. Batu Hampar	91	93	92	91	89	B/C
		Sg. Chembong	88	89	92	94	93	B/C
		Sg. Empangan Terip	82	85	83	83	82	B/C
		Sg. Jelai	86	88	87	89	88	B/C
		Sg. Kayu Ara	80	84	81	78	81	B/C
		Sg. Kenaboi	87	85	89	81	90	B/C
		Sg. Kepayong	89	85	93	90	85	B/C
		Sg. Kundur Besar	92	92	93	95	84	B/C
		Sg. Linggi	84	85	84	82	80	ST/SP
		Sg. Muar	93	91	93	94	94	B/C
		Sg. Ngoi Ngoi	80	83	80	80	80	ST/SP
		Sg. Paroi	80	85	80	83	81	B/C
		Sg. Pedas	94	93	95	92	86	B/C
		Sg. Rembau	92	91	91	86	86	B/C
		Sg. Senawang	77	81	83	84	83	B/C
		Sg. Simin	85	87	84	80	80	ST/SP
		Sg. Simpang Ampat	87	84	87	87	88	B/C
		Sg. Siput	90	90	89	90	89	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
N. Sembilan/ Melaka	Sg. Linggi	Sg. Temiang	71	83	78	82	78	ST/SP
		Sg. Tuang	62	70	74	69	73	ST/SP
	Sg. Tuang	Sg. Tuang	63	75	75	74	80	ST/SP
	Sg. Melaka	Sg. Batang Melaka	91	91	92	92	90	B/C
		Sg. Durian Tunggal	86	88	85	85	77	ST/SP
		Sg. Dusun	94	94	96	95	94	B/C
		Sg. Kemunting	92	91	96	93	95	B/C
		Sg. Malim	68	71	68	66	63	ST/SP
		Sg. Melaka	80	83	84	82	83	B/C
		Sg. Putat	72	67	67	63	63	ST/SP
		Sg. Rembia	77	77	76	77	78	ST/SP
		Sg. Tampin	94	87	93	92	89	B/C
Melaka	Sg. Duyong	Sg. Duyong	71	74	76	81	79	ST/SP
		Sg. Gapam	92	93	93	91	90	B/C
		Sg. Punggur	63	58	60	69	69	ST/SP
	Sg. Kesang	Sg. Chin-Chin	84	80	84	84	88	B/C
		Sg. Chohong	92	93	94	94	94	B/C
		Sg. Kesang	87	85	86	87	89	B/C
		Sg. Tangkak	77	74	71	75	79	ST/SP
	Sg. Merlimau	Sg. Merlimau	59	61	63	67	68	ST/SP
	Sg. Seri Melaka	Sg. Air Salak	79	78	67	68	62	ST/SP
		Sg. Seri Melaka	66	69	67	67	66	ST/SP
		Sg. Udag	86	91	94	88	88	B/C
Johor/ N. Sembilan/ Pahang	Sg. Muar	Sg. Air Panas	97	96	97	97	97	B/C
		Sg. Belemang	95	94	96	96	96	B/C
		Sg. Gemas	83	82	83	80	84	B/C
		Sg. Gemencheh	91	85	92	92	91	B/C
		Sg. Jelai	92	91	94	93	95	B/C
		Sg. Jementah	96	95	96	97	96	B/C
		Sg. Juasseh	95	94	94	95	94	B/C
		Sg. Kelamah	88	79	84	85	80	ST/SP
		Sg. Labis	88	86	86	87	90	B/C
		Sg. Meda	85	80	85	85	88	B/C
		Sg. Merbudu	77	72	85	81	83	B/C
		Sg. Merlimau	66	73	72	67	79	ST/SP
		Sg. Muar	87	85	88	87	89	B/C
		Sg. P. Mengkuang	92	91	89	93	94	B/C
		Sg. Pagoh	74	76	76	78	78	ST/SP
		Sg. Palong	87	83	88	85	91	B/C
		Sg. Pendol	95	93	95	95	93	B/C
		Sg. Sarang Buaya	60	60	67	69	73	ST/SP
		Sg. Segamat	93	89	91	93	92	B/C
		Sg. Senarut	77	79	75	76	83	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Johor/ N. Sembilan/ Pahang	Sg. Muar	Sg. Serom	63	63	67	67	74	ST/SP
		Sg. Simpang Loi	84	73	81	66	78	ST/SP
		Sg. Tenang	76	81	78	85	85	B/C
Johor	Sg. Air Baloi	Sg. Air Baloi	55	58	67	64	67	ST/SP
	Sg. Batu Pahat	Sg. Amran	81	80	82	86	85	B/C
		Sg. Bantang	97	97	97	97	97	B/C
		Sg. Batu Pahat	64	61	63	68	72	ST/SP
		Sg. Bekok	88	83	84	87	87	B/C
		Sg. Berlian	77	79	82	82	80	ST/SP
		Sg. Chaah	93	90	90	87	90	B/C
		Sg. Kahang	92	82	86	90	90	B/C
		Sg. Lenik	91	90	90	91	88	B/C
		Sg. Merek	89	88	92	90	90	B/C
		Sg. Merpo	90	91	94	94	90	B/C
		Sg. Panchor	63	59	62	68	74	ST/SP
		Sg. Semberong	71	66	77	72	77	ST/SP
		Sg. Semberong Dam	91	89	93	91	91	B/C
		Sg. Simpang Kanan	62	59	62	67	73	ST/SP
		Sg. Simpang Kiri	71	75	69	74	79	ST/SP
		Sg. Temehel	54	59	62	64	75	ST/SP
	Sg. Benut	Sg. Benut	78	77	81	78	82	B/C
		Sg. Machap Dam	94	93	90	94	90	B/C
		Sg. Parit Hj. Yassin	81	81	83	84	83	B/C
		Sg. Pinggan	59	63	67	67	72	ST/SP
		Sg. Ulu Benut	90	86	90	91	93	B/C
	Sg. Danga	Sg. Danga	61	64	57	69	59	T/P
	Sg. Endau	Sg. Anak Sg. Semberong	85	84	82	71	81	B/C
		Sg. Dengar	91	90	90	91	92	B/C
		Sg. Empangan Labong	91	91	91	92	93	B/C
		Sg. Endau	92	91	92	94	94	B/C
		Sg. Jasin	97	96	97	96	96	B/C
		Sg. Jebong	82	75	86	88	88	B/C
		Sg. Kahang	91	90	92	93	93	B/C
		Sg. Lenga	69	74	78	73	74	ST/SP
		Sg. Lenggong	89	89	89	92	91	B/C
		Sg. Mamai	88	89	86	89	91	B/C
		Sg. Melatai	71	73	71	75	76	ST/SP
		Sg. Mengkibol	84	82	81	83	84	B/C
		Sg. Paloh	85	85	90	86	83	B/C
		Sg. Pamol	76	73	69	81	76	ST/SP
		Sg. Selai	94	94	90	94	95	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Johor	Sg. Endau	Sg. Semberong	87	83	88	91	90	B/C
		Sg. Singol	83	87	84	85	86	B/C
		Sg. Tamok	90	91	87	92	92	B/C
	Sg. Jemaluang	Sg. Jemaluang	88	86	91	91	91	B/C
		Sg. Anak Sg. Sayong	90	79	84	83	83	B/C
	Sg. Johor	Sg. Belitong	89	86	87	85	84	B/C
		Sg. Berangan	82	81	82	84	75	ST/SP
		Sg. Bukit Besar	82	77	68	75	77	ST/SP
		Sg. Chemangar	73	77	79	80	81	B/C
		Sg. Johor	89	89	88	89	89	B/C
		Sg. Layang	93	93	94	95	94	B/C
		Sg. Layau Kiri	92	89	87	93	88	B/C
		Sg. Lebam	87	88	94	90	94	B/C
		Sg. Linggiu	93	92	92	93	92	B/C
		Sg. Panti	87	86	84	90	89	B/C
		Sg. Papan	86	87	90	89	88	B/C
		Sg. Pelepah	91	91	92	92	92	B/C
		Sg. Penggeli	88	90	90	87	88	B/C
		Sg. Remis	89	89	92	86	88	B/C
		Sg. Santi	87	90	92	91	91	B/C
		Sg. Sayong	85	87	88	86	88	B/C
		Sg. Sebol	80	79	80	84	83	B/C
		Sg. Seluyut	87	83	85	90	90	B/C
		Sg. Semangar	92	90	89	90	91	B/C
		Sg. Semenchu	85	86	86	78	82	B/C
		Sg. Sening	93	96	94	96	93	B/C
		Sg. Serai	60	62	64	74	68	ST/SP
		Sg. Telor	89	93	92	93	90	B/C
		Sg. Temoh	84	88	79	82	87	B/C
		Sg. Tiram	85	82	87	87	85	B/C
	Sg. Kaw. Pasir Gudang	Sg. Buluh	43	40	46	35	63	ST/SP
		Sg. Lato	68	71	69	71	77	ST/SP
		Sg. Masai	60	63	73	69	76	ST/SP
		Sg. Perembi	47	59	69	56	70	ST/SP
		Sg. Tukang Batu	35	34	35	44	50	T/P
	Sg. Kempas	Sg. Kempas	42	41	38	40	52	T/P
	Sg. Kim-Kim	Sg. Kim-Kim	79	69	84	81	73	ST/SP
	Sg. Mersing	Sg. Empangan Congok	88	86	92	93	93	B/C
		Sg. Mersing	92	87	92	91	90	B/C
	Sg. Paloi	Sg. Paloi	90	90	91	91	93	B/C
	Sg. Pontian Besar	Sg. Air Hitam	74	73	82	80	79	ST/SP

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Johor	Sg. Pontian Besar	Sg. Ayer Merah	54	54	65	61	64	ST/SP
		Sg. Pontian Besar	71	74	81	78	78	ST/SP
	Sg. Pontian Kecil	Sg. Pontian Kecil	79	77	79	80	78	ST/SP
	Sg. Pulai	Sg. Pulai	80	85	80	76	76	ST/SP
		Sg. Pulai Dam	95	96	96	95	95	B/C
		Sg. Ulu Choh	72	74	74	83	82	B/C
	Sg. Rambah	Sg. Rambah	66	71	70	65	71	ST/SP
	Sg. Sanglang	Sg. Sanglang	57	51	66	63	66	ST/SP
	Sg. Sedili Besar	Sg. Ambat	84	76	88	84	87	B/C
		Sg. Dohol	90	86	89	86	91	B/C
		Sg. Mupur	73	73	60	78	81	B/C
		Sg. Pasir Panjang	87	76	71	83	84	B/C
		Sg. Sedili Besar	87	85	89	88	91	B/C
		Sg. Temubor Kanan	95	93	95	93	96	B/C
	Sg. Sedili Kecil	Sg. Anak Sedili Kecil	63	75	80	75	78	ST/SP
		Sg. Bahan	75	69	83	80	83	B/C
		Sg. Sedili Kecil	80	82	84	83	89	B/C
	Sg. Segget	Sg. Segget	70	68	52	55	55	T/P
	Sg. Skudai	Sg. Melana	81	83	83	83	79	ST/SP
		Sg. Skudai	76	74	79	79	75	ST/SP
	Sg. Tebrau	Sg. Bala	47	55	60	63	63	ST/SP
		Sg. Pandan	43	58	44	45	54	T/P
		Sg. Plentong	66	67	63	71	71	ST/SP
		Sg. Sebulung	58	62	56	58	62	ST/SP
		Sg. Sengkuang	53	50	35	37	39	T/P
		Sg. Tampoi	60	58	54	48	55	T/P
		Sg. Tebrau	71	65	62	65	63	ST/SP
Pahang	Sg. Anak Endau	Sg. Anak Endau	90	89	90	89	91	B/C
	Sg. Balok	Sg. Balok	77	76	76	69	76	ST/SP
		Sg. Panjang	78	72	80	71	80	ST/SP
		Sg. Yior	75	74	72	65	76	ST/SP
	Sg. Bebar	Sg. Bebar	88	87	90	89	86	B/C
		Sg. Merba	91	88	88	86	89	B/C
		Sg. Serai	86	83	87	90	86	B/C
	Sg. Cherating	Sg. Cherating	86	85	86	82	83	B/C
	Sg. Kuantan	Sg. Belat	86	88	87	86	84	B/C
		Sg. Charu	96	95	96	96	96	B/C
		Sg. Galing Besar	67	76	76	77	74	ST/SP
		Sg. Kenau	97	96	97	97	96	B/C
		Sg. Kuantan	93	91	92	92	92	B/C
		Sg. Pandan	93	94	93	95	91	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Pahang	Sg. Kuantan	Sg. Pinang	88	88	89	85	85	B/C
		Sg. Reman	91	90	91	93	91	B/C
		Sg. Riau	88	88	87	82	83	B/C
		Sg. Talam	70	76	70	63	67	ST/SP
	Sg. Merchong	Sg. Merchong	92	87	89	85	88	B/C
		Sg. Aur	91	90	91	88	91	B/C
	Sg. Rompin	Sg. Bakar	69	92	95	94	92	B/C
		Sg. Jekatih	90	91	91	90	87	B/C
		Sg. Jeram	93	90	90	90	89	B/C
		Sg. Kepasing	90	92	88	91	86	B/C
		Sg. Keratong	91	90	91	90	88	B/C
		Sg. Pontian	90	84	88	89	88	B/C
		Sg. Pukin	89	94	94	94	91	B/C
		Sg. Rompin	92	90	89	88	89	B/C
		Sg. Sepayang	84	86	85	85	82	B/C
		Sg. Tonggok	81	73	80	73	80	ST/SP
Pahang/ N. Sembilan	Sg. Pahang	Sg. Anak Sg. Lepar	93	89	94	91	89	B/C
		Sg. Batu	92	91	94	90	92	B/C
		Sg. Belayar	94	92	93	91	91	B/C
		Sg. Bentong	94	93	92	91	91	B/C
		Sg. Benus	95	91	95	94	94	B/C
		Sg. Bera	86	86	87	84	84	B/C
		Sg. Berkelah	97	97	97	97	96	B/C
		Sg. Bertam	95	95	93	93	92	B/C
		Sg. Bilut	88	89	88	92	92	B/C
		Sg. Burung	96	95	93	90	94	B/C
		Sg. Chini	84	85	84	86	90	B/C
		Sg. Gapoi	97	96	97	97	97	B/C
		Sg. Habu	96	94	94	96	95	B/C
		Sg. Jelai	92	89	91	92	89	B/C
		Sg. Jempol	95	92	95	94	91	B/C
		Sg. Jengka	92	91	93	94	89	B/C
		Sg. Kecau	88	91	91	90	88	B/C
		Sg. Kelau	90	89	90	94	93	B/C
		Sg. Kertam	91	93	93	92	90	B/C
		Sg. Koyan	94	92	93	94	92	B/C
		Sg. Krau	94	92	94	92	90	B/C
		Sg. Kundang	82	85	86	81	83	B/C
		Sg. Lenggok	96	92	96	95	89	B/C
		Sg. Lepar	91	93	95	94	92	B/C
		Sg. Lipis	92	92	93	92	92	B/C
		Sg. Luit	93	92	89	92	87	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Pahang/ N. Sembilan	Sg. Pahang	Sg. Maran	96	96	96	95	95	B/C
		Sg. Mentiga	86	88	91	90	91	B/C
		Sg. Pahang	91	90	90	90	91	B/C
		Sg. Penjuring	97	97	97	97	96	B/C
		Sg. Pertang	91	91	91	91	91	B/C
		Sg. Perting	96	97	97	96	97	B/C
		Sg. Raub	95	95	96	94	96	B/C
		Sg. Retang	93	94	94	92	89	B/C
		Sg. Ringlet	91	89	91	94	91	B/C
		Sg. Salak	91	91	92	94	93	B/C
		Sg. Semantan	91	88	90	91	92	B/C
		Sg. Serting	84	83	84	84	81	B/C
		Sg. T. Paya Bungor	91	92	92	92	94	B/C
		Sg. Tahan	92	94	96	94	94	B/C
		Sg. Tanglir	89	89	90	93	90	B/C
		Sg. Tasik Bera	88	89	89	88	88	B/C
		Sg. Tasik Chini	90	92	92	93	91	B/C
		Sg. Teh	94	94	96	96	96	B/C
		Sg. Tekal	89	87	90	86	89	B/C
		Sg. Telang	94	93	93	93	93	B/C
		Sg. Telemong	96	94	94	96	96	B/C
		Sg. Telom	94	92	91	92	86	B/C
		Sg. Tembeling	90	94	95	94	92	B/C
		Sg. Teranum	96	96	97	96	94	B/C
		Sg. Teras	96	96	96	96	96	B/C
		Sg. Teris	94	94	94	95	94	B/C
		Sg. Terla	97	97	97	96	95	B/C
		Sg. Triang	91	85	87	87	88	B/C
		Sg. Tringkap	94	96	97	94	89	B/C
		Sg. Ulong	97	97	97	97	97	B/C
Terengganu	Sg. Besut	Sg. Besut	94	94	94	95	95	B/C
		Sg. Jertih	92	91	87	89	92	B/C
	Sg. Chukai	Sg. Bungkus	83	81	82	84	82	B/C
		Sg. Chukai	87	88	84	82	91	B/C
		Sg. Ibok	89	89	91	90	90	B/C
		Sg. Ruang	80	80	79	75	72	ST/SP
	Sg. Dungun	Sg. Dungun	96	92	93	95	94	B/C
		Sg. Telemboh	89	89	87	86	85	B/C
	Sg. Ibai	Sg. Ibai	80	82	80	79	80	ST/SP
	Sg. Kemaman	Sg. Cherul	91	91	93	94	93	B/C
		Sg. Kemaman	92	92	92	93	90	B/C
		Sg. Neram	86	85	88	77	83	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Terengganu	Sg. Kemaman	Sg. Perasing	92	94	90	90	89	B/C
		Sg. Ransan	87	87	90	90	88	B/C
	Sg. Kertih	Sg. Kertih	85	88	88	88	91	B/C
	Sg. Kluang	Sg. Kluang	84	84	85	84	85	B/C
	Sg. Marang	Sg. Kerak	82	85	82	82	82	B/C
		Sg. Marang	89	94	90	91	93	B/C
		Sg. Temala	92	91	90	92	92	B/C
	Sg. Merang	Sg. Merang	77	77	80	84	76	ST/SP
	Sg. Merchang	Sg. Landas	87	87	84	87	85	B/C
		Sg. Merchang	80	73	76	81	77	ST/SP
	Sg. Paka	Sg. Besul	96	96	92	96	96	B/C
		Sg. Paka	90	90	90	90	93	B/C
		Sg. Rasau	84	83	83	81	85	B/C
		Sg. Rengat	91	91	89	89	84	B/C
	Sg. Setiu	Sg. Bari	95	95	93	94	94	B/C
		Sg. Chalok	92	90	91	91	92	B/C
		Sg. Setiu	93	93	93	96	96	B/C
		Sg. Tarom	94	95	92	91	95	B/C
	Sg. Terengganu	Sg. Berang	95	96	97	97	97	B/C
		Sg. Nerus	92	93	92	94	93	B/C
		Sg. Pueh	87	92	91	86	91	B/C
		Sg. Telemong	93	91	93	96	95	B/C
		Sg. Terengganu	91	92	92	91	92	B/C
Kelantan	Sg. Golok	Sg. Golok	93	90	93	96	93	B/C
		Sg. Jedok	95	95	93	95	93	B/C
		Sg. Lanas	94	90	94	96	94	B/C
		Sg. Tasik Garu	85	82	87	90	85	B/C
	Sg. Kelantan	Sg. Aring	80	83	82	85	89	B/C
		Sg. Belatop	89	87	89	91	89	B/C
		Sg. Ber	91	91	91	89	91	B/C
		Sg. Berok	88	89	87	88	89	B/C
		Sg. Betis	93	92	92	93	95	B/C
		Sg. Chiku	89	91	87	94	90	B/C
		Sg. Galas	88	90	91	89	91	B/C
		Sg. Isos	73	78	74	80	73	ST/SP
		Sg. Kelantan	86	87	87	90	87	B/C
		Sg. Kelesa	94	91	90	83	86	B/C
		Sg. Kenkren	93	94	94	93	95	B/C
		Sg. Kerilla	94	94	95	93	93	B/C
		Sg. Ketil	97	90	92	95	96	B/C
		Sg. Lebir	92	90	91	92	90	B/C
		Sg. Muring	92	90	93	93	90	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Kelantan	Sg. Kelantan	Sg. Nal	91	89	91	91	93	B/C
		Sg. Nenggiri	82	87	87	88	89	B/C
		Sg. Pehi	91	91	92	94	94	B/C
		Sg. Pelaur	96	95	87	96	94	B/C
		Sg. Penangau	87	89	86	90	89	B/C
		Sg. Pergau	96	96	96	97	97	B/C
		Sg. Rasau	80	85	85	88	89	B/C
		Sg. Relai	91	90	87	91	89	B/C
		Sg. Sokor	89	89	88	93	87	B/C
		Sg. Tuang	94	91	97	96	96	B/C
	Sg. Kemasin	Sg. Gali	75	83	81	89	84	B/C
		Sg. Kemasin	85	87	84	88	88	B/C
		Sg. Semerak	87	88	86	87	88	B/C
	Sg. Pengkalan Chepa	Sg. Alor B	63	59	63	63	59	T/P
		Sg. Alor Lintah	68	70	74	70	59	T/P
		Sg. Keladi	84	89	87	87	86	B/C
		Sg. Pengkalan Chepa	73	75	69	72	69	ST/SP
	Sg. Pengkalan Datu	Sg. Raja Gali	87	81	87	87	85	B/C
		Sg. Pasir Hor	77	75	77	82	74	ST/SP
		Sg. Pengkalan Datu	86	85	87	86	89	B/C
Sarawak	Sg. Balingian	Sg. Balingian	87	87	76	71	79	ST/SP
		Sg. Baram	85	86	81	76	79	ST/SP
	Sg. Baram	Sg. Tutuh	-	87	79	78	81	B/C
		Sg. Kayan	83	82	78	77	79	ST/SP
	Sg. Kemena	Sg. Kemena	82	84	79	74	77	ST/SP
		Sg. Sibiu	79	83	76	77	71	ST/SP
	Sg. Kerian	Sg. Kerian	84	86	83	80	77	ST/SP
		Sg. Seblak	88	87	79	77	79	ST/SP
		Sg. Selalang	92	90	90	89	90	B/C
	Sg. Lawas	Sg. Lawas	89	91	92	87	91	B/C
	Sg. Limbang	Sg. Limbang	89	88	85	82	82	B/C
	Sg. Lupar	Sg. Ai	91	89	91	90	88	B/C
		Sg. Lupar	84	88	79	75	77	ST/SP
		Sg. Sekerang	88	87	90	90	88	B/C
		Sg. Seterap	86	89	80	76	75	ST/SP
		Sg. Undup	85	89	89	85	88	B/C
	Sg. Miri	Sg. Adong	78	57	54	51	47	T/P
		Sg. Dalam	83	80	70	71	73	ST/SP
		Sg. Lutong	82	79	74	67	62	ST/SP
		Sg. Miri	88	58	50	49	47	T/P
		Sg. Padang Liku	88	83	81	82	80	ST/SP

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Sarawak	Sg. Mukah	Sg. Mukah	82	86	75	73	74	ST/SP
	Sg. Niah	Sg. Niah	86	86	83	83	83	B/C
		Sg. Sekaloh	81	83	75	70	70	ST/SP
	Sg. Oya	Sg. Oya	84	86	73	67	68	ST/SP
	Sg. Rajang	Sg. Baloi	-	89	73	73	74	ST/SP
		Sg. Binatang	89	87	86	84	87	B/C
		Sg. Daro	62	66	53	53	57	T/P
		Sg. Jemoreng	63	66	55	52	59	T/P
		Sg. Julau	86	85	89	85	87	B/C
		Sg. Kanowit	87	87	88	86	86	B/C
		Sg. Meradong	82	85	78	70	76	ST/SP
		Sg. Pakan	89	88	88	88	87	B/C
		Sg. Pila Parit	77	78	81	80	79	ST/SP
		Sg. Rajang	85	86	83	81	81	B/C
		Sg. Salim	81	86	76	66	70	ST/SP
		Sg. Sarikei	89	88	83	82	82	B/C
	Sg. Sadong	Sg. Karangan	76	84	68	69	70	ST/SP
		Sg. Sadong	85	85	83	84	82	B/C
		Sg. Tarat	90	90	90	92	89	B/C
	Sg. Sarawak	Sg. Kelantan	59	68	66	60	69	ST/SP
		Sg. Kuap	88	89	79	77	77	ST/SP
		Sg. Maong Kiri	73	82	70	59	60	ST/SP
		Sg. Samarahan	71	79	72	69	65	ST/SP
		Sg. Sarawak	86	88	87	85	84	B/C
		Sg. Sarawak Kanan	84	85	83	80	81	B/C
		Sg. Sarawak Kiri	87	87	89	91	88	B/C
		Sg. Semadang	90	90	93	92	93	B/C
		Sg. Semenggoh	78	83	75	75	73	ST/SP
		Sg. Tabuan	76	78	64	61	68	ST/SP
		Sg. Tapah	91	90	88	84	87	B/C
	Sg. Saribas	Sg. Layar	89	88	84	88	82	B/C
		Sg. Saribas	79	87	75	67	69	ST/SP
	Sg. Semunsam	Sg. Semunsam	80	85	88	88	90	B/C
	Sg. Sibuti	Sg. Kabuloh	64	76	82	72	77	ST/SP
		Sg. Kejapil	89	85	86	79	82	B/C
		Sg. Satap	84	84	74	77	76	ST/SP
		Sg. Sibuti	85	81	79	78	75	ST/SP
	Sg. Similajau	Sg. Similajau	85	87	83	83	84	B/C
	Sg. Suai	Sg. Suai	87	85	80	79	78	ST/SP
	Sg. Tatau	Sg. Tatau	85	86	84	81	83	B/C
	Sg. Trusan	Sg. Trusan	88	90	86	84	87	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
 Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Sabah	Sg. Apas	Sg. Apas	90	92	90	91	91	B/C
	Sg. Balung	Sg. Balung	91	92	90	92	93	B/C
	Sg. Bengkoka	Sg. Bengkoka	89	90	85	88	87	B/C
	Sg. Bingkongan	Sg. Bandau	92	92	94	92	92	B/C
		Sg. Bingkongan	94	93	94	94	92	B/C
		Sg. Menggaris	92	92	93	93	91	B/C
		Sg. Tandek	91	91	91	90	88	B/C
	Sg. Bongawan	Sg. Bongawan	87	88	87	88	89	B/C
	Sg. Brantian	Sg. Brantian	84	90	87	91	90	B/C
	Sg. Kalabakan	Sg. Kalabakan	83	86	81	86	85	B/C
	Sg. Kalumpang	Sg. Kalumpang	87	88	87	86	80	ST/SP
		Sg. Pang Burong 1	86	86	87	90	81	B/C
		Sg. Pang Burong 2	85	80	79	76	75	ST/SP
	Sg. Kedamaian	Sg. Kedamaian	93	92	95	96	92	B/C
		Sg. Tempasuk	92	91	92	94	90	B/C
		Sg. Wariu	93	93	94	94	92	B/C
	Sg. Kimanis	Sg. Kimanis	90	92	90	89	90	B/C
	Sg. Kinabatangan	Sg. Karamuak	92	92	91	94	93	B/C
		Sg. Kinabatangan	85	84	84	85	82	B/C
		Sg. Koyah	89	88	86	87	90	B/C
		Sg. Leepang	85	84	83	85	83	B/C
		Sg. Menanggul	86	86	82	81	81	B/C
		Sg. Pin	87	86	86	86	83	B/C
		Sg. Takala	88	87	85	84	86	B/C
	Sg. Labok	Sg. Kinipir	91	90	92	92	90	B/C
		Sg. Labok	86	88	87	89	85	B/C
		Sg. Liwagu	89	88	92	88	90	B/C
		Sg. Maliau	94	93	95	94	93	B/C
		Sg. Tungud	91	85	87	90	90	B/C
	Sg. Lakutan	Sg. Lakutan	93	88	92	87	89	B/C
	Sg. Likas	Sg. Darau	83	83	81	81	85	B/C
		Sg. Inanam	88	89	88	87	89	B/C
		Sg. Likas	76	78	71	71	75	ST/SP
		Sg. Menggatal	89	91	94	89	91	B/C
	Sg. Lingkungan	Sg. Bukau	92	87	90	88	89	B/C
		Sg. Lingkungan	93	89	93	88	92	B/C
	Sg. Membakut	Sg. Membakut	87	89	89	89	91	B/C
	Sg. Menggalong	Sg. Menggalong	93	90	91	91	92	B/C

Jadual 2.1 : Status Kualiti Air Sungai Mengikut Sungai, 2025
Table 2.1 : Water Quality Status by River, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	NILAI IKA/ WQI VALUE					KATEGORI IKA/ WQI CATEGORY
			2021	2022	2023	2024	2025	
Sabah	Sg. Merotai	Sg. Merotai	91	91	92	91	90	B/C
	Sg. Mounad	Sg. Mounad	87	88	87	86	86	B/C
	Sg. Moyog	Sg. Moyog	92	92	93	90	91	B/C
	Sg. Padas	Sg. Bunsit	93	92	94	94	91	B/C
		Sg. Liawan	91	92	93	93	91	B/C
		Sg. Padas	88	87	86	84	87	B/C
		Sg. Pangatan	88	87	86	86	87	B/C
		Sg. Pegalan	88	87	90	90	88	B/C
		Sg. Tandulu	92	92	93	92	89	B/C
	Sg. Paitan	Sg. Paitan	91	90	88	86	89	B/C
	Sg. Papar	Sg. Papar	91	91	92	93	91	B/C
	Sg. Sapi	Sg. Sapi	87	84	85	85	84	B/C
		Sg. Sualong	92	93	95	95	92	B/C
	Sg. Segaliud	Sg. Segaliud	85	82	84	86	81	B/C
	Sg. Segama	Sg. Segama	87	86	86	88	86	B/C
	Sg. Sembulan	Sg. Sembulan	81	74	70	75	70	ST/SP
	Sg. Silabukan	Sg. Silabukan	89	87	93	91	88	B/C
	Sg. Sugut	Sg. Bongkud	92	93	93	93	91	B/C
		Sg. Lohan	92	93	95	93	90	B/C
		Sg. Merali	91	90	95	92	92	B/C
		Sg. Sugut	91	91	94	93	91	B/C
	Sg. Tawau	Sg. Tawau	91	91	92	91	90	B/C
	Sg. Telipok	Sg. Telipok	89	89	91	82	88	B/C
	Sg. Tenghilan	Sg. Tenghilan	92	90	92	92	93	B/C
	Sg. Tingkayu	Sg. Tingkayu	85	85	80	87	87	B/C
	Sg. Tuaran	Sg. Damit	87	89	92	91	87	B/C
		Sg. Song Sai	92	92	94	93	90	B/C
		Sg. Tuaran	93	93	94	94	89	B/C
	Sg. Tungku	Sg. Tungku	90	89	92	92	90	B/C
	Sg. Umas-Umas	Sg. Umas-Umas	84	89	85	86	90	B/C

NOTA / NOTE:

KATEGORI IKA/ WQI CATEGORY

- B/C Bersih / Clean
- ST/SP Sederhana Tercemar/ Slightly Polluted
- T/P Tercemar/ Polluted

NILAI IKA/ WQI VALUE

- > 92.7 Kelas I / Class I
- 31.0 - 51.9 Kelas IV / Class IV
- 76.5 - 92.7 Kelas II / Class II
- < 31.0 Kelas V / Class V
- 51.9 - 76.5 Kelas III / Class III
- Tiada Data / No Data

Jadual 2.2: Sungai Tercemar dan Kelas Kualiti Air Berdasarkan BOD, AN dan SS, 2025
Table 2.2: Polluted Rivers and Water Quality Classes Based on BOD, AN and SS, 2025

NEGERI/ STATE	LEMBANGAN/ BASIN	SUNGAI/ RIVER	2025			KELAS BERDASARKAN/ CLASS BASED ON		
			IKA/ WQI	KATEGORI/ CATEGORY	KELAS/ CLASS	BOD	AN	SS
Kedah	Sg. Merbok	Sg. Batu	56	T/P	III	IV	V	I
		Sg. Petani	59	T/P	III	IV	V	I
P. Pinang/ Kedah	Sg. Perai	Sg. Air Melintas	54	T/P	III	V	V	II
		Sg. Kereh	56	T/P	III	IV	V	II
		Sg. Seluang	58	T/P	III	IV	IV	I
		Sg. Seluang Bawah	59	T/P	III	IV	IV	I
P. Pinang	Sg. Jawi	Sg. Chempedak	55	T/P	III	V	IV	II
		Sg. Jawi	56	T/P	III	III	V	II
		Sg. Tengah	57	T/P	III	IV	V	I
	Sg. Juru	Sg. Juru	56	T/P	III	IV	V	I
		Sg. Rambai	55	T/P	III	IV	V	I
	Sg. Kluang	Sg. Kluang	51	T/P	IV	IV	V	I
		Sg. Pinang	46	T/P	IV	V	V	I
	Sg. Pinang	Sg. Titi Kerawang	42	T/P	IV	V	V	I
Selangor	Sg. Buloh	Sg. Buloh	54	T/P	III	IV	V	II
Selangor/ W.P. Kuala Lumpur	Sg. Klang	Sg. Air Busuk	45	T/P	IV	V	V	II
		Sg. Kerayong	50	T/P	IV	V	V	I
		Sg. Toba	45	T/P	IV	V	V	II
		Sg. Untut	59	T/P	III	IV	V	I
Johor	Sg. Danga	Sg. Danga	59	T/P	III	IV	V	I
	Sg. Kaw. Pasir Gudang	Sg. Tukang Batu	50	T/P	IV	V	V	I
	Sg. Kempas	Sg. Kempas	52	T/P	IV	V	V	II
	Sg. Segget	Sg. Segget	55	T/P	III	V	V	I
		Sg. Pandan	54	T/P	III	V	V	I
		Sg. Sengkuang	39	T/P	IV	V	V	II
		Sg. Tampoi	55	T/P	III	V	V	I
Kelantan	Sg. Pengkalan Chepa	Sg. Alor B	59	T/P	III	III	V	I
		Sg. Alor Lintah	59	T/P	III	IV	V	I
N. Sembilan / Selangor	Sg. Sepang	Sg. Rambai	57	T/P	III	IV	V	II
Sarawak	Sg. Miri	Sg. Adong	47	T/P	IV	II	III	I
		Sg. Miri	47	T/P	IV	II	III	II
	Sg. Rajang	Sg. Daro	57	T/P	III	II	II	I
		Sg. Jemoreng	59	T/P	III	II	II	I

NOTA / NOTE:

KATEGORI IKA/ WQI CATEGORY

- **B/C** Bersih / Clean
- **ST/SP** Sederhana Tercemar / Slightly Polluted
- **T/P** Tercemar / Polluted

NILAI IKA/ WQI VALUE

- > 92.7 Kelas I / Class I
- 31.0 - 51.9 Kelas IV / Class IV
- 76.5 - 92.7 Kelas II / Class II
- < 31.0 Kelas V / Class V
- 51.9 - 76.5 Kelas III / Class III

TREND AIR SUNGAI

Trend in River Water

Berdasarkan kepada IKA yang telah direkodkan pada tahun 2025, didapati berlakunya penurunan kepada kualiti air sungai. Bilangan sungai yang dikategorikan sebagai bersih telah menurun kepada 467 (69%) sungai pada tahun 2025 berbanding 475 (71%) sungai pada tahun 2024. Secara umumnya, penurunan kualiti air yang direkodkan pada tahun 2025 adalah disebabkan oleh peningkatan beban pencemaran pada sungai daripada punca tetap dan punca tidak tetap.

Bilangan sungai tercemar telah meningkat daripada 27 sungai pada tahun 2024 kepada 33 sungai pada tahun 2025. Ini menunjukkan terdapat penurunan tren kualiti air dan bilangan sungai tercemar semakin meningkat. Trend kualiti air sungai adalah ditunjukkan di dalam **Rajah 2.1**.

Berdasarkan sub-indeks BOD, bilangan sungai yang dikategorikan sebagai bersih adalah 511 (76%) sungai pada tahun 2025 (**Rajah 2.2**). Bilangan sungai yang tercemar dari segi sub-indeks BOD telah menurun daripada 72 (11%) pada tahun 2024 kepada 69 (10%) sungai pada tahun 2025. Peningkatan kualiti air sungai dari segi BOD ini adalah disebabkan oleh pengurangan pelepasan bahan buangan yang bersifat organik daripada pelbagai punca seperti aktiviti komersial, domestik dan industri.

Dari segi sub-indeks AN pula, bilangan sungai bersih telah menurun daripada 328 (49%) sungai pada tahun 2024 kepada 322 (48%) sungai pada tahun 2025 (**Rajah 2.3**). Bilangan sungai yang tercemar dari segi sub-indeks AN telah meningkat daripada 193 (29%) sungai pada tahun 2024 kepada 210 (31%) sungai pada tahun 2025. Penurunan kualiti air sungai bagi sub-indeks AN boleh dikaitkan dengan peningkatan pelepasan air sisa kumbahan manusia dan haiwan yang tidak diolah dan diolah ke dalam air sungai.

Based on the WQI recorded in 2025, there has been a decrease in river water quality. The number of rivers categorised as clean has decreased to 467 (69%) rivers in 2025, compared to 475 (71%) rivers in 2024. In general, the decrease in water quality recorded in 2025 is due to an increase in the pollution load on the river from point sources and non-point sources.

The number of polluted rivers has increased from 27 rivers in 2024 to 33 rivers in 2025. This indicates that there was decrease in water quality trends and the number of polluted rivers was increasing. The river water quality trend is shown in **Figure 2.1**.

Based on the BOD sub-index, the number of rivers categorised as clean were 511 (76%) rivers in 2025 (**Figure 2.2**). The number of rivers polluted in terms of the BOD sub-index has decreased from 72 (11%) in 2024 to 69 (10%) rivers in 2025. The increase in river water quality in terms of BOD was due to the reduction in discharge of organic wastes from various sources such as commercial, domestic, and industrial activities.

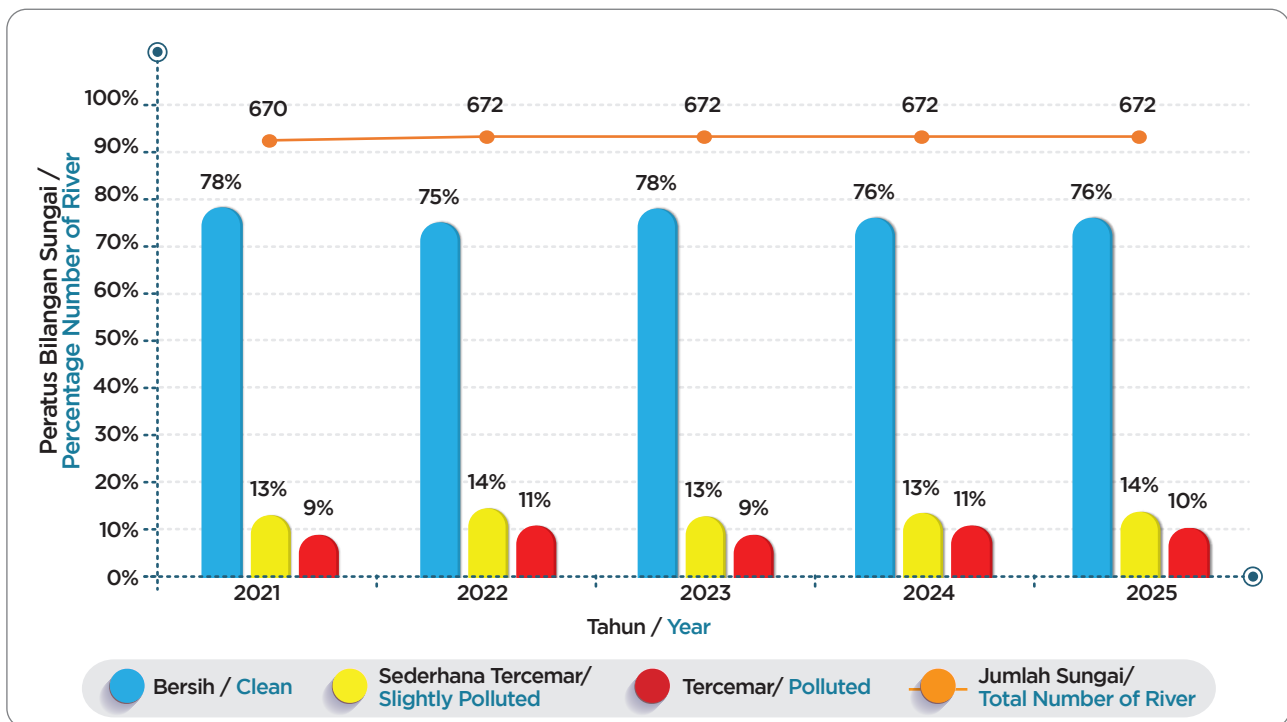
In terms of sub-index AN, the number of clean rivers has decreased from 328 (49%) rivers in 2024 to 322 (48%) rivers in 2025 (**Figure 2.3**). The number of rivers polluted in terms of sub-index AN has increased from 193 (29%) rivers in 2024 to 210 (31%) rivers in 2025. The decrease in river water quality for the AN sub-index can be attributed to an increase in the discharge of human and animal wastewater that was untreated and treated into the river water.

Dari segi sub-indeks SS pula, bilangan sungai yang dikategorikan bersih telah menurun daripada 558 (83%) sungai pada tahun 2024 kepada 556 (83%) sungai pada tahun 2025 (**Rajah 2.4**). Bilangan sungai yang dikategorikan sebagai tercemar dari segi sub-indeks SS pula telah menurun daripada 69 (10%) sungai pada 2024 kepada 60 (9%) sungai pada tahun 2025. Peningkatan kualiti air sungai dari segi parameter SS disebabkan oleh pelaksanaan Amalan Pengurusan Terbaik (BMPs) semasa aktiviti kerja tanah dan pembukaan tanah di kawasan-kawasan tertentu.

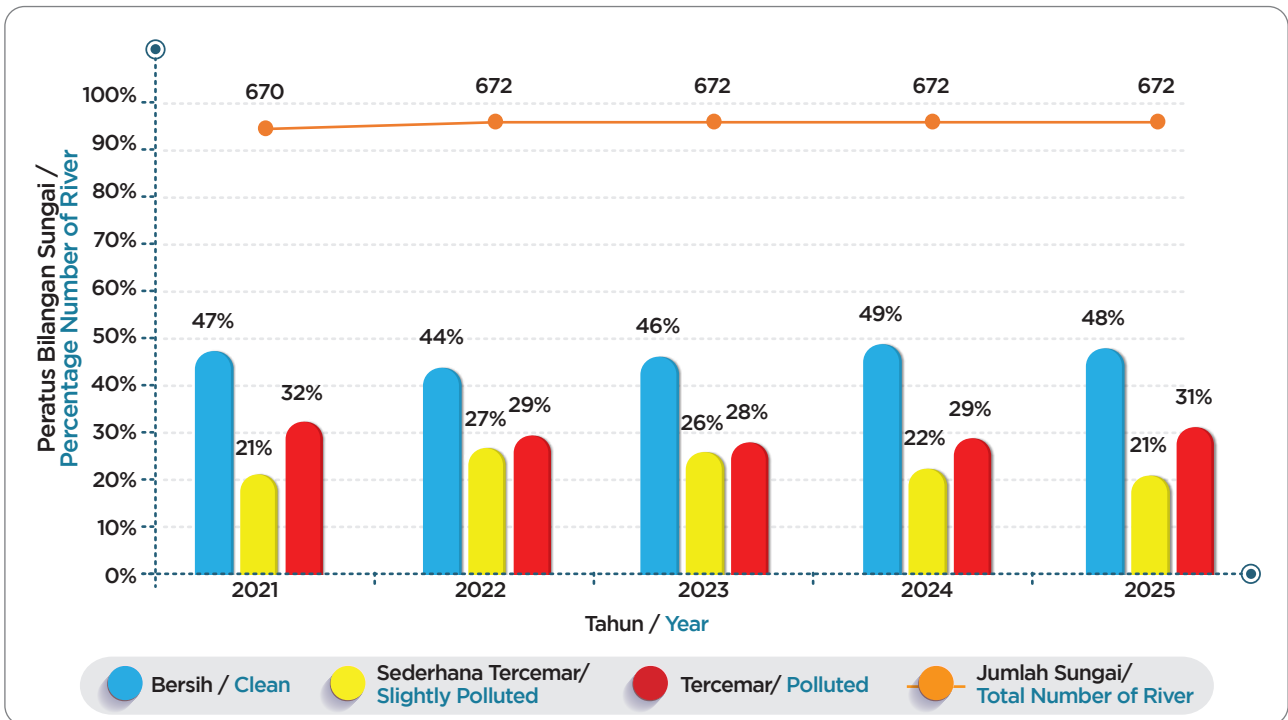
Secara keseluruhannya, penyumbang utama kepada kemerosotan kualiti air sungai yang direkodkan adalah daripada AN manakala BOD dan SS pada tahap yang lebih rendah. Keperluan tindakan bersepadu bagi mengawal beban pencemaran daripada pelbagai sektor dan meningkatkan keberkesanan pengurusan kualiti air sungai secara berterusan.

In terms of SS sub-index, the number of clean rivers has decreased from 558 (83%) rivers in 2024 to 556 (83%) rivers in 2025 (**Figure 2.4**). The number of rivers categorised as polluted in terms of sub-index SS has decreased from 69 (10%) rivers in 2024 to 60 (9%) rivers in 2025. The improvement in river water quality in terms of SS parameter was due to the implementation of Best Management Practices (BMPs) during earthworks activities and land clearing in certain areas.

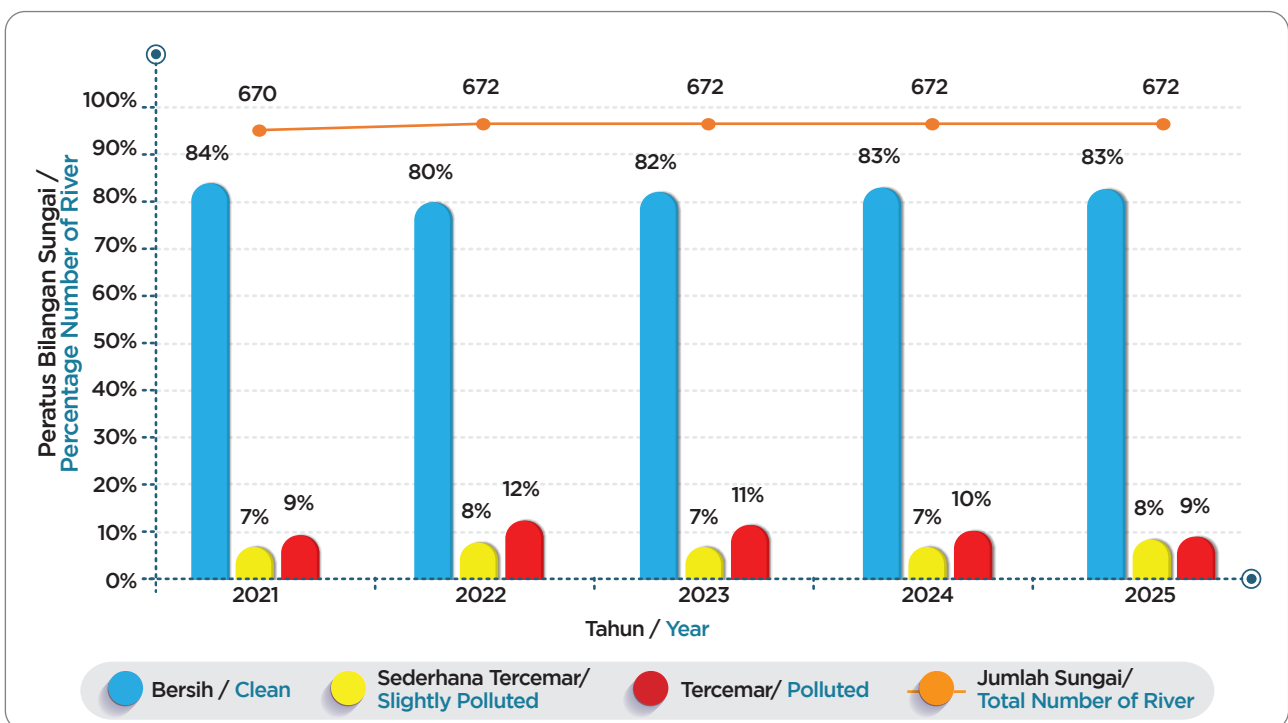
Overall, the main contributors to the deterioration in river water quality have been recorded as AN, and to a lesser extent, BOD and SS. Integrated efforts are needed to control pollution loads from multiple sectors and improve the effectiveness of river water quality management continuously.



Rajah 2.2: Tren Kualiti Air Sungai Berdasarkan Sub-Indeks BOD (2021- 2025)
 Figure 2.2: Trend of River Water Quality Based on BOD Sub-Index (2021-2025)



Rajah 2.3: Tren Kualiti Air Sungai Berdasarkan Sub-Indeks AN (2021- 2025)
Figure 2.3: Trend of River Water Quality Based on AN Sub-Index (2021-2025)



Rajah 2.4: Tren Kualiti Air Sungai Berdasarkan Sub-Indeks SS (2021- 2025)
Figure 2.4: Trend of River Water Quality Based on SS Sub-Index (2021-2025)

STATUS KUALITI AIR MENGIKUT STESEN

Water Quality Status by Station

Jadual 2.3 menunjukkan status kualiti air mengikut stesen. Daripada 1,353 stesen, 955 (71%) stesen dikategorikan sebagai bersih, 322 (24%) stesen adalah sederhana tercemar dan 76 (5%) stesen adalah tercemar (**Rajah 2.5**).

Berdasarkan kepada IKA yang telah direkodkan pada tahun 2025, didapati berlakunya penurunan kepada kualiti air sungai pada stesen-stesen yang dipantau. Ini memandangkan terdapat stesen-stesen yang sebelum ini dikategorikan sebagai bersih telah menjadi kategori sederhana tercemar dan stesen sederhana tercemar merosot kepada tercemar.

Bilangan stesen yang dikategorikan sebagai bersih adalah 955 (71%) stesen pada tahun 2025 berbanding 973 (72%) stesen pada tahun sebelumnya. Bilangan stesen sungai yang dikategorikan sebagai sederhana tercemar telah berlaku sedikit pengurangan daripada 324 (24%) stesen pada tahun 2024 kepada 322 (24%) stesen pada tahun 2025. Bilangan stesen kategori tercemar telah meningkat daripada 56 (4%) stesen pada tahun 2024 kepada 76 (5%) stesen pada tahun 2025. Ini menunjukkan terdapat penurunan tren kualiti air pada bilangan stesen yang berada di dalam kategori tercemar.

Secara umumnya, penurunan kualiti air yang direkodkan pada tahun 2025 adalah disebabkan oleh peningkatan pelepasan beban bahan pencemar sama ada daripada punca tetap atau punca tidak tetap ke dalam sungai.

Bagi pengelasan IKA stesen pengawasan kualiti air sungai pula, sebanyak 280 (21%) stesen dalam Kelas I, 773 (57%) stesen dalam Kelas II, 278 (20%) stesen dalam Kelas III, dan 22 (2%) stesen dalam Kelas IV.

Table 2.3 shows the water quality status by station. Out of the 1,353 stations, 955 (71%) stations were categorised as clean, 322 (24%) stations were slightly polluted and 76 (5%) stations were polluted (**Figure 2.5**).

Based on the WQI recorded in 2025, there has been a decrease in river water quality at the monitored stations. This is due to several stations that were previously categorised as clean having deteriorated to slightly polluted, while stations previously classified as slightly polluted have further deteriorated to polluted.

A total of 955 (71%) stations were categorised as clean in 2025 compared to 973 (72%) stations in the previous year. The number of river stations categorised as slightly polluted has decreased slightly from 324 (24%) stations in 2024 to 322 (24%) stations in 2025. The number of polluted stations increased from 56 (4%) stations in 2024 to 76 (5%) stations in 2025. This indicates that there was a decreased in water quality trends in the number of stations that were in the polluted category.

Generally, the declined in water quality recorded in 2025 can be attributed to increased pollution loads discharged into the rivers from both point sources or non-point sources into the river.

For the WQI classification of river water quality monitoring stations, 280 (21%) stations in Class I, 773 (57%) stations in Class II, 278 (20%) stations in Class III, and 22 (2%) stations in Class IV.

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perlis	Sg. Perlis	Sg. Arau	1RPLS012	88	85	90	87	87	B/C
		Sg. Arau	1RPLS014	92	93	89	90	89	B/C
		Sg. Empangan Timah Tasoh	1RPLS015	95	96	95	95	90	B/C
		Sg. Jarum	1RPLS006	91	89	88	90	88	B/C
		Sg. Jernih	1RPLS004	92	95	91	91	93	B/C
		Sg. Jernih	1RPLS005	95	94	94	95	94	B/C
		Sg. Kok Mak	1RPLS007	87	88	86	85	88	B/C
		Sg. Korok	1RPLS013	76	74	79	75	79	ST/SP
		Sg. Ngulang	1RPLS002	92	93	88	87	90	B/C
		Sg. Pelarit	1RPLS008	96	96	96	97	97	B/C
		Sg. Perlis	1RPLS001	77	78	81	70	76	ST/SP
		Sg. Serai	1RPLS003	86	90	86	89	85	B/C
		Sg. Terusan Mada	1RPLS010	91	92	93	89	93	B/C
		Sg. Terusan Mada	1RPLS011	92	89	91	91	91	B/C
		Sg. Wang Kelian	1RPLS009	97	97	97	97	96	B/C
Kedah	Sg. Kedah	Sg. Ahning	1KKDH011	96	95	94	97	96	B/C
		Sg. Changlun	1KKDH016	88	87	86	87	87	B/C
		Sg. Janing	1KKDH007	97	97	97	97	96	B/C
		Sg. Kedah	1KKDH001	77	76	73	67	69	ST/SP
		Sg. Napoh	1KKDH017	89	90	88	87	89	B/C
		Sg. Padang Terap	1KKDH002	91	89	93	95	93	B/C
		Sg. Padang Terap	1KKDH003	91	90	87	91	89	B/C
		Sg. Padang Terap	1KKDH004	96	95	95	96	96	B/C
		Sg. Padang Terap	1KKDH009	81	78	86	80	78	ST/SP
		Sg. Padang Terap	1KKDH012	97	95	96	96	92	B/C
		Sg. Pedu	1KKDH005	95	94	95	94	96	B/C
		Sg. Pendang	1KKDH008	82	85	85	82	79	ST/SP
		Sg. Sintok	1KKDH018	96	95	92	90	90	B/C
		Sg. Tekai	1KKDH006	94	93	91	92	91	B/C
		Sg. Temin	1KKDH010	89	89	87	86	87	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kedah	Sg. Kedah	Sg. Terusan Lengkuas	1KKDH014	92	92	93	95	93	B/C
		Sg. Terusan Mada Selatan	1KKDH013	92	90	91	90	92	B/C
		Sg. Terusan Tengah	1KKDH015	93	93	94	96	94	B/C
	Sg. Kerian	Sg. Kerian	1KKER001	95	96	95	95	96	B/C
	Sg. Kisap	Sg. Kisap	1KKSP001	97	97	96	97	98	B/C
	Sg. Kuah	Sg. Kuah	1KKUA001	79	81	69	79	77	ST/SP
	Sg. Merbok	Sg. Bakar Arang	1KMBK008	69	66	58	60	70	ST/SP
		Sg. Batu	1KMBK002	64	59	65	52	56	T/P
		Sg. Bongkok	1KMBK003	75	71	74	69	71	ST/SP
		Sg. Bukit Merah	1KMBK006	92	89	95	92	93	B/C
		Sg. Bukit Nanas	1KMBK011	97	97	98	97	98	B/C
		Sg. Korok	1KMBK009	71	66	64	70	75	ST/SP
		Sg. Merbok	1KMBK001	81	81	82	83	86	B/C
		Sg. Petani	1KMBK007	68	64	53	65	59	T/P
		Sg. Tok Pawang	1KMBK004	95	94	96	95	95	B/C
		Sg. Tok Pawang	1KMBK005	95	96	96	94	94	B/C
		Sg. Tupah	1KMBK010	97	97	98	98	97	B/C
	Sg. Muda	Sg. Chepir	1KMUD012	91	92	90	93	92	B/C
		Sg. Gunung Inas	1KMUD021	93	95	96	89	96	B/C
		Sg. Jerong	1KMUD002	75	73	77	75	74	ST/SP
		Sg. Jerong	1KMUD003	78	70	74	75	73	ST/SP
		Sg. Karangan	1KMUD009	91	83	87	84	83	B/C
		Sg. Ketil	1KMUD007	93	91	93	96	95	B/C
		Sg. Muda	1KMUD001	92	90	87	89	90	B/C
		Sg. Muda	1KMUD004	90	91	90	94	92	B/C
		Sg. Muda	1KMUD005	94	95	94	94	92	B/C
		Sg. Muda	1KMUD013	92	91	88	89	90	B/C
		Sg. Muda	1KMUD014	91	94	94	94	94	B/C
		Sg. Muda	1KMUD015	92	94	95	93	93	B/C
		Sg. Muda	1KMUD016	90	91	91	92	90	B/C
		Sg. Muda	1KMUD018	94	91	90	91	89	B/C
		Sg. Muda	1KMUD019	93	96	94	96	93	B/C
		Sg. Muda	1KMUD023	92	91	89	92	91	B/C
		Sg. Muda	1KMUD024	90	91	90	94	92	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kedah	Sg. Muda	Sg. Muda	1KMUD025	94	95	94	96	93	B/C
		Sg. Pegang	1KMUD011	97	97	97	97	98	B/C
		Sg. Sedim	1KMUD008	93	91	93	94	92	B/C
		Sg. Sedim	1KMUD017	91	93	93	94	91	B/C
		Sg. Tawar	1KMUD006	91	92	92	87	95	B/C
		Sg. Tawar	1KMUD010	89	94	91	94	94	B/C
		Sg. Tawar	1KMUD020	90	93	91	89	94	B/C
	Sg. Perai	Sg. Jarak	1KPRI018	77	69	71	73	71	ST/SP
		Sg. Jarak	1KPRI019	76	69	75	74	72	ST/SP
		Sg. Jarak	1KPRI024	70	71	69	72	72	ST/SP
		Sg. Keladi	1KPRI015	81	82	82	78	80	ST/SP
		Sg. Kulim	1KPRI014	82	78	81	83	76	ST/SP
		Sg. Kulim	1KPRI016	91	92	91	92	92	B/C
		Sg. Kulim	1KPRI017	93	94	88	93	94	B/C
		Sg. Kulim	1KPRI023	92	91	91	93	95	B/C
		Sg. Kulim	1KPRI025	94	94	88	93	96	B/C
		Sg. Seluang	1KPRI021	67	65	64	57	58	T/P
		Sg. Seluang Bawah	1KPRI020	71	66	64	63	63	ST/SP
	Sg. Ulu Melaka	Sg. Chenang	1KMLK006	84	77	84	76	73	ST/SP
		Sg. Melaka	1KMLK002	90	85	83	89	91	B/C
		Sg. Melaka	1KMLK003	91	91	93	92	93	B/C
		Sg. Melaka	1KMLK007	97	97	97	97	96	B/C
		Sg. Petang	1KMLK001	97	98	97	97	97	B/C
		Sg. Saga	1KMLK004	92	88	85	90	92	B/C
		Sg. Tuba	1KMLK005	96	97	96	96	96	B/C
P. Pinang	Sg. Bayan Lepas	Sg. Bayan Lepas	1PBLS003	74	69	71	74	64	ST/SP
		Sg. Tiram	1PBLS001	76	78	71	78	77	ST/SP
		Sg. Tiram	1PBLS002	67	71	67	62	71	ST/SP
	Sg. Jawi	Sg. Chempedak	1PJWI003	41	36	55	42	55	T/P
		Sg. Jawi	1PJWI001	52	57	54	52	56	T/P
		Sg. Junjong	1PJWI002	60	57	66	59	61	ST/SP
		Sg. Junjong	1PJWI004	52	58	53	49	54	T/P
		Sg. Junjong	1PJWI006	95	96	97	97	98	B/C
		Sg. Machang Bubok	1PJWI007	72	68	73	65	63	ST/SP
		Sg. Tengah	1PJWI005	58	47	63	55	57	T/P
	Sg. Juru	Sg. Ara	1PJRU006	77	75	77	75	78	ST/SP
		Sg. Juru	1PJRU001	69	66	63	62	56	T/P
		Sg. Juru	1PJRU012	65	70	65	53	56	T/P

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
P. Pinang	Sg. Juru	Sg. Kilang Ubi	1PJRU002	69	68	66	71	70	ST/SP
		Sg. Kilang Ubi	1PJRU003	70	68	67	72	69	ST/SP
		Sg. Kilang Ubi	1PJRU009	97	96	97	95	97	B/C
		Sg. Kilang Ubi	1PJRU010	60	61	54	60	56	T/P
		Sg. Kilang Ubi	1PJRU011	69	68	65	66	63	ST/SP
		Sg. Pasir	1PJRU004	75	66	63	63	69	ST/SP
		Sg. Permatang Rawa	1PJRU008	60	55	64	56	59	T/P
		Sg. Permatang Rawa	1PJRU013	90	87	79	79	81	B/C
		Sg. Rambai	1PJRU005	57	56	50	46	52	T/P
		Sg. Rambai	1PJRU007	62	55	67	60	58	T/P
	Sg. Kerian	Sg. Kechil	1PKER002	90	91	91	92	95	B/C
		Sg. Kechil	1PKER005	87	84	85	86	89	B/C
		Sg. Kerian	1PKER003	89	87	88	90	87	B/C
		Sg. Kerian	1PKER004	89	92	92	91	92	B/C
		Sg. Kerian	1PKER006	89	89	87	90	91	B/C
		Sg. Kerian	1PKER009	84	82	82	83	78	ST/SP
		Sg. Kerian	1PKER014	86	85	84	85	84	B/C
	Sg. Kluang	Sg. Serdang	1PKER007	80	83	89	92	91	B/C
		Sg. Ara	1PKLU002	97	97	97	97	98	B/C
		Sg. Ara	1PKLU003	69	72	63	60	64	ST/SP
		Sg. Dua Besar	1PKLU005	68	67	63	63	62	ST/SP
		Sg. Kluang	1PKLU001	68	52	58	45	51	T/P
	Sg. Perai	Sg. Relau	1PKLU004	68	69	65	73	64	ST/SP
		Sg. Air Melintas	1PPRI007	57	60	64	59	54	T/P
		Sg. Jarak	1PPRI009	79	71	76	73	71	ST/SP
		Sg. Jarak	1PPRI011	70	74	69	74	79	ST/SP
		Sg. Jarak	1PPRI012	71	76	80	79	79	ST/SP
		Sg. Kereh	1PPRI006	59	57	60	48	44	T/P
		Sg. Kereh	1PPRI008	60	56	57	55	57	T/P
		Sg. Kereh	1PPRI024	66	64	62	63	61	ST/SP
		Sg. Kubang Semang	1PPRI005	66	68	74	63	71	ST/SP
		Sg. Perai	1PPRI003	74	62	67	80	69	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
P. Pinang	Sg. Perai	Sg. Perai	1PPRI004	70	62	65	61	65	ST/SP
		Sg. Pertama	1PPRI022	69	52	63	63	60	ST/SP
		Sg. Seluang Bawah	1PPRI010	68	67	62	58	53	T/P
	Sg. Pinang	Sg. Air Itam	1PPNG006	74	69	65	69	72	ST/SP
		Sg. Air Itam	1PPNG011	76	65	62	72	65	ST/SP
		Sg. Air Itam	1PPNG018	97	96	97	98	98	B/C
		Sg. Air Terjun	1PPNG019	97	97	97	97	97	B/C
		Sg. Batu Feringghi	1PPNG001	82	81	77	81	80	ST/SP
		Sg. Batu Feringghi	1PPNG002	96	96	97	97	98	B/C
		Sg. Dondang	1PPNG012	86	54	57	56	49	T/P
		Sg. Dondang	1PPNG013	87	58	56	58	50	T/P
		Sg. Dondang	1PPNG014	79	75	73	77	72	ST/SP
		Sg. Dondang	1PPNG015	75	73	76	79	73	ST/SP
		Sg. Dondang	1PPNG016	73	68	68	67	70	ST/SP
		Sg. Dondang	1PPNG017	63	61	66	74	73	ST/SP
		Sg. Jelutong	1PPNG010	65	68	63	72	72	ST/SP
		Sg. Pinang	1PPNG003	94	92	89	83	92	B/C
		Sg. Pinang	1PPNG008	67	61	50	51	43	T/P
		Sg. Pinang	1PPNG021	63	56	41	41	38	T/P
		Sg. Satu	1PPNG020	97	97	97	98	97	B/C
		Sg. Titi Kerawang	1PPNG004	75	63	57	57	42	T/P
Perak	Sg. Bernam	Sg. Bernam	1ABNM001	73	74	68	67	75	ST/SP
		Sg. Bernam	1ABNM002	66	63	67	68	69	ST/SP
		Sg. Bernam	1ABNM003	81	82	84	76	78	ST/SP
		Sg. Bernam	1ABNM004	93	93	90	90	93	B/C
		Sg. Bernam	1ABNM005	93	93	92	91	94	B/C
		Sg. Bernam	1ABNM006	97	96	96	96	96	B/C
		Sg. Gelinting	1ABNM015	96	96	97	92	97	B/C
		Sg. Inki	1ABNM012	97	97	97	97	98	B/C
		Sg. Slim	1ABNM007	94	95	94	93	92	B/C
		Sg. Slim	1ABNM008	94	95	94	93	93	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perak	Sg. Bernam	Sg. Slim	1ABNM011	94	91	92	90	89	B/C
		Sg. Trolak	1ABNM009	96	96	96	94	95	B/C
		Sg. Trolak	1ABNM010	97	95	95	95	96	B/C
		Sg. Trolak	1ABNM014	96	96	97	97	97	B/C
	Sg. Bruas	Sg. Bruas	1ABRU001	75	69	73	74	75	ST/SP
		Sg. Bruas	1ABRU004	94	95	95	96	96	B/C
		Sg. Bruas	1ABRU005	97	97	98	97	97	B/C
		Sg. Dandang	1ABRU006	94	95	95	95	95	B/C
		Sg. Licin	1ABRU007	97	97	97	97	97	B/C
		Sg. Rotan	1ABRU002	96	94	96	98	96	B/C
		Sg. Rotan	1ABRU003	88	83	86	84	70	ST/SP
	Sg. Kerian	Sg. Selama	1AKER011	88	86	89	90	92	B/C
		Sg. Selama	1AKER012	88	89	89	90	91	B/C
		Sg. Selama	1AKER016	97	97	97	98	98	B/C
		Sg. Semang	1AKER013	80	81	72	80	90	B/C
		Sg. Terusan Bagan Serai	1AKER015	93	93	94	94	94	B/C
	Sg. Kurau	Sg. Air Hitam	1AKRU007	98	97	96	97	97	B/C
		Sg. Ara	1AKRU001	96	94	96	97	96	B/C
		Sg. Ara	1AKRU006	97	97	97	98	97	B/C
		Sg. Kurau	1AKRU002	76	78	78	78	77	ST/SP
		Sg. Kurau	1AKRU003	78	79	82	82	76	ST/SP
		Sg. Kurau	1AKRU004	94	93	94	93	93	B/C
		Sg. Kurau	1AKRU005	91	90	92	92	93	B/C
	Sg. Perak	Sg. Batang Padang	1APRK003	86	87	86	88	88	B/C
		Sg. Batang Padang	1APRK006	95	96	96	97	95	B/C
		Sg. Batang Padang	1APRK009	90	90	91	90	91	B/C
		Sg. Behrang	1APRK077	97	98	97	98	96	B/C
		Sg. Berok	1APRK068	97	97	96	97	97	B/C
		Sg. Bidor	1APRK002	84	87	83	83	87	B/C
		Sg. Bidor	1APRK004	89	91	88	90	90	B/C
		Sg. Bidor	1APRK005	88	87	92	94	92	B/C
		Sg. Chenderiang	1APRK012	95	94	94	97	95	B/C
		Sg. Chenderiang	1APRK013	93	94	90	93	94	B/C
		Sg. Chepor	1APRK056	97	96	97	97	97	B/C
		Sg. Cuar	1APRK046	96	95	95	96	94	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perak	Sg. Perak	Sg. Ibol	1APRK066	97	96	97	97	96	B/C
		Sg. Kampar	1APRK031	95	96	94	96	96	B/C
		Sg. Kampar	1APRK032	94	93	92	93	93	B/C
		Sg. Kangsar	1APRK043	93	94	92	93	92	B/C
		Sg. Kangsar	1APRK044	91	93	95	96	92	B/C
		Sg. Kangsar	1APRK079	97	97	97	98	96	B/C
		Sg. Kepadang	1APRK037	86	78	84	85	91	B/C
		Sg. Kepadang	1APRK038	83	78	84	86	90	B/C
		Sg. Kerbau	1APRK064	96	95	96	96	97	B/C
		Sg. Kerbau	1APRK078	94	91	95	95	89	B/C
		Sg. Kerdah	1APRK041	73	69	79	74	79	ST/SP
		Sg. Kerdah	1APRK053	85	86	89	83	86	B/C
		Sg. Kinjang	1APRK055	97	97	97	97	97	B/C
		Sg. Kinta	1APRK019	86	83	79	81	86	B/C
		Sg. Kinta	1APRK022	95	96	96	97	95	B/C
		Sg. Kinta	1APRK024	85	67	92	89	91	B/C
		Sg. Kinta	1APRK025	79	78	82	81	79	ST/SP
		Sg. Kinta	1APRK033	84	84	83	83	83	B/C
		Sg. Kinta	1APRK034	85	83	88	85	81	B/C
		Sg. Kinta	1APRK057	83	80	83	83	84	B/C
		Sg. Kinta	1APRK058	83	85	83	84	86	B/C
		Sg. Kinta	1APRK063	95	96	97	97	97	B/C
		Sg. Klah	1APRK014	95	90	92	94	93	B/C
		Sg. Klah	1APRK015	95	91	93	94	94	B/C
		Sg. Klian Baru	1APRK016	84	80	88	89	91	B/C
		Sg. Klian Baru	1APRK017	84	77	79	79	84	B/C
		Sg. Klian Gunong	1APRK081	97	96	97	97	96	B/C
		Sg. Kuang	1APRK042	88	85	88	87	92	B/C
		Sg. Manong	1APRK060	97	97	98	98	97	B/C
		Sg. Nyamok	1APRK052	77	74	73	72	69	ST/SP
		Sg. Pari	1APRK023	83	87	91	92	84	B/C
		Sg. Pari	1APRK028	79	83	85	85	85	B/C
		Sg. Pelus	1APRK039	86	89	89	87	92	B/C
		Sg. Pelus	1APRK040	91	87	90	87	93	B/C
		Sg. Perak	1APRK001	86	88	81	83	85	B/C
		Sg. Perak	1APRK018	90	92	89	90	91	B/C
		Sg. Perak	1APRK020	92	94	93	91	94	B/C
		Sg. Perak	1APRK045	94	95	95	95	96	B/C
		Sg. Perak	1APRK047	88	86	86	88	91	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perak	Sg. Perak	Sg. Perak	1APRK048	94	94	94	95	93	B/C
		Sg. Perak	1APRK049	92	92	93	93	94	B/C
		Sg. Perak	1APRK051	94	94	93	95	93	B/C
		Sg. Perak	1APRK059	97	97	97	97	96	B/C
		Sg. Perak	1APRK065	95	95	95	95	96	B/C
		Sg. Perak	1APRK069	91	86	87	84	88	B/C
		Sg. Perak	1APRK070	92	93	93	92	92	B/C
		Sg. Perak	1APRK071	92	92	93	95	94	B/C
		Sg. Perak	1APRK072	93	94	95	95	94	B/C
		Sg. Perak	1APRK074	92	92	93	94	92	B/C
		Sg. Perak	1APRK080	97	97	96	97	98	B/C
		Sg. Perak	1APRK082	96	96	96	96	95	B/C
		Sg. Perak	1APRK086	94	96	97	97	96	B/C
		Sg. Pinji	1APRK021	75	77	79	80	77	ST/SP
		Sg. Pinji	1APRK036	78	79	79	79	74	ST/SP
		Sg. Pulau	1APRK067	97	97	97	97	96	B/C
		Sg. Raia	1APRK030	90	93	93	95	95	B/C
		Sg. Raia	1APRK035	89	89	91	90	84	B/C
		Sg. Rui	1APRK084	96	93	94	96	96	B/C
		Sg. Rui	1APRK085	91	88	85	92	94	B/C
		Sg. Seluang	1APRK050	62	62	66	68	66	ST/SP
		Sg. Serokai	1APRK026	71	77	79	78	76	ST/SP
		Sg. Serokai	1APRK027	86	87	89	91	88	B/C
		Sg. Sintang	1APRK054	72	67	64	68	65	ST/SP
		Sg. Sungkai	1APRK007	95	94	94	96	95	B/C
		Sg. Sungkai	1APRK008	91	91	89	89	90	B/C
		Sg. Sungkai	1APRK073	93	92	89	93	89	B/C
		Sg. Sungkai	1APRK075	93	93	90	93	91	B/C
		Sg. Sungkai Mati	1APRK010	65	67	69	67	64	ST/SP
		Sg. Sungkai Mati	1APRK011	87	89	92	92	88	B/C
		Sg. Tapah	1APRK076	97	96	97	97	97	B/C
		Sg. Teja	1APRK083	88	85	81	83	86	B/C
		Sg. Tesong	1APRK062	97	97	97	97	96	B/C
		Sg. Tumboh	1APRK029	73	76	76	78	77	ST/SP
		Sg. Woh	1APRK061	97	98	97	97	97	B/C
	Sg. Raja Hitam	Sg. Derhaka	1ARHT004	78	74	75	77	74	ST/SP
		Sg. Derhaka	1ARHT006	79	75	74	78	75	ST/SP
		Sg. Manjong	1ARHT001	88	87	88	86	86	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perak	Sg. Raja Hitam	Sg. Manjong	1ARHT002	86	85	88	86	88	B/C
		Sg. Nyior	1ARHT007	97	97	98	98	97	B/C
		Sg. Raja Hitam	1ARHT003	81	78	75	80	77	ST/SP
		Sg. Raja Hitam	1ARHT005	84	78	71	82	82	B/C
		Sg. Raja Hitam	1ARHT008	39	30	47	75	65	ST/SP
	Sg. Sepetang	Sg. Batu Tegoh	1ASPT006	87	84	87	84	90	B/C
		Sg. Batu Tegoh	1ASPT007	92	91	88	92	90	B/C
		Sg. Batu Tegoh	1ASPT009	90	89	87	90	84	B/C
		Sg. Batu Tegoh	1ASPT012	97	97	97	97	98	B/C
		Sg. Batu Tegoh	1ASPT016	97	97	97	98	98	B/C
		Sg. Jana	1ASPT004	68	72	73	72	77	ST/SP
		Sg. Jana	1ASPT013	97	97	97	97	98	B/C
		Sg. Lidin	1ASPT008	86	84	86	84	79	ST/SP
		Sg. Limau	1ASPT014	96	96	96	96	94	B/C
		Sg. Malai	1ASPT002	82	77	75	79	76	ST/SP
		Sg. Malai	1ASPT019	77	73	73	77	73	ST/SP
		Sg. Nyior	1ASPT018	97	98	98	97	98	B/C
		Sg. Nyior	1ASPT020	94	92	96	92	94	B/C
		Sg. Sepetang	1ASPT001	75	72	76	78	76	ST/SP
		Sg. Sepetang	1ASPT003	84	83	84	88	86	B/C
		Sg. Temerloh	1ASPT010	96	95	96	94	95	B/C
		Sg. Temerloh	1ASPT011	92	92	93	88	91	B/C
		Sg. Trong	1ASPT015	96	94	96	95	96	B/C
		Sg. Trong	1ASPT017	97	97	97	97	98	B/C
	Sg. Wangi	Sg. Deralik	1AWGI001	70	77	75	74	78	ST/SP
		Sg. Deralik	1AWGI002	79	74	74	79	78	ST/SP
		Sg. Wangi	1AWGI003	82	75	84	82	78	ST/SP
		Sg. Wangi	1AWGI004	68	65	77	81	78	ST/SP
Selangor	Sg. Bernam	Sg. Bernam	2BBNM013	92	91	91	92	88	B/C
		Sg. Bernam	2BBNM016	91	90	91	93	90	B/C
		Sg. Dusun	2BBNM017	95	95	95	95	96	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Selangor	Sg. Buloh	Sg. Buloh	2BBLH001	67	55	60	65	57	T/P
		Sg. Buloh	2BBLH002	61	51	48	66	53	T/P
		Sg. Buloh	2BBLH003	47	46	41	53	43	T/P
		Sg. Buloh	2BBLH004	43	45	59	67	49	T/P
		Sg. Buloh	2BBLH005	82	84	79	81	74	ST/SP
		Sg. Buloh	2BBLH006	55	50	48	67	57	T/P
	Sg. Klang	Sg. Ampang	2BKLG032	64	64	66	71	67	ST/SP
		Sg. Ampang	2BKLG042	76	81	83	85	81	B/C
		Sg. Anak Air Batu	2BKLG047	89	80	81	82	86	B/C
		Sg. Batu	2BKLG007	97	97	97	96	97	B/C
		Sg. Batu	2BKLG036	96	97	98	97	97	B/C
		Sg. Damansara	2BKLG008	71	68	66	68	63	ST/SP
		Sg. Damansara	2BKLG009	71	66	64	68	65	ST/SP
		Sg. Damansara	2BKLG017	64	65	65	62	65	ST/SP
		Sg. Damansara	2BKLG055	71	70	68	70	64	ST/SP
		Sg. Damansara	2BKLG067	95	95	95	96	90	B/C
		Sg. Gombak	2BKLG020	97	97	97	97	97	B/C
		Sg. Gombak	2BKLG027	97	95	97	95	95	B/C
		Sg. Jinjang	2BKLG044	84	86	86	87	80	ST/SP
		Sg. Kerayong	2BKLG013	55	50	49	56	43	T/P
		Sg. Kerayong	2BKLG051	65	63	60	54	55	T/P
		Sg. Keroh	2BKLG030	97	97	97	97	97	B/C
		Sg. Klang	2BKLG005	97	96	96	95	96	B/C
		Sg. Klang	2BKLG006	84	91	90	71	81	B/C
		Sg. Klang	2BKLG016	64	77	68	65	72	ST/SP
		Sg. Klang	2BKLG022	60	61	64	59	60	ST/SP
		Sg. Klang	2BKLG023	61	63	66	57	58	T/P
		Sg. Klang	2BKLG024	60	66	66	61	60	ST/SP
		Sg. Klang	2BKLG034	67	64	70	61	58	T/P
		Sg. Klang	2BKLG050	56	60	65	58	59	T/P
		Sg. Kuyoh	2BKLG011	69	72	69	63	64	ST/SP
		Sg. Penchala	2BKLG019	72	60	66	61	57	T/P
		Sg. Penchala	2BKLG054	73	75	71	67	67	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Selangor	Sg. Klang	Sg. Pusu	2BKLG021	80	78	75	74	73	ST/SP
		Sg. Rasau	2BKLG003	87	93	94	91	87	B/C
		Sg. Rumpit	2BKLG033	97	95	97	97	97	B/C
		Sg. Semelah	2BKLG025	87	90	91	84	85	B/C
	Sg. Langat	Sg. Anak Chuau	2BCHU004	94	94	94	94	93	B/C
		Sg. Balak	2BLGT025	70	71	74	68	65	ST/SP
		Sg. Batang Labu	2BLGT028	75	83	82	80	80	ST/SP
		Sg. Batang Labu	2BLGT030	80	81	79	73	74	ST/SP
		Sg. Batang Labu	2BLGT031	71	78	77	76	71	ST/SP
		Sg. Batang Labu	2BLGT032	65	79	80	79	80	ST/SP
		Sg. Batang Labu	2BLGT033	91	88	86	72	78	ST/SP
		Sg. Batang Labu	2BLGT035	94	91	88	88	90	B/C
		Sg. Chuau	2BCHU001	94	94	95	93	93	B/C
		Sg. Chuau	2BCHU002	93	94	93	94	91	B/C
		Sg. Langat	2BLGT002	82	85	88	83	85	B/C
		Sg. Langat	2BLGT003	82	80	81	78	78	ST/SP
		Sg. Langat	2BLGT004	72	76	79	75	73	ST/SP
		Sg. Langat	2BLGT005	71	79	77	69	70	ST/SP
		Sg. Langat	2BLGT006	96	97	97	96	96	B/C
		Sg. Langat	2BLGT007	84	84	85	83	85	B/C
		Sg. Langat	2BLGT008	95	93	91	90	92	B/C
		Sg. Langat	2BLGT026	78	80	75	66	66	ST/SP
		Sg. Langat	2BLGT027	72	74	63	67	61	ST/SP
		Sg. Limau Manis	2BCHU003	75	82	75	82	82	B/C
		Sg. Rinching	2BLGT014	84	80	88	87	81	B/C
		Sg. Rinching	2BLGT015	97	94	97	95	97	B/C
		Sg. Semenyih	2BLGT010	88	85	86	86	87	B/C
		Sg. Semenyih	2BLGT011	86	84	86	81	81	B/C
		Sg. Semenyih	2BLGT012	86	89	86	86	87	B/C
		Sg. Sering	2BLGT034	72	80	81	83	80	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Selangor	Sg. Selangor	Sg. Air Hitam	2BSEL002	80	74	73	75	76	ST/SP
		Sg. Air Hitam	2BSEL024	80	79	74	76	81	B/C
		Sg. Batang Kali	2BSEL003	96	93	91	90	95	B/C
		Sg. Guntong	2BSEL021	81	83	82	78	76	ST/SP
		Sg. Kanching	2BSEL007	96	93	94	94	93	B/C
		Sg. Kerling	2BSEL006	97	96	97	97	95	B/C
		Sg. Kundang	2BSEL012	71	77	77	77	68	ST/SP
		Sg. Rangkap	2BSEL016	96	97	97	96	97	B/C
		Sg. Rawang	2BSEL013	81	81	82	82	74	ST/SP
		Sg. Selangor	2BSEL001	81	80	79	81	80	ST/SP
		Sg. Selangor	2BSEL004	96	96	97	96	95	B/C
		Sg. Selangor	2BSEL005	97	96	97	96	96	B/C
		Sg. Selangor	2BSEL010	83	86	86	88	88	B/C
		Sg. Selangor	2BSEL011	91	91	90	92	92	B/C
		Sg. Selangor	2BSEL014	84	85	83	88	89	B/C
		Sg. Selangor	2BSEL015	97	96	97	96	96	B/C
		Sg. Selangor	2BSEL017	95	94	92	92	92	B/C
		Sg. Selangor	2BSEL018	88	88	84	92	92	B/C
		Sg. Selangor	2BSEL023	83	85	82	86	87	B/C
		Sg. Sembah	2BSEL009	80	80	80	83	80	ST/SP
		Sg. Sembah	2BSEL019	83	84	82	84	86	B/C
		Sg. Serendah	2BSEL008	96	95	95	95	94	B/C
	Sg. Sepang	Sg. Sepang	2BSPG001	83	88	90	86	88	B/C
		Sg. Sepang	2BSPG002	78	81	87	83	81	B/C
		Sg. Sepang	2BSPG003	80	83	82	80	75	ST/SP
	Sg. Tenggi	Sg. Tenggi	2BTGI001	80	72	77	70	70	ST/SP
		Sg. Tenggi	2BTGI002	96	96	96	97	97	B/C
		Sg. Tenggi	2BTGI003	84	82	78	74	78	ST/SP
		Sg. Tenggi	2BTGI004	94	95	95	95	95	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
W.P. Kuala Lumpur	Sg. Klang	Sg. Air Busuk	2WKLG041	40	52	42	46	45	T/P
		Sg. Batu	2WKLG028	58	64	69	64	67	ST/SP
		Sg. Batu	2WKLG056	67	72	67	63	51	T/P
		Sg. Batu	2WKLG061	61	78	65	69	58	T/P
		Sg. Belongkong	2WKLG040	73	65	78	74	71	ST/SP
		Sg. Bunos	2WKLG006	63	44	57	57	55	T/P
		Sg. Bunos	2WKLG039	75	71	68	70	66	ST/SP
		Sg. Bunos	2WKLG043	85	83	89	81	77	ST/SP
		Sg. Gombak	2WKLG018	65	67	67	63	67	ST/SP
		Sg. Gombak	2WKLG026	74	80	82	74	72	ST/SP
		Sg. Gombak	2WKLG060	69	70	71	64	63	ST/SP
		Sg. Jinjang	2WKLG014	69	67	67	67	58	T/P
		Sg. Jinjang	2WKLG031	70	70	68	69	62	ST/SP
		Sg. Jinjang	2WKLG045	59	63	62	62	58	T/P
		Sg. Kerayong	2WKLG046	61	64	63	49	51	T/P
		Sg. Kerayong	2WKLG058	64	58	59	62	61	ST/SP
		Sg. Keroh	2WKLG015	65	61	64	62	58	T/P
		Sg. Keroh	2WKLG048	61	65	64	68	59	T/P
		Sg. Klang	2WKLG001	67	72	71	58	58	T/P
		Sg. Klang	2WKLG002	69	70	71	62	64	ST/SP
		Sg. Klang	2WKLG003	68	74	71	68	69	ST/SP
		Sg. Klang	2WKLG004	75	70	69	59	66	ST/SP
		Sg. Klang	2WKLG049	69	72	72	76	71	ST/SP
		Sg. Kuyoh	2WKLG052	70	66	68	67	65	ST/SP
		Sg. Penchala	2WKLG010	92	89	92	92	83	B/C
		Sg. Toba	2WKLG037	69	63	53	60	45	T/P
		Sg. Untut	2WKLG038	73	78	64	65	59	T/P
N. Sembilan	Sg. Langat	Sg. Batang Benar	3NLGT013	74	76	84	63	61	ST/SP
		Sg. Batang Labu	3NLGT009	87	85	78	81	80	ST/SP
		Sg. Batang Labu	3NLGT025	94	89	91	92	91	B/C
		Sg. Batang Nilai	3NLGT023	87	83	87	80	86	B/C
		Sg. Batang Nilai	3NLGT024	75	75	73	76	78	ST/SP
		Sg. Beranang	3NLGT019	87	85	84	82	83	B/C
		Sg. Buan	3NLGT022	83	85	82	78	77	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
N. Sembilan	Sg. Langat	Sg. Jijan	3NLGT026	82	88	88	86	86	B/C
		Sg. Pajam	3NLGT020	85	86	87	82	80	ST/SP
		Sg. Pajam	3NLGT021	56	58	59	56	54	T/P
	Sg. Linggi	Sg. Batang Penar	3NLGI009	89	84	89	85	85	B/C
		Sg. Batang Penar	3NLGI010	95	91	92	92	87	B/C
		Sg. Batang Penar	3NLGI020	92	89	90	85	88	B/C
		Sg. Batang Penar	3NLGI021	95	93	96	93	93	B/C
		Sg. Batang Penar	3NLGI027	96	97	97	97	96	B/C
		Sg. Batang Penar	3NLGI034	78	84	84	81	85	B/C
		Sg. Batu Hampar	3NLGI024	91	93	92	91	89	B/C
		Sg. Chembong	3NLGI012	88	89	92	94	93	B/C
		Sg. Empangan Terip	3NLGI022	82	85	83	83	82	B/C
		Sg. Jelai	3NLGI025	86	88	87	89	88	B/C
		Sg. Kayu Ara	3NLGI016	80	84	81	78	81	B/C
		Sg. Kenaboi	3NLGI032	87	85	89	81	90	B/C
		Sg. Kepayong	3NLGI007	80	79	80	83	78	ST/SP
		Sg. Kepayong	3NLGI023	97	97	96	97	96	B/C
		Sg. Kundur Besar	3NLGI013	92	92	93	95	84	B/C
		Sg. Linggi	3NLGI001	87	86	83	84	85	B/C
		Sg. Linggi	3NLGI002	86	86	85	84	83	B/C
		Sg. Linggi	3NLGI003	85	87	85	84	79	ST/SP
		Sg. Linggi	3NLGI004	85	85	85	83	78	ST/SP
		Sg. Linggi	3NLGI005	82	82	81	78	79	ST/SP
		Sg. Linggi	3NLGI006	82	83	80	82	79	ST/SP
		Sg. Muar	3NLGI026	93	91	93	94	94	B/C
		Sg. Ngoi Ngoi	3NLGI040	80	83	80	80	80	ST/SP
		Sg. Paroi	3NLGI018	80	85	80	83	81	B/C
		Sg. Pedas	3NLGI014	94	93	95	92	86	B/C
		Sg. Rembau	3NLGI011	92	91	91	86	86	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
N. Sembilan	Sg. Linggi	Sg. Senawang	3NLGI017	77	81	83	84	83	B/C
		Sg. Simin	3NLGI015	85	87	84	80	80	ST/SP
		Sg. Temiang	3NLGI019	85	87	88	87	86	B/C
		Sg. Temiang	3NLGI033	61	70	74	68	54	T/P
	Sg. Lukut	Sg. Lukut	3NLKT001	73	80	79	79	74	ST/SP
	Sg. Melaka	Sg. Dusun	3NMLK017	94	94	96	95	94	B/C
		Sg. Kemunting	3NMLK039	92	91	96	93	95	B/C
		Sg. Tampin	3NMLK038	96	95	97	97	96	B/C
		Sg. Tampin	3NMLK041	83	84	84	79	84	B/C
	Sg. Muar	Sg. Gemas	3NMUA041	71	76	78	55	68	ST/SP
		Sg. Gemencheh	3NMUA043	91	88	94	93	94	B/C
		Sg. Gemencheh	3NMUA045	90	85	90	91	89	B/C
		Sg. Jelai	3NMUA054	92	91	94	93	95	B/C
		Sg. Kelamah	3NMUA044	88	79	84	85	80	ST/SP
		Sg. Muar	3NMUA042	95	96	96	97	97	B/C
		Sg. Muar	3NMUA046	90	84	89	86	88	B/C
		Sg. Muar	3NMUA047	90	85	89	93	90	B/C
		Sg. Muar	3NMUA048	86	86	90	92	88	B/C
		Sg. Muar	3NMUA049	89	89	92	93	92	B/C
		Sg. Muar	3NMUA050	88	87	90	83	82	B/C
		Sg. Muar	3NMUA051	90	86	91	82	85	B/C
		Sg. Muar	3NMUA052	91	90	92	92	89	B/C
		Sg. Muar	3NMUA053	90	90	91	93	90	B/C
		Sg. Muar	3NMUA055	91	91	92	91	90	B/C
	Sg. Pahang	Sg. Pertang	3NPHG002	92	91	88	90	90	B/C
		Sg. Serting	3NPHG003	87	82	85	76	77	ST/SP
		Sg. Serting	3NPHG004	86	81	84	82	83	B/C
		Sg. Serting	3NPHG005	81	77	78	75	76	ST/SP
		Sg. Triang	3NPHG006	93	89	91	92	91	B/C
	Sg. Sepang	Sg. Rambai	2BSPG004	25	60	64	61	57	T/P
Melaka	Sg. Baru	Sg. Baru	3MBAR001	70	75	79	78	77	ST/SP
	Sg. Duyong	Sg. Duyong	3MDYG001	69	72	68	82	81	B/C
		Sg. Duyong	3MDYG002	65	66	68	70	77	ST/SP
		Sg. Duyong	3MDYG003	84	87	86	85	80	ST/SP
		Sg. Gapam	3MDYG004	92	93	93	91	90	B/C
		Sg. Punggur	3MPGR001	67	58	66	69	66	ST/SP
		Sg. Punggur	3MPGR002	58	56	54	67	72	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Melaka	Sg. Kesang	Sg. Chin-Chin	3MKSG006	53	66	64	69	68	ST/SP
		Sg. Chin-Chin	3MKSG008	87	84	85	89	91	B/C
		Sg. Chin-Chin	3MKSG009	89	86	87	88	88	B/C
		Sg. Chohong	3MKSG004	91	93	92	94	93	B/C
		Sg. Chohong	3MKSG005	94	94	95	95	94	B/C
		Sg. Kesang	3MKSG001	82	83	84	87	88	B/C
		Sg. Kesang	3MKSG002	88	84	87	87	89	B/C
		Sg. Kesang	3MKSG003	88	88	88	89	89	B/C
		Sg. Tangkak	3MKSG007	77	74	71	75	79	ST/SP
	Sg. Linggi	Sg. Simpang Ampat	3MLGI029	87	84	87	87	88	B/C
		Sg. Siput	3MLGI030	90	91	89	90	89	B/C
		Sg. Siput	3MLGI031	92	89	90	89	86	B/C
		Sg. Tuang	3MTUG002	62	70	74	69	73	ST/SP
	Sg. Melaka	Sg. Batang Melaka	3MMLK008	91	91	92	89	91	B/C
		Sg. Batang Melaka	3MMLK027	91	91	93	92	91	B/C
		Sg. Batang Melaka	3MMLK028	89	92	91	90	89	B/C
		Sg. Durian Tunggal	3MMLK011	86	88	85	85	77	ST/SP
		Sg. Malim	3MMLK014	71	70	66	66	58	T/P
		Sg. Malim	3MMLK034	68	71	70	66	69	ST/SP
		Sg. Melaka	3MMLK007	71	74	72	71	70	ST/SP
		Sg. Melaka	3MMLK009	93	92	93	94	94	B/C
		Sg. Melaka	3MMLK010	96	96	95	97	96	B/C
		Sg. Melaka	3MMLK012	72	71	69	65	65	ST/SP
		Sg. Melaka	3MMLK013	68	73	67	67	74	ST/SP
		Sg. Melaka	3MMLK015	82	84	85	83	83	B/C
		Sg. Melaka	3MMLK021	85	86	88	84	85	B/C
		Sg. Melaka	3MMLK022	86	87	88	88	88	B/C
		Sg. Melaka	3MMLK023	72	67	75	68	74	ST/SP
		Sg. Melaka	3MMLK024	69	72	66	61	56	T/P
		Sg. Melaka	3MMLK025	84	84	87	85	85	B/C
		Sg. Melaka	3MMLK026	81	83	86	84	84	B/C
		Sg. Melaka	3MMLK030	84	85	84	82	86	B/C
		Sg. Melaka	3MMLK032	67	68	74	71	72	ST/SP
		Sg. Putat	3MMLK029	74	68	68	66	64	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Melaka	Sg. Melaka	Sg. Putat	3MMLK033	63	64	65	61	59	T/P
		Sg. Rembia	3MMLK035	82	77	76	78	81	B/C
		Sg. Rembia	3MMLK036	54	82	76	75	76	ST/SP
		Sg. Tampin	3MMLK031	94	90	93	92	92	B/C
	Sg. Merlimau	Sg. Merlimau	3MMLU001	55	59	61	64	71	ST/SP
		Sg. Merlimau	3MMLU002	56	51	54	63	59	T/P
		Sg. Merlimau	3MMLU003	58	61	62	71	70	ST/SP
		Sg. Merlimau	3MMLU004	58	63	67	67	71	ST/SP
		Sg. Merlimau	3MMLU005	68	66	69	70	69	ST/SP
	Sg. Seri Melaka	Sg. Air Salak	3MSMK001	79	78	67	68	62	ST/SP
		Sg. Seri Melaka	3MSMK002	66	69	67	67	66	ST/SP
		Sg. Sg.Udang	3MSUD001	86	91	94	88	88	B/C
	Sg. Tuang	Sg. Tuang	3MTUG001	63	75	75	74	80	ST/SP
Johor	Sg. Air Baloi	Sg. Air Baloi	3JABL001	56	55	64	68	68	ST/SP
		Sg. Air Baloi	3JABL002	52	56	69	57	67	ST/SP
		Sg. Air Baloi	3JABL003	57	61	67	64	67	ST/SP
	Sg. Batu Pahat	Sg. Amran	3JBPT018	81	80	82	86	85	B/C
		Sg. Bantang	3JBPT020	97	97	97	97	97	B/C
		Sg. Batu Pahat	3JBPT001	64	61	63	68	72	ST/SP
		Sg. Bekok	3JBPT005	84	81	84	84	88	B/C
		Sg. Bekok	3JBPT008	67	58	73	74	78	ST/SP
		Sg. Bekok	3JBPT016	91	85	84	90	89	B/C
		Sg. Bekok	3JBPT017	91	90	89	90	92	B/C
		Sg. Bekok	3JBPT019	94	93	94	94	95	B/C
		Sg. Bekok	3JBPT023	63	60	66	68	75	ST/SP
		Sg. Berlian	3JBPT007	77	79	82	82	80	ST/SP
		Sg. Chaah	3JBPT010	93	90	90	87	90	B/C
		Sg. Kahang	3JBPT022	92	82	86	90	90	B/C
		Sg. Lenik	3JBPT011	91	90	90	91	88	B/C
		Sg. Merek	3JBPT009	89	88	92	90	90	B/C
		Sg. Merpo	3JBPT006	90	91	94	94	90	B/C
		Sg. Panchor	3JBPT025	63	59	62	68	74	ST/SP
		Sg. Semberong	3JBPT003	64	63	73	70	74	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Sg. Batu Pahat	Sg. Semberong	3JBPT004	77	72	77	73	80	ST/SP
		Sg. Semberong Dam	3JBPT021	91	89	93	91	91	B/C
		Sg. Simpang Kanan	3JBPT002	62	59	65	67	76	ST/SP
		Sg. Simpang Kanan	3JBPT013	60	59	60	67	71	ST/SP
		Sg. Simpang Kiri	3JBPT012	82	80	87	88	83	B/C
		Sg. Simpang Kiri	3JBPT014	71	76	66	70	79	ST/SP
		Sg. Simpang Kiri	3JBPT015	64	66	65	68	75	ST/SP
		Sg. Temehel	3JBPT024	54	59	62	64	75	ST/SP
	Sg. Benut	Sg. Benut	3JBNT001	92	92	94	91	91	B/C
		Sg. Benut	3JBNT002	86	86	82	85	88	B/C
		Sg. Benut	3JBNT005	66	68	72	69	72	ST/SP
		Sg. Benut	3JBNT006	62	62	72	68	75	ST/SP
		Sg. Machap Dam	3JBNT008	94	93	90	94	90	B/C
		Sg. Parit Hj.Yassin	3JBNT004	81	81	83	84	83	B/C
		Sg. Pinggan	3JBNT007	59	63	67	67	72	ST/SP
		Sg. Ulu Benut	3JBNT003	90	86	90	91	93	B/C
	Sg. Danga	Sg. Danga	3JDGA001	62	66	57	67	57	T/P
		Sg. Danga	3JDGA002	59	62	57	69	59	T/P
	Sg. Endau	Sg. Anak Sg. Semberong	3JEND007	85	84	82	71	81	B/C
		Sg. Dengar	3JEND010	91	90	90	91	92	B/C
		Sg. Empangan Labong	3JEND027	91	91	91	92	93	B/C
		Sg. Endau	3JEND019	88	89	91	89	92	B/C
		Sg. Endau	3JEND022	90	91	91	94	94	B/C
		Sg. Endau	3JEND023	96	92	95	96	96	B/C
		Sg. Jasin	3JEND024	97	96	97	96	96	B/C
		Sg. Jebong	3JEND005	82	75	86	88	88	B/C
		Sg. Kahang	3JEND020	89	89	91	92	93	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Sg. Endau	Sg. Kahang	3JEND026	94	92	93	93	94	B/C
		Sg. Kahang	3JEND028	88	88	90	89	91	B/C
		Sg. Lenga	3JEND008	69	74	78	73	74	ST/SP
		Sg. Lenggor	3JEND009	89	89	89	92	91	B/C
		Sg. Lenggor	3JEND029	88	90	88	93	92	B/C
		Sg. Mamai	3JEND015	88	89	86	89	91	B/C
		Sg. Melatai	3JEND017	71	73	71	75	76	ST/SP
		Sg. Mengkibol	3JEND001	89	92	88	91	92	B/C
		Sg. Mengkibol	3JEND002	84	82	83	81	83	B/C
		Sg. Mengkibol	3JEND003	75	77	72	80	77	ST/SP
		Sg. Paloh	3JEND016	85	85	90	86	83	B/C
		Sg. Pamol	3JEND011	76	73	69	81	76	ST/SP
		Sg. Selai	3JEND025	94	94	90	94	95	B/C
		Sg. Semberong	3JEND004	90	87	91	92	91	B/C
		Sg. Semberong	3JEND006	84	80	90	93	90	B/C
		Sg. Semberong	3JEND012	80	77	79	80	82	B/C
		Sg. Semberong	3JEND018	88	88	86	88	92	B/C
		Sg. Semberong	3JEND021	88	89	88	92	91	B/C
		Sg. Singol	3JEND013	83	87	84	85	86	B/C
		Sg. Tamok	3JEND014	90	91	87	92	92	B/C
	Sg. Jemaluang	Sg. Jemaluang	3JJML001	90	90	93	92	91	B/C
		Sg. Jemaluang	3JJML002	86	80	89	89	91	B/C
	Sg. Johor	Sg. Anak Sg. Sayong	3JJHR023	92	92	92	88	92	B/C
		Sg. Anak Sg. Sayong	3JJHR032	84	72	71	75	70	ST/SP
		Sg. Belitong	3JJHR038	89	86	87	85	84	B/C
		Sg. Berangan	3JJHR013	82	81	82	84	75	ST/SP
		Sg. Bukit Besar	3JJHR007	60	56	46	60	45	T/P
		Sg. Bukit Besar	3JJHR009	95	95	90	91	92	B/C
		Sg. Chemangar	3JJHR019	73	77	79	80	81	B/C
		Sg. Johor	3JJHR011	89	91	88	90	87	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Sg. Johor	Sg. Johor	3JJHR014	89	91	86	90	90	B/C
		Sg. Johor	3JJHR015	91	92	90	88	89	B/C
		Sg. Johor	3JJHR040	87	88	84	86	87	B/C
		Sg. Johor	3JJHR041	89	88	90	87	89	B/C
		Sg. Johor	3JJHR042	90	88	90	90	91	B/C
		Sg. Layang	3JJHR001	93	93	94	95	94	B/C
		Sg. Layau Kiri	3JJHR017	92	89	87	93	88	B/C
		Sg. Lebam	3JJHR020	87	88	94	90	94	B/C
		Sg. Linggiu	3JJHR030	93	92	92	93	92	B/C
		Sg. Pant	3JJHR037	87	86	84	90	89	B/C
		Sg. Papan	3JJHR034	86	87	90	89	88	B/C
		Sg. Pelepah	3JJHR039	97	97	97	97	96	B/C
		Sg. Pelepah	3JJHR043	87	87	84	81	83	B/C
		Sg. Pelepah	3JJHR044	88	90	92	89	92	B/C
		Sg. Pelepah	3JJHR045	92	93	93	92	96	B/C
		Sg. Penggeli	3JJHR028	87	90	90	85	88	B/C
		Sg. Penggeli	3JJHR031	88	89	90	89	89	B/C
		Sg. Remis	3JJHR026	89	89	92	86	88	B/C
		Sg. Santi	3JJHR022	87	90	92	91	91	B/C
		Sg. Sayong	3JJHR024	85	82	84	86	83	B/C
		Sg. Sayong	3JJHR025	84	88	90	85	87	B/C
		Sg. Sayong	3JJHR027	84	88	88	90	91	B/C
		Sg. Sayong	3JJHR033	88	89	88	87	88	B/C
		Sg. Sebol	3JJHR029	80	79	80	84	83	B/C
		Sg. Seluyut	3JJHR035	87	83	85	90	90	B/C
		Sg. Semangar	3JJHR008	92	90	89	90	91	B/C
		Sg. Semenchu	3JJHR018	85	86	86	78	82	B/C
		Sg. Sening	3JJHR021	93	96	94	96	93	B/C
		Sg. Serai	3JJHR002	60	62	64	74	68	ST/SP
		Sg. Telor	3JJHR012	89	93	92	93	90	B/C
		Sg. Temoh	3JJHR016	84	88	79	82	87	B/C
		Sg. Tiram	3JJHR003	79	77	84	85	78	ST/SP
		Sg. Tiram	3JJHR004	91	89	90	90	88	B/C
		Sg. Tiram	3JJHR005	68	77	79	80	75	ST/SP
		Sg. Tiram	3JJHR006	93	92	91	93	92	B/C
	Sg. Kaw. Pasir Gudang	Sg. Buluh	3JPGD002	43	40	46	35	63	ST/SP
		Sg. Latoh	3JPGD004	68	71	69	71	77	ST/SP
		Sg. Masai	3JPGD005	60	63	73	69	76	ST/SP
		Sg. Perembi	3JPGD001	47	59	69	56	70	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Sg. Kaw. Pasir Gudang	Sg. Tukang Batu	3JPGD003	35	34	35	44	50	T/P
	Sg. Kempas	Sg. Kempas	3JKPS001	33	39	33	37	34	T/P
		Sg. Kempas	3JKPS002	42	43	45	40	62	ST/SP
	Sg. Kim-Kim	Sg. Kim-Kim	3JKIM001	66	57	58	61	66	ST/SP
		Sg. Kim-Kim	3JKIM002	90	89	89	90	87	B/C
	Sg. Mersing	Sg. Empangan Congok	3JMSG004	88	86	92	93	93	B/C
		Sg. Mersing	3JMSG001	95	93	94	96	95	B/C
		Sg. Mersing	3JMSG002	88	81	80	84	86	B/C
		Sg. Mersing	3JMSG003	92	87	92	93	91	B/C
	Sg. Muar	Sg. Air Panas	3JMUA035	97	96	97	97	97	B/C
		Sg. Belemang	3JMUA051	95	94	96	96	96	B/C
		Sg. Gemas	3JMUA036	85	86	89	88	89	B/C
		Sg. Jementah	3JMUA040	96	95	96	97	96	B/C
		Sg. Juasseh	3JMUA014	96	92	88	91	93	B/C
		Sg. Juasseh	3JMUA037	95	95	94	96	95	B/C
		Sg. Juasseh	3JMUA045	95	94	94	96	96	B/C
		Sg. Labis	3JMUA011	88	87	85	88	92	B/C
		Sg. Labis	3JMUA012	89	88	85	87	91	B/C
		Sg. Labis	3JMUA015	87	82	89	87	90	B/C
		Sg. Meda	3JMUA034	85	80	85	85	88	B/C
		Sg. Merbudu	3JMUA030	77	72	85	81	83	B/C
		Sg. Merlimau	3JMUA020	66	73	72	67	79	ST/SP
		Sg. Muar	3JMUA017	86	81	86	86	88	B/C
		Sg. Muar	3JMUA019	87	76	87	84	84	B/C
		Sg. Muar	3JMUA022	89	82	88	82	87	B/C
		Sg. Muar	3JMUA026	89	85	88	84	87	B/C
		Sg. Muar	3JMUA027	84	83	87	87	89	B/C
		Sg. Muar	3JMUA028	81	83	88	87	88	B/C
		Sg. Muar	3JMUA029	84	85	86	89	91	B/C
		Sg. Muar	3JMUA031	83	84	83	87	89	B/C
		Sg. Muar	3JMUA033	77	80	83	83	90	B/C
		Sg. Muar	3JMUA039	85	82	89	87	90	B/C
		Sg. Muar	3JMUA041	86	84	88	88	91	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Sg. Muar	Sg. Muar	3JMUA042	86	85	87	90	91	B/C
		Sg. Muar	3JMUA043	83	85	87	89	89	B/C
		Sg. Muar	3JMUA046	89	83	87	86	86	B/C
		Sg. Muar	3JMUA047	87	84	89	88	87	B/C
		Sg. P. Mengkuang	3JMUA018	92	91	89	93	94	B/C
		Sg. Pagoh	3JMUA049	74	76	76	78	78	ST/SP
		Sg. Palong	3JMUA024	89	87	87	86	91	B/C
		Sg. Palong	3JMUA025	85	81	88	84	90	B/C
		Sg. Pendol	3JMUA050	95	93	95	95	93	B/C
		Sg. Sarang Buaya	3JMUA038	60	60	67	69	73	ST/SP
		Sg. Segamat	3JMUA016	90	86	90	91	90	B/C
		Sg. Segamat	3JMUA044	94	89	89	91	92	B/C
		Sg. Segamat	3JMUA048	95	91	94	93	93	B/C
		Sg. Senarut	3JMUA021	77	79	75	76	83	B/C
		Sg. Serom	3JMUA032	63	63	67	67	74	ST/SP
		Sg. Simpang Loi	3JMUA023	84	73	81	66	78	ST/SP
		Sg. Tenang	3JMUA013	76	81	78	85	85	B/C
	Sg. Paloi	Sg. Paloi	3JPAL001	90	90	91	91	93	B/C
	Sg. Pontian Besar	Sg. Air Hitam	3JPBS001	74	73	82	80	79	ST/SP
		Sg. Ayer Merah	3JPBS005	54	54	65	61	64	ST/SP
		Sg. Pontian Besar	3JPBS002	65	63	78	74	73	ST/SP
		Sg. Pontian Besar	3JPBS003	85	78	81	77	78	ST/SP
		Sg. Pontian Besar	3JPBS004	84	85	86	89	88	B/C
		Sg. Pontian Besar	3JPBS006	63	60	79	74	74	ST/SP
		Sg. Pontian Besar	3JPBS007	73	74	80	83	78	ST/SP
	Sg. Pontian Kecil	Sg. Pontian Kecil	3JPKC001	84	85	82	90	85	B/C
		Sg. Pontian Kecil	3JPKC002	75	70	61	66	62	ST/SP
	Sg. Pulai	Sg. Pulai	3JPLI001	83	86	83	74	81	B/C
		Sg. Pulai	3JPLI002	77	82	80	79	76	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Sg. Pulai	Sg. Pulai Dam	3JPLI004	95	96	96	95	95	B/C
		Sg. Ulu Choh	3JPLI003	72	74	74	83	82	B/C
	Sg. Rambah	Sg. Rambah	3JRBH001	69	78	72	69	74	ST/SP
		Sg. Rambah	3JRBH002	63	70	68	65	65	ST/SP
	Sg. Sanglang	Sg. Sanglang	3JSLG001	57	51	66	63	66	ST/SP
	Sg. Sedili Besar	Sg. Ambat	3JSBE005	84	76	88	84	87	B/C
		Sg. Dohol	3JSBE001	90	86	89	86	91	B/C
		Sg. Mupur	3JSBE009	73	73	60	78	81	B/C
		Sg. Pasir Panjang	3JSBE010	87	76	71	83	84	B/C
		Sg. Sedili Besar	3JSBE002	86	86	87	87	87	B/C
		Sg. Sedili Besar	3JSBE004	93	91	92	92	95	B/C
		Sg. Sedili Besar	3JSBE006	87	85	88	88	91	B/C
		Sg. Sedili Besar	3JSBE007	72	70	86	82	80	ST/SP
		Sg. Sedili Besar	3JSBE008	89	85	89	89	91	B/C
		Sg. Sedili Besar	3JSBE011	88	87	91	88	93	B/C
		Sg. Temubor Kanan	3JSBE003	95	93	95	93	96	B/C
	Sg. Sedili Kecil	Sg. Anak Sedili Kecil	3JSKE005	24	74	74	73	75	ST/SP
		Sg. Anak Sedili Kecil	3JSKE006	85	75	86	84	84	B/C
		Sg. Bahan	3JSKE002	73	64	79	79	81	B/C
		Sg. Bahan	3JSKE004	78	76	85	84	84	B/C
		Sg. Sedili Kecil	3JSKE001	88	83	88	85	91	B/C
		Sg. Sedili Kecil	3JSKE003	76	78	82	83	81	B/C
	Sg. Segget	Sg. Segget	3JSGT001	71	64	47	48	53	T/P
		Sg. Segget	3JSGT002	68	72	47	47	53	T/P
		Sg. Segget	3JSGT003	67	65	53	56	54	T/P
		Sg. Segget	3JSGT004	78	76	61	66	58	T/P
		Sg. Segget	3JSGT005	65	72	59	58	57	T/P

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Sg. Skudai	Sg. Melana	3JSKU008	95	94	94	94	91	B/C
		Sg. Melana	3JSKU009	59	66	62	62	56	T/P
		Sg. Skudai	3JSKU001	63	65	65	71	65	ST/SP
		Sg. Skudai	3JSKU002	71	65	78	81	75	ST/SP
		Sg. Skudai	3JSKU003	74	74	66	76	75	ST/SP
		Sg. Skudai	3JSKU004	90	93	92	95	92	B/C
		Sg. Skudai	3JSKU005	79	81	80	84	78	ST/SP
		Sg. Skudai	3JSKU006	76	77	74	77	72	ST/SP
		Sg. Skudai	3JSKU007	54	63	66	68	66	ST/SP
		Sg. Skudai	3JSKU010	62	61	67	67	68	ST/SP
		Sg. Skudai	3JSKU011	92	95	96	95	94	B/C
	Sg. Tebrau	Sg. Bala	3JTRU008	47	55	60	63	63	ST/SP
		Sg. Pandan	3JTRU007	43	58	44	45	54	T/P
		Sg. Plentong	3JTRU004	66	67	63	71	71	ST/SP
		Sg. Sebulung	3JTRU009	58	62	56	58	62	ST/SP
		Sg. Sengkuang	3JTRU011	53	50	35	37	39	T/P
		Sg. Tampoi	3JTRU010	60	58	54	48	55	T/P
		Sg. Tebrau	3JTRU001	65	57	56	57	55	T/P
		Sg. Tebrau	3JTRU002	72	54	71	64	63	ST/SP
		Sg. Tebrau	3JTRU003	72	68	72	69	68	ST/SP
		Sg. Tebrau	3JTRU005	65	62	56	69	65	ST/SP
		Sg. Tebrau	3JTRU006	69	71	54	56	59	T/P
Pahang	Sg. Anak Endau	Sg. Anak Endau	4CAED001	95	95	96	94	94	B/C
		Sg. Anak Endau	4CAED002	87	86	84	83	84	B/C
	Sg. Balok	Sg. Balok	4CBLK001	82	74	75	67	75	ST/SP
		Sg. Balok	4CBLK002	77	77	76	73	76	ST/SP
		Sg. Panjang	4CBLK004	78	72	80	71	80	ST/SP
		Sg. Yior	4CBLK003	75	74	72	65	76	ST/SP
	Sg. Bebar	Sg. Bebar	4CBBR001	86	83	84	87	77	ST/SP
		Sg. Bebar	4CBBR002	92	89	90	90	91	B/C
		Sg. Merba	4CBBR005	91	88	88	86	89	B/C
		Sg. Serai	4CBBR003	85	74	86	90	74	ST/SP
		Sg. Serai	4CBBR004	88	86	87	91	91	B/C
	Sg. Cherating	Sg. Cherating	4CCHE001	86	85	86	82	83	B/C
	Sg. Kuantan	Sg. Belat	4CKTN001	86	88	87	86	84	B/C
		Sg. Charu	4CKTN006	96	95	96	96	96	B/C
		Sg. Galing Besar	4CKTN003	70	76	75	77	73	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Pahang	Sg. Kuantan	Sg. Galing Besar	4CKTN004	62	76	77	77	75	ST/SP
		Sg. Kenau	4CKTN010	97	96	97	97	96	B/C
		Sg. Kuantan	4CKTN002	93	87	92	93	91	B/C
		Sg. Kuantan	4CKTN015	93	87	93	93	90	B/C
		Sg. Kuantan	4CKTN016	93	94	91	92	94	B/C
		Sg. Kuantan	4CKTN017	96	96	97	96	96	B/C
		Sg. Kuantan	4CKTN018	96	97	97	97	96	B/C
		Sg. Kuantan	4CKTN019	85	87	85	86	87	B/C
		Sg. Kuantan	4CKTN020	93	87	92	92	90	B/C
		Sg. Kuantan	4CKTN021	88	89	91	91	92	B/C
		Sg. Pandan	4CKTN012	93	94	93	95	91	B/C
		Sg. Pinang	4CKTN005	88	88	89	85	85	B/C
		Sg. Reman	4CKTN014	91	90	91	93	91	B/C
		Sg. Riau	4CKTN007	88	88	87	82	83	B/C
		Sg. Talam	4CKTN013	70	76	70	63	67	ST/SP
	Sg. Merchong	Sg. Merchong	4CMCO002	92	86	87	85	88	B/C
		Sg. Merchong	4CMCO003	93	89	89	87	87	B/C
	Sg. Pahang	Sg. Anak Sg. Lepar	4CPHG136	93	89	94	91	89	B/C
		Sg. Batu	4CPHG056	92	91	94	90	92	B/C
		Sg. Belayar	4CPHG135	94	92	93	91	91	B/C
		Sg. Bentong	4CPHG040	95	95	94	94	94	B/C
		Sg. Bentong	4CPHG045	91	89	90	87	89	B/C
		Sg. Bentong	4CPHG092	95	90	89	90	89	B/C
		Sg. Bentong	4CPHG133	93	94	93	94	94	B/C
		Sg. Bentong	4CPHG134	96	96	95	97	97	B/C
		Sg. Bentong	4CPHG144	89	88	86	88	89	B/C
		Sg. Benus	4CPHG047	91	91	90	89	91	B/C
		Sg. Benus	4CPHG118	94	92	96	95	94	B/C
		Sg. Benus	4CPHG152	96	91	97	95	96	B/C
		Sg. Bera	4CPHG019	86	85	87	84	84	B/C
		Sg. Bera	4CPHG020	86	89	87	83	83	B/C
		Sg. Bera	4CPHG058	86	88	87	83	82	B/C
		Sg. Bera	4CPHG059	91	85	88	85	87	B/C
		Sg. Bera	4CPHG063	86	85	88	84	86	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Pahang	Sg. Pahang	Sg. Berkelah	4CPHG098	97	97	97	97	96	B/C
		Sg. Bertam	4CBTM002	94	89	90	87	89	B/C
		Sg. Bertam	4CBTM010	79	78	79	86	80	ST/SP
		Sg. Bertam	4CBTM011	96	97	97	96	97	B/C
		Sg. Bertam	4CBTM013	97	97	96	97	97	B/C
		Sg. Bilut	4CPHG119	88	85	87	92	90	B/C
		Sg. Bilut	4CPHG129	92	92	88	94	93	B/C
		Sg. Burung	4CBTM005	96	95	93	90	94	B/C
		Sg. Chini	4CPHG004	84	85	84	86	90	B/C
		Sg. Gapoi	4CPHG086	97	96	97	97	97	B/C
		Sg. Habu	4CBTM004	96	94	94	96	95	B/C
		Sg. Jelai	4CPHG0130	93	93	93	94	93	B/C
		Sg. Jelai	4CPHG096	91	88	86	90	88	B/C
		Sg. Jelai	4CPHG125	90	90	90	92	89	B/C
		Sg. Jempol	4CPHG049	91	90	91	87	87	B/C
		Sg. Jempol	4CPHG050	97	94	96	94	92	B/C
		Sg. Jempol	4CPHG087	95	93	96	95	95	B/C
		Sg. Jempol	4CPHG088	95	91	91	89	85	B/C
		Sg. Jempol	4CPHG121	95	94	95	95	93	B/C
		Sg. Jengka	4CPHG041	95	93	94	96	95	B/C
		Sg. Jengka	4CPHG051	89	90	91	91	86	B/C
		Sg. Kecau	4CPHG091	87	91	91	89	87	B/C
		Sg. Kecau	4CPHG116	87	84	85	87	87	B/C
		Sg. Kecau	4CPHG151	89	95	94	95	93	B/C
		Sg. Kelau	4CPHG117	91	94	93	95	94	B/C
		Sg. Kelau	4CPHG145	86	86	87	92	91	B/C
		Sg. Kelau	4CPHG146	93	94	91	96	95	B/C
		Sg. Kelau	4CPHG153	89	84	88	90	89	B/C
		Sg. Kertam	4CPHG014	91	93	93	92	90	B/C
		Sg. Koyan	4CPHG033	94	92	93	94	92	B/C
		Sg. Krau	4CPHG003	94	92	94	92	90	B/C
		Sg. Kundang	4CPHG018	82	85	86	81	83	B/C
		Sg. Lenggok	4CBTM003	96	92	96	95	89	B/C
		Sg. Lepar	4CPHG006	91	93	95	94	92	B/C
		Sg. Lipis	4CPHG029	90	89	92	91	90	B/C
		Sg. Lipis	4CPHG030	91	91	91	90	90	B/C
		Sg. Lipis	4CPHG035	96	94	97	94	96	B/C
		Sg. Luit	4CPHG015	93	92	89	92	87	B/C
		Sg. Maran	4CPHG016	96	96	96	95	95	B/C
		Sg. Mentiga	4CPHG005	77	83	91	87	89	B/C
		Sg. Mentiga	4CPHG042	86	88	89	89	91	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Pahang	Sg. Pahang	Sg. Mentiga	4CPHG089	87	89	90	90	93	B/C
		Sg. Pahang	4CPHG007	90	88	88	88	89	B/C
		Sg. Pahang	4CPHG008	93	91	94	91	93	B/C
		Sg. Pahang	4CPHG010	90	92	91	89	88	B/C
		Sg. Pahang	4CPHG011	93	89	90	86	92	B/C
		Sg. Pahang	4CPHG012	93	90	92	92	90	B/C
		Sg. Pahang	4CPHG013	91	90	88	88	92	B/C
		Sg. Pahang	4CPHG021	92	90	93	93	90	B/C
		Sg. Pahang	4CPHG022	91	91	93	93	90	B/C
		Sg. Pahang	4CPHG023	94	92	91	90	90	B/C
		Sg. Pahang	4CPHG027	94	92	96	95	95	B/C
		Sg. Pahang	4CPHG054	90	88	90	90	89	B/C
		Sg. Pahang	4CPHG055	91	90	91	89	87	B/C
		Sg. Pahang	4CPHG097	93	89	89	88	91	B/C
		Sg. Pahang	4CPHG100	89	88	88	87	89	B/C
		Sg. Pahang	4CPHG104	91	90	91	94	92	B/C
		Sg. Pahang	4CPHG111	92	93	92	92	91	B/C
		Sg. Pahang	4CPHG113	92	88	90	89	91	B/C
		Sg. Pahang	4CPHG124	91	91	90	92	92	B/C
		Sg. Pahang	4CPHG126	92	91	91	91	90	B/C
		Sg. Pahang	4CPHG127	88	96	95	95	91	B/C
		Sg. Pahang	4CPHG131	88	89	93	92	90	B/C
		Sg. Pahang	4CPHG137	93	90	90	89	92	B/C
		Sg. Pahang	4CPHG138	90	89	89	90	90	B/C
		Sg. Pahang	4CPHG139	90	89	89	89	89	B/C
		Sg. Pahang	4CPHG141	91	93	93	93	92	B/C
		Sg. Pahang	4CPHG148	92	88	90	89	90	B/C
		Sg. Pahang	4CPHG150	89	89	88	91	89	B/C
		Sg. Penjuring	4CPHG044	97	97	97	97	96	B/C
		Sg. Pertang	4CPHG132	90	91	92	92	92	B/C
		Sg. Perting	4CPHG120	96	97	97	96	97	B/C
		Sg. Raub	4CPHG123	95	95	96	94	96	B/C
		Sg. Retang	4CPHG105	93	94	94	92	89	B/C
		Sg. Ringlet	4CBTM001	91	89	91	94	91	B/C
		Sg. Salak	4CPHG122	91	91	92	94	93	B/C
		Sg. Semantan	4CPHG025	92	88	89	92	90	B/C
		Sg. Semantan	4CPHG036	92	93	96	94	95	B/C
		Sg. Semantan	4CPHG061	90	85	88	89	90	B/C
		Sg. Semantan	4CPHG084	93	88	90	88	93	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Pahang	Sg. Pahang	Sg. Serting	4CPHG101	85	86	87	85	85	B/C
		Sg. Serting	4CPHG102	84	86	88	85	84	B/C
		Sg. T. Paya Bungor	4CPHG002	91	92	92	92	94	B/C
		Sg. Tahan	4CPHG109	92	94	96	94	94	B/C
		Sg. Tanglir	4CPHG048	94	90	92	93	94	B/C
		Sg. Tanglir	4CPHG053	87	89	89	93	90	B/C
		Sg. Tanglir	4CPHG057	84	89	90	92	90	B/C
		Sg. Tanglir	4CPHG106	86	87	90	94	91	B/C
		Sg. Tanglir	4CPHG107	88	90	90	93	88	B/C
		Sg. Tasik Bera	4CPHG140	88	89	89	88	88	B/C
		Sg. Tasik Chini	4CPHG043	88	93	91	93	91	B/C
		Sg. Tasik Chini	4CPHG060	90	92	92	94	93	B/C
		Sg. Tasik Chini	4CPHG071	92	93	93	93	92	B/C
		Sg. Tasik Chini	4CPHG108	93	93	93	95	92	B/C
		Sg. Tasik Chini	4CPHG110	87	93	92	93	91	B/C
		Sg. Tasik Chini	4CPHG112	89	92	93	93	91	B/C
		Sg. Tasik Chini	4CPHG114	92	93	94	94	92	B/C
		Sg. Tasik Chini	4CPHG115	90	92	92	93	91	B/C
		Sg. Tasik Chini	4CPHG130	90	92	91	94	91	B/C
		Sg. Tasik Chini	4CPHG143	87	90	90	90	89	B/C
		Sg. Teh	4CPHG090	94	94	96	96	96	B/C
		Sg. Tekal	4CPHG062	89	87	90	86	89	B/C
		Sg. Telang	4CPHG032	94	93	93	93	93	B/C
		Sg. Telemong	4CPHG046	96	95	95	96	96	B/C
		Sg. Telemong	4CPHG093	93	93	93	94	91	B/C
		Sg. Telemong	4CPHG094	97	94	94	97	96	B/C
		Sg. Telom	4CBTM008	95	94	93	93	93	B/C
		Sg. Telom	4CBTM009	93	92	90	89	84	B/C
		Sg. Tembeling	4CPHG142	90	94	95	94	92	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Pahang	Sg. Pahang	Sg. Teranum	4CPHG038	96	96	97	96	94	B/C
		Sg. Teras	4CPHG037	96	95	96	95	96	B/C
		Sg. Teras	4CPHG147	96	96	94	96	96	B/C
		Sg. Teris	4CPHG081	94	95	94	96	95	B/C
		Sg. Teris	4CPHG082	95	94	95	95	94	B/C
		Sg. Teris	4CPHG083	94	94	95	95	94	B/C
		Sg. Terla	4CBTM007	95	97	97	95	95	B/C
		Sg. Terla	4CBTM012	97	97	97	96	95	B/C
		Sg. Triang	4CPHG024	91	85	87	87	88	B/C
		Sg. Triang	4CPHG074	91	84	86	88	88	B/C
		Sg. Tringkap	4CBTM006	94	96	97	94	89	B/C
		Sg. Ulong	4CBTM014	97	97	97	97	97	B/C
	Sg. Rompin	Sg. Aur	4CRPN005	91	90	91	88	91	B/C
		Sg. Bakar	4CRPN016	69	92	95	94	92	B/C
		Sg. Jekatih	4CRPN012	91	92	91	91	88	B/C
		Sg. Jekatih	4CRPN013	90	91	91	90	85	B/C
		Sg. Jeram	4CRPN006	93	90	90	90	89	B/C
		Sg. Kepasing	4CRPN010	90	92	88	91	86	B/C
		Sg. Keratong	4CRPN011	87	91	89	90	89	B/C
		Sg. Keratong	4CRPN018	91	91	90	85	87	B/C
		Sg. Keratong	4CRPN021	93	90	93	91	88	B/C
		Sg. Keratong	4CRPN022	93	90	93	91	87	B/C
		Sg. Pontian	4CRPN003	90	84	88	89	88	B/C
		Sg. Pukin	4CRPN014	90	92	94	94	92	B/C
		Sg. Pukin	4CRPN015	90	94	94	93	91	B/C
		Sg. Pukin	4CRPN017	89	94	94	95	92	B/C
		Sg. Rompin	4CRPN004	88	87	86	86	85	B/C
		Sg. Rompin	4CRPN007	92	88	88	86	86	B/C
		Sg. Rompin	4CRPN008	93	91	91	88	91	B/C
		Sg. Rompin	4CRPN020	93	91	89	90	90	B/C
		Sg. Rompin	4CRPN030	90	91	90	90	90	B/C
		Sg. Sepayang	4CRPN002	84	86	85	85	82	B/C
	Sg. Tonggok	Sg. Tonggok	4CTGK001	82	67	80	80	80	ST/SP
		Sg. Tonggok	4CTGK002	80	75	81	72	79	ST/SP
Terengganu	Sg. Besut	Sg. Besut	4TBST002	93	94	93	95	96	B/C
		Sg. Besut	4TBST003	94	93	94	96	96	B/C
		Sg. Besut	4TBST004	96	93	94	96	95	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Terengganu	Sg. Besut	Sg. Besut	4TBST005	93	95	94	95	95	B/C
		Sg. Besut	4TBST006	94	95	93	95	95	B/C
		Sg. Jertih	4TBST001	92	91	87	89	92	B/C
	Sg. Chukai	Sg. Bungkus	4TCKI006	83	81	82	84	82	B/C
		Sg. Chukai	4TCKI003	87	88	84	82	91	B/C
		Sg. Ibok	4TCKI001	87	89	89	85	89	B/C
		Sg. Ibok	4TCKI002	91	87	94	93	90	B/C
		Sg. Ruang	4TCKI004	80	80	80	74	72	ST/SP
		Sg. Ruang	4TCKI005	80	79	78	77	72	ST/SP
		Sg. Ruang	4TCKI005	80	79	78	77	72	ST/SP
	Sg. Dungun	Sg. Dungun	4TDGN002	96	95	96	95	95	B/C
		Sg. Dungun	4TDGN003	95	93	93	96	93	B/C
		Sg. Dungun	4TDGN004	94	91	93	93	95	B/C
		Sg. Dungun	4TDGN005	94	92	92	95	93	B/C
		Sg. Dungun	4TDGN006	94	91	92	95	95	B/C
		Sg. Telemboh	4TDGN001	89	89	87	86	85	B/C
	Sg. Ibai	Sg. Ibai	4TIBI001	75	73	81	73	76	ST/SP
		Sg. Ibai	4TIBI002	84	83	79	78	80	ST/SP
		Sg. Ibai	4TIBI003	82	87	83	89	88	B/C
	Sg. Kemaman	Sg. Cherul	4TKMM003	92	92	94	92	94	B/C
		Sg. Cherul	4TKMM004	91	90	94	92	93	B/C
		Sg. Cherul	4TKMM010	90	91	93	95	92	B/C
		Sg. Kemaman	4TKMM007	95	95	96	95	93	B/C
		Sg. Kemaman	4TKMM008	94	89	91	93	90	B/C
		Sg. Kemaman	4TKMM009	90	92	91	87	90	B/C
		Sg. Neram	4TKMM005	86	85	88	77	83	B/C
		Sg. Perasing	4TKMM006	92	94	90	90	89	B/C
		Sg. Ransan	4TKMM001	78	79	87	85	78	ST/SP
		Sg. Ransan	4TKMM002	95	95	95	95	94	B/C
		Sg. Ransan	4TKMM002	95	95	95	95	94	B/C
	Sg. Kertih	Sg. Kertih	4TKTH001	88	91	89	84	91	B/C
		Sg. Kertih	4TKTH002	83	86	87	91	90	B/C
	Sg. Kluang	Sg. Kluang	4TKLU005	84	84	85	84	85	B/C
	Sg. Marang	Sg. Kerak	4TMRG001	82	85	82	82	82	B/C
		Sg. Marang	4TMRG002	89	94	90	91	93	B/C
		Sg. Temala	4TMRG003	92	91	90	92	92	B/C
	Sg. Merang	Sg. Merang	4TMER001	77	77	80	84	76	ST/SP
	Sg. Merchang	Sg. Landas	4TMCA001	87	87	84	87	85	B/C
		Sg. Merchang	4TMCA002	80	73	76	81	77	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Terengganu	Sg. Paka	Sg. Besul	4TPKA001	96	96	92	96	96	B/C
		Sg. Paka	4TPKA005	88	89	90	90	93	B/C
		Sg. Paka	4TPKA006	92	91	89	90	92	B/C
		Sg. Paka	4TPKA007	90	91	89	89	93	B/C
		Sg. Rasau	4TPKA003	85	86	87	82	89	B/C
		Sg. Rasau	4TPKA004	83	79	80	80	79	ST/SP
		Sg. Rengat	4TPKA002	91	91	89	89	84	B/C
	Sg. Setiu	Sg. Bari	4TSTU002	95	95	93	94	94	B/C
		Sg. Chalok	4TSTU001	94	91	93	92	95	B/C
		Sg. Chalok	4TSTU005	92	93	92	94	91	B/C
		Sg. Chalok	4TSTU006	83	85	87	85	88	B/C
		Sg. Setiu	4TSTU004	93	93	93	96	96	B/C
		Sg. Setiu	4TSTU007	94	93	94	96	96	B/C
		Sg. Tarom	4TSTU003	94	95	92	91	95	B/C
	Sg. Terengganu	Sg. Berang	4TTGG002	92	96	95	94	96	B/C
		Sg. Berang	4TTGG011	97	96	97	97	97	B/C
		Sg. Nerus	4TTGG004	91	87	90	92	92	B/C
		Sg. Nerus	4TTGG005	95	96	94	96	94	B/C
		Sg. Nerus	4TTGG006	93	95	94	95	96	B/C
		Sg. Nerus	4TTGG010	68	72	71	70	70	ST/SP
		Sg. Nerus	4TTGG014	94	94	92	94	95	B/C
		Sg. Nerus	4TTGG015	94	95	92	95	94	B/C
		Sg. Pueh	4TTGG007	82	86	89	78	82	B/C
		Sg. Pueh	4TTGG008	89	93	93	91	93	B/C
		Sg. Telemong	4TTGG012	93	91	93	96	95	B/C
		Sg. Terengganu	4TTGG001	91	90	89	90	92	B/C
		Sg. Terengganu	4TTGG003	95	96	94	94	94	B/C
		Sg. Terengganu	4TTGG009	88	89	91	92	94	B/C
		Sg. Terengganu	4TTGG013	92	93	93	90	91	B/C
Kelantan	Sg. Golok	Sg. Golok	4DGLK002	93	91	92	94	92	B/C
		Sg. Golok	4DGLK003	97	94	97	97	97	B/C
		Sg. Golok	4DGLK004	93	89	94	95	94	B/C
		Sg. Golok	4DGLK005	93	90	92	95	92	B/C
		Sg. Golok	4DGLK006	91	88	87	86	90	B/C
		Sg. Jedok	4DGLK008	95	95	93	95	93	B/C
		Sg. Lanas	4DGLK007	94	90	94	96	94	B/C
		Sg. Tasik Garu	4DGLK001	85	82	87	90	85	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kelantan	Sg. Kelantan	Sg. Aring	4DKLT013	80	83	82	85	89	B/C
		Sg. Belatop	4DKLT020	89	87	87	90	89	B/C
		Sg. Belatop	4DKLT021	96	93	92	95	91	B/C
		Sg. Belatop	4DKLT046	82	82	80	80	81	B/C
		Sg. Ber	4DKLT018	91	91	91	89	91	B/C
		Sg. Berok	4DKLT016	83	85	85	86	86	B/C
		Sg. Berok	4DKLT019	90	90	90	89	91	B/C
		Sg. Berok	4DKLT022	84	81	83	88	89	B/C
		Sg. Betis	4DKLT017	93	92	92	93	95	B/C
		Sg. Chiku	4DKLT037	88	90	84	89	90	B/C
		Sg. Chiku	4DKLT043	90	92	90	95	93	B/C
		Sg. Galas	4DKLT014	89	81	85	89	91	B/C
		Sg. Galas	4DKLT031	90	92	97	95	96	B/C
		Sg. Galas	4DKLT032	92	87	91	92	92	B/C
		Sg. Galas	4DKLT033	81	91	88	85	90	B/C
		Sg. Galas	4DKLT034	79	92	88	86	90	B/C
		Sg. Isos	4DKLT049	73	78	74	80	73	ST/SP
		Sg. Kelantan	4DKLT001	83	87	86	90	88	B/C
		Sg. Kelantan	4DKLT006	87	89	87	89	84	B/C
		Sg. Kelantan	4DKLT010	83	82	88	88	84	B/C
		Sg. Kelantan	4DKLT045	84	87	88	89	85	B/C
		Sg. Kelantan	4DKLT054	89	91	87	91	91	B/C
		Sg. Kelantan	4DKLT055	93	90	94	97	96	B/C
		Sg. Kelantan	4DKLT056	83	87	87	89	85	B/C
		Sg. Kelesa	4DKLT015	94	91	90	83	86	B/C
		Sg. Kenkren	4DKLT047	93	94	94	93	95	B/C
		Sg. Kerilla	4DKLT002	94	94	95	93	89	B/C
		Sg. Kerilla	4DKLT003	94	93	95	94	95	B/C
		Sg. Ketil	4DKLT036	97	90	93	97	98	B/C
		Sg. Ketil	4DKLT053	96	90	92	94	93	B/C
		Sg. Lebir	4DKLT026	94	91	91	94	92	B/C
		Sg. Lebir	4DKLT027	87	79	87	91	88	B/C
		Sg. Lebir	4DKLT028	94	94	93	93	93	B/C
		Sg. Lebir	4DKLT029	87	81	88	92	89	B/C
		Sg. Lebir	4DKLT058	95	91	95	95	96	B/C
		Sg. Muring	4DKLT059	92	90	93	93	90	B/C
		Sg. Nal	4DKLT007	93	90	91	91	93	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kelantan	Sg. Kelantan	Sg. Nal	4DKLT008	91	89	91	91	93	B/C
		Sg. Nal	4DKLT009	91	88	90	90	92	B/C
		Sg. Nenggiri	4DKLT023	83	86	88	89	88	B/C
		Sg. Nenggiri	4DKLT024	86	87	86	87	90	B/C
		Sg. Nenggiri	4DKLT025	78	91	85	88	90	B/C
		Sg. Pehi	4DKLT011	92	91	92	96	95	B/C
		Sg. Pehi	4DKLT044	90	91	92	92	93	B/C
		Sg. Pelaur	4DKLT048	96	95	87	96	94	B/C
		Sg. Penangau	4DKLT050	87	89	86	90	89	B/C
		Sg. Pergau	4DKLT004	96	97	97	98	98	B/C
		Sg. Pergau	4DKLT005	95	94	95	96	95	B/C
		Sg. Pergau	4DKLT038	96	97	97	97	98	B/C
		Sg. Pergau	4DKLT039	97	97	97	96	97	B/C
		Sg. Pergau	4DKLT040	97	97	96	98	98	B/C
		Sg. Pergau	4DKLT041	94	93	93	96	93	B/C
		Sg. Pergau	4DKLT051	96	97	97	97	97	B/C
		Sg. Pergau	4DKLT052	94	94	95	96	95	B/C
		Sg. Rasau	4DKLT061	80	85	85	88	89	B/C
		Sg. Relai	4DKLT012	91	88	88	91	87	B/C
		Sg. Relai	4DKLT030	91	94	85	91	90	B/C
		Sg. Sokor	4DKLT042	89	89	88	93	87	B/C
		Sg. Tuang	4DKLT035	94	91	97	96	96	B/C
	Sg. Kemasin	Sg. Gali	4DKMS006	75	83	81	89	84	B/C
		Sg. Kemasin	4DKMS001	90	90	87	90	90	B/C
		Sg. Kemasin	4DKMS003	76	76	78	85	79	ST/SP
		Sg. Semerak	4DKMS002	91	88	88	89	87	B/C
		Sg. Semerak	4DKMS004	89	89	88	87	90	B/C
		Sg. Semerak	4DKMS005	77	80	76	85	85	B/C
	Sg. Pengkalan Chepa	Sg. Alor B	4DPCH003	63	59	63	63	59	T/P
		Sg. Alor Lintah	4DPCH004	68	70	74	70	59	T/P
		Sg. Keladi	4DPCH002	84	89	87	87	86	B/C
		Sg. Pengkalan Chepa	4DPCH005	70	70	61	64	65	ST/SP
		Sg. Pengkalan Chepa	4DPCH006	82	76	76	78	71	ST/SP
		Sg. Raja Gali	4DPCH001	87	81	87	87	85	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025

Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kelantan	Sg. Pengkalan Datu	Sg. Pasir Hor	4DPDT004	77	75	77	82	74	ST/SP
		Sg. Pengkalan Datu	4DPDT001	86	88	86	86	89	B/C
		Sg. Pengkalan Datu	4DPDT002	87	85	87	86	88	B/C
		Sg. Pengkalan Datu	4DPDT003	86	87	89	87	88	B/C
Sarawak	Sg. Balingian	Sg. Balingian	6QBLG001	87	84	69	63	68	ST/SP
		Sg. Balingian	6QBLG002	86	89	88	88	87	B/C
	Sg. Baram	Sg. Baram	6QBRM001	81	83	79	74	75	ST/SP
		Sg. Baram	6QBRM002	83	83	84	75	77	ST/SP
		Sg. Baram	6QBRM003	89	88	80	77	81	B/C
		Sg. Baram	6QBRM004	88	88	80	78	82	B/C
		Sg. Tutuh	6QBRM005	-	87	79	78	81	B/C
	Sg. Kayan	Sg. Kayan	6QKYN001	76	76	76	72	76	ST/SP
		Sg. Kayan	6QKYN002	83	84	82	78	78	ST/SP
		Sg. Kayan	6QKYN003	88	87	84	83	84	B/C
	Sg. Kemena	Sg. Kemena	6QKMN001	82	82	78	71	74	ST/SP
		Sg. Kemena	6QKMN002	83	84	76	73	74	ST/SP
		Sg. Kemena	6QKMN003	80	85	80	74	79	ST/SP
		Sg. Kemena	6QKMN004	83	84	82	80	82	B/C
		Sg. Sibiu	6QKMN005	79	83	76	77	71	ST/SP
	Sg. Kerian	Sg. Kerian	6QKRN014	81	86	77	73	71	ST/SP
		Sg. Kerian	6QKRN015	84	88	86	87	80	ST/SP
		Sg. Seblak	6QKRN016	88	87	79	77	79	ST/SP
		Sg. Selalang	6QKRN017	92	90	90	89	90	B/C
	Sg. Lawas	Sg. Lawas	6QLWS001	87	90	90	87	89	B/C
		Sg. Lawas	6QLWS002	88	91	93	86	89	B/C
		Sg. Lawas	6QLWS003	90	92	92	90	92	B/C
	Sg. Limbang	Sg. Limbang	6QLBG001	86	88	83	79	79	ST/SP
		Sg. Limbang	6QLBG002	86	88	85	83	79	ST/SP
		Sg. Limbang	6QLBG003	90	89	86	81	81	B/C
		Sg. Limbang	6QLBG004	91	88	87	82	82	B/C
		Sg. Limbang	6QLBG005	88	90	87	87	84	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sarawak	Sg. Lupar	Sg. Ai	6QLPR001	91	88	87	88	83	B/C
		Sg. Ai	6QLPR002	91	89	94	93	89	B/C
		Sg. Lupar	6QLPR003	83	88	76	66	70	ST/SP
		Sg. Lupar	6QLPR004	85	87	75	73	76	ST/SP
		Sg. Lupar	6QLPR005	85	90	90	87	87	B/C
		Sg. Sekerang	6QLPR006	88	87	90	90	88	B/C
		Sg. Seterap	6QLPR007	86	89	80	76	75	ST/SP
		Sg. Undup	6QLPR008	85	89	89	85	88	B/C
	Sg. Miri	Sg. Adong	6QMRI001	78	57	54	51	47	T/P
		Sg. Dalam	6QMRI002	83	80	70	71	73	ST/SP
		Sg. Lutong	6QMRI003	82	83	79	67	66	ST/SP
		Sg. Lutong	6QMRI004	80	74	72	67	62	ST/SP
		Sg. Miri	6QMRI005	88	56	48	48	46	T/P
		Sg. Miri	6QMRI006	88	60	52	50	47	T/P
		Sg. Padang Liku	6QMRI007	88	83	81	82	80	ST/SP
	Sg. Mukah	Sg. Mukah	6QMKH001	80	81	72	65	67	ST/SP
		Sg. Mukah	6QMKH002	82	86	61	58	68	ST/SP
		Sg. Mukah	6QMKH003	81	86	73	69	73	ST/SP
		Sg. Mukah	6QMKH004	87	88	86	84	83	B/C
		Sg. Mukah	6QMKH005	84	87	80	77	77	ST/SP
	Sg. Niah	Sg. Niah	6QNIA001	87	85	82	83	81	B/C
		Sg. Niah	6QNIA002	86	86	84	84	83	B/C
		Sg. Sekaloh	6QNIA003	64	79	59	67	63	ST/SP
		Sg. Sekaloh	6QNIA004	86	84	79	77	73	ST/SP
	Sg. Oya	Sg. Oya	6QOYA001	76	83	67	64	65	ST/SP
		Sg. Oya	6QOYA002	81	87	68	64	66	ST/SP
		Sg. Oya	6QOYA003	89	86	84	86	81	B/C
	Sg. Rajang	Sg. Baloi	6QRJG019	-	89	73	73	74	ST/SP
		Sg. Binatang	6QRJG004	89	87	86	84	87	B/C
		Sg. Daro	6QRJG021	62	66	53	53	57	T/P
		Sg. Jemoreng	6QRJG022	63	66	55	52	59	T/P
		Sg. Julau	6QRJG005	86	85	89	85	87	B/C
		Sg. Kanowit	6QRJG006	87	87	88	86	86	B/C
		Sg. Meradong	6QRJG003	82	85	78	70	76	ST/SP
		Sg. Pakan	6QRJG020	89	88	88	88	87	B/C
		Sg. Pila Parit	6QRJG023	77	78	81	80	79	ST/SP
		Sg. Rajang	6QRJG008	86	86	81	75	77	ST/SP
		Sg. Rajang	6QRJG009	86	87	81	75	78	ST/SP

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sarawak	Sg. Rajang	Sg. Rajang	6QRJG010	86	85	81	75	80	ST/SP
		Sg. Rajang	6QRJG011	85	87	81	75	81	B/C
		Sg. Rajang	6QRJG012	84	89	64	72	67	ST/SP
		Sg. Rajang	6QRJG013	86	87	83	84	83	B/C
		Sg. Rajang	6QRJG014	84	86	82	83	82	B/C
		Sg. Rajang	6QRJG015	83	84	83	83	84	B/C
		Sg. Rajang	6QRJG016	86	87	84	83	84	B/C
		Sg. Rajang	6QRJG017	86	86	88	87	86	B/C
		Sg. Rajang	6QRJG018	84	87	85	84	84	B/C
		Sg. Salim	6QRJG007	81	86	76	66	70	ST/SP
		Sg. Sarikei	6QRJG001	86	87	82	78	79	ST/SP
		Sg. Sarikei	6QRJG002	90	88	88	86	86	B/C
	Sg. Sadong	Sg. Karangan	6QSDG001	69	76	62	63	65	ST/SP
		Sg. Karangan	6QSDG002	87	88	72	74	71	ST/SP
		Sg. Sadong	6QSDG003	81	84	77	77	76	ST/SP
		Sg. Sadong	6QSDG004	66	78	63	64	66	ST/SP
		Sg. Sadong	6QSDG005	90	87	88	89	87	B/C
		Sg. Sadong	6QSDG006	91	88	92	92	90	B/C
		Sg. Tarat	6QSDG007	90	90	90	92	89	B/C
	Sg. Sarawak	Sg. Kelantan	6QSWK017	59	68	66	60	69	ST/SP
		Sg. Kuap	6QSWK009	88	86	72	69	70	ST/SP
		Sg. Kuap	6QSWK010	88	89	87	88	85	B/C
		Sg. Maong Kiri	6QSWK011	73	82	70	59	60	ST/SP
		Sg. Samarahan	6QSWK013	63	66	62	61	62	ST/SP
		Sg. Samarahan	6QSWK014	85	87	80	80	79	ST/SP
		Sg. Sarawak	6QSWK001	84	84	78	74	74	ST/SP
		Sg. Sarawak	6QSWK003	85	87	83	78	83	B/C
		Sg. Sarawak	6QSWK004	87	88	88	87	84	B/C
		Sg. Sarawak	6QSWK006	80	84	81	83	78	ST/SP
		Sg. Sarawak	6QSWK007	88	91	91	91	87	B/C
		Sg. Sarawak	6QSWK008	89	90	92	93	87	B/C
		Sg. Sarawak Kanan	6QSWK002	84	85	83	80	81	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sarawak	Sg. Sarawak	Sg. Sarawak Kiri	6QSWK005	87	87	89	91	88	B/C
		Sg. Semadang	6QSWK016	90	90	93	92	93	B/C
		Sg. Semenggoh	6QSWK012	78	83	75	75	73	ST/SP
		Sg. Tabuan	6QSWK015	76	78	64	61	68	ST/SP
		Sg. Tapah	6QSWK018	91	90	88	84	87	B/C
	Sg. Saribas	Sg. Layar	6QSRB002	88	87	83	82	77	ST/SP
		Sg. Layar	6QSRB003	90	88	90	90	88	B/C
		Sg. Saribas	6QSRB001	79	87	75	67	69	ST/SP
	Sg. Semunsam	Sg. Semunsam	6QSMS001	80	85	88	88	90	B/C
		Sg. Sibuti	6QSBT001	61	70	69	68	71	ST/SP
	Sg. Sibuti	Sg. Kabuloh	6QSBT002	64	87	92	82	83	B/C
		Sg. Kejapil	6QSBT003	89	85	86	79	82	B/C
		Sg. Satap	6QSBT004	84	84	74	77	76	ST/SP
		Sg. Sibuti	6QSBT005	84	77	78	75	74	ST/SP
		Sg. Sibuti	6QSBT006	88	84	81	81	81	B/C
	Sg. Similajau	Sg. Similajau	6QSML001	86	86	83	83	81	B/C
		Sg. Similajau	6QSML002	84	88	85	80	86	B/C
	Sg. Suai	Sg. Suai	6QSUA001	87	85	80	79	78	ST/SP
	Sg. Tatau	Sg. Tatau	6QTTU001	85	86	84	81	83	B/C
	Sg. Trusan	Sg. Trusan	6QTSN001	88	90	86	84	87	B/C
Sabah	Sg. Apas	Sg. Apas	5SAPS001	90	92	90	91	91	B/C
	Sg. Balung	Sg. Balung	5SBLU001	91	92	90	92	93	B/C
	Sg. Bengkoka	Sg. Bengkoka	5SBKK001	91	90	88	89	91	B/C
		Sg. Bengkoka	5SBKK002	86	88	85	84	84	B/C
	Sg. Bingkongan	Sg. Bandau	5SBKG001	92	92	94	92	92	B/C
		Sg. Bingkongan	5SBKG005	94	93	94	93	92	B/C
		Sg. Bingkongan	5SBKG006	94	94	94	95	93	B/C
		Sg. Menggaris	5SBKG002	93	90	93	94	92	B/C
		Sg. Menggaris	5SBKG003	92	93	93	93	91	B/C
		Sg. Tandek	5SBKG004	91	91	91	90	88	B/C
	Sg. Bongawan	Sg. Bongawan	5SBGW001	87	88	87	88	89	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Sg. Brantian	Sg. Brantian	5SBTN001	84	90	87	91	90	B/C
	Sg. Kalabakan	Sg. Kalabakan	5SKBK001	85	90	82	86	86	B/C
		Sg. Kalabakan	5SKBK002	84	86	81	84	85	B/C
		Sg. Kalabakan	5SKBK003	83	86	83	89	85	B/C
	Sg. Kalumpang	Sg. Kalumpang	5SKLP001	86	91	91	84	73	ST/SP
		Sg. Kalumpang	5SKLP002	90	88	89	86	82	B/C
		Sg. Kalumpang	5SKLP003	85	86	83	86	80	ST/SP
		Sg. Pang Burong 1	5SKLP004	86	86	87	90	81	B/C
		Sg. Pang Burong 2	5SKLP005	85	80	79	76	75	ST/SP
	Sg. Kedamaian	Sg. Kedamaian	5SKDI004	93	92	95	96	92	B/C
		Sg. Tempasuk	5SKDI001	93	91	92	94	90	B/C
		Sg. Tempasuk	5SKDI002	92	92	93	93	90	B/C
		Sg. Wariu	5SKDI003	93	93	94	94	92	B/C
	Sg. Kimanis	Sg. Kimanis	5SKMA001	90	92	90	89	90	B/C
	Sg. Kinabatangan	Sg. Karamuak	5SKBT006	92	92	91	94	93	B/C
		Sg. Kinabatangan	5SKBT001	86	83	84	85	83	B/C
		Sg. Kinabatangan	5SKBT002	84	85	83	85	83	B/C
		Sg. Kinabatangan	5SKBT004	87	84	83	83	82	B/C
		Sg. Kinabatangan	5SKBT005	85	83	83	86	83	B/C
		Sg. Koyah	5SKBT003	89	88	86	87	90	B/C
		Sg. Leepang	5SKBT009	85	84	83	85	83	B/C
		Sg. Menanggul	5SKBT008	86	86	82	81	81	B/C
		Sg. Pin	5SKBT010	87	86	86	86	83	B/C
		Sg. Takala	5SKBT007	88	87	85	84	86	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Sg. Labok	Sg. Kinipir	5SLBK001	91	90	92	89	90	B/C
		Sg. Kinipir	5SLBK002	91	91	93	93	90	B/C
		Sg. Labok	5SLBK006	86	88	87	89	85	B/C
		Sg. Liwagu	5SLBK003	89	86	89	89	87	B/C
		Sg. Liwagu	5SLBK004	88	91	93	88	90	B/C
		Sg. Maliau	5SLBK005	94	93	95	94	93	B/C
		Sg. Tungud	5SLBK007	91	85	87	90	90	B/C
	Sg. Lakutan	Sg. Lakutan	5SLKT001	93	88	92	87	89	B/C
	Sg. Likas	Sg. Darau	5SLKS008	83	83	81	81	85	B/C
		Sg. Inanam	5SLKS001	81	80	75	73	82	B/C
		Sg. Inanam	5SLKS002	87	90	88	87	89	B/C
		Sg. Inanam	5SLKS003	93	93	95	94	93	B/C
		Sg. Likas	5SLKS004	73	78	71	71	73	ST/SP
		Sg. Likas	5SLKS005	77	80	73	70	77	ST/SP
		Sg. Menggatal	5SLKS006	87	89	95	84	84	B/C
		Sg. Menggatal	5SLKS007	91	92	91	94	92	B/C
	Sg. Lingkungan	Sg. Bukau	5SLKG002	92	87	90	88	89	B/C
		Sg. Lingkungan	5SLKG001	93	89	93	88	92	B/C
	Sg. Membakut	Sg. Membakut	5SMBT001	87	89	89	89	91	B/C
	Sg. Menggalong	Sg. Menggalong	5SMGL001	91	85	87	86	88	B/C
		Sg. Menggalong	5SMGL002	93	92	92	94	94	B/C
	Sg. Merotai	Sg. Merotai	5SMRT001	90	91	91	89	89	B/C
		Sg. Merotai	5SMRT002	94	92	94	94	92	B/C
		Sg. Merotai	5SMRT003	90	87	90	90	89	B/C
	Sg. Mounad	Sg. Mounad	5SMND001	89	88	88	83	88	B/C
		Sg. Mounad	5SMND002	86	89	85	88	82	B/C
	Sg. Moyog	Sg. Moyog	5SMYG001	88	91	90	88	90	B/C
		Sg. Moyog	5SMYG002	92	91	92	88	90	B/C
		Sg. Moyog	5SMYG003	94	93	94	95	92	B/C
		Sg. Moyog	5SMYG004	94	92	95	92	93	B/C
	Sg. Padas	Sg. Bunsit	5SPDS001	93	92	94	94	91	B/C
		Sg. Liawan	5SPDS002	91	92	93	93	91	B/C
		Sg. Padas	5SPDS003	87	88	85	79	85	B/C
		Sg. Padas	5SPDS004	90	88	90	86	88	B/C
		Sg. Padas	5SPDS005	88	82	86	89	87	B/C
		Sg. Padas	5SPDS011	88	87	85	81	86	B/C
		Sg. Pangatan	5SPDS006	88	87	86	86	87	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
 Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Sg. Padas	Sg. Pegalan	5SPDS008	91	90	93	92	88	B/C
		Sg. Pegalan	5SPDS009	86	86	89	88	88	B/C
		Sg. Pegalan	5SPDS010	87	84	89	89	87	B/C
		Sg. Tandulu	5SPDS007	92	92	93	92	89	B/C
	Sg. Paitan	Sg. Paitan	5SPTN001	91	90	88	86	89	B/C
		Sg. Papar	5SPPR001	91	90	92	91	91	B/C
	Sg. Papar	Sg. Papar	5SPPR002	91	90	91	94	91	B/C
		Sg. Papar	5SPPR003	90	88	92	87	88	B/C
		Sg. Papar	5SPPR004	91	93	92	94	91	B/C
		Sg. Papar	5SPPR005	91	93	91	95	92	B/C
	Sg. Sapi	Sg. Sapi	5SSAP002	85	83	86	87	85	B/C
		Sg. Sapi	5SSAP003	86	84	88	85	84	B/C
		Sg. Sapi	5SSAP004	88	87	82	86	82	B/C
		Sg. Sualong	5SSAP001	92	93	95	95	92	B/C
	Sg. Segaliud	Sg. Segaliud	5SSLD001	85	81	83	86	81	B/C
		Sg. Segaliud	5SSLD002	86	84	85	86	81	B/C
	Sg. Segama	Sg. Segama	5SSGM001	87	86	86	88	86	B/C
		Sg. Segama	5SSGM002	88	87	87	88	87	B/C
		Sg. Segama	5SSGM003	88	87	85	90	85	B/C
	Sg. Sembulan	Sg. Sembulan	5SSBL001	81	74	75	80	70	ST/SP
		Sg. Sembulan	5SSBL002	80	69	70	70	71	ST/SP
	Sg. Silabukan	Sg. Silabukan	5SSBK001	87	83	89	88	86	B/C
		Sg. Silabukan	5SSBK002	91	91	95	93	92	B/C
	Sg. Sugut	Sg. Bongkud	5SSUG001	92	93	93	93	91	B/C
		Sg. Lohan	5SSUG002	92	93	95	93	90	B/C
		Sg. Merali	5SSUG003	91	90	95	92	92	B/C
		Sg. Sugut	5SSUG004	91	91	94	93	92	B/C
		Sg. Sugut	5SSUG005	92	91	95	94	92	B/C
		Sg. Sugut	5SSUG006	89	87	89	92	88	B/C
	Sg. Tawau	Sg. Tawau	5STWU001	83	78	80	81	74	ST/SP
		Sg. Tawau	5STWU002	88	88	88	89	86	B/C
		Sg. Tawau	5STWU003	93	92	94	94	93	B/C
		Sg. Tawau	5STWU004	93	93	94	93	92	B/C
	Sg. Telipok	Sg. Telipok	5STLP001	70	82	86	73	83	B/C
		Sg. Telipok	5STLP002	90	91	93	92	92	B/C
	Sg. Tenghilan	Sg. Tenghilan	5STHL001	92	90	92	92	93	B/C

Jadual 2.3 : Status Kualiti Air Sungai Mengikut Stesen, 2025
Table 2.3 : Water Quality Status by Station, 2025

NEGERI/ STATE	LEMBANGAN /BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	NILAI IKA/ WQI VALUE					KATEGORI IKA (2025)/ WQI CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Sg. Tingkayu	Sg. Tingkayu	5STKY001	85	85	80	86	87	B/C
		Sg. Tingkayu	5STKY002	86	84	80	87	88	B/C
	Sg. Tuaran	Sg. Damit	5STUA001	87	88	93	91	88	B/C
		Sg. Damit	5STUA002	87	90	92	90	86	B/C
		Sg. Song Sai	5STUA003	92	92	94	93	90	B/C
		Sg. Tuaran	5STUA004	93	93	95	94	87	B/C
		Sg. Tuaran	5STUA005	93	93	94	93	89	B/C
	Sg. Tungku	Sg. Tungku	5STKU001	90	88	90	90	83	B/C
		Sg. Tungku	5STKU002	89	90	94	92	92	B/C
	Sg. Umas-Umas	Sg. Umas Umas	5SUSM001	84	89	85	86	90	B/C

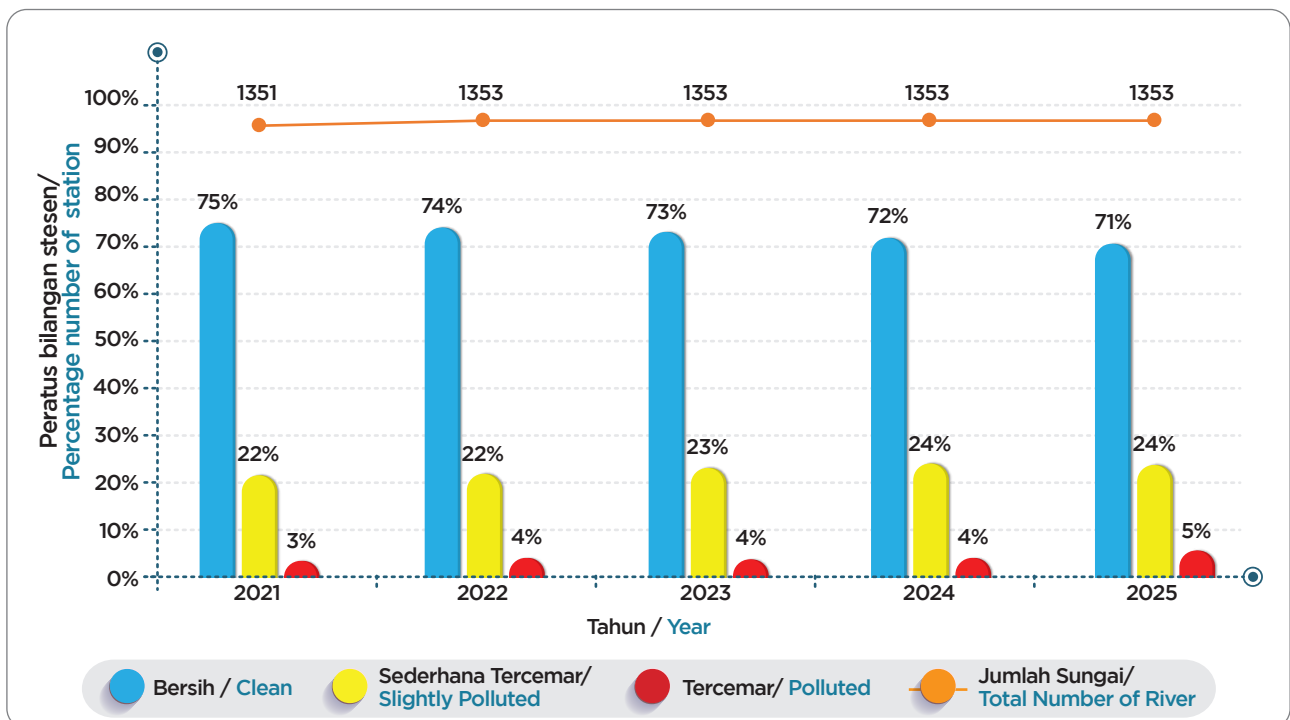
NOTA / NOTE:

KATEGORI IKA/ WQI CATEGORY

- **B/C** Bersih / Clean
- **ST/SP** Sederhana Tercemar/ Slightly Polluted
- **T/P** Tercemar/ Polluted

NILAI IKA/ WQI VALUE

- > 92.7 Kelas I / Class I
- 31.0 - 51.9 Kelas IV / Class IV
- 76.5 - 92.7 Kelas II / Class II
- < 31.0 Kelas V / Class V
- 51.9 - 76.5 Kelas III / Class III
- Tiada Data / No Data



Rajah 2.5 : Tren Stesen Kualiti Air Sungai, 2021 – 2025
Figure 2.5 : Trend of River Water Quality Status by Stations, 2021 – 2025

STESEN PENGAWASAN KUALITI AIR SUNGAI KATEGORI TERCEMAR

Water Quality Monitoring Stations Categorised as Polluted

Jadual 2.4 menunjukkan sebanyak 76 stesen pengawasan kualiti air sungai dikategorikan tercemar pada tahun 2025. Sebanyak 54 stesen berada dalam Kelas III dan 22 stesen berada dalam Kelas IV.

Berdasarkan sub-indeks BOD, lima (5) stesen sungai dikategorikan sebagai Kelas II, empat (4) stesen di Kelas III, 32 stesen di Kelas IV dan 35 stesen di Kelas V.

Dari segi sub-indeks AN pula, dua (2) stesen sungai dikategorikan sebagai Kelas II, tiga (3) stesen di Kelas III, enam (6) stesen di Kelas IV dan 65 stesen di Kelas V.

Dari segi sub-indeks SS, sebanyak 40 stesen sungai dikategorikan sebagai Kelas I, 30 stesen di Kelas II dan enam (6) stesen di Kelas III.

Daripada keseluruhan 76 stesen sungai yang berada dalam kategori tercemar, penyumbang terbesar kemerosotan kualiti air kepada Kelas V adalah berpunca daripada parameter AN iaitu sebanyak 86% dan diikuti parameter BOD iaitu sebanyak 46%.

Table 2.4 indicates a total of 76 river water quality monitoring stations categorised as polluted in 2025. 54 stations were in Class III and 22 stations in Class IV.

Based on the BOD sub-index, five (5) river stations were classified as Class II, four (4) stations in Class III, 32 stations in Class IV, and 35 stations in Class V.

In terms of the AN sub-index, two (2) river stations classified as Class II, three (3) stations in Class III, six (6) stations in Class IV, and 65 stations in Class V.

In terms of the SS sub-index, 40 river stations were classified as Class I, 30 stations in Class II, and six (6) stations in Class III.

Out of the total 76 river monitoring stations categorised as polluted, the main contributor to the deterioration of water quality to Class V was the AN parameter at 86%, followed by the BOD parameter at 46%.

Jadual 2.4 : Stesen Sungai Tercemar dan Kelas Kualiti Air Berdasarkan Sub-Indeks BOD, AN dan SS, 2025

Table 2.4 : Polluted River Stations and Classes Based on BOD, AN and SS Sub-Index, 2025

NEGERI/ STATE	LEMBANGAN / BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	2025			KELAS BERDASARKAN/ CLASS BASED ON		
				IKA/ WQI	KATEGORI/ CATEGORY	KELAS/ CLASS	BOD	AN	SS
Kedah	Sg. Merbok	Sg. Batu	1KMBK002	56	T/P	III	IV	V	I
		Sg. Petani	1KMBK007	59	T/P	III	IV	V	I
	Sg. Perai	Sg. Seluang	1KPRI021	58	T/P	III	IV	IV	I
P. Pinang	Sg. Juru	Sg. Juru	1PJRU001	56	T/P	III	III	V	I
		Sg. Rambai	1PJRU005	52	T/P	IV	IV	V	II
		Sg. Rambai	1PJRU007	58	T/P	III	IV	V	I

Jadual 2.4 : Stesen Sungai Tercemar dan Kelas Kualiti Air Berdasarkan Sub-Indeks BOD, AN dan SS, 2025
Table 2.4 : Polluted River Stations and Classes Based on BOD, AN and SS Sub-Index, 2025

NEGERI/ STATE	LEMBANGAN / BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	2025			KELAS BERDASARKAN/ CLASS BASED ON		
				IKA/ WQI	KATEGORI/ CATEGORY	KELAS/ CLASS	BOD	AN	SS
P. Pinang	Sg. Juru	Sg. Permatang Rawa	1PJRU008	59	T/P	III	IV	V	I
		Sg. Kilang Ubi	1PJRU010	56	T/P	III	IV	V	I
		Sg. Juru	1PJRU012	56	T/P	III	IV	V	II
	Sg. Jawi	Sg. Jawi	1PJWI001	56	T/P	III	III	V	II
		Sg. Chempedak	1PJWI003	55	T/P	III	V	IV	II
		Sg. Junjong	1PJWI004	54	T/P	III	IV	V	I
		Sg. Tengah	1PJWI005	57	T/P	III	IV	V	I
	Sg. Kluang	Sg. Kluang	1PKLU001	51	T/P	IV	IV	V	I
	Sg. Pinang	Sg. Titi Kerawang	1PPNG004	42	T/P	IV	V	V	I
		Sg. Pinang	1PPNG008	43	T/P	IV	V	V	I
		Sg. Dondang	1PPNG012	49	T/P	IV	V	V	I
		Sg. Dondang	1PPNG013	50	T/P	IV	V	V	I
		Sg. Pinang	1PPNG021	38	T/P	IV	V	V	II
	Sg. Perai	Sg. Kereh	1PPRI006	44	T/P	IV	V	V	III
		Sg. Air Melintas	1PPRI007	54	T/P	III	V	V	II
		Sg. Kereh	1PPRI008	57	T/P	III	IV	V	II
		Sg. Seluang Bawah	1PPRI010	53	T/P	III	V	IV	I
Selangor	Sg. Buloh	Sg. Buloh	2BBLH001	57	T/P	III	IV	V	III
		Sg. Buloh	2BBLH002	53	T/P	III	IV	V	II
		Sg. Buloh	2BBLH003	43	T/P	IV	V	IV	II
		Sg. Buloh	2BBLH004	49	T/P	IV	V	IV	II
		Sg. Buloh	2BBLH006	57	T/P	III	IV	V	II
	Sg. Klang	Sg. Kerayong	2BKLG013	43	T/P	IV	V	V	II
		Sg. Penchala	2BKLG019	57	T/P	III	IV	V	I
		Sg. Klang	2BKLG023	58	T/P	III	IV	V	II
		Sg. Klang	2BKLG034	58	T/P	III	IV	V	II
		Sg. Klang	2BKLG050	59	T/P	III	IV	V	II
		Sg. Kerayong	2BKLG051	55	T/P	III	V	V	I

Jadual 2.4 : Stesen Sungai Tercemar dan Kelas Kualiti Air Berdasarkan Sub-Indeks BOD, AN dan SS, 2025
 Table 2.4 : Polluted River Stations and Classes Based on BOD, AN and SS Sub-Index, 2025

NEGERI/ STATE	LEMBANGAN / BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	2025			KELAS BERDASARKAN/ CLASS BASED ON		
				IKA/ WQI	KATEGORI/ CATEGORY	KELAS/ CLASS	BOD	AN	SS
N. Sembilan	Sg. Sepang	Sg. Rambai	2BSPG004	57	T/P	III	IV	V	II
W.P. Kuala Lumpur	Sg. Klang	Sg. Klang	2WKLG001	58	T/P	III	IV	V	II
		Sg. Bunos	2WKLG006	55	T/P	III	V	IV	I
		Sg. Jinjang	2WKLG014	58	T/P	III	IV	V	I
		Sg. Keroh	2WKLG015	58	T/P	III	IV	V	I
		Sg. Toba	2WKLG037	45	T/P	IV	V	V	II
		Sg. Untut	2WKLG038	59	T/P	III	IV	V	I
		Sg. Air Busuk	2WKLG041	45	T/P	IV	V	V	II
		Sg. Jinjang	2WKLG045	58	T/P	III	IV	V	I
		Sg. Kerayong	2WKLG046	51	T/P	IV	V	V	I
		Sg. Keroh	2WKLG048	59	T/P	III	V	V	I
		Sg. Batu	2WKLG056	51	T/P	IV	V	V	II
		Sg. Batu	2WKLG061	58	T/P	III	IV	V	I
Johor	Sg. Danga	Sg. Danga	3JDGA001	57	T/P	III	IV	V	II
		Sg. Danga	3JDGA002	59	T/P	III	IV	V	I
	Sg. Johor	Sg. Bukit Besar	3JJHR007	45	T/P	IV	V	V	III
	Sg. Kempas	Sg. Kempas	3JKPS001	34	T/P	IV	V	V	II
	Sg. Kaw. Pasir Gudang	Sg. Tukang Batu	3JPGD003	50	T/P	IV	V	V	I
	Sg. Segget	Sg. Segget	3JSGT001	53	T/P	III	V	V	I
		Sg. Segget	3JSGT002	53	T/P	III	V	V	II
		Sg. Segget	3JSGT003	54	T/P	III	V	V	III
		Sg. Segget	3JSGT004	58	T/P	III	V	V	III
		Sg. Segget	3JSGT005	57	T/P	III	V	V	I
	Sg. Skudai	Sg. Melana	3JSKU009	56	T/P	III	V	V	II

Jadual 2.4 : Stesen Sungai Tercemar dan Kelas Kualiti Air Berdasarkan Sub-Indeks BOD, AN dan SS, 2025
Table 2.4 : Polluted River Stations and Classes Based on BOD, AN and SS Sub-Index, 2025

NEGERI/ STATE	LEMBANGAN / BASIN	SUNGAI/ RIVER	NOMBOR STESEN/ STATION NUMBER	2025			KELAS BERDASARKAN/ CLASS BASED ON		
				IKA/ WQI	KATEGORI/ CATEGORY	KELAS/ CLASS	BOD	AN	SS
Johor	Sg. Tebrau	Sg. Tebrau	3JTRU001	55	T/P	III	V	V	III
		Sg. Tebrau	3JTRU006	59	T/P	III	V	V	II
		Sg. Pandan	3JTRU007	54	T/P	III	V	V	I
		Sg. Tampoi	3JTRU010	55	T/P	III	V	V	I
		Sg. Sengkuang	3JTRU011	39	T/P	IV	V	V	II
Melaka	Sg. Melaka	Sg. Malim	3MMLK014	58	T/P	III	IV	V	II
		Sg. Melaka	3MMLK024	56	T/P	III	IV	V	II
		Sg. Putat	3MMLK033	59	T/P	III	III	V	I
	Sg. Merlimau	Sg. Merlimau	3MMLU002	59	T/P	III	IV	V	I
N. Sembilan	Sg. Linggi	Sg. Temiang	3NLGI033	54	T/P	III	V	V	I
	Sg. Langat	Sg. Pajam	3NLGT021	54	T/P	III	V	V	II
Kelantan	Sg. Pengkalan Chepa	Sg. Alor B	4DPCH003	59	T/P	III	III	V	I
		Sg. Alor Lintah	4DPCH004	59	T/P	III	IV	V	I
Sarawak	Sg. Miri	Sg. Adong	6QMRI001	47	T/P	IV	II	III	I
		Sg. Miri	6QMRI005	46	T/P	IV	II	III	I
		Sg. Miri	6QMRI006	47	T/P	IV	II	III	II
	Sg. Rajang	Sg. Daro	6QRJG021	57	T/P	III	II	II	I
		Sg. Jemoreng	6QRJG022	59	T/P	III	II	II	I

NOTA / NOTE:

KATEGORI IKA/ WQI CATEGORY

- **B/C** Bersih / Clean
- **ST/SP** Sederhana Tercemar/ Slightly Polluted
- **T/P** Tercemar/ Polluted

NILAI IKA/ WQI VALUE

- > 92.7 Kelas I / Class I
- 76.5 - 92.7 Kelas II / Class II
- 51.9 - 76.5 Kelas III / Class III
- 31.0 - 51.9 Kelas IV / Class IV
- < 31.0 Kelas V / Class V

TREND PENCEMARAN STESEN PENGAWASAN KUALITI AIR SUNGAI

Pollution Trends of River Water Quality Monitoring Stations

Berdasarkan sub-indeks BOD, 1,045 (77%) stesen sungai dikategorikan sebagai bersih pada tahun 2025, adalah sedikit meningkat berbanding 1,038 (77%) stesen pada tahun 2024 (**Rajah 2.6**). Bilangan stesen sungai yang sederhana tercemar dari segi sub-indeks BOD menurun daripada 163 (12%) stesen pada tahun 2024 kepada 157 (12%) stesen pada tahun 2025, manakala bilangan stesen yang berada di dalam kategori tercemar telah menurun sedikit daripada 152 (11%) stesen pada tahun 2024 kepada 151 (11%) stesen pada tahun 2025.

Dari segi sub-indeks AN, bilangan stesen sungai berada di dalam kategori bersih telah menurun daripada 688 (51%) stesen pada tahun 2024 kepada 679 (50%) stesen pada tahun 2025 (**Rajah 2.7**). Bilangan stesen sungai yang sederhana tercemar telah menurun daripada 300 (22%) stesen pada tahun 2024 kepada 274 (20%) stesen pada tahun 2025, manakala bilangan stesen yang berada di dalam kategori tercemar telah meningkat daripada 365 (27%) stesen pada tahun 2024 kepada 400 (30%) stesen pada tahun 2025.

Dari segi sub-indeks SS pula, bilangan stesen sungai yang dikategorikan bersih telah meningkat 1% daripada 1,011 (75%) stesen pada tahun 2024 kepada 1,024 (76%) stesen pada tahun 2025 (**Rajah 2.8**). Bilangan stesen sungai yang dikategorikan sebagai sederhana tercemar telah menurun daripada 148 (11%) stesen pada 2024 kepada 121 (9%) stesen pada tahun 2025, manakala bilangan stesen yang tercemar telah meningkat daripada 194 (14%) stesen pada tahun 2024 kepada 208 (15%) stesen pada tahun 2025.

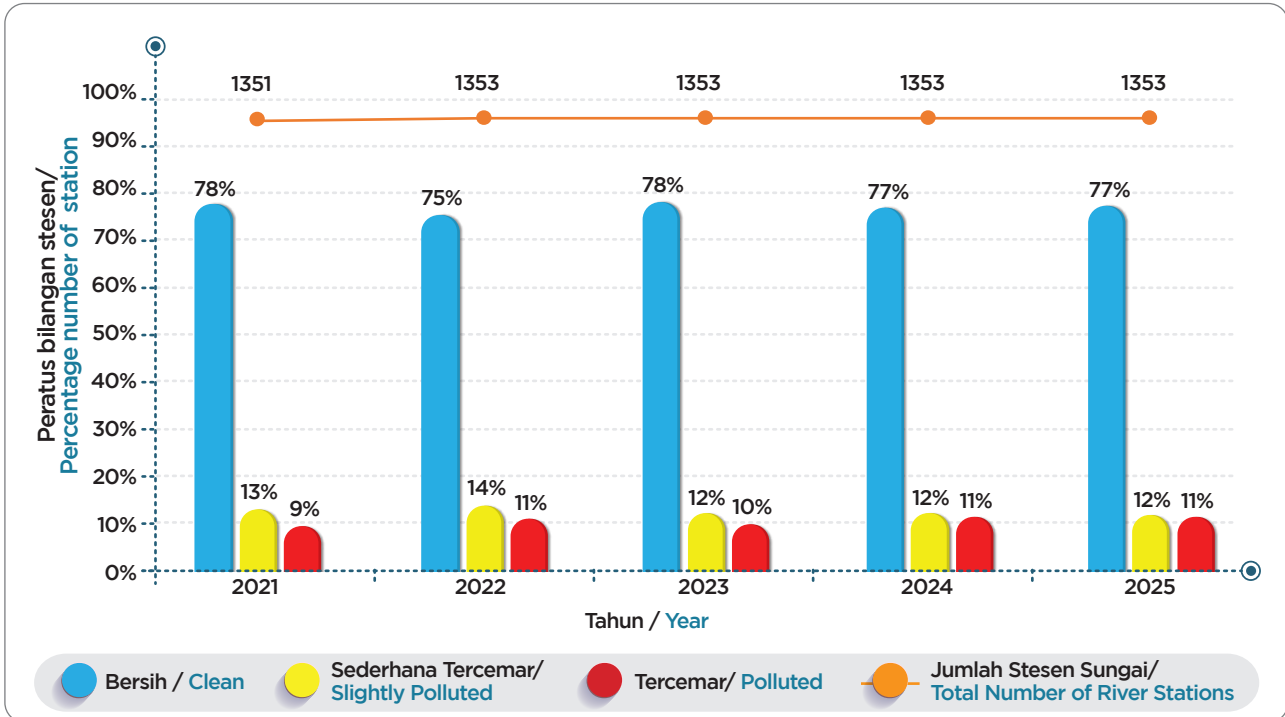
Kesimpulannya, didapati stesen pengawasan kualiti air sungai mengalami sedikit kemerosotan kualiti air bagi tahun 2025 berbanding 2024. Secara umumnya, kemerosotan tersebut adalah disebabkan peningkatan jumlah beban pencemaran kepada stesen pengawasan berkenaan yang berpunca daripada aktiviti yang berkaitan dengan punca tetap serta punca tidak tetap.

In terms of the BOD sub-index, 1,045 (77%) river stations were categorised as clean in 2025, this is a slight increase compared to 1,038 (77%) stations in the year before (**Figure 2.6**). The number of river stations in the slightly polluted category in terms of BOD sub-index decreased from 163 (12%) stations in 2024 to 157 (12%) stations in 2025 while the number of stations in the polluted category decreased from 152 (11%) stations in 2024 to 151 (11%) stations in 2025.

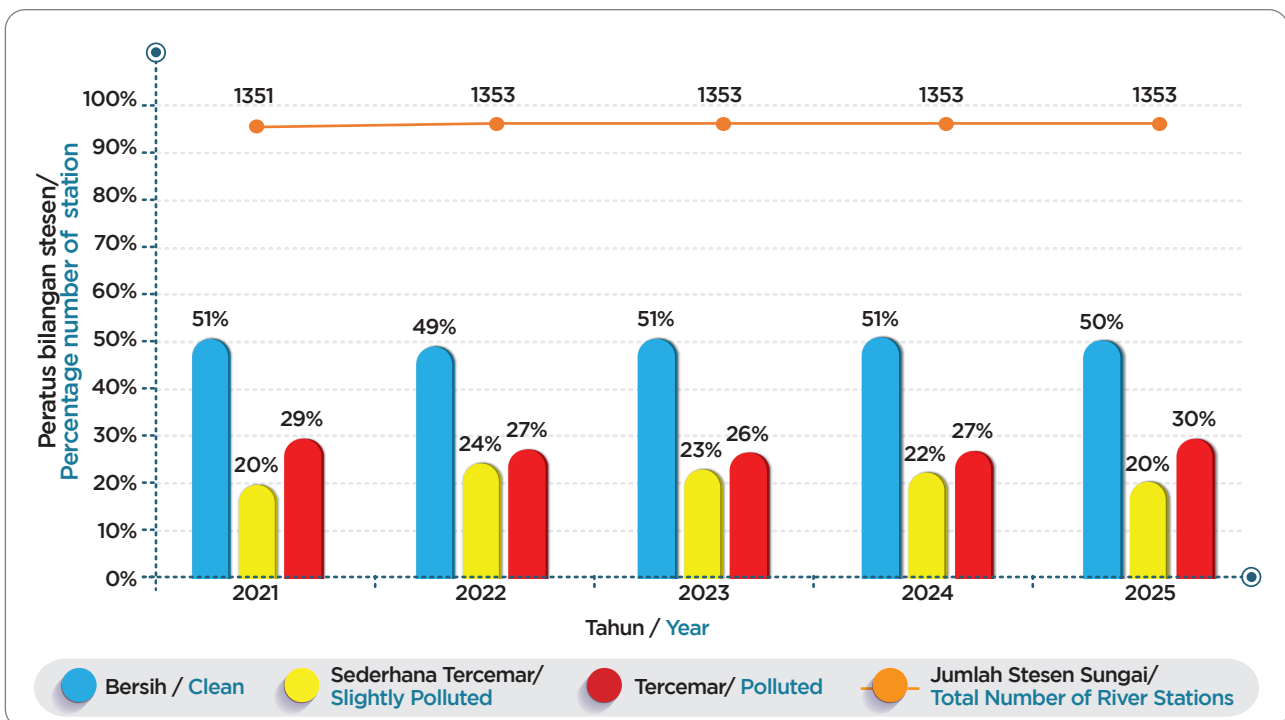
In terms of the AN sub-index, the number of river stations in the clean category significantly decreased compared to 2024, from 688 (51%) stations in 2024 to 679 (50%) stations in 2025 (**Figure 2.7**). The number of river stations in the slightly polluted category has decreased from 300 (22%) stations in 2024 to 274 (20%) stations in 2025 while the number of stations in the polluted category increased from 365 (27%) stations in 2024 to 400 (30%) stations in 2025.

In terms of SS sub-index, the number of river stations in the clean category has increased 1% from 1,011 (75%) stations in 2024 to 1,024 (76%) stations in 2025 (**Figure 2.8**). The number of river stations categorised as slightly polluted has decreased from 148 (11%) stations in 2024 to 121 (9%) stations in 2025, while the number of polluted stations has increased from 194 (14%) stations in 2024 to 208 (15%) stations in 2025.

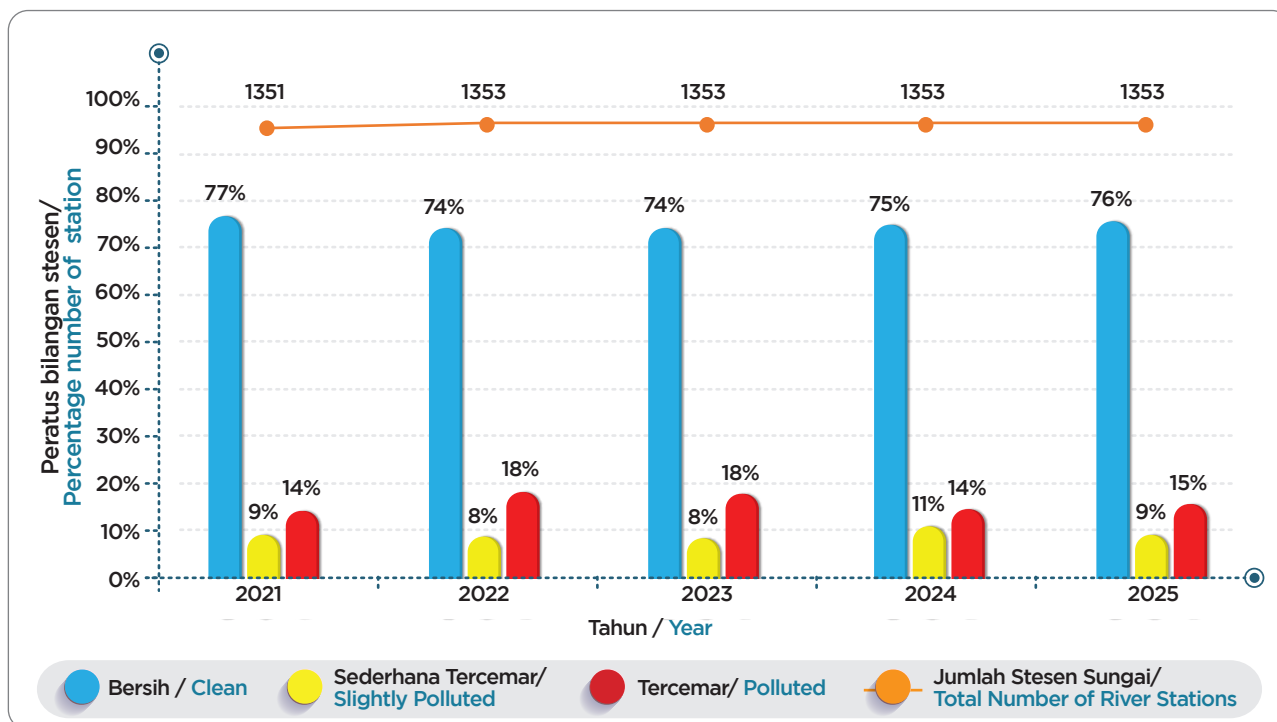
In conclusion, it was found that the river water quality monitoring stations experienced a slight deterioration in water quality for 2025 compared to 2024. In general, the decrease is due to the increase in the amount of pollution load to the monitoring stations due to activities related to point sources and nonpoint sources.



Rajah 2.6 : Tren Stesen Kualiti Air Sungai Berdasarkan Sub-Indeks BOD, 2021 – 2025
Figure 2.6 : River Water Quality Stations Trend on BOD Sub-Index, 2021 – 2025



Rajah 2.7 : Tren Stesen Kualiti Air Sungai Berdasarkan Sub-Indeks AN, 2021 – 2025
Figure 2.7 : River Water Quality Stations Trend on AN Sub-Index, 2021 – 2025



Rajah 2.8 : Tren Stesen Kualiti Air Sungai Berdasarkan Sub-Indeks SS, 2021 – 2025

Figure 2.8 : River Water Quality Stations Trend on SS Sub-Index, 2021 – 2025

ANALISIS LOGAM BERAT DI STESEN PENGAWASAN KUALITI AIR SUNGAI

Analysis of Heavy Metals at River Water Quality Monitoring Stations

Pada tahun 2025, sebanyak 8,118 sampel kualiti air telah diambil mewakili 1,353 stesen pengawasan sungai manual setiap negeri bagi tujuan memantau kandungan beberapa parameter logam berat seperti raksa (Hg), arsenik (As), kadmium (Cd), kromium (Cr), plumbum (Pb) dan zink (Zn). Pematuhan dinilai berdasarkan Standard Kualiti Air Kebangsaan (NWQS) (**Jadual 2.5**).

Bagi parameter Hg dan Cd, semua stesen sungai di seluruh negara menunjukkan pematuhan penuh kepada Kelas II. Parameter As, Cr, Pb dan Zn menunjukkan julat pematuhan Kelas II antara 87.04% hingga 100%.

In 2025, a total of 8,118 water quality samples were collected from 1,353 manual river water quality monitoring stations across all states to monitor the concentration of several heavy metals such as mercury (Hg), arsenic (As), cadmium (Cd), chromium (Cr), lead (Pb) and zinc (Zn). Compliance was accessed to the National Water Quality Standards (NWQS) (**Table 2.5**).

For Hg and Cd parameter, all river stations in the country showed full compliance to Class II. Parameters of As, Cr, Pb and Zn showed compliance to Class II ranging of 87.04% to 100%.

Jadual 2.5 : Peratusan Pematuhan Parameter Logam Berat mengikut Negeri
Table 2.5: Percentage of Heavy Metal Parameter Compliance by State

NEGERI/ STATE	BIL. STESEN/ NO OF STATIONS	BIL. PERSAMPELAN/ NO OF SAMPLING	PEMATUHAN KELAS II (%) / COMPLIANCE OF CLASS II (%)					
			RAKSA/ MERCURY (Hg)	ARSENIK/ ARSENIC (As)	KADMIUM/ CADMIUM (Cd)	KROMIUM/ CHROMIUM (Cr)	PLUMBUM/ PLUMBUM (Pb)	ZINK/ ZINC (Zn)
Perlis	15	90	100%	100%	100%	100%	100%	100%
Kedah	74	444	100%	100%	100%	99.77%	100%	100%
P. Pinang	66	396	100%	100%	100%	99.75%	99.75%	100%
Perak	150	900	100%	97.33%	100%	100%	100%	100%
Selangor	95	570	100%	94.39%	100%	100%	99.30%	100%
W.P. Kuala Lumpur	27	162	100%	87.04%	100%	100%	100%	100%
N. Sembilan	66	396	100%	99.50%	100%	100%	99.24%	100%
Melaka	54	324	100%	99.69%	100%	99.07%	100%	100%
Johor	227	1362	100%	100%	100%	99.85%	100%	99.93%
Pahang	192	1152	100%	100%	100%	100%	99.91%	100%
Terengganu	69	414	100%	100%	100%	100%	100%	100%
Kelantan	83	498	100%	100%	100%	100%	99.60%	100%
Sarawak	117	702	100%	99.86%	100%	100%	100%	100%
Sabah	118	708	100%	100%	100%	100%	99.01%	100%

KUALITI AIR SUNGAI BAGI STESEN DI HULU MUKA SAUK

River Water Quality for Stations Located Upstream of Water Intakes

Pada tahun 2025, 50 (91%) daripada 55 stesen pengawasan kualiti air di hulu muka sauk telah menunjukkan indeks kualiti air bersih, tiga (3) (5%) stesen kategori sederhana tercemar, manakala dua (2) (4%) stesen berada dalam kategori tercemar.

Berdasarkan pengelasan kualiti air, sebanyak 27 (49%) stesen berada di dalam Kelas I dan 26 (47%) stesen di Kelas II, manakala dua (2) (4%) stesen di Kelas III. **Jadual 2.6** menunjukkan status kualiti air di stesen hulu muka sauk.

Bagi sub-indeks BOD, 54 (98%) stesen sungai telah menunjukkan kualiti air dalam Kelas II dan satu (1) (2%) stesen di Kelas III.

Berdasarkan sub-indeks AN, sebanyak 47 (85%) stesen menunjukkan kualiti air berada dalam Kelas I, enam (6) (11%) stesen di Kelas II, satu (1) (2%) stesen di Kelas III dan satu (1) (2%) stesen di Kelas IV.

Dari segi sub-indeks SS, 37 (67%) stesen sungai telah berada dalam Kelas I, 13 (24%) stesen di Kelas II, tiga (3) (5%) stesen di Kelas III dan dua (2) (4%) stesen di Kelas IV (**Rajah 2.9**).

In 2025, 50 (91%) of the 55 water quality monitoring stations located upstream of water intake points showed a clean water quality index, while three (3) (5%) stations were in the slightly polluted category, and two (2) (4%) stations were in the polluted category.

Based on the water quality classification, 27 (49%) stations were in Class I and 26 (47%) stations in Class II, while two (2) (4%) stations was in Class III. **Table 2.6** shows the status of water quality status of these upstream station.

For the BOD sub-index, 54 (98%) stations recorded water quality in Class II and one (1) station was in Class III.

Based on sub-index AN, 47 (85%) stations were in Class I, six (6) (11%) stations in Class II, one (1) (2%) station in Class III and one (1) (2%) station in Class IV.

In terms of SS sub-index, 37 (67%) stations were in Class I, 13 (24%) stations in Class II, three (3) (5%) stations in Class III and two (2) (4%) stations in Class IV (**Figure 2.9**).

Jadual 2.6 : Status Kualiti Air di Hulu Muka Sauk, 2025
Table 2.6 : Water Quality Status of Upstream Water Intake, 2025

NEGERI/ STATE	LEMBANGAN SUNGAI/ RIVER BASIN	SUNGAI/ RIVER	STATION ID/ ID STATION	MUKA SAUK/ WATER INTAKE	NILAI IKA/ WQI VALUE	2025		
						SUB- INDEKS BOD/ BOD SUB- INDEX	SUB- INDEKS AN/ AN SUB- INDEX	SUB- INDEKS SS/ SS SUB- INDEX
Perlis	Sg. Perlis	Sg. Terusan Mada	1RPLS010	Loji Rawatan Air Arau Fasa IV	93	96	95	86
		Sg. Terusan Mada	1RPLS011	Loji Rawatan Air TTPC, Sg. Baru	91	96	95	85
Kedah	Sg. Kedah	Sg. Ahning	1KKDH011	Padang Sanai	96	96	99	92

Jadual 2.6 : Status Kualiti Air di Hulu Muka Sauk, 2025
Table 2.6 : Water Quality Status of Upstream Water Intake, 2025

NEGERI/ STATE	LEMBANGAN SUNGAI/ RIVER BASIN	SUNGAI/ RIVER	STATION ID/ ID STATION	MUKA SAUK/ WATER INTAKE	NILAI IKA/ WQI VALUE	2025		
						SUB- INDEKS BOD/ BOD SUB- INDEX	SUB- INDEKS AN/ AN SUB- INDEX	SUB- INDEKS SS/ SS SUB- INDEX
Kedah	Sg. Kedah	Sg. Padang Terap	1KKDH012	Kuala Nerang	92	96	64	85
	Sg. Kedah	Sg. Temin	1KKDH010	Changloon	87	92	90	79
	Sg. Muda	Sg. Muda	1KMUD014	Jeneri	94	96	96	81
			1KMUD015	Jeniang	93	96	96	76
			1KMUD016	Bukit Selambau	90	96	93	76
			1KMUD018	Pinang Tunggal	89	96	88	83
			1KMUD019	Nami	93	96	98	76
		Sg. Sedim	1KMUD017	Bikan	91	96	96	74
	Sg. Ulu Melaka	Sg. Melaka	1KMLK003	Ulu Melaka	93	96	94	86
		Sg. Saga	1KMLK004	Padang Saga	92	96	93	92
P. Pinang	Sg. Pinang	Sg. Satu	1PPNG020	Batu Feringgi	97	96	98	97
Perak	Sg. Bernam	Sg. Gelinting	1ABNM015	Loji Rawatan Air Ulu Slim	97	96	99	93
		Sg. Trolak	1ABNM014	Loji Rawatan Air Trolak Timur	97	96	99	95
	Sg. Kurau	Sg. Air Hitam	1AKRU007	Loji Rawatan Air Jelai	97	96	99	97
	Sg. Perak	Sg. Manong	1APRK060	Loji Rawatan Air Manong	97	96	99	95
		Sg. Perak	1APRK059	Loji Rawatan Air Sauk	96	96	99	97
		Sg. Tesong	1APRK062	Loji Rawatan Air Sg. Klah	96	96	99	97
		Sg. Woh	1APRK061	Loji Rawatan Air Kuala Woh	97	96	99	97
	Sg. Sepetang	Sg. Batu Tegoh	1ASPT016	Loji Rawatan Air Bukit Larut	98	96	99	97
Selangor	Sg. Klang	Sg. Gombak	2BKLG020	Loji Rawatan Air Gombak	97	96	99	97
	Sg. Langat	Sg. Batang Labu	2BLGT028	Loji Rawatan Air Salak Tinggi	80	86	49	84

Jadual 2.6 : Status Kualiti Air di Hulu Muka Sauk, 2025

Table 2.6 : Water Quality Status of Upstream Water Intake, 2025

NEGERI/ STATE	LEMBANGAN SUNGAI/ RIVER BASIN	SUNGAI/ RIVER	STATION ID/ ID STATION	MUKA SAUK/ WATER INTAKE	NILAI IKA/ WQI VALUE	2025		
						SUB- INDEKS BOD/ BOD SUB- INDEX	SUB- INDEKS AN/ AN SUB- INDEX	SUB- INDEKS SS/ SS SUB- INDEX
Selangor	Sg. Langat	Sg. Semenyih	2BLGT010	Loji Rawatan Air Semenyih	87	94	72	76
N. Sembilan	Sg. Muar	Sg. Jelai	3NMUA054	Loji Rawatan Air Dangi	95	96	99	85
Melaka	Sg. Kesang	Sg. Chin-Chin	3MKSG008	Muka sauK Loji Rawatan Air Chin-chin	91	96	87	80
Johor	Sg. Batu Pahat	Sg. Semberong Dam	3JBPT021	Semberong Dam	91	92	99	92
	Sg. Benut	Sg. Machap Dam	3JBNT008	Machap Dam	90	92	94	87
	Sg. Endau	Sg. Kahang	3JEND026	Jalan Felda Kahang Timur, Kluang	94	96	93	88
	Sg. Muar	Sg. Jementah	3JMUA040	Loji Rawatan Air Jementah	96	96	99	95
		Sg. Muar	3JMUA039	Loji Rawatan Air Gombang	90	96	96	91
	Sg. Pulai	Sg. Pulai Dam	3JPLI004	Pulai Dam	95	96	93	97
Pahang	Sg. Pahang	Sg. Bertam	4CBTM013	Loji Rawatan Air Habu	97	96	99	97
		Sg. Gapoi	4CPHG086	Muka sauK Loji Rawatan Air Gapoi	97	96	99	97
		Sg. Jempol	4CPHG087	Loji Air Sg Jerik	95	96	98	88
		Sg. Jempol	4CPHG088	Loji Air Jengka 3	85	94	96	70
		Sg. Mentiga	4CPHG089	Loji Air Chini	93	96	95	87
		Sg. Terla	4CBTM012	Loji Rawatan Air Kuala Terla	95	96	99	95
		Sg. Triang	4CPHG074	Loji Rawatan Air Sg. Triang	88	96	96	62
		Sg. Ulong	4CBTM014	Brinchang Dam	97	96	99	97

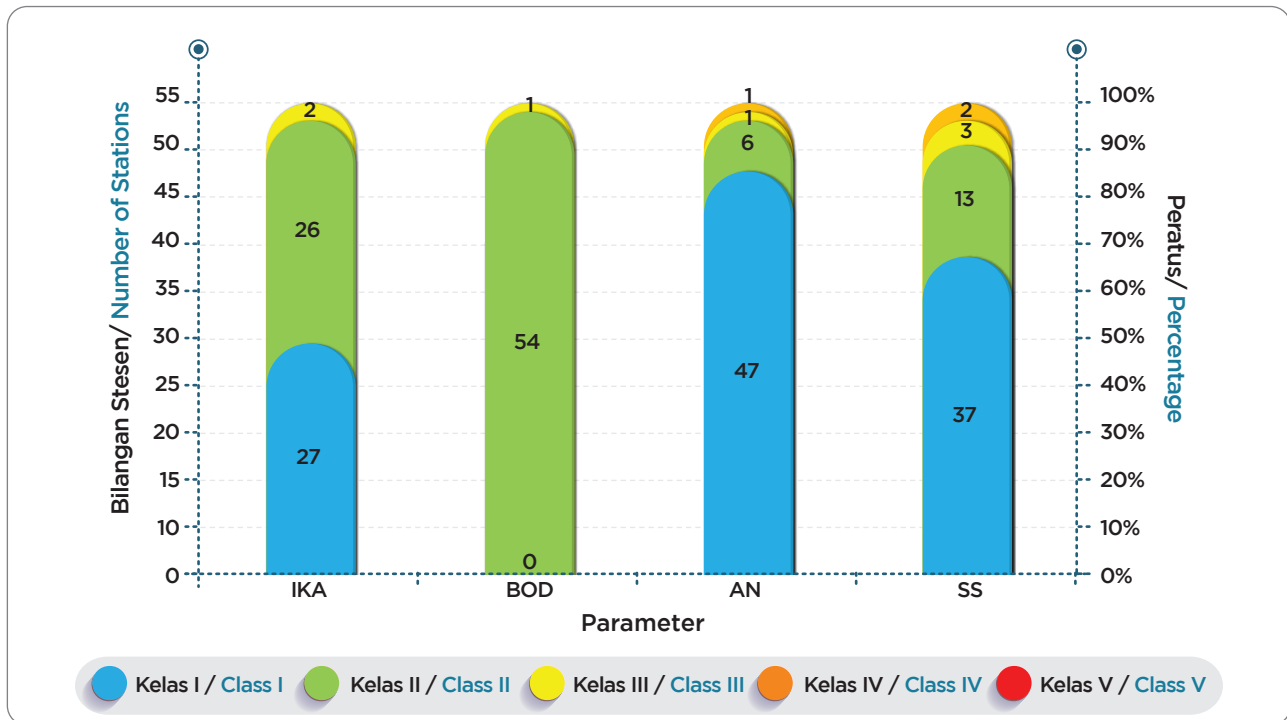
Jadual 2.6 : Status Kualiti Air di Hulu Muka Sauk, 2025
Table 2.6 : Water Quality Status of Upstream Water Intake, 2025

NEGERI/ STATE	LEMBANGAN SUNGAI/ RIVER BASIN	SUNGAI/ RIVER	STATION ID/ ID STATION	MUKA SAUK/ WATER INTAKE	NILAI IKA/ WQI VALUE	2025		
						SUB- INDEKS BOD/ BOD SUB- INDEX	SUB- INDEKS AN/ AN SUB- INDEX	SUB- INDEKS SS/ SS SUB- INDEX
Terengganu	Sg. Terengganu	Sg. Terengganu	4TTGG013	Loji Air Serada	91	96	99	95
Kelantan	Sg. Golok	Sg. Golok	4DGLK003	Syarikat Air Kelantan	97	96	99	97
	Sg. Kelantan	Sg. Chiku	4DKLT043	Felda Ciku 2	93	96	99	76
		Sg. Kelantan	4DKLT045	Loji Air Kelar, Pasir Mas	85	96	96	46
		Sg. Pehi	4DKLT044	Loji Air Pahi	93	96	99	76
Sarawak	Sg. Kerian	Sg. Selalang	6QKRN017	Selalang Water Intake	90	96	99	92
	Sg. Mukah	Sg. Mukah	6QMKH005	Mukah Water Intake	77	96	96	57
	Sg. Rajang	Sg. Daro	6QRJG021	Daro Water Intake	57	96	86	93
		Sg. Jemoreng	6QRJG022	Jemoreng Water Intake	59	94	88	92
		Sg. Pakan	6QRJG020	Pakan Water Intake	87	96	99	77
		Sg. Pila Parit	6QRJG023	Igan Water Intake	79	96	92	76
Sabah	Sg. Padas	Sg. Padas	5SPDS011	Water Intake Jabatan Air Beaufort	86	96	92	50
	Sg. Papar	Sg. Papar	5SPPR004	Sekolah Kebangsaan Mandalipau	91	96	94	89
		Sg. Papar	5SPPR005	Water Intake Kogopon	92	96	97	92

NOTA / NOTE:

KATEGORI IKA/ WQI CATEGORY

 Kelas I / Class I
  Kelas II / Class II
  Kelas III / Class III
  Kelas IV / Class IV
  Kelas V / Class V



Rajah 2.9 : Kualiti Air Sungai di Stesen Hulu Muka Sauk, 2025
 Figure 2.9 : River Water Quality at Upstream Water Intake Stations, 2025

STATUS PENGAWASAN KUALITI AIR SUNGAI AUTOMATIK

Continuous River Water Quality Monitoring Status

Rajah 2.10(a) dan Rajah 2.10(b) menunjukkan lokasi 30 stesen pengawasan sungai automatik serta takat pengambilan air yang disenaraikan seperti dalam **Jadual 2.7**.

Pada tahun 2025, status kualiti air sungai bagi 30 stesen pengawasan sungai automatik telah dinilai berdasarkan peratusan pematuhan Kelas II. Parameter yang diukur adalah pH, DO, BOD, COD, AN dan pepejal terampai (SS). Pematuhan ini ditunjukkan seperti pada **Jadual 2.8**.

Dari segi pematuhan Kelas II, stesen yang menunjukkan pematuhan 90% atau lebih kepada kualiti air Kelas II pada tahun 2025 adalah didapati di 14 (47%) stesen iaitu CR02K, CR05A, CR06A, CR07B, CR14N, CR15N, CR18J, CR22C, CR25T, CR26D, CR27S, CR29Q, CR30Q dan CR31S.

Figure 2.10(a) and **Figure 2.10(b)** show the location of the 30 continuous river monitoring stations and subsequent water intakes as listed in **Table 2.7**.

In 2025, the river water quality status of the 30 continuous river water quality monitoring stations were assessed based on percentage of compliance to Class II. The measured parameters are pH, DO, BOD, COD, AN and suspended solids (SS). The compliance is shown in **Table 2.8**.

In terms of compliance to Class II, 90% compliance or more to Class II water quality in 2025 at 14 (47%) stations which were CR02K, CR05A, CR06A, CR07B, CR14N, CR15N, CR18J, CR22C, CR25T, CR26D, CR27S, CR29Q, CR30Q and CR31S stations.

DO merupakan parameter yang berkait rapat dengan kehadiran bahan organik di dalam air. Kehadiran bahan organik yang tinggi akan meningkatkan BOD dan seterusnya menurunkan kepekatan DO di dalam sungai. Pematuhan Kelas II DO yang lebih atau sama dengan 90% didapati di 14 (47%) stesen iaitu CR02K, CR06A, CR07B, CR11B, CR14N, CR15N, CR17M, CR18J, CR20J, CR22C, CR26D, CR27S, CR31S dan CR29Q.

Ammonium (NH_4) adalah satu bentuk ammonia (NH_3) yang telah terion. Pengukuran NH_4 memberi petunjuk kepada potensi kehadiran pencemar NH_3 atau AN dalam air sungai apabila pH dan suhu air berubah. Pematuhan yang lebih atau sama dengan 90% bagi Kelas II AN didapati di 17 (57%) stesen iaitu CR03K, CR06A, CR14N, CR15N, CR17M, CR18J, CR19J, CR20J, CR22C, CR23C, CR24T, CR25T, CR26D, CR27S, CR31S, CR29Q dan CR30Q.

pH adalah ukuran bagi keasidan dan kealkalian mengikut skala pH. Pematuhan Kelas II bagi pH yang lebih atau sama dengan 90% diperhatikan di 20 (67%) stesen sungai iaitu CR01K, CR02K, CR06A, CR07B, CR08B, CR09B, CR10B, CR11B, CR12W, CR13N, CR14N, CR15N, CR16M, CR21J, CR22C, CR26D, CR27S, CR31S, CR29Q, dan CR30Q.

Kekeruhan digunakan sebagai penunjuk kehadiran SS di dalam sungai. Pematuhan Kelas II SS yang direkodkan adalah kurang daripada 90% bagi semua stesen kecuali di stesen CR05A.

Rajah 2.11 hingga **Rajah 2.16** menunjukkan peratus pematuhan Kelas II mengikut zon.

DO is a parameter that is closely related to the presence of organic matter in water. High concentrations of organic matter increase the BOD, which subsequently reduces the DO concentration in the river. Compliance equal to or greater than 90% to Class II DO was observed at 14 (47%) stations CR02K, CR06A, CR07B, CR11B, CR14N, CR15N, CR17M, CR18J, CR20J, CR22C, CR26D, CR27S, CR31S and CR29Q.

Ammonium (NH_4) is an ionized form of ammonia (NH_3). The measurement of NH_4 indicates the potential presence of NH_3 or AN pollutant in rivers when the pH and temperature changes. Compliance of more or equal than 90% to Class II AN was observed at 17 (57%) stations CR03K, CR06A, CR14N, CR15N, CR17M, CR18J, CR19J, CR20J, CR22C, CR23C, CR24T, CR25T, CR26D, CR27S, CR31S, CR29Q and CR30Q.

pH is a measurement of acidity and alkalinity based on the pH scale. More or equal than 90% compliance to Class II was observed at 20 (67%) river stations CR01K, CR02K, CR06A, CR07B, CR08B, CR09B, CR10B, CR11B, CR12W, CR13N, CR14N, CR15N, CR16M, CR21J, CR22C, CR26D, CR27S, CR31S, CR29Q, and CR30Q.

Turbidity is used as an indicator of SS presence in a river. Compliance to Class II SS was less than 90% at all stations, except for CR05A.

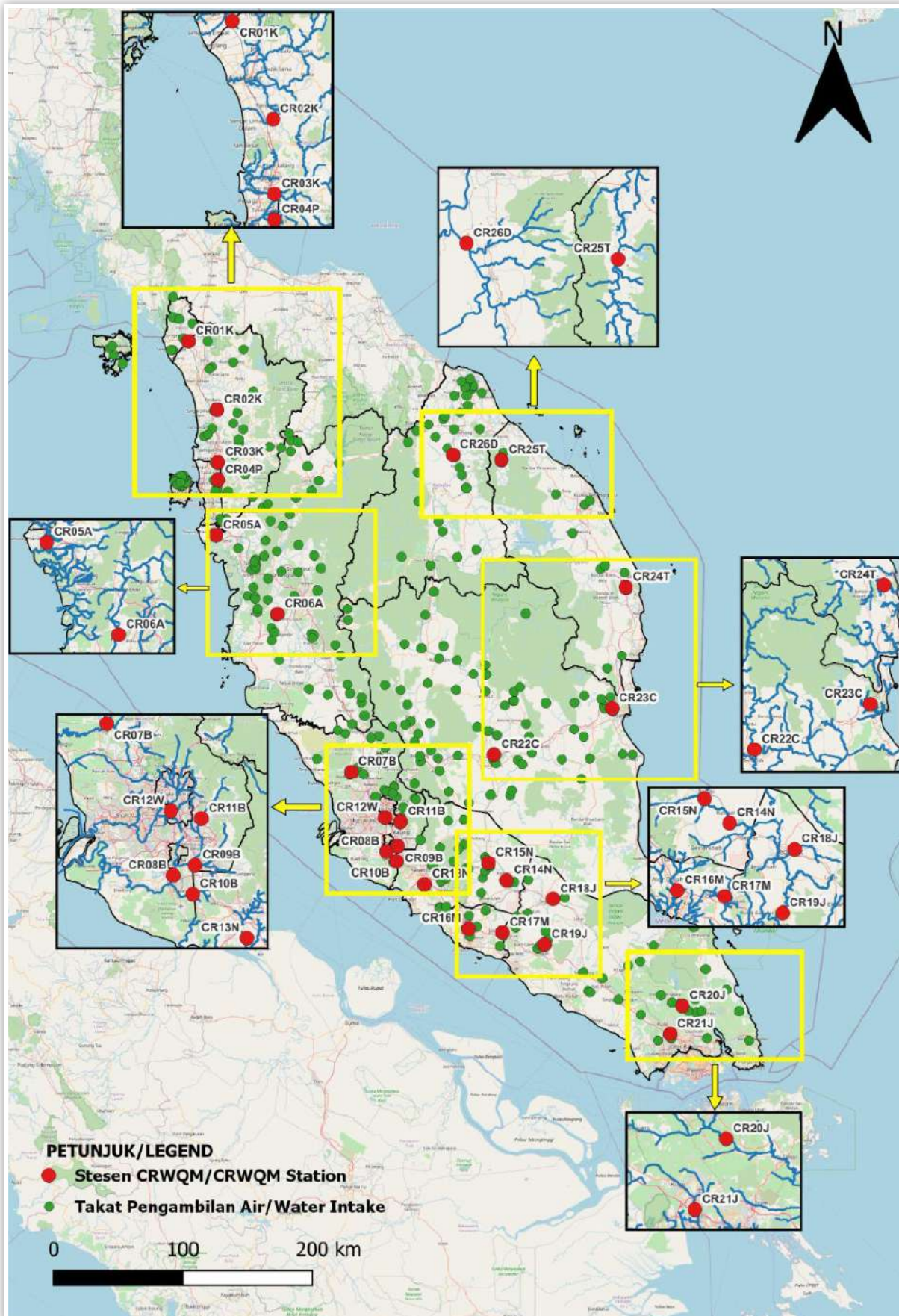
Figure 2.11 to **Figure 2.16** shows the percentage of Class II compliance by zones.

Jadual 2.7: Lokasi CRWQM: ID Stesen, Sungai bagi Stesen dan Takat Pengambilan Air
 Table 2.7: CRWQM Location: Station ID, River of the Station and Water Intakes

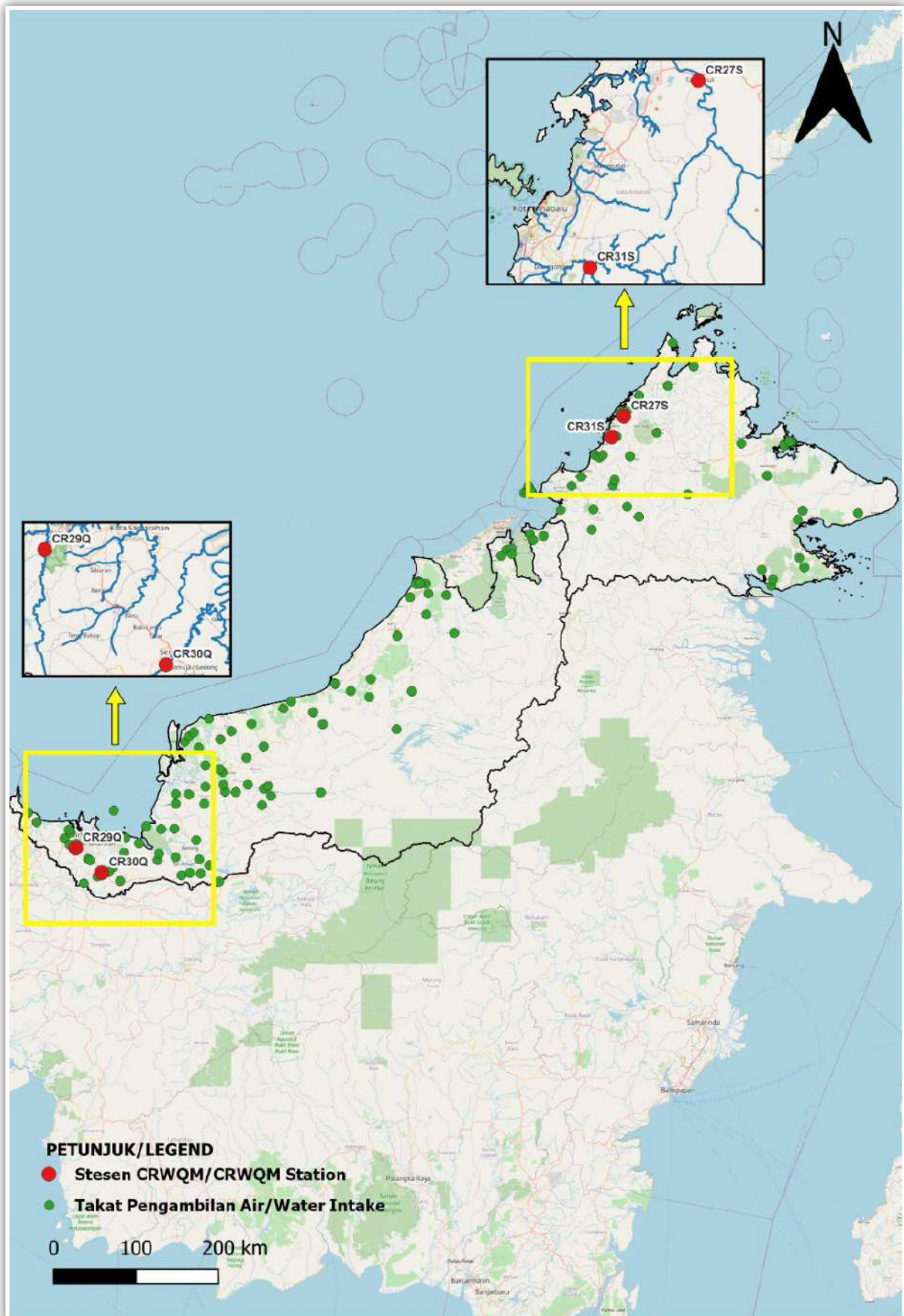
NEGERI/ STATE	ID STESEN/ ID STATION	SUNGAI/ RIVER	TAKAT PENGAMBILAN AIR/ WATER INTAKE
Kedah	CR01K CR02K CR03K	Terusan MADA Terusan MADA Sungai Muda	Arau Fasa IV Bukit Jenun Kulim Hi-Tech
Penang	CR04P	Sungai Kulim	Toh Alang
Perak	CR05A CR06A	Sungai Bogak Sungai Perak	Parit Buntar Sultan Idris
Selangor	CR07B CR08B CR09B CR10B CR11B	Sungai Selangor Sungai Langat Sungai Semenyih Sungai Labu Sungai Langat	Sg. Selangor Fasa 1,2,3 Bukit Tampoi Jenderam Labu Lanjut Cheras Batu 11
W. P. Kuala Lumpur	CR12W	Sungai Klang	Tiada Berkenaan / Not Applicable
N. Sembilan	CR13N CR14N CR15N	Sungai Linggi Sungai Muar Sungai Muar	Linggi Pasir Besar Jelai Jempol
Melaka	CR16M CR17M	Sungai Melaka Sungai Kesang	Durian Tunggal Chin Chin
Johor	CR18J CR19J CR20J CR21J	Sungai Segamat Sungai Muar Sungai Johor Sungai Sekudai	Segamat Panchor Semanggar Skudai
Pahang	CR22C CR23C	Sungai Pahang Sungai Kuantan	Lubuk Kawah Semambu
Terengganu	CR24T CR25T	Sungai Paka Sungai Besut	Bukit Bauk Bukit Bunga
Kelantan	CR26D	Sungai Kelantan	Bukit Remah
Sabah	CR27S CR31S	Sungai Tuaran Sungai Moyog	Telibong Kasigui
Sarawak	CR29Q CR30Q	Sungai Sarawak Sungai Batang Sadong	Sarawak Kiri Tebekang

Jadual 2.8: Peratus Pematuhan Kelas II mengikut Stesen
Table 2.8: Percentage of Compliance to Class II by Station

NEGERI/ STATE	ID STESEN/ STATION ID	PEMATUHAN KELAS II (%) / COMPLIANCE TO CLASS II (%)						
		WQI	DO sat (%)	BOD	COD	TSS	AN	pH
Kedah	CR01K	88.92	78.02	100	100	46.70	74.73	91.62
	CR02K	99.33	100	99.20	100	39.90	85.89	96.07
	CR03K	69.76	27.80	100	100	48.32	90.22	72.88
P. Pinang	CR04P	10.29	34.11	96.57	91.17	23.35	2.17	57.11
Perak	CR05A	95.44	82.38	100	100	92.28	86.20	27.76
	CR06A	99.80	99.82	100	100	56.19	96.97	100
Selangor	CR07B	91.01	94.07	48.43	100	57.85	59.32	91.81
	CR08B	26.90	32.85	6.69	100	52.02	7.05	99.40
	CR09B	72.29	42.52	99.99	100	51.63	76.28	96.53
	CR10B	19.23	26.21	84.23	99.64	72.31	1.88	96.47
	CR11B	85.07	93.29	0	100	18.11	76.15	98.31
W.P. Kuala Lumpur	CR12W	0.06	0.69	0	100	55.57	0.06	99.83
N. Sembilan	CR13N	33.16	42.08	100	100	27.05	11.16	98.74
	CR14N	92.88	99.81	99.00	99.99	1.66	97.91	99.67
	CR15N	97.88	99.90	100	100	7.56	99.38	97.07
Melaka	CR16M	48.20	62.27	99.99	100	20.46	7.83	99.68
	CR17M	89.16	90.05	99.60	99.93	31.53	97.16	88.56
Johor	CR18J	94.20	98.13	100	100	33.24	91.97	81.27
	CR19J	50.23	0.77	93.62	100	40.51	99.94	55.20
	CR20J	85.21	92.04	88.46	100	25.74	95.61	12.75
	CR21J	10.00	40.51	2.58	99.96	42.85	1.67	98.54
Pahang	CR22C	97.88	93.85	95.17	99.41	25.71	98.95	99.19
	CR23C	86.40	53.34	100	99.51	57.24	95.45	57.60
Terengganu	CR24T	61.61	44.18	98.66	98.73	78.63	93.01	0.34
	CR25T	98.97	89.62	100	100	81.92	98.89	87.09
Kelantan	CR26D	99.41	99.49	100	100	3.35	100	100
Sabah	CR27S	99.98	100	100	100	78.63	99.56	99.98
	CR31S	99.34	98.23	93.75	100	76.59	98.87	98.01
Sarawak	CR29Q	100	99.99	100	100	68.84	97.94	97.60
	CR30Q	99.65	80.06	100	100	80.02	100	97.72

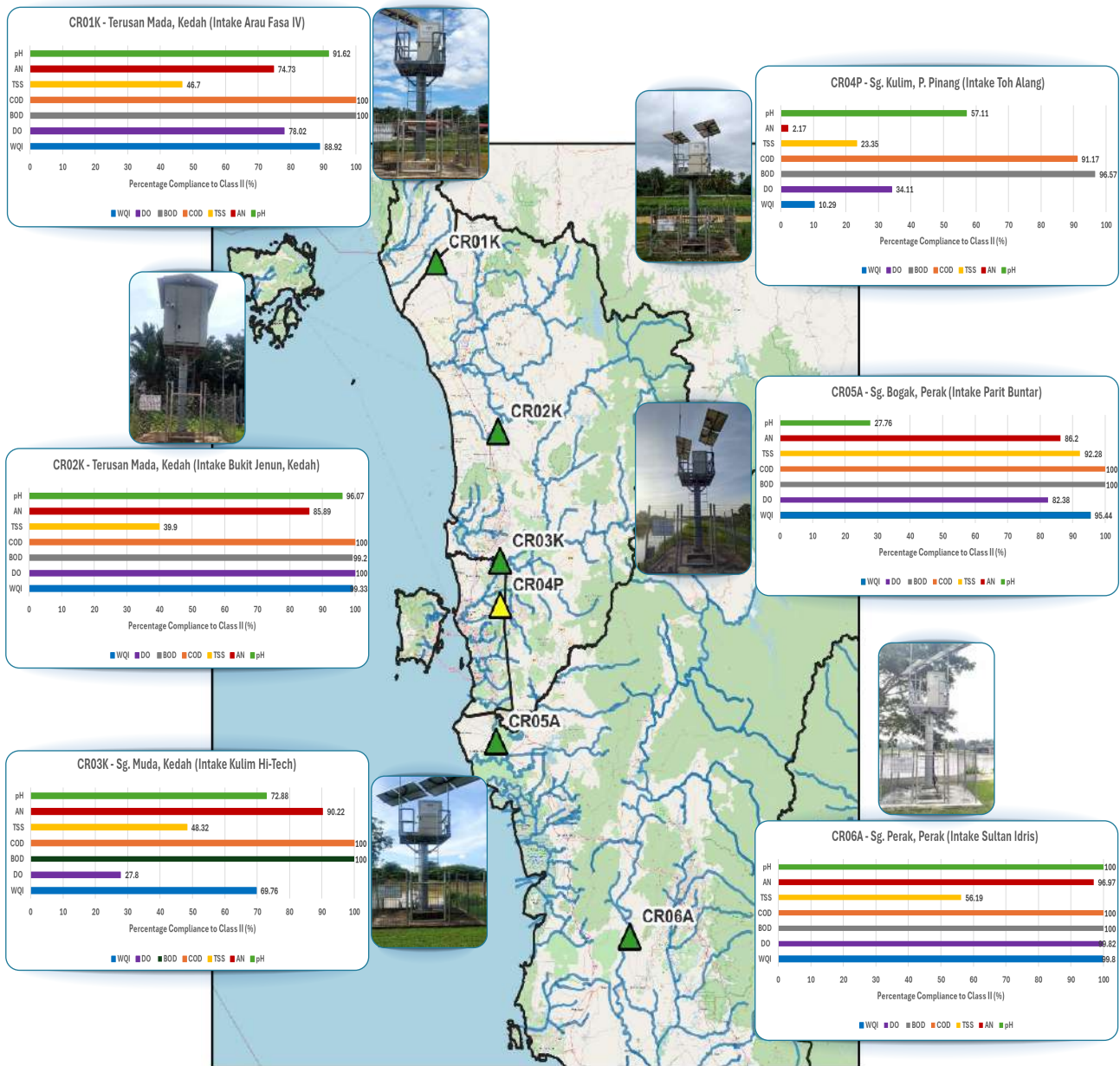


Rajah 2.10(a): Stesen Pengawasan Kualiti Air Sungai Automatik Dan Takat Pengambilan Air
 Figure 2.10(a): Continuous River Water Quality Monitoring Stations and Water Intakes



Rajah 2.10(b): Stesen Pengawasan Kualiti Air Sungai Automatik dan Takat Pengambilan Air
Figure 2.10(b): Continuous River Water Quality Monitoring Stations and Water Intakes

CRWQM 2025 (WILAYAH UTARA/NORTHERN REGION)



PETUNJUK / LEGEND

KELAS IKA/ WQI CLASS

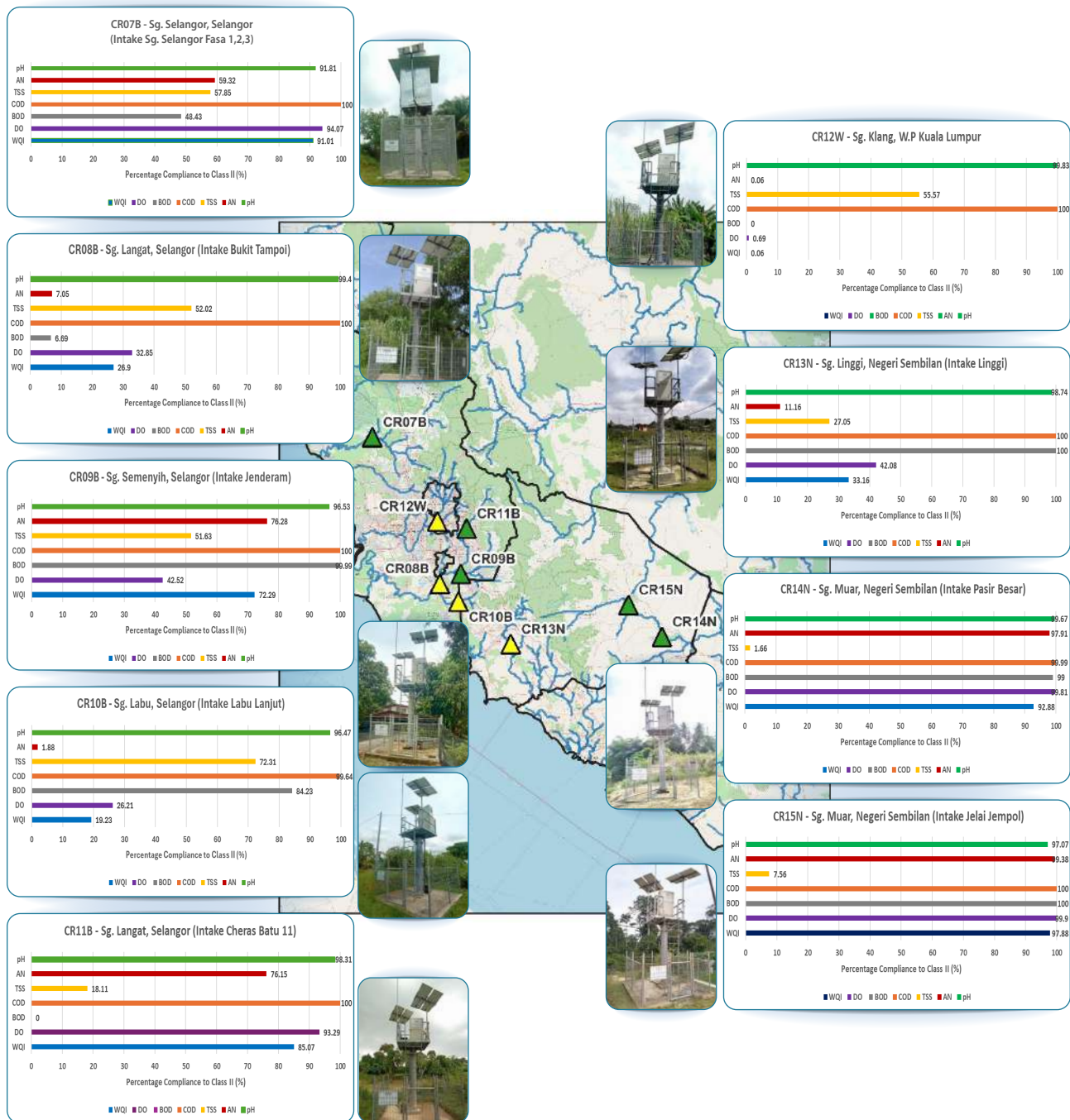
- ▲ Kelas I / Class I
 ▲ Kelas II / Class II
 ▲ Kelas III / Class III
 ▲ Kelas IV / Class IV
 ▲ Kelas V / Class V

Sempadan Negeri / State Boundary



Rajah 2.11 : Peratus Pematuhan Kelas II (Wilayah Utara)
Figure 2.11 : Percentage of Compliance to Class II (Northern Region)

CRWQM 2025 (WILAYAH TENGAH/CENTRAL REGION)



PETUNJUK / LEGEND

KELAS IKA/ WQI CLASS

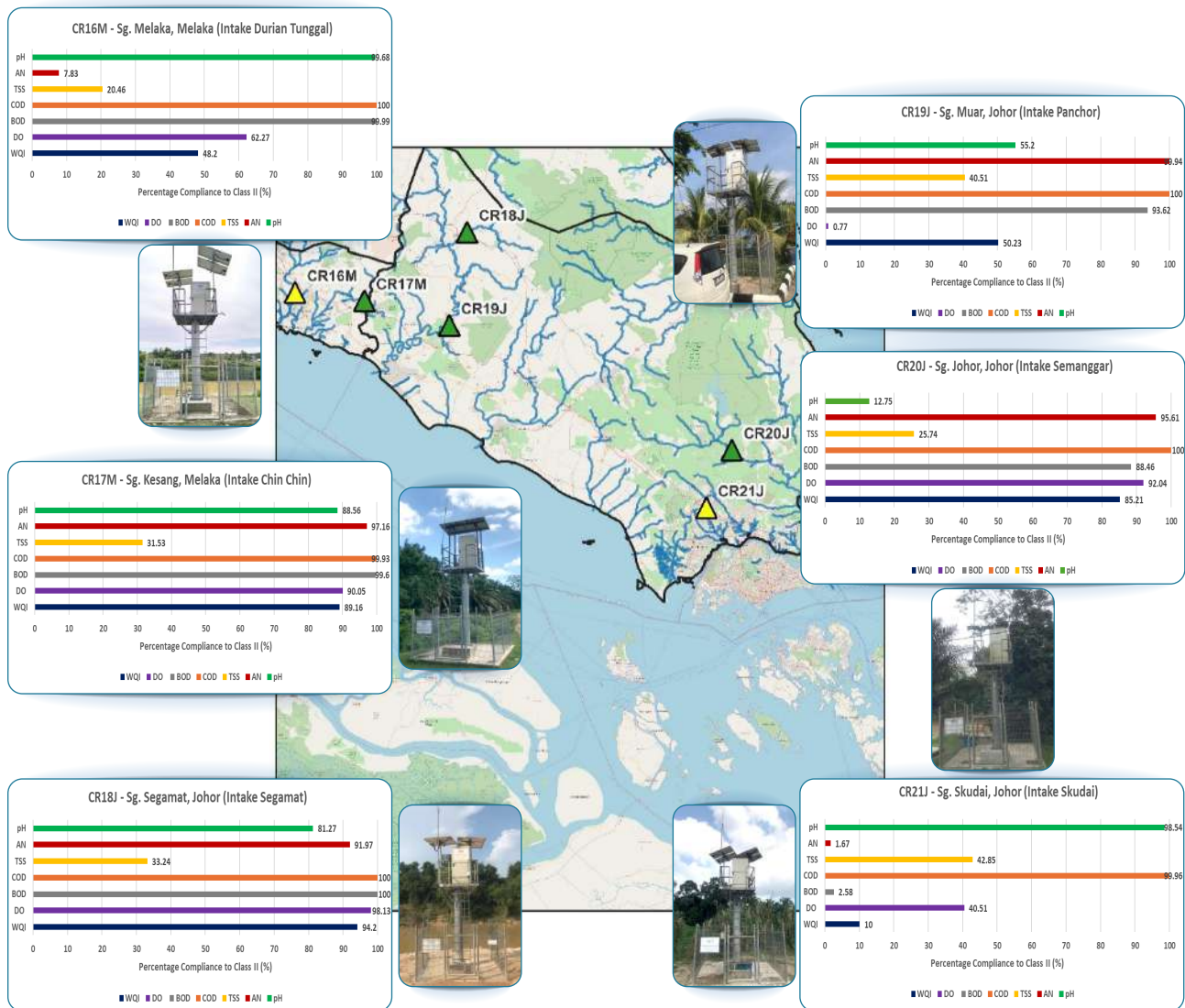
- ▲ Kelas I / Class I
- ▲ Kelas II / Class II
- ▲ Kelas III / Class III
- ▲ Kelas IV / Class IV
- ▲ Kelas V / Class V

Sempadan Negeri / State Boundary

0 50 100 km

Rajah 2.12 : Peratus Pematuhan Kelas II (Wilayah Tengah)
Figure 2.12 : Percentage of Compliance to Class II (Central Region)

CRWQM 2025 (WILAYAH SELATAN/SOUTHERN REGION)



PETUNJUK / LEGEND

KELAS IKA/ WQI CLASS

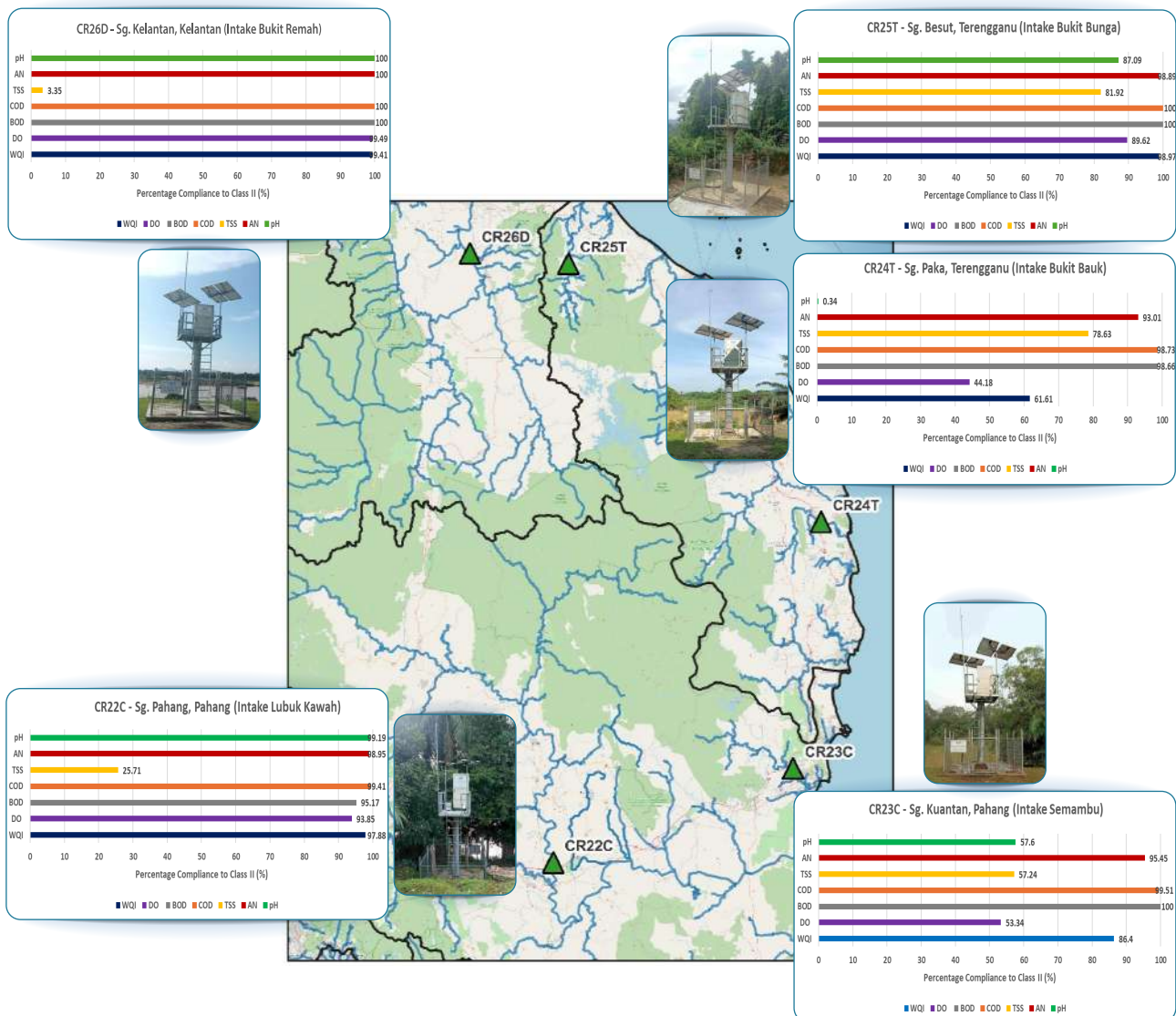
- ▲ Kelas I / Class I ▲ Kelas II / Class II ▲ Kelas III / Class III ▲ Kelas IV / Class IV ▲ Kelas V / Class V

□ Sempadan Negeri / State Boundary

0 50 100 km

Rajah 2.13 : Peratus Pematuhan Kelas II (Wilayah Selatan)
 Figure 2.13 : Percentage of Compliance to Class II (Southern Region)

CRWQM 2025 (WILAYAH TIMUR/EASTERN REGION)



PETUNJUK / LEGEND

KELAS IKA/ WQI CLASS

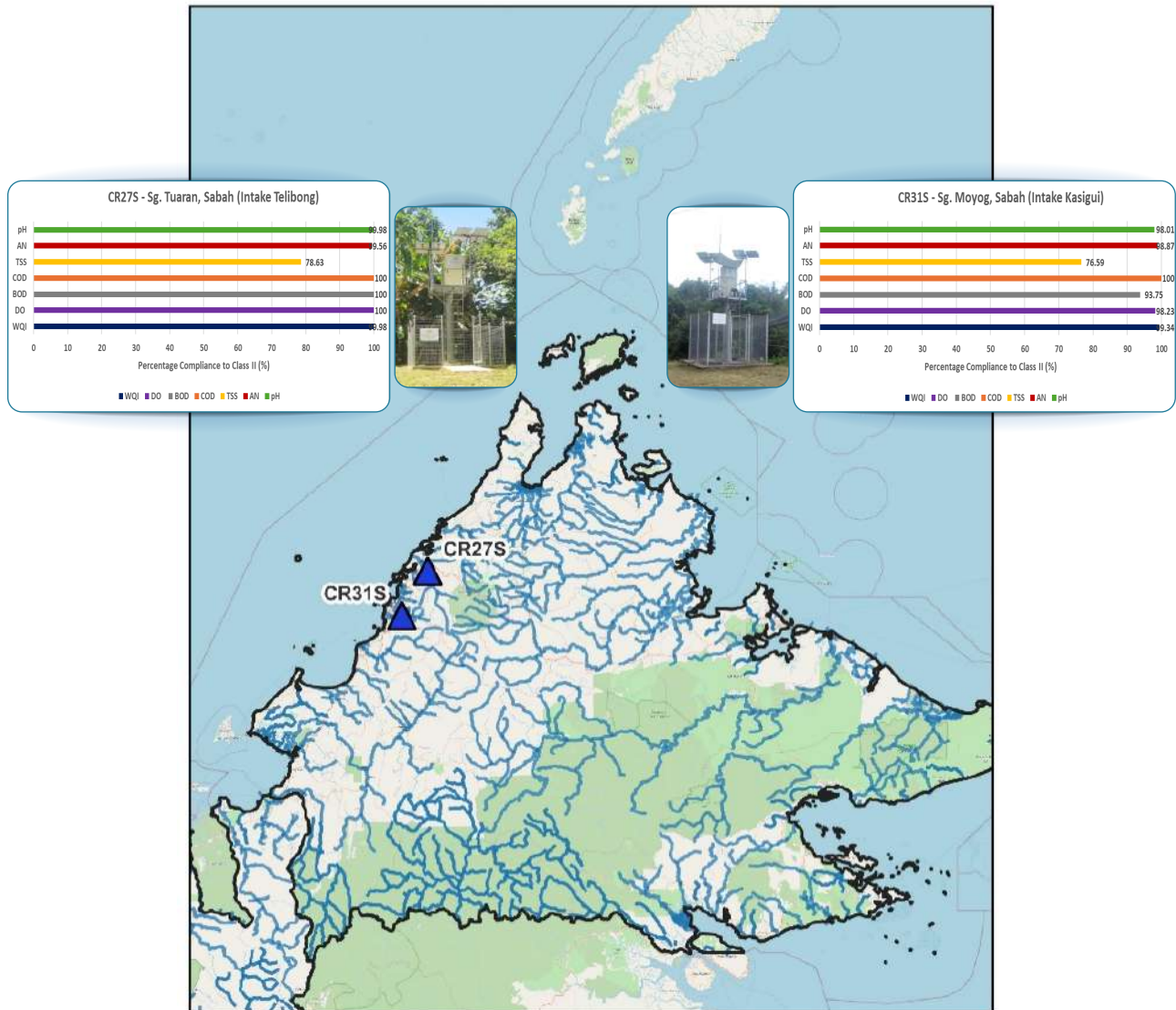
- ▲ Kelas I / Class I
- ▲ Kelas II / Class II
- ▲ Kelas III / Class III
- ▲ Kelas IV / Class IV
- ▲ Kelas V / Class V

Sempadan Negeri / State Boundary

0 50 100 km

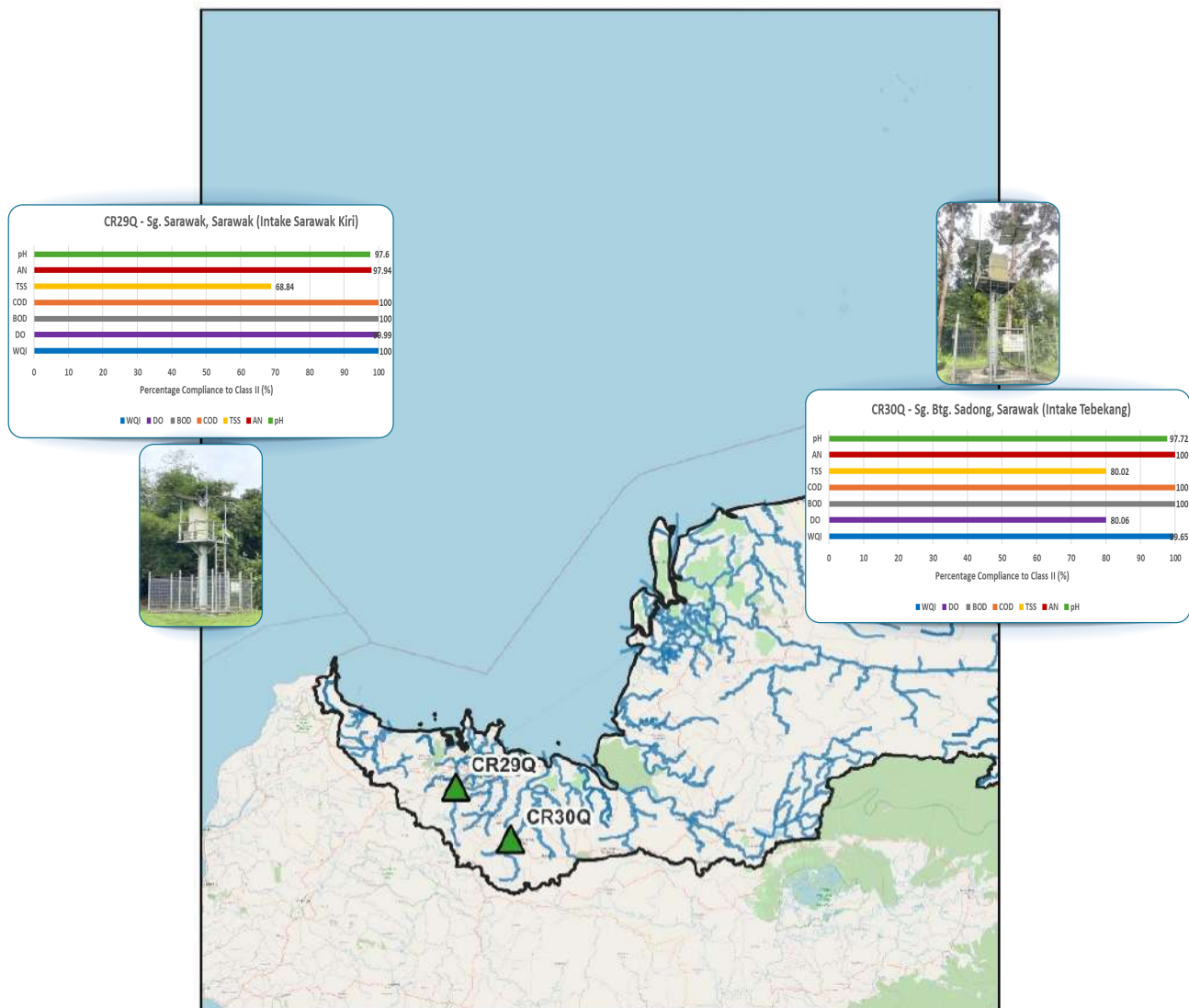
Rajah 2.14 : Peratus Pematuhan Kelas II (Wilayah Timur)
Figure 2.14 : Percentage of Compliance to Class II (Eastern Region)

CRWQM 2025 (WILAYAH SABAH/SABAH REGION)



Rajah 2.15 : Peratus Pematuhan Kelas II (Wilayah Sabah)
 Figure 2.15 : Percentage of Compliance to Class II (Sabah Region)

CRWQM 2025 (WILAYAH SARAWAK/SARAWAK REGION)



PETUNJUK / LEGEND

KELAS IKA/ WQI CLASS

- ▲ Kelas I / Class I
- ▲ Kelas II / Class II
- ▲ Kelas III / Class III
- ▲ Kelas IV / Class IV
- ▲ Kelas V / Class V

Sempadan Negeri / State Boundary

0 50 100 km

Rajah 2.16 : Peratus Pematuhan Kelas II (Wilayah Sarawak)
Figure 2.16 : Percentage of Compliance to Class II (Sarawak Region)





3

BAB/
CHAPTER

KUALITI AIR **TANAH** Groundwater Quality

119

**STESEN DI
SELURUH
NEGARA**
 Stations (Wells)
 Nationwide

12

**JENIS GUNA
TANAH**
 Land Use
 Category

447

**BILANGAN SAMPEL
AIR TANAH
DIANALISA**
 Number of
 Groundwater
 Samples Analysed

BEKAS LOMBONG USED MINES

**0**

SANGAT BAIK/
Excellent

3

BAIK/
Good

0

SEDERHANA /
Moderate

KAWASAN PERTANIAN AGRICULTURAL AREA

**2**

SANGAT BAIK/
Excellent

9

BAIK/
Good

3

SEDERHANA /
Moderate

AKUAKULTUR AQUACULTURE

**0**

SANGAT BAIK/
Excellent

3

BAIK/
Good

4

SEDERHANA /
Moderate

BEKAS TAPAK PELUPUSAN SAMPAH USED SOLID WASTE LANDFILL

**1**

SANGAT BAIK/
Excellent

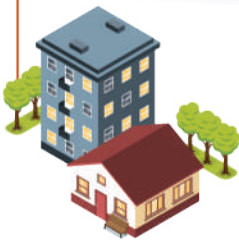
15

BAIK/
Good

8

SEDERHANA /
Moderate

BANDAR & PINGGIR BANDAR URBAN & SUBURBAN AREA



1 SANGAT BAIK/
Excellent

10 BAIK/
Good

2 SEDERHANA /
Moderate

PADANG GOLF GOLF COURSES



0 SANGAT BAIK/
Excellent

5 BAIK/
Good

1 SEDERHANA /
Moderate

TAPAK PERINDUSTRIAN INDUSTRIAL SITES



1 SANGAT BAIK/
Excellent

11 BAIK/
Good

9 SEDERHANA /
Moderate

BEKALAN AIR WATER SUPPLY



0 SANGAT BAIK/
Excellent

4 BAIK/
Good

0 SEDERHANA /
Moderate

LUAR BANDAR RURAL

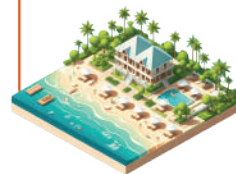


1 SANGAT BAIK/
Excellent

2 BAIK/
Good

2 SEDERHANA /
Moderate

KAWASAN PERANGINAN RESORTS



0 SANGAT BAIK/
Excellent

2 BAIK/
Good

0 SEDERHANA /
Moderate

BEKAS TAPAK PELUPUSAN BANGKAI HAIWAN USED ANIMAL BURIAL SITES



1 SANGAT BAIK/
Excellent

8 BAIK/
Good

4 SEDERHANA /
Moderate

PENGAWASAN KUALITI AIR TANAH

Groundwater Quality Monitoring

Program Pengawasan Kualiti Air Tanah Kebangsaan telah dimulakan semenjak tahun 1997. Tapak stesen pengawasan yang telah dipilih adalah mewakili jenis guna tanah spesifik di mana terdapat 119 buah stesen pengawasan kualiti air tanah (telaga) di seluruh negara.

Pada tahun 2025, sebanyak 112 stesen sahaja terlibat dalam pensampelan kualiti air bawah tanah. Ini adalah kerana terdapat enam (6) stesen pengawasan kualiti air tanah yang tidak mempunyai luahan air akibat faktor pembangunan di kawasan berhampiran, keadaan stesen yang memerlukan penyelenggaraan dalaman dan ketiadaan akses masuk ke stesen. **Jadual 3.1** menunjukkan taburan stesen pengawasan kualiti air tanah di Malaysia mengikut jenis kategori guna tanah.

Pada tahun 2025, sebanyak 447 sampel telah dianalisa bagi mendapatkan bacaan bahan kimia organik meruap (VOCs), racun perosak, logam berat, anion, bakteria (koliform), sebatian berfenol, jumlah keliatan, jumlah pepejal terlarut, pH, suhu, konduktiviti dan oksigen terlarut (DO).

Indeks Kualiti Air Tanah (IKAT) digunakan sebagai kaedah untuk menentukan kategori dan status kualiti airtanah. IKAT dibangunkan berdasarkan tujuh (7) parameter utama iaitu pH, Besi, Jumlah Pepejal Terlarut, Nitrat, E. Coli, Fenol dan Sulfat. Skala IKAT yang bermula daripada 0 hingga 100 digunakan bagi menentukan kategori kualiti air tanah daripada sangat baik hingga sangat tercemar (**Jadual 3.2**).

Groundwater Water Quality Monitoring was established in 1997. The monitoring station sites that have been selected are representative of specific land use, where there are 119 groundwater quality monitoring stations (wells) across the country.

In 2025, a total of only 112 stations were involved in groundwater quality sampling. This is because there are six (6) ground water quality monitoring stations that have no water discharge due to nearby development factors, the condition of the station that requires internal maintenance and no access to the station. **Table 3.1** shows the distribution of groundwater quality monitoring stations in Malaysia based on land use.

In 2025, 447 samples were analysed for volatile organic compounds (VOCs), pesticides, heavy metals, anions, bacteria (coliform), phenolic compounds, total hardness, total dissolved solids (TDS), pH, temperature, conductivity, and dissolved oxygen (DO).

The Groundwater Quality Index (GWQI) is used as a benchmark to determine the groundwater quality status and its category. GWQI was developed based on seven (7) parameters which are pH, Iron, Total Dissolved Solids, Nitrate, E. coli, Phenol, and Sulphate. The GWQI with a scale ranging from 0 to 100 will identify the quality of the groundwater from excellent to very poor (**Table 3.2**).



Jadual 3.1: Taburan Stesen Pengawasan Kualiti Air Tanah di Seluruh Negeri di Malaysia
 mengikut Jenis Kategori Guna Tanah, 2025

Table 3.1: Distribution of Groundwater Quality Monitoring Stations Throughout the States in Malaysia
 Based on Land Use, 2025

KATEGORI / CATEGORY	BILANGAN STESEN / NUMBER OF STATIONS	NEGERI / STATE	BILANGAN TELAGA / NUMBER OF WELLS
Kawasan Pertanian / Agricultural Area	15	Sabah	2
		Terengganu	5
		Pahang	1
		Kedah	3
		Perlis	1
		Kelantan	2
		Selangor	1
Bandar & Pinggir Bandar / Urban & Suburban Area	13	Sabah	1
		Terengganu	2
		Pahang	1
		Kedah	1
		Perlis	2
		Kelantan	3
		Selangor	2
		W.P. Putrajaya	1
Tapak Perindustrian / Industrial Sites	22	W.P. Labuan	1
		Terengganu	5
		Johor	2
		Kedah	1
		Kelantan	2
		Melaka	1
		Selangor	3
		P. Pinang	3
		N. Sembilan	1
		Perak	1
		Pahang	1
		Perlis	1
Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfill	26	Sabah	7
		Sarawak	2
		Terengganu	2
		Johor	2
		Kelantan	3
		Perak	1
		W.P. Kuala Lumpur	5
		N. Sembilan	3
		Melaka	1

Jadual 3.1: Taburan Stesen Pengawasan Kualiti Air Tanah di Seluruh Negeri di Malaysia
mengikut Jenis Kategori Guna Tanah, 2025

Table 3.1: Distribution of Groundwater Quality Monitoring Stations Throughout the States in Malaysia
Based on Land Use, 2025

KATEGORI / CATEGORY	BILANGAN STESEN / NUMBER OF STATIONS	NEGERI / STATE	BILANGAN TELAGA / NUMBER OF WELLS
Padang Golf / Golf Courses	7	Sabah	2
		Kelantan	4
		W.P. Kuala Lumpur	1
Luar Bandar / Rural	5	Terengganu	1
		Kelantan	2
		Melaka	1
		Selangor	1
Bekas Lombong / Used Mine	3	Sarawak	3
Bekalan Air / Water Supply	5	Sabah	1
		Sarawak	4
Bekas Tapak Pelupusan Bangkai Haiwan / Used Animal Burial Sites	13	Sarawak	2
		Johor	3
		Perak	3
		Selangor	2
		P. Pinang	3
Akuakultur / Aquaculture	7	Pahang	6
		Terengganu	1
Tapak Pelupusan Radioaktif / Radioactive Landfills	1	Perak	1
Kawasan Peranginan / Resorts	2	Sabah	1
		Kedah	1
JUMLAH / TOTAL			119

Jadual 3.2: Klasifikasi Indeks Kualiti Air Tanah

Table 3.2: Groundwater Quality Index Classification

KATEGORI/ CATEGORY	IKAT/ GWQI	POTENSI KEGUNAAN / POTENTIAL USE
Sangat Tercemar / Very Poor	0-15	Kajian air terperinci sebelum digunakan/ Detailed investigation before use
Tercemar / Poor	16-39	Pengairan atau pertanian / Irrigation or agriculture
Sederhana / Moderate	40-69	Penggunaan industri / Industrial use
Baik / Good	70-89	Berpontensi sebagai air minuman / Potential use as drinking water
Sangat Baik / Excellent	≥ 90	Air berkualiti tinggi untuk semua kegunaan/ High quality water for all purpose

STATUS INDEKS KUALITI AIR TANAH BAGI KAWASAN PERTANIAN

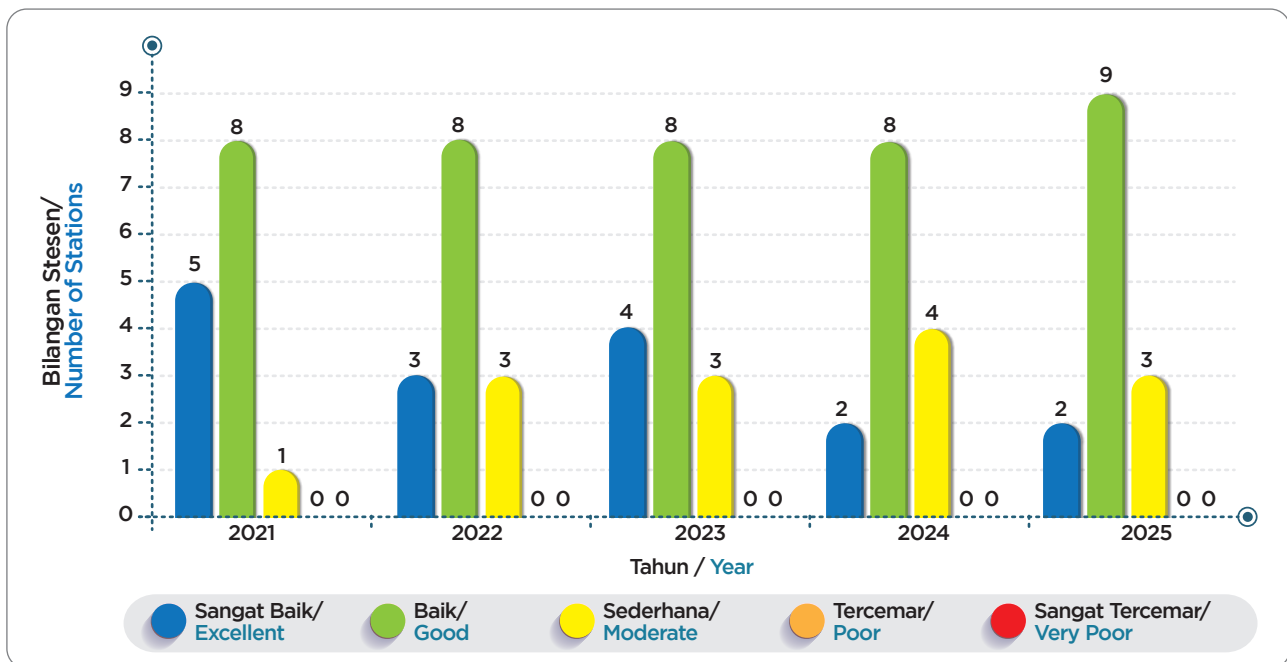
Status of Groundwater Quality Index for Agriculture

Trend IKAT mulai tahun 2021 hingga 2025 bagi kawasan pertanian adalah seperti yang ditunjukkan dalam **Rajah 3.1**. Berdasarkan **Rajah 3.1**, bilangan stesen dalam kategori sangat baik, baik dan sederhana pada tahun 2025 adalah kekal sama seperti tahun sebelumnya. Tiada stesen tercemar atau sangat tercemar pada tahun 2025.

Pada tahun 2025, sebanyak 15 stesen kawasan pertanian telah dipantau. Hasil program pengawasan yang telah dijalankan, dua (2) stesen (14%) dikategorikan sebagai sangat baik, sembilan (9) stesen (64%) dikategorikan sebagai baik dan tiga (3) stesen (22%) dikategorikan sebagai sederhana. Satu (1) stesen tiada luahan air (**Jadual 3.3**).

The GWQI trend for agriculture from the year 2021 until 2025 is shown in **Figure 3.1**. Based on **Figure 3.1**, the stations ranked as excellent, good and moderate maintained as the previous year. There were no stations ranked as poor and very poor in the year 2025.

In 2025, a total of 15 stations under agriculture area were monitored. The monitoring results indicated that two (2) stations were categorised as excellent (14%), nine (9) stations were good (64%), and three (3) stations were moderate (22%). There was no groundwater discharge from one (1) station (**Table 3.3**).



Rajah 3.1: Trend Indeks Kualiti Air Tanah Kawasan Pertanian, 2021-2025
Figure 3.1: Trends of Groundwater Quality Index for Agriculture, 2021-2025

Jadual 3.3: Status Indeks Kualiti Air Tanah bagi Kawasan Pertanian
Table 3.3: Status of Groundwater Quality Index for Agriculture

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN / STATION NUMBER	NILAI IKAT/ GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perlis	Pertanian / Agriculture	Rimba Mas, Padang Besar	MW(7)-R610006- 1-15.72	86	90	90	81	91	Sangat Baik/ Excellent
Kedah	Pertanian / Agriculture	Padang Mat Sirat, Langkawi	MW(7)-K69911- 1-5.80	97	91	91	82	89	Baik/Good
		Padang Mat Sirat, Langkawi	MW(7)-K69911- 2-12.09	95	78	85	79	86	Baik/Good
		Sek.Keb. Kepala Batas	MW(7)-R610014- 2-9.34	91	81	77	70	79	Baik/Good
Selangor	Pertanian / Agriculture	Masjid Jameul Huda, Parit 7, Sekinchan	MW(7)-B310105- 1-13.70	63	65	64	60	65	Sederhana/ Moderate
Pahang	Pertanian / Agriculture	Sek. Keb. Lepar	MW(7)-C310302- 1-6.64	90	91	91	90	90	Sangat Baik/ Excellent
Kelantan	Pertanian / Agriculture	Kampong Jembal Kota Bharu	MW(7)-D610214- 7-7.58	79	79	85	86	79	Baik/Good
		Sek. Keb. Beris Lalang Bachok	MW(7)-D510202- 1-4.05	-	-	74	-	81	Baik/Good
Terengganu	Pertanian / Agriculture	Kg.Merang, Setiu	MW(7)-T510208- 1-8.56	78	82	80	81	81	Baik/Good
		Sek. Keb. Alor Peroi Kg. Gajah Mati	MW(7)-T510203- 3-45.82	77	61	66	66	63	Sederhana/ Moderate
		Sek. Keb. Alor Peroi Kg. Gajah Mati	MW(7)-T510203- 4-22.13	80	63	65	68	62	Sederhana/ Moderate
		Sek. Keb. Alor Peroi Kg. Gajah Mati	MW(7)-T510203- 5-6.16	97	80	82	86	80	Baik/Good
		Sek Keb. Telaga Hulu Terengganu	MW(7)-T510216- 1-9.06	72	79	78	80	87	Baik/Good
Sabah	Pertanian / Agriculture	Limbawang Agriculture Station, Beaufort	MW(7)-H511511- 1-7.50	81	70	76	68	75	Baik/Good
		Yongs Farm, Tawau	MW(7)-H411712- 1-16.2	79	83	90	90	-	Tiada Data

Nota / Note:

- Tiada Data / No Data
- Tiada Air / No Water
- Stesen Rosak / Destroyed Station



STATUS INDEKS KUALITI AIR TANAH BAGI BANDAR DAN PINGGIR BANDAR

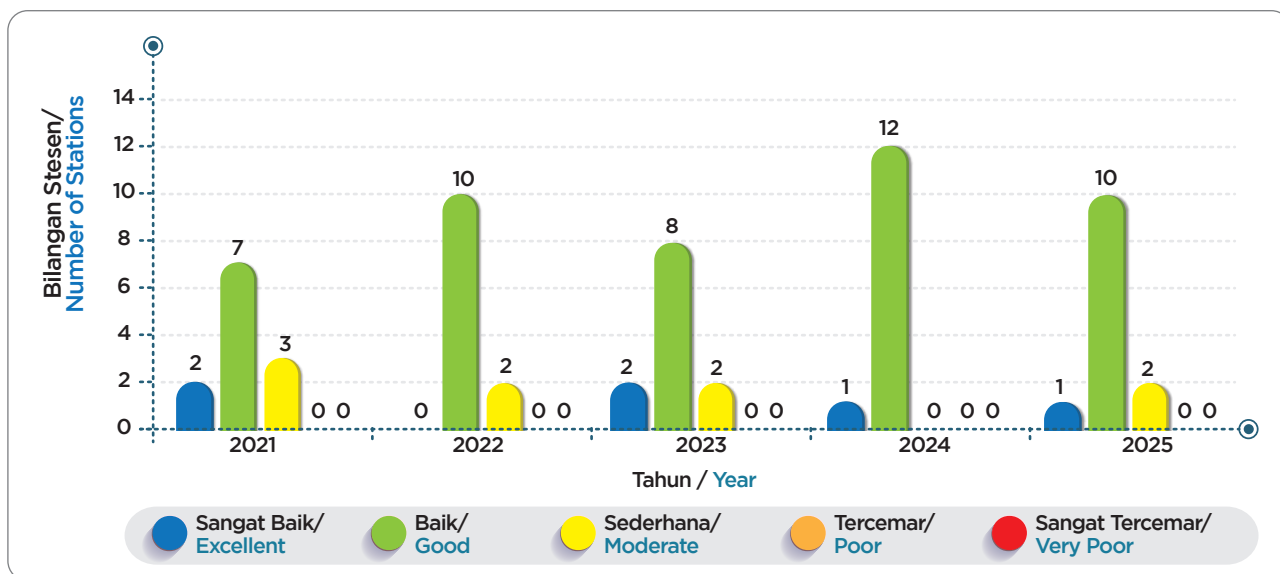
Status of Groundwater Quality Index for Urban and Suburban

Trend IKAT pada tahun 2021 hingga 2025 bagi kawasan bandar dan pinggir bandar adalah seperti yang ditunjukkan dalam **Rajah 3.2**. Berdasarkan **Rajah 3.2**, bilangan stesen sangat baik adalah sama seperti tahun sebelumnya, manakala bilangan stesen baik adalah menurun jika dibandingkan dengan tahun sebelumnya. Tiada stesen dalam kategori tercemar atau sangat tercemar pada tahun 2025.

Pada tahun 2025, sebanyak 13 stesen guna tanah bandar dan pinggir bandar telah dipantau. Hasil program pengawasan yang telah dijalankan menunjukkan satu (1) stesen (8%) dikategorikan sebagai sangat baik, 10 stesen (77%) dikategorikan sebagai baik dan dua (2) stesen (15%) dikategorikan sebagai sederhana (Jadual 3.4).

The GWQI trend for urban and suburban from year 2021 until 2025 is shown in **Figure 3.2**. Based on **Figure 3.2**, the number of stations ranked as excellent maintained as the previous year, while the number of stations ranked as good had decreased compared to the previous year. There were no stations ranked as poor or very poor in 2025.

In 2025, a total of 13 stations under urban and suburban were monitored. The monitoring results indicated that one (1) station (8%) was categorised as excellent and 10 stations (77%) were ranked as good and two (2) stations (15%) categorised as moderate (**Table 3.4**).



Rajah 3.2: Trend Indeks Kualiti Air Tanah bagi Bandar dan Pinggir Bandar, 2021-2025
Figure 3.2: Trends of Groundwater Quality Index for Urban and Suburban, 2021-2025

Jadual 3.4: Status Indeks Kualiti Air Tanah bagi Bandar dan Pinggir Bandar
Table 3.4: Status of Groundwater Quality Index for Urban and Suburban

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perlis	Bandar & Pinggir Bandar / Urban & Suburban	Arau , Perlis	MW(7)-R610010-1-5.41	68	68	83	70	73	Baik/ Good
		Arau , Perlis	MW(7)-R610010-2-19.80	88	87	89	92	91	Sangat Baik/ Excellent
Kedah	Bandar & Pinggir Bandar / Urban & Suburban	Sek. Keb. Darul Uloom Kepala Batas	MW(7)-K610014-1-6.22	82	77	67	70	63	Sederhana/ Moderate
Selangor	Bandar & Pinggir Bandar / Urban & Suburban	Saujana Golf Resort, Subang	MW(7)-B310115-4-5.45	80	78	82	87	88	Baik/ Good
		Saujana Golf Resort, Subang	MW(7)-B310115-5-12.67	89	83	85	89	89	Baik/ Good
W.P. Putrajaya	Bandar & Pinggir Bandar / Urban & Suburban	Taman Wetland	MW(7)-W210103-1-10.0	-	-	91	77	79	Baik/ Good
Pahang	Bandar & Pinggir Bandar / Urban & Suburban	Nenasi	MW(7)-C310314-1-45.97	85	88	87	85	87	Baik/ Good
Kelantan	Bandar & Pinggir Bandar / Urban & Suburban	Sek. Men. Keb. Rantau Panjang	MW(7)-D610116-2-5.50	80	85	86	77	77	Baik/ Good
		Sek. Men. Keb. Rantau Panjang	MW(7)-D610116-1-20.23	79	80	77	77	80	Baik/ Good
		Sek. Men. Keb. Cherang Ruku, Pasir Puteh	MW(7)-D510202-1-7.96	88	68	76	80	77	Baik/ Good
Terengganu	Bandar & Pinggir Bandar / Urban & Suburban	Kg. Raja, Besut	MW(7)-T510203-1-7.25	96	76	82	87	81	Baik/ Good
		Kg. Raja, Besut	MW(7)-T510203-2-31.79	64	64	67	70	64	Sederhana/ Moderate
Sabah	Bandar & Pinggir Bandar / Urban & Suburban	Sek. Keb. Inanam	MW(7)-H511601-8-7.50	92	84	90	74	80	Baik/ Good

Nota / Note:

- Tiada Data / No Data
- Tiada Air / No Water
- Stesen Rosak / Destroyed Station

STATUS INDEKS KUALITI AIR TANAH BAGI TAPAK PERINDUSTRIAN

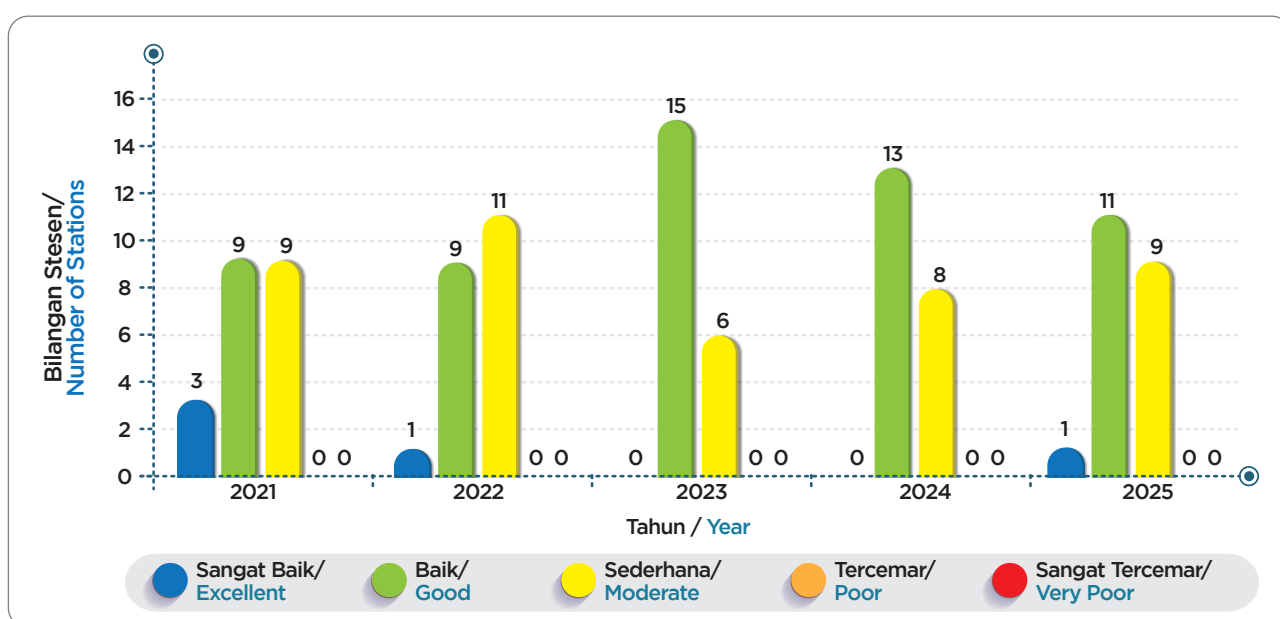
Status of Groundwater Quality Index for Industrial Sites

Trend IKAT mulai tahun 2021 hingga 2025 bagi tapak perindustrian adalah seperti yang ditunjukkan dalam **Rajah 3.3** . Berdasarkan **Rajah 3.3** , bilangan stesen kategori sangat baik bertambah, stesen kategori baik telah menurun manakala stesen kategori sederhana meningkat berbanding tahun sebelumnya. Tiada stesen berada dalam kategori tercemar atau sangat tercemar pada tahun 2025.

The GWQI trend for industrial sites from year 2021 until 2025 is shown in **Figure 3.3**. Based on **Figure 3.3**, the number of stations ranked as excellent had increased, stations as good category had decreased while stations categorised as moderate increased compared to the previous year. No station was categorised as poor or very poor in the year 2025.

Pada tahun 2025, sebanyak 22 stesen tapak perindustrian telah dipantau. Hasil program pengawasan yang telah dijalankan menunjukkan satu (1) stesen (5%) dikategorikan sebagai sangat baik, 11 stesen (52%) dikategorikan sebagai baik dan sembilan (9) stesen (43%) dikategorikan sebagai sederhana. Satu (1) stesen yang telah ditutup pada tahun sebelumnya telah digantikan dengan stesen baharu yang mewakili lokasi serta kategori guna tanah yang sama. Walau bagaimanapun, tiada data pemantauan bagi tahun 2025 untuk stesen baharu tersebut (**Jadual 3.5**).

In 2025, a total of 22 stations for industrial sites were monitored. The monitoring result indicates that one (1) stations (5%) were categorised as excellent, 11 stations (52%) were categorised as good and nine (9) stations (43%) were categorised as moderate. One (1) monitoring station that was decommissioned in the previous year was replaced by a new monitoring station representing the same location and land use category to ensure continuity of the monitoring programme. However, monitoring data for the new station are not available for 2025 (**Table 3.5**).



Rajah 3.3: Trend Indeks Kualiti Air Tanah bagi Tapak Perindustrian, 2021 - 2025
 Figure 3.3: Trends of Groundwater Quality Index for Industrial Sites, 2021 -2025

Jadual 3.5: Status Indeks Kualiti Air Tanah bagi Tapak Perindustrian
 Table 3.5: Status of Groundwater Quality Index for Industrial Sites

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN / STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perlis	Tapak Perindustrian / Industrial Sites	Felda Chuping	MW(7)-R610006-2-7.22	76	84	84	-	-	Tiada Data / No Data
Kedah	Tapak Perindustrian / Industrial Sites	Kulim Hi-Tech	MW(7)-K510011-1-8.45	82	76	73	64	67	Sederhana / Moderate

Jadual 3.5: Status Indeks Kualiti Air Tanah bagi Tapak Perindustrian
Table 3.5: Status of Groundwater Quality Index for Industrial Sites

NEGERI / STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
P. Pinang	Tapak Perindustrian / Industrial Sites	Mak Mandin (MAGRI)	MW(7)-P510010- 1-4.50	78	65	70	70	71	Baik/ Good
		Mak Mandin (KASTAM)	MW(7)-P510010- 2-6.50	84	74	75	77	77	Baik/ Good
		Bayan Lepas	MW(7)-P510010- 3-4.34	95	77	78	76	81	Baik/ Good
Selangor	Tapak Perindustrian / Industrial Sites	Sek Keb. Seksyen 20, Shah Alam	MW(7)-B310115- 1-8.20	62	75	65	76	76	Baik/ Good
		CIASST, Seksyen 19, Shah Alam	MW(7)-B310115- 2-20.21	66	78	70	72	74	Baik/ Good
		CIASST, Seksyen 19, Shah Alam	MW(7)-B310115- 3-5.97	53	68	67	71	65	Sederhana/ Moderate
N. Sembilan	Tapak Perindustrian / Industrial Sites	Senawang Edible Oil	MW(7)-N210108- 1-6.44	72	66	71	71	65	Sederhana/ Moderate
Melaka	Tapak Perindustrian / Industrial Sites	Petronas Oil Refinery, Melaka	MW(7)-M210209- 1-8.10	82	64	64	65	64	Sederhana/ Moderate
Johor	Tapak Perindustrian / Industrial Sites	Tg. Puteri, Pasir Gudang	MW(7)-J110312- 2-7.34	90	91	80	84	80	Baik/ Good
		Tg. Puteri, Pasir Gudang	MW(7)-J110312- 3-7.49	48	64	63	67	59	Sederhana/ Moderate
Pahang	Tapak Perindustrian / Industrial Sites	Lynas, Gebeng	MW(7)-C310302- 1-6.50	77	68	65	67	71	Baik/ Good
Kelantan	Tapak Perindustrian / Industrial Sites	Eastern Garment Manufacturing, Pengkalan Chepa	MW(7)-D610214- 4-51.38	57	67	84	69	67	Sederhana/ Moderate
		Eastern Garment Manufacturing, Pengkalan Chepa	MW(7)-D610214- 3-4.24	68	81	82	86	81	Baik/ Good
Terengganu	Tapak Perindustrian / Industrial Sites	TCOT Kerteh, Kemaman	MW(7)-T410306- 1-5.68	80	84	86	82	87	Baik/ Good
		TCOT Kerteh, Kemaman	MW(7)-T410306- 2-24.89	65	68	70	65	65	Sederhana/ Moderate
		KSB Telok Kalong, Kemaman	MW(7)-T410310- 1-5.57	64	69	70	68	69	Sederhana/ Moderate
		KSB Telok Kalong, Kemaman	MW(7)-T410310- 2-18.76	60	66	67	63	67	Sederhana/ Moderate
		Sek. Keb. Bari Pantai, Setiu	MW(7)-T510208- 1-7.86	78	78	84	86	80	Baik/ Good
Perak	Tapak Perindustrian / Industrial Sites	Pusat Kecemerlangan, Gopeng, Perak	MW(7)-A410109- 2-11.95	-	-	-	87	92	Sangat Baik/ Excellent
W. P. Labuan	Tapak Perindustrian / Industrial Sites	Asian Supply Base W. P. Labuan	MW(7)-L511510- 1-6.80	91	69	80	84	79	Baik/ Good

Nota / Note:

- Tiada Data / No Data
- Tiada Air / No Water
- Stesen Rosak / Destroyed Station

STATUS INDEKS KUALITI AIR TANAH BAGI BEKAS TAPAK PELUPUSAN SAMPAH

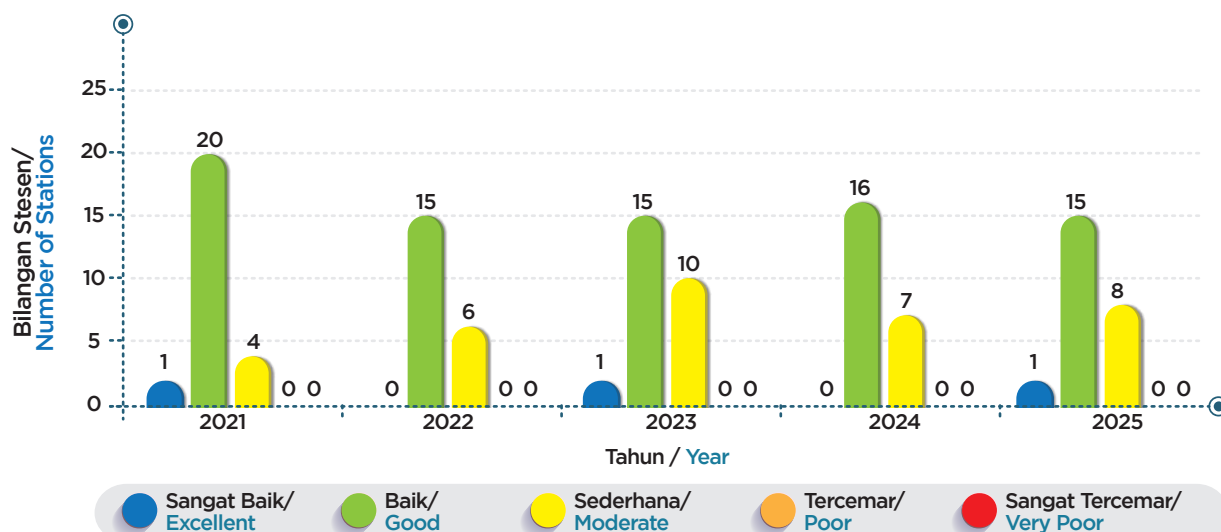
Status of Groundwater Quality Index for Used Solid Waste Landfills

Trend IKAT mulai tahun 2021 hingga 2025 bagi bekas tapak pelupusan sampah adalah seperti yang ditunjukkan dalam **Rajah 3.4**. Berdasarkan **Rajah 3.4**, bilangan stesen sangat baik dan sederhana telah meningkat manakala stesen kategori baik telah menurun berbanding tahun sebelumnya. Tiada stesen tercemar atau sangat tercemar pada tahun 2025.

Pada tahun 2025, sebanyak 26 stesen bekas tapak pelupusan sampah telah dipantau. Hasil program pengawasan yang telah dijalankan menunjukkan satu (1) stesen (4%) dikategorikan sebagai sangat baik, 15 stesen (63%) dikategorikan sebagai baik dan lapan (8) stesen (33%) dikategorikan sebagai sederhana. Dua (2) stesen tidak dapat dijalankan persampelan kerana tiada akses dan dalam proses penutupan (**Jadual 3.6**).

The GWQI trend from 2021 to 2025 for used solid waste landfills is shown in **Figure 3.4**. Based on **Figure 3.4**, the number of stations ranked as excellent and moderate increased, while the number of stations ranked as good decreased from the previous year. There were no stations ranked poor or very poor in 2025.

In 2025, a total of 26 stations for used solid waste landfills were monitored. The results of the monitoring programme conducted showed that one (1) stations (4%) were categorised as excellent, 15 stations (63%) were categorised as good and eight (8) stations (33%) were categorised as moderate. Two (2) stations could not be sampled due to lack of access and ongoing closure process (**Table 3.6**).



Rajah 3.4: Trend Indeks Kualiti Air Tanah bagi Bekas Tapak Pelupusan Sampah, 2021 -2025
 Figure 3.4: Trends of Groundwater Quality Index for Used Solid Waste Landfills, 2021 -2025

Jadual 3.6: Status Indeks Kualiti Air Tanah bagi Bekas Tapak Pelupusan Sampah
Table 3.6: Status of Groundwater Quality Index for Used Solid Waste Landfills

NEGERI / STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perak	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Pusing, Batu Gajah	MW(7)-A410109-1-6.05	79	67	68	62	59	Sederhana/ Moderate
W. P. Kuala Lumpur	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Jln Sg. Besi	MW(7)-W310115-1-5.50	64	-	61	-	83	Baik/ Good
		Jln Sg. Besi	MW(7)-W310115-2-5.54	73	-	69	83	84	Baik/ Good
		Jln Sg. Besi	MW(7)-W310115-3-5.57	82	-	70	83	92	Sangat Baik/ Excellent
		Taman Beringin, Kepong	MW(7)-W310115-4-7.26	73	-	89	88	80	Baik/ Good
		Taman Beringin, Kepong	MW(7)-W310115-5-6.10	77	-	69	66	77	Baik/ Good
N. Sembilan	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Kualiti Alam	MW(7)-N210108-2-8.00	83	81	91	77	85	Baik/ Good
		Kualiti Alam	MW(7)-N210108-3-7.55	82	70	75	64	64	Sederhana/ Moderate
		TPS Tanah Merah (CYPARK), Port Dickson	MW(7)-N210108-2-10.03	71	66	73	73	63	Sederhana/ Moderate
Melaka	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Tapak Pelupusan Sampah, Sungai Udang	MW(7)-M210209-1-7.68	56	64	64	64	64	Sederhana/ Moderate
Johor	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Kg. Batu 4, Kota Tinggi	MW(7)J110304-1-6.94	61	73	76	76	76	Baik/ Good
		Tapak Pelupusan Sisa Pepejal, Ladang CEP, Simpang Renggam	MW(7)-J110302-1-7.02	64	72	69	71	62	Sederhana/ Moderate
Kelantan	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Panji Landfill, Panji Kota Bharu	MW(7)-D610214-5-13.43	73	86	85	83	82	Baik/ Good
		Panji Landfill, Panji Kota Bharu	MW(7)-D610214-6-5.34	73	74	83	86	81	Baik/ Good
		P.Mas Landfill, Kg. Pusu 40, P. Mas	MW(7)D510201-1-5.22	72	76	82	72	65	Sederhana/ Moderate
Terengganu	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Kg. Kubang Badak, K. Terengganu	MW(7)-T510309-1-5.45	75	74	85	-	-	Tiada Data
		Kg. Kubang Badak, K. Terengganu	MW(7)-T510309-2-22.89	76	73	77	-	-	Tiada Data

Jadual 3.6: Status Indeks Kualiti Air Tanah bagi Bekas Tapak Pelupusan Sampah
Table 3.6: Status of Groundwater Quality Index for Used Solid Waste Landfills

NEGERI / STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	IATC, Kg. Duvanson, Penampang	MW(7)-H511601- 1-8.80	82	77	64	64	76	Baik/ Good
		IATC, Kg. Duvanson, Penampang	MW(7)-H511601- 2-14.00	82	70	72	65	71	Baik/ Good
		IATC, Kg. Duvanson, Penampang	MW(7)-H511601- 3-8.00	85	75	71	80	69	Sederhana/ Moderate
		IATC, Kg. Duvanson, Penampang	MW(7)-H511601- 4-17.35	84	72	74	74	75	Baik/ Good
		IATC, Kg. Duvanson, Penampang	MW(7)-H511601- 5-19.00	80	69	69	68	72	Baik/ Good
		IATC, Kg. Duvanson, Penampang	MW(7)-H511601- 6-10.20	96	69	64	71	69	Sederhana/ Moderate
		IATC, Kg. Duvanson, Penampang	MW(7)-H511601- 7-10.30	97	84	82	80	82	Baik/ Good
Sarawak	Bekas Tapak Pelupusan Sampah / Used Solid Waste Landfills	Kemuyang, No. 1	MW(7)-Q211112- 1-11.10	84	61	63	72	72	Baik/ Good
		Kemuyang, No. 2	MW(7)-Q211112- 2-10.78	83	70	70	72	75	Baik/ Good

Nota / Note:

- Tiada Data / No Data
- Tiada Air / No Water
- Stesen Rosak / Destroyed Station

STATUS INDEKS KUALITI AIR TANAH BAGI PADANG GOLF

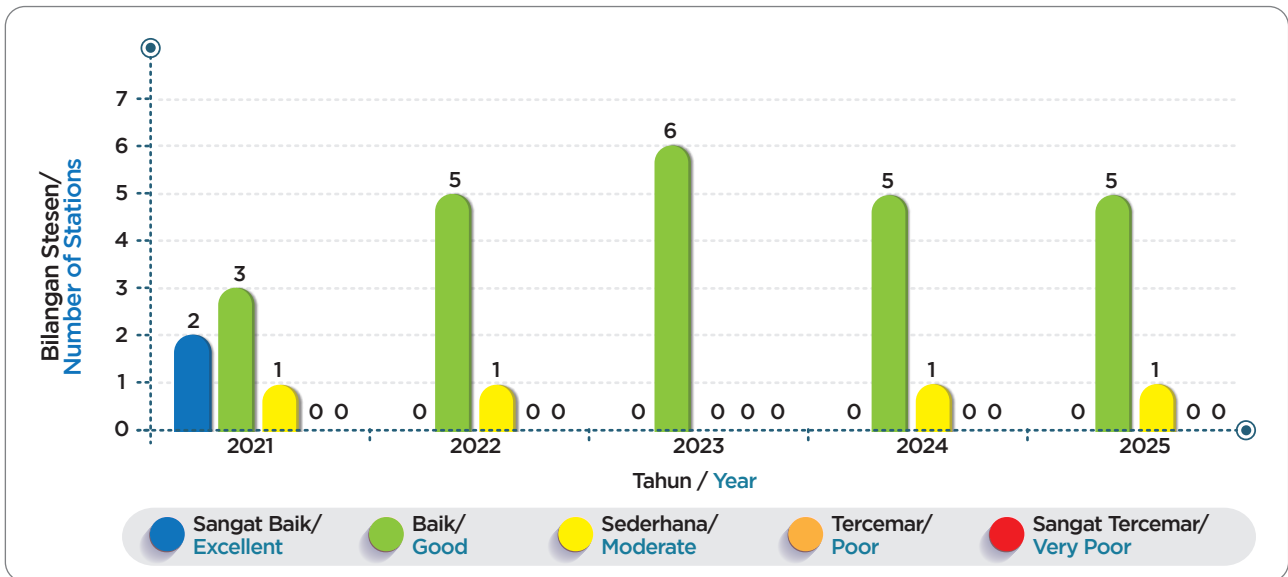
Status of Groundwater Quality Index for Golf Courses

Trend IKAT mulai tahun 2021 hingga 2025 bagi padang golf adalah seperti yang ditunjukkan dalam **Rajah 3.5**. Berdasarkan **Rajah 3.5**, bilangan stesen dalam kategori baik dan sederhana adalah sama seperti tahun sebelumnya. Tiada stesen dalam kategori sangat baik, tercemar dan sangat tercemar pada tahun 2025.

Pada tahun 2025, sebanyak tujuh (7) stesen telah dipantau. Hasil program pengawasan yang telah dijalankan menunjukkan lima (5) stesen (83%) dikategorikan sebagai baik dan satu (1) stesen (17%) dikategorikan sebagai sederhana. Satu (1) stesen tiada luahan air (**Jadual 3.7**).

The GWQI trend from 2021 to 2025 for golf courses is as shown in **Figure 3.5**. Based on **Figure 3.5**, the number of stations under the good and moderate category were the same as the previous year. No station was categorised as excellent, poor and very poor category in the year 2025.

In the year 2025, seven (7) stations were monitored. The monitoring results indicate that all five (5) stations (83%) were categorised as good, and one (1) station (17%) was categorised as moderate. There was no groundwater discharge from one (1) station (**Table 3.7**).



Rajah 3.5: Trend Indeks Kualiti Air Tanah bagi Padang Golf, 2021 -2025
Figure 3.5: Trends of Groundwater Quality Index for Golf Courses, 2021 -2025

Jadual 3.7: Status Indeks Kualiti Air Tanah bagi Padang Golf
Table 3.7: Status of Groundwater Quality Index for Golf Courses

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN / STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
W. P. Kuala Lumpur	Padang Golf / Golf Courses	Royal Selangor Golf Club	MW(7)-W310115-6-5.37	-	-	-	-	-	Tiada Data / No Data
Kelantan	Padang Golf / Golf Courses	Kelab Golf & Desa Pengkalan Chepa	MW(7)-D610214-2-6.90	79	86	86	79	74	Baik / Good
		Kelab Golf & Desa Pengkalan Chepa	MW(7)-D610214-1-6.37	62	82	86	76	77	Baik / Good
		Kelab Golf D'Raja Kubang Kerian	MW(7)-D610214-8-31.29	75	64	83	70	65	Sederhana / Moderate
		Kelab Golf D'Raja Kubang Kerian	MW(7)-D610214-9-9.05	90	76	83	82	82	Baik / Good
Sabah	Padang Golf / Golf Courses	Sandakan Golf Club, Sandakan	MW(7)-H511801-1-8.82	81	76	71	64	73	Baik / Good
		Sandakan Golf Club, Sandakan	MW(7)-H511801-2-8.60	95	78	89	81	82	Baik / Good

Nota / Note:

- Tiada Data / No Data
- Tiada Air / No Water
- Stesen Rosak / Destroyed Station



STATUS INDEKS KUALITI AIR TANAH BAGI LUAR BANDAR

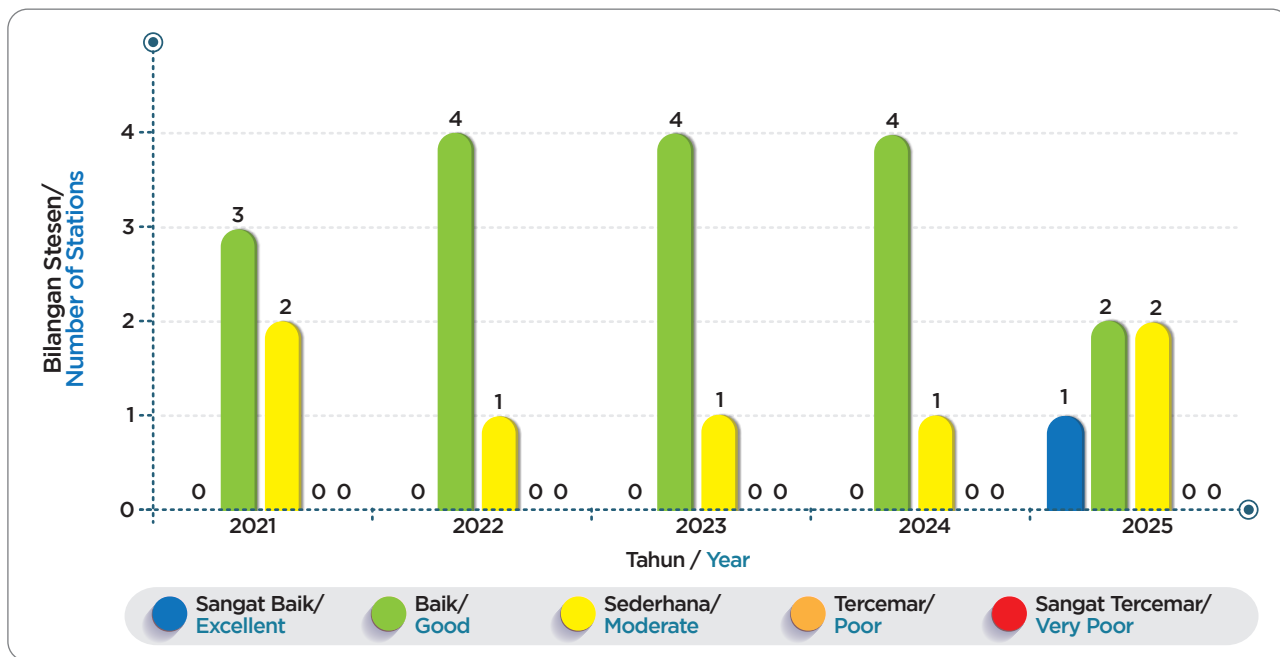
Status of Groundwater Quality Index for Rural

Trend IKAT mulai tahun 2021 hingga 2025 bagi kawasan luar bandar adalah seperti yang ditunjukkan dalam **Rajah 3.6**. Berdasarkan **Rajah 3.6**, bilangan stesen dalam kategori sangat baik telah meningkat manakala stesen kategori baik adalah menurun. Stesen kategori sederhana adalah sama seperti tahun sebelumnya. Tiada stesen dalam kategori tercemar atau sangat tercemar pada tahun 2025.

Pada tahun 2025, sebanyak lima (5) stesen kawasan luar bandar telah dipantau. Hasil program pengawasan yang telah dijalankan menunjukkan satu (1) stesen (20%) dikategorikan sebagai sangat baik, dua (2) stesen (40%) dikategorikan sebagai baik dan dua (2) stesen (40%) dikategorikan sebagai sederhana (Jadual 3.8).

GWQI trend for rural area from the year 2021 until 2025 is shown in **Figure 3.6**. Based on **Figure 3.6**, the number of stations under excellent category increased while stations in good category decreased. Stations in moderate category were the same as the previous year. No station was categorised as poor or very poor in the year 2025.

In 2025, a total of five (5) stations under rural areas were monitored. The monitoring results indicate that one (1) station (20%) were categorised excellent, two (2) stations (40%) were categorised as good and two (2) station (40%) was categorised as moderate (**Table 3.8**).



Rajah 3.6: Trend Indeks Kualiti Air Tanah bagi Luar Bandar, 2021 -2025
 Figure 3.6: Trends of Groundwater Quality Index for Rural, 2021 -2025

Jadual 3.8: Status Indeks Kualiti Air Tanah bagi Luar Bandar
Table 3.8: Status of Groundwater Quality Index for Rural

NEGERI / STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kelantan	Luar Bandar / Rural Areas	Sek. Keb. Jelawat Bachok	MW(7)-D610214-10-6.10	73	84	78	81	81	Baik/ Good
		Sek. Men. Keb. Jelawat Bachok	MW(7)-D610213-1-5.09	58	79	81	70	65	Sederhana/ Moderate
Selangor	Luar Bandar / Rural Areas	Institut Alam Sekitar, EIMAS, UKM Bangi	MW(7)-B210104-1-20.40	76	73	88	88	92	Sangat Baik/ Excellent
Melaka	Luar Bandar / Rural Areas	Pusat Kecemerlangan Buangan Terjadual, JAS Taboh Naning	MW(7)-M210209-2-21.10	63	45	50	55	43	Sederhana/ Moderate
Terengganu	Luar Bandar / Rural Areas	Kg. Padang Pak Wan, Bkt. Payung, Marang	MW(7)-T510313-1-6.99	79	85	84	81	81	Baik/ Good

STATUS INDEKS KUALITI AIR TANAH BAGI BEKAS LOMBONG

Status of Groundwater Quality Index for Used Mine

Trend IKAT mulai tahun 2021 hingga 2025 bagi bekas lombong adalah seperti yang ditunjukkan dalam **Rajah 3.7**. Berdasarkan **Rajah 3.7**, bilangan stesen kategori baik adalah meningkat dari tahun sebelumnya. Tiada stesen yang berada dalam kategori sangat baik, sederhana, tercemar atau sangat tercemar pada tahun 2025.

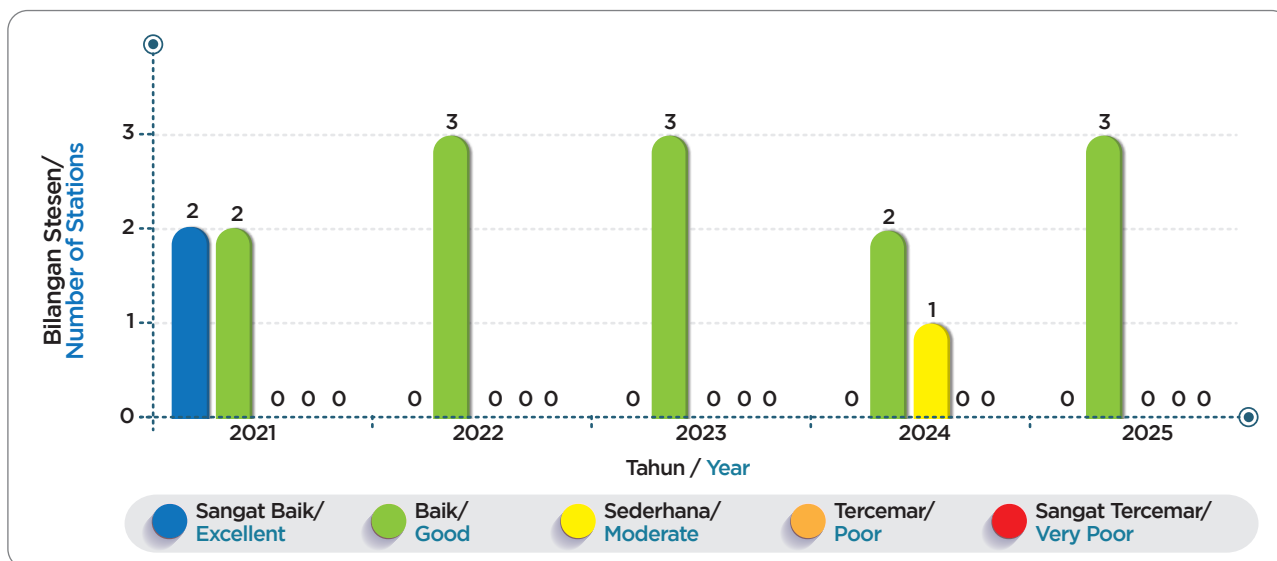
Pada tahun 2025, sebanyak tiga (3) stesen bekas lombong telah dipantau. Hasil program pengawasan yang telah dijalankan menunjukkan tiga (3) stesen (100%) dikategorikan sebagai baik (**Jadual 3.9**).

GWQI trend for used mine from the year 2021 until 2025 is shown in **Figure 3.7**. Based on **Figure 3.7**, the number of stations ranked in good category in 2025 increased from the previous year. No station was categorised as excellent, moderate, poor or very poor in the year 2025.

In 2025, a total of three (3) stations for used mines were monitored. The monitoring results indicate that three (3) stations (100%) were categorised as good (**Table 3.9**).



Tasik Biru Kangkar Pulai, Johor



Rajah 3.7: Trend Indeks Kualiti Air Tanah bagi Bekas Lombong, 2021 -2025
Figure 3.7: Trends of Groundwater Quality Index for Used Mine, 2021 -2025

Jadual 3.9: Status Indeks Kualiti Air Tanah bagi Bekas Lombong
Table 3.9: Status of Groundwater Quality Index for Used Mine

NEGERI / STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sarawak	Bekas Lombong / Used Mine	Bau, No. 1	MW(7)-Q111009- 1-27.27	92	87	71	76	74	Baik/ Good
		Bau, No. 2	MW(7)-Q111009- 2-29.50	87	84	70	69	70	Baik/ Good
		Bau	MW(7)-Q111009- 3-29.00	82	87	70	70	77	Baik/ Good

STATUS INDEKS KUALITI AIR TANAH BAGI BEKALAN AIR

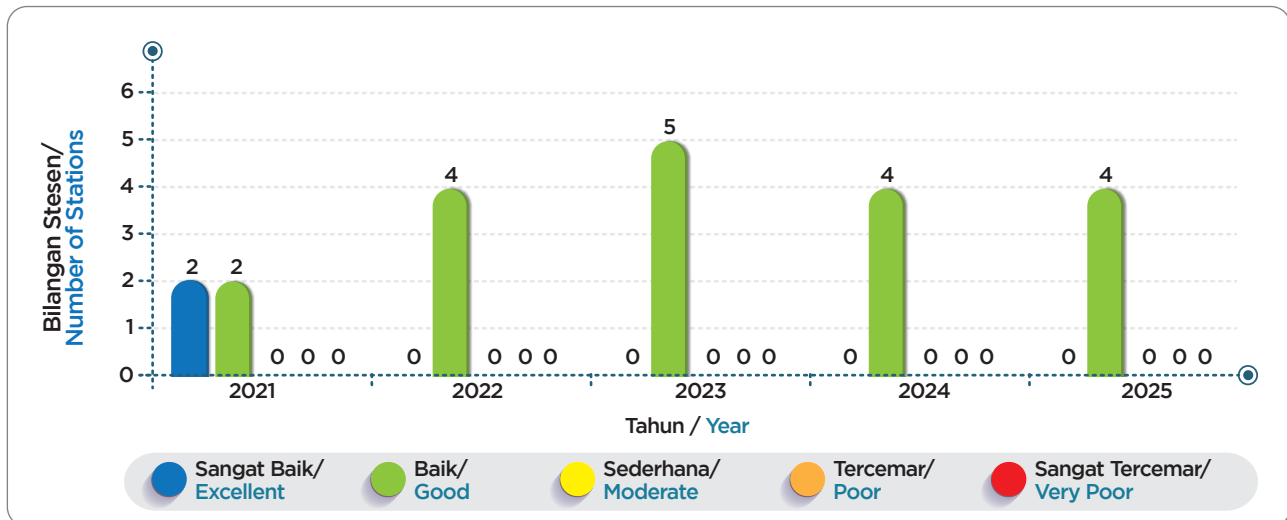
Status of Groundwater Quality Index for Water Supply

Trend IKAT pada tahun 2021 hingga 2025 bagi bekalan air adalah seperti yang ditunjukkan dalam **Rajah 3.8**. Berdasarkan **Rajah 3.8**, bilangan stesen bagi kategori baik adalah sama seperti tahun sebelumnya. Tiada stesen dalam kategori sangat baik, sederhana, tercemar atau sangat tercemar pada tahun 2025.

Pada tahun 2025, sebanyak lima (5) stesen bekalan air telah dipantau. Hasil program pengawasan yang telah dijalankan menunjukkan empat (4) stesen (100%) dikategorikan sebagai baik. Satu (1) stesen tidak dijalankan persampelan atas faktor keselamatan (**Jadual 3.10**).

GWQI trend for water supply from the year 2021 until 2025 is shown in **Figure 3.8**. Based on **Figure 3.8**, the number of stations categorised as good were same as the previous year. No stations were categorised under excellent, moderate, poor or very poor in the year 2025.

In 2025, a total of five (5) stations for water supply were monitored. The monitoring results indicate that four (4) stations (100%) were categorised as good. One (1) station was not sampled due to safety factors (**Table 3.10**).



Rajah 3.8: Trend Indeks Kualiti Air Tanah bagi Bekalan Air, 2021 -2025
Figure 3.8: Trends of Groundwater Quality Index for Water Supply, 2021 -2025

Jadual 3.10: Status Indeks Kualiti Air Tanah bagi Bekalan Air
Table 3.10: Status of Groundwater Quality Index for Water Supply

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN / STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Bekalan Air Tempatan / Municipal Water Supply	Kg. Tajau Laut, Kudat	MW(7)-H611604-1-4.5	97	77	88	81	77	Baik/ Good
Sarawak	Bekalan Air Tempatan / Municipal Water Supply	Kabong, No. 1	MW(7)-Q111101-1-6.70	79	70	70	73	70	Baik/ Good
		Pusat Rawatan Air, JKR, No. 1, Miri	MW(7)-Q411501-1-7.53	-	-	71	70	73	Baik/ Good
		LAKU (Lambir), No. 1, Miri	MW(7)-Q411409-1-30.50	93	80	81	-	-	Tiada Data/ No Data
		Kg. Lusut Kiri, No. 3, Miri	MW(7)-Q411312-1-28.30	76	70	70	74	70	Baik/ Good

Nota / Note:

- Tiada Data / No Data
- Tiada Air / No Water
- Stesen Rosak / Destroyed Station

STATUS INDEKS KUALITI AIR TANAH BAGI BEKAS TAPAK PELUPUSAN BANGKAI HAIWAN

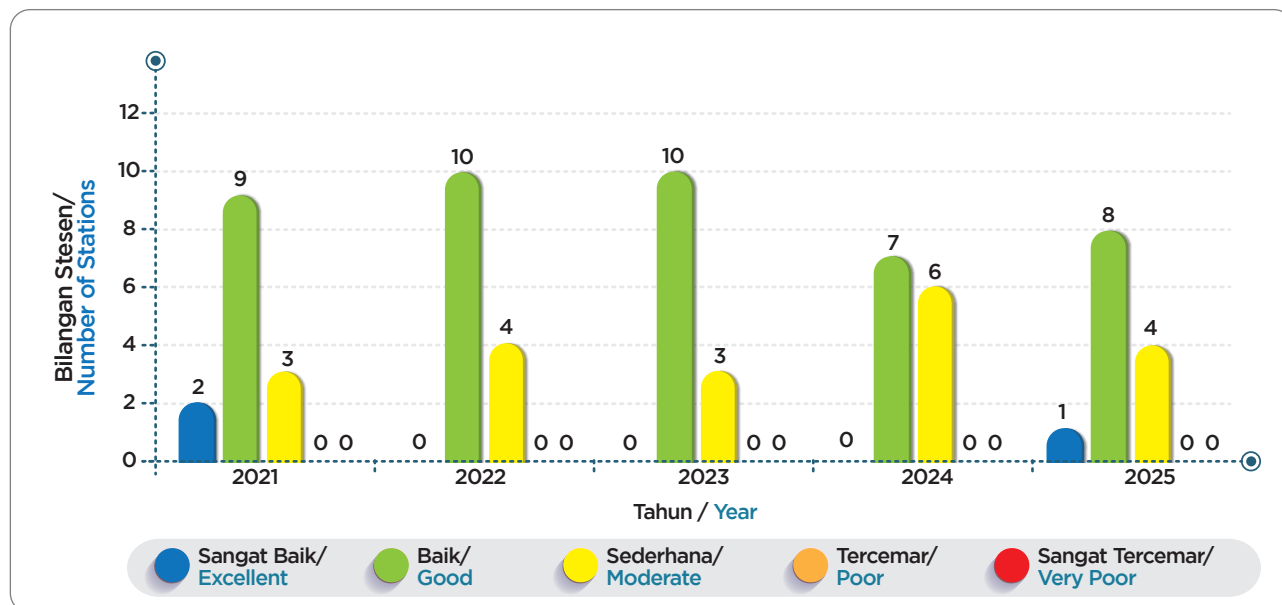
Status of Groundwater Quality Index for Used Animal Burial Sites

Trend IKAT pada tahun 2021 hingga 2025 bagi bekas tapak pelupusan bangkai haiwan adalah seperti yang ditunjukkan dalam **Rajah 3.9**. Berdasarkan **Rajah 3.9**, bilangan stesen dalam kategori sangat baik dan baik telah meningkat manakala stesen kategori sederhana telah menurun berbanding tahun sebelumnya. Tiada stesen dalam kategori tercemar atau sangat tercemar pada tahun 2025.

GWQI trend for used animal burial sites from the year 2021 until 2025 is shown in **Figure 3.9**. Based on **Figure 3.9**, the number of stations categorised as excellent and good had increased while the number of stations ranked as moderate decreased compared to the previous year. No stations were in the poor or very poor categories in the year 2025.

Pada tahun 2025, sebanyak 13 stesen yang dipantau. Berdasarkan **Jadual 3.11**, satu (1) stesen (8%) dikategorikan sebagai sangat baik, lapan (8) stesen (61%) dikategorikan sebagai baik dan empat (4) stesen (31%) dikategorikan sebagai sederhana (**Jadual 3.11**).

In the year 2025, 13 stations were monitored. Based on **Table 3.11**, one (1) station (8%) were categorised as excellent, eight (8) stations (61%) were categorised as good, and four (4) stations (31%) were categorised as moderate (**Table 3.11**).



Rajah 3.9: Trend Indeks Kualiti Air Tanah bagi Bekas Tapak Pelupusan Bangkai Haiwan, 2021-2025
 Figure 3.9: Trends of Groundwater Quality Index for Used Animal Burial Sites, 2021 -2025

Jadual 3.11: Status Indeks Kualiti Air Tanah bagi Bekas Tapak Pelupusan Bangkai Haiwan
Table 3.11: Status of Groundwater Quality Index for Used Animal Burial Sites

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN / STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perak	Tapak Pelupusan Bangkai Haiwan / Used Animal Burial Sites	Tapak Bazar Seramik Tambun	MW(7)-A410105-1-5.92	73	67	69	68	76	Baik/Good
		Tapak Bekas Wabak JE Jalong	MW(7)-A410101-1-3.14	88	73	85	68	83	Baik/Good
		Tapak Bekas Wabak JE Jalong	MW(7)-A410101-2-7.65	84	74	75	80	85	Baik/Good
P. Pinang	Tapak Pelupusan Bangkai Haiwan / Used Animal Burial Sites	Perkampungan Ldg Valdor (Kelapa)	MW(7)-P510010-4-7.45	93	72	72	76	79	Baik/Good
		Perkampungan Ldg Valdor (Tengah)	MW(7)-P510010-5-6.78	92	75	74	68	70	Baik/Good
		Perkampungan Ldg Valdor (Jalan)	MW(7)-P510010-6-7.30	81	74	64	64	69	Sederhana/Moderate

Jadual 3.11: Status Indeks Kualiti Air Tanah bagi Bekas Tapak Pelupusan Bangkai Haiwan
Table 3.11: Status of Groundwater Quality Index for Used Animal Burial Sites

NEGERI / STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Tapak Pelupusan Bangkai Haiwan / Used Animal Burial Sites	Ulu Choh (Pintu)	MW(7)-J110307- 1-6.90	81	63	68	64	64	Sederhana/ Moderate
		Ulu Choh (kolam)	MW(7)-J110311- 2-6.10	62	71	74	68	63	Sederhana/ Moderate
		Ulu Choh (sungai)	MW(7)-J110311- 3-6.71	82	69	85	79	80	Baik/ Good
Selangor	Tapak Pelupusan Bangkai Haiwan / Used Animal Burial Sites	Stesen Kg. Sg. Keroh, Sepang	MW(7)-B210107- 1-5.67	62	62	-	-	-	Stesen ditutup/ Station Closed
		TNB Sepang	MW(7)-B210107- 2-6.95	68	76	80	72	84	Baik/ Good
		Ladang Sepang	MW(7)-B210107- 3-5.60	72	77	81	85	92	Sangat Baik/ Excellent
Sarawak	Tapak Pelupusan Bangkai Haiwan / Used Animal Burial Sites	Oya Road, No. 1, Sibu	MW(7)-Q211209- 1-10.00	89	71	70	72	58	Sederhana/ Moderate
		Oya Road, No. 2, Sibu	MW(7)-Q211209- 2-9.17	82	72	76	81	79	Baik/ Good

Nota / Note:

- Tiada Data / No Data
- Tiada Air / No Water
- Stesen Rosak / Destroyed Station

STATUS INDEKS KUALITI AIR TANAH BAGI AKUAKULTUR

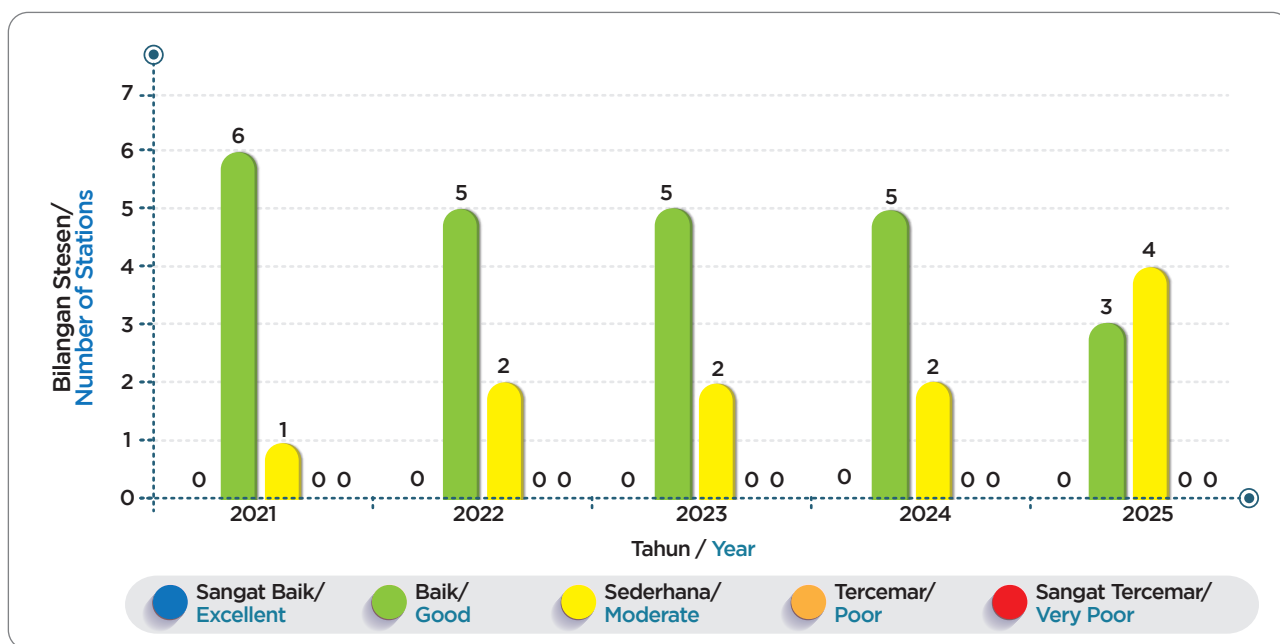
Status of Groundwater Quality Index for Aquaculture

Trend IKAT pada tahun 2021 hingga 2025 bagi akuakultur adalah seperti yang ditunjukkan dalam **Rajah 3.10**. Berdasarkan **Rajah 3.10**, bilangan stesen yang dikategorikan sebagai baik adalah menurun manakala stesen kategori sederhana meningkat dari tahun sebelumnya. Tiada stesen dalam kategori sangat baik, tercemar atau sangat tercemar pada tahun 2025.

Pada tahun 2025, sebanyak tujuh (7) stesen bagi akuakultur telah dipantau. Hasil program pengawasanyangtelahdijalankan, tiga (3) stesen (43%) dikategorikan sebagai baik dan empat (4) stesen (57%) dikategorikan sebagai sederhana (**Jadual 3.12**).

GWQI trend for aquaculture from the year 2021 until 2025 is shown in **Figure 3.10**. Based on **Figure 3.10**, the number of stations categorised as good decreased while the number of stations categorised as moderate had increased compared to the previous year. No stations were in excellent, poor or very poor categories in 2025.

In 2025, a total of seven (7) stations for aquaculture were monitored. The monitoring results indicate that three (3) stations (43%) were categorised as good and four (4) stations (57%) were categorised as moderate (**Table 3.12**).



Rajah 3.10: Trend Indeks Kualiti Air Tanah bagi Akuakultur, 2021-2025
 Figure 3.10: Trends of Groundwater Quality Index for Aquaculture, 2021-2025

Jadual 3.12: Status Indeks Kualiti Air Tanah bagi Akuakultur
 Table 3.12: Status of Groundwater Quality Index for Aquaculture

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN / STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Pahang	Kolam Akuakultur / Aquaculture Farms	Nenasi (Agrobest)	MW(7)-C310310-1-10.5	79	68	66	61	60	Sederhana / Moderate
		Nenasi (Agrobest)	MW(7)-C310314-4-43	79	73	73	72	70	Baik / Good
		Nenasi (Agrobest)	MW(7)-C310314-5-38	82	76	74	71	69	Sederhana / Moderate
		Nenasi (Agrobest)	MW(7)-C310314-3-10	76	73	74	76	78	Baik / Good
		Nenasi (Agrobest)	MW(7)-C310314-6-10	82	76	89	73	64	Sederhana / Moderate
		Nenasi (Agrobest)	MW(7)C310314-2-7.29	86	80	78	73	78	Baik / Good
Terengganu	Kolam Akuakultur / Aquaculture Farms	Blue Archipelago	MW(7)-T510208-2-14.00	59	61	64	62	65	Sederhana / Moderate

STATUS INDEKS KUALITI AIR TANAH BAGI KAWASAN PERANGINAN

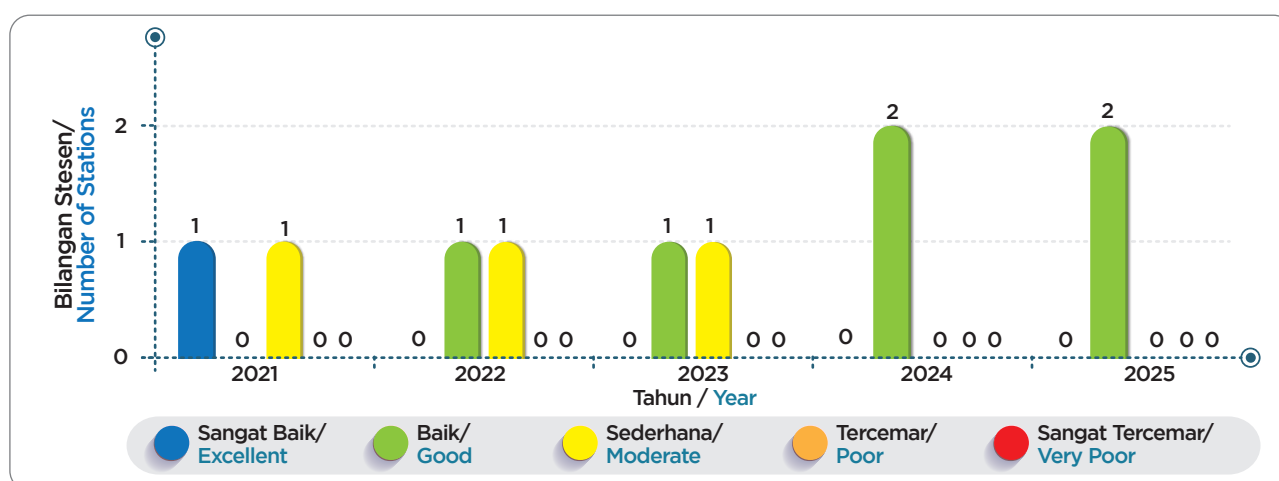
Status of Groundwater Quality Index for Resorts

Trend IKAT pada tahun 2021 hingga 2025 bagi kawasan peranginan adalah seperti yang ditunjukkan dalam **Rajah 3.11**. Berdasarkan **Rajah 3.11**, bilangan stesen dalam kategori baik adalah sama dengan tahun sebelumnya. Tiada stesen dalam kategori sangat baik, sederhana, tercemar atau sangat tercemar.

Pada tahun 2025, sebanyak dua (2) stesen bagi kawasan peranginan telah dipantau. Hasil program pengawasan yang telah dijalankan, dua (2) stesen (100%) dikategorikan sebagai baik (**Jadual 3.13**).

GWQI trend from 2021 to 2025 for resorts is shown in **Figure 3.11**. Based on **Figure 3.11**, the number of stations categorised as good was the same from the previous year. There were no stations in the excellent, moderate, poor or very poor categories.

In 2025, a total of two (2) stations for resorts were monitored. The monitoring results indicate that two (2) stations (100%) were categorised as good (**Table 3.13**).



Rajah 3.11: Trend Indeks Kualiti Air Tanah bagi Kawasan Peranginan, 2021-2025
Figure 3.11: Trends of Groundwater Quality Index for Resorts, 2021-2025

Jadual 3.13: Status Indeks Kualiti Air Tanah bagi Kawasan Peranginan
Table 3.13: Status of Groundwater Quality Index for Resorts

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	KAWASAN / AREA	NOMBOR STESEN / STATION NUMBER	NILAI IKAT / GWQI VALUE					KATEGORI (2025) / CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Peranginan / Resort	Pulau Manukan	MW(7)-H511601-9-6.50	95	82	74	73	87	Baik / Good
Kedah	Peranginan / Resort	Kuarters Imigresen Tanjung Rhu, Langkawi	MW(7)-KV69912-1-10.10	79	65	60	73	76	Baik / Good

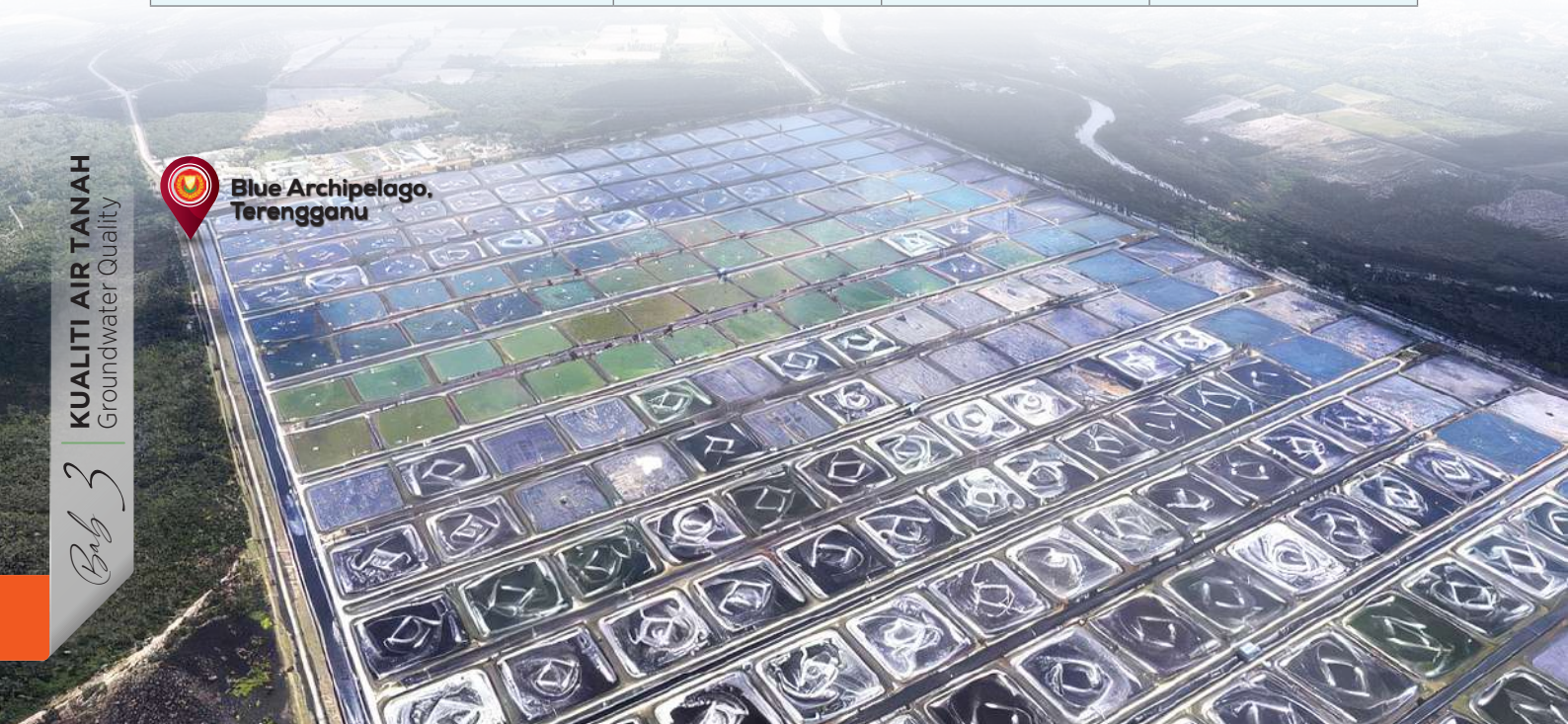
Jadual 3.14 menunjukkan Standard Kualiti Air Tanah bagi Rawatan Air Mentah Secara Konvensional (Air Minuman) Merujuk kepada Parameter Utama dalam Penilaian Status Kualiti Air Tanah.

Table 3.14 shows the Groundwater Quality Standards for Conventional Treatment of Raw Water (Drinking Water) with Reference to Significant Parameters in Assessing Groundwater Quality Status.

Jadual 3.14: Standard Kualiti Air Tanah bagi Rawatan Air Mentah Secara Konvensional (Air Minuman) Merujuk kepada Parameter Utama dalam Penilaian Status Kualiti Air Tanah

Table 3.14: Groundwater Quality Standards for Conventional Treatment of Raw Water (Drinking Water) with Reference to Significant Parameters in Assessing Groundwater Quality Status

PARAMETER / PARAMETER	SIMBOL / SYMBOL	STANDARD / STANDARD	UNIT / UNIT
Jumlah Koliform / Total coliform	–	5000	MPN/100 ml
Pepejal Terlarut / TDS	–	1500	mg/l
Klorida / Chloride	Cl	250	mg/l
Besi / Iron	Fe	1.0	mg/l
Keliatan / Hardness	CaCO ₃	500	mg/l
Mangan / Manganese	Mn	0.2	mg/l
Nitrat / Nitrate	NO ₃	10	mg/l
Raksa / Mercury	Hg	0.001	mg/l
Kadmium / Cadmium	Cd	0.003	mg/l
Arsenik / Arsenic	As	0.01	mg/l
Plumbum / Lead	Pb	0.05	mg/l
Kromium / Chromium	Cr	0.05	mg/l
Kuprum / Copper	Cu	1.0	mg/l
Zink / Zinc	Zn	3.0	mg/l
Sulfat / Sulphate	SO ₄ ²⁻	250	mg/l
Selenium / Selenium	Se	0.01	mg/l
Fenol / Phenol	–	0.002	mg/l



STATUS PEMATUHAN AIR TANAH MENGIKUT PARAMETER UTAMA**Groundwater Compliance Status According to Key Parameters**

Penilaian terhadap kualiti air tanah adalah berdasarkan kepada nilai peratusan yang melebihi had penerimaan dalam Standard Kebangsaan Bagi Standard Kualiti Air Tanah Bagi Rawatan Air Mentah Secara Konvensional (Air Minuman).

The assessment of groundwater quality is based on the percentage value that exceeds the acceptance limit in the National Standards for Groundwater Quality Standards for Conventional Raw Water Treatment (Drinking Water).

Nilai peratusan tersebut ditunjukkan di dalam **Jadual 3.15**.

The value of the percentage is shown in the **Table 3.15**.

Jadual 3.15: Peratusan Julat Nilai Pematuhan, 2025

Table 3.15: Percentage of Compliance, 2025

PERATUSAN JULAT NILAI PEMATUHAN (%) / PERCENTAGE OF COMPLIANCE (%)	KATEGORI / CATEGORY
0% - 49%	Rendah / Low
50% - 79%	Sederhana / Moderate
80% - 100%	Tinggi / High

**ANALISIS PERATUSAN NILAI PEMATUHAN MENGIKUT
PARAMETER BERDASARKAN JENIS GUNA TANAH****Percentage Analysis of Compliance Value by Parameter
Based on Type of Land Use**

Berdasarkan **Jadual 3.15**, analisis peratusan nilai pematuhan mengikut parameter berdasarkan lapan (8) jenis guna tanah mengikut parameter utama dalam penilaian status kualiti air tanah adalah seperti yang ditunjukkan dalam **Rajah 3.12**. Berdasarkan rajah tersebut, parameter Fenol berada pada kategori rendah (0-49%) bagi semua jenis guna tanah. Parameter Ferum berada pada kategori rendah di dalam Guna Tanah Bekas Lombong, Padang Golf, Tapak Perindustrian, Bekas Tapak Pelupusan Sampah dan Bekalan Air manakala Mangan berada pada kategori rendah dalam Guna Tanah Bekas Lombong, Luar Bandar dan Tapak Pelupusan Sampah. Selain itu Arsenik berada pada kategori rendah di dalam Guna Tanah Bekas Lombong.

Based on **Table 3.15**, the analysis of the percentage of compliance values by parameter based on eight (8) land use type with reference to significant parameters in assessing groundwater quality status is as shown in **Figure 3.12**. Based on the diagram, Phenol parameter was classified under the low category (0-49%) for all land use types. The Ferrous parameter was classified under the low category in Landuse of Used Mine, Golf Courses, Industrial Sites, Used Solid Waste Landfills, and Water Supply. Meanwhile, Manganese was classified under the low category in landuse of Used Mines, Rural Area and Used Solid Waste Landfills. In addition, arsenic was classified under the low category in landuse of Used Mine.



Pantai Teluk Cempedak
Kuantan, Pahang





4

**BAB/
CHAPTER**

KUALITI AIR MARIN BAGI PULAU, PANTAI DAN MUARA SUNGAI

Marine Water
Quality for
Island, Coastal
and Estuary

PENGAWASAN KUALITI AIR MARIN MANUAL MANUAL MARINE WATER QUALITY MONITORING (MMWQM)

29

PARAMETER DIPANTAU /
 PARAMETERS MONITORED

188

**STESEN
 PANTAI**
 COASTAL
 STATIONS



85

**STESEN
 MUARA SUNGAI**
 ESTUARY
 STATIONS



95

**STESEN
 PULAU**
 ISLAND
 STATIONS



**PERSAMPELAN
 STESEN PANTAI**
 COASTAL STATION
 SAMPLING

1128

**PERSAMPELAN
 STESEN
 MUARA SUNGAI**
 ESTUARY STATION
 SAMPLING

510

**PERSAMPELAN
 STESEN PULAU**
 ISLAND STATION
 SAMPLING

570

PENGAWASAN KUALITI AIR MARIN AUTOMATIK CONTINUOUS MARINE WATER QUALITY MONITORING (CMWQM)

10

STESEN AUTOMATIK
 CONTINUOUS STATIONS

11

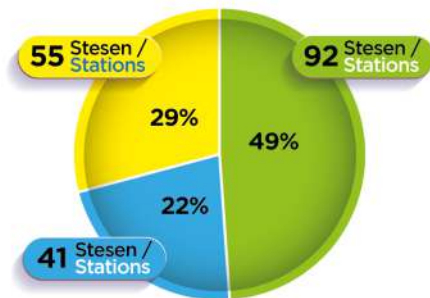
PARAMETER DIPANTAU
 PARAMETERS MONITORED

STESEN TERBAIK KUALITI AIR MARIN 2025 EXCELLENT MARINE WATER QUALITY STATION 2025

STATUS KUALITI AIR MARIN 2025 MARINE WATER QUALITY STATUS 2025

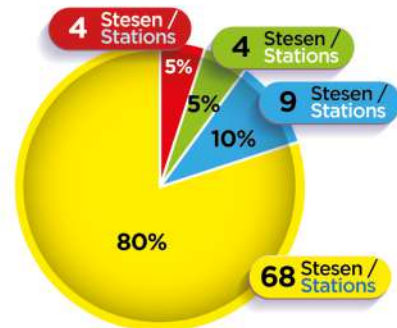
STESEN PANTAI / COASTAL STATION

BIL. / NO.	NEGERI / STATE	LOKASI / LOCATION
1	Johor	Pantai Desaru
2	Kedah	Langkawi Island Resort
3	Kedah	Pantai Kok
4	Kedah	Pantai Teluk Burau
5	Kedah	Pantai Teluk Nibong
6	Pahang	Pantai Tanjung Batu
7	Pahang	Pantai Lanjut
8	Perak	Pantai Pasir Panjang
9	Terengganu	KIPC Utara
10	Terengganu	Pantai Rhu 10



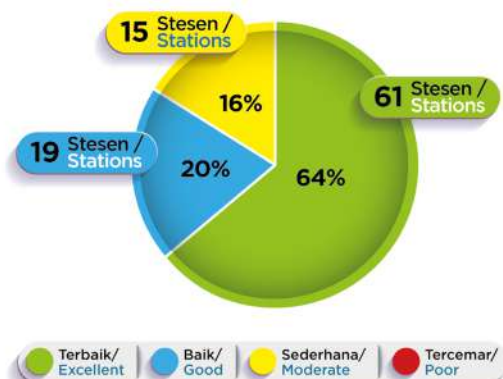
STESEN MUARA SUNGAI / ESTUARY STATION

BIL. / NO.	NEGERI / STATE	LOKASI / LOCATION
1	Terengganu	Tioxide Utara (Kg. Bukit Kuang, Kijal)
2	Terengganu	Tioxide Tengah (Pupuk Semangat, Kijal)
3	Terengganu	Tioxide Selatan (KSB, T. Kalong)
4	Terengganu	Kuala Sungai Setiu



STESEN PULAU / ISLAND STATION

BIL. / NO.	NEGERI / STATE	LOKASI / LOCATION
1	Johor	Dayang
2	Pahang	Labas
3	Pahang	Cebah
4	Pahang	Sembilang
5	Terengganu	Perhentian Besar (South)
6	Terengganu	Redang (South)
7	Terengganu	Lima
8	Kedah	Payar
9	Kedah	Kaca
10	Pahang	Pulau Tioman (Kg. Genting)



PENGAWASAN KUALITI AIR MARIN

Marine Water Quality Monitoring

Jabatan Alam Sekitar (JAS) telah menjalankan pengawasan kualiti air marin semenjak tahun 1978 di Semenanjung Malaysia dan 1985 di Sabah dan Sarawak. Objektif utama program pengawasan kualiti air marin ini adalah untuk menilai status kualiti air marin dan seterusnya untuk menentukan tahap pencemaran daripada punca-punca di daratan dan juga laut. Punca-punca pencemaran ini boleh menimbulkan ancaman terhadap kemampuan ekosistem dari segi kesihatan dan biodiversiti persekitaran marin.

Stesen-stesen pengawasan yang dibangunkan di bawah Program Pengawasan Kualiti Air Marin diklasifikasikan kepada tiga (3) kategori seperti berikut:

1. Stesen Pantai
2. Stesen Muara Sungai
3. Stesen Pulau

Stesen pantai terletak di sepanjang kawasan pesisir, lebih kurang 100 m daripada gigi air laut semasa surut, dan sekurang-kurangnya 500 m daripada punca pencemaran.

Stesen muara sungai terletak di persekitaran muara sungai yang mana air tawar dan air laut berinteraksi. Stesen muara sungai menerima kesan daripada ekosistem sungai.

Stesen pulau pula dibahagikan kepada empat (4) kategori iaitu Kawasan Dilindungi, Taman Laut, Pembangunan dan Peranginan:

The Department of Environment (DOE) has been monitoring marine water quality since 1978 in Peninsular Malaysia and since 1985 in Sabah and Sarawak. The main objective of this marine water quality monitoring programme is to assess the status of marine water quality and to further determine the level of pollution from sources on land and sea. The causes of this pollution can pose a threat to the sustainability of the ecosystem in terms of health and biodiversity of the marine environment.

Monitoring stations established under the Marine Water Quality Monitoring Programme are classified into three (3) categories as follows:

1. Coastal Stations
2. Estuary Stations
3. Island Stations

Coastal stations are located along the coastline; approximately 100 metres from the water edge during low tide and at least 500 metres away from potential point source(s).

Estuary stations are located within an estuarine environment where the freshwater and seawater interact. The estuarine stations are impacted by the riverine system.

The island stations are divided into four (4) categories namely Protected Area, Marine Park, Development, and Resort:

- i. Stesen Pulau (Kawasan Dilindungi) adalah stesen yang dibangunkan di dalam Kawasan Perlindungan Perikanan di bawah Peraturan - Peraturan Perikanan (Kawasan Larangan) 1994.
 - ii. Stesen Pulau (Taman Laut) adalah stesen pengawasan yang dibangunkan di kawasan Taman Laut yang ditetapkan di bawah Perintah Taman Laut Malaysia 1994.
 - iii. Stesen Pulau (Pembangunan) adalah stesen pengawasan yang dibangunkan di sekitar pulau yang sekurang-kurangnya 90 km² dengan jumlah penduduk lebih daripada 20,000 orang; dan/ atau pulau-pulau yang ada kepentingan ekonomi.
 - iv. Stesen Pulau (Peranginan) adalah stesen pengawasan di sekitar pulau yang dibangunkan untuk pelancongan yang mempunyai pusat peranginan dan chalet sebagai pemacu ekonomi di pulau tersebut.
- i. Island Stations (Protected Area) are those stations established within the Fisheries Protected Area under the Fisheries (Prohibited Area) Regulation, 1994.
 - ii. Island Stations (Marine Parks) are those stations that established within the designated Marine Park area under the Marine Park Malaysia Order, 1994, Fisheries Act 1985.
 - iii. Island Stations (Development) are monitoring stations that established around islands that are at least 90 km² with a total population of more than 20,000 people resident; and economically significant.
 - iv. Island Stations (Resort) are those stations that have been established surrounding the islands that were developed for tourists; with resorts and chalets as the key driver of economy for the islands.

Standard Kualiti Air Marin Malaysia (SKAMM) merupakan standard ambien, berfokus kepada perlindungan dan kelestarian ekosistem akuatik serta kepentingan perkhidmatan ekosistem kepada masyarakat. Pada tahun 2023, Jabatan Alam Sekitar telah mengemas kini maklumat stesen untuk menambah baik keberkesanan rangkaian pengawasan kualiti air marin. Inisiatif ini adalah sejajar dengan matlamat program untuk mengoptimumkan program pengawasan, dan pengurusan kualiti air marin di negara.

Pemakaian SKAMM adalah berdasarkan pra-penentuan kelas kualiti air marin mengikut kegunaan berfaedah yang ditetapkan (Rajah 4.1). SKAMM terdiri daripada lima (5) kelas iaitu:

The Malaysian Marine Water Quality Standards (MMWQS) is an ambient standard, focuses on protection and the sustainability of the aquatic ecosystems as well as the importance of the ecosystem services for the society. In 2023, the Department of Environment underwent a comprehensive review of station information, resulting in the enhancement of the Marine Water Quality Monitoring Network. This initiative was undertaken with the overarching goal of optimising the efficiency of monitoring and managing marine water quality in the country.

The MMWQS is applied based on the pre-determined marine water quality classification in accordance with its designated use (Figure 4.1). The MMWQS consisted of five (5) classes:

- i. Kelas 1 merangkumi air di perairan yang diwartakan atau ada perlindungan berkanun serta perairan yang belum diwartakan, tetapi mempunyai ekosistem marin yang sensitif termasuk terumbu karang, rumput laut, tapak pendaratan penyu dan habitat sensitif bagi lain-lain organisma marin yang sensitif.
 - ii. Kelas 2 merangkumi perairan yang mempunyai aktiviti perikanan dan marikultur berdasarkan zon perikanan yang ditetapkan oleh Jabatan Perikanan Malaysia sebagai panduan. Kelas 2 meliputi zon pemuliharaan (termasuk 'Kawasan Larangan Perikanan') sehingga ke Zon Ekonomi Eksklusif (ZEE). Aktiviti marikultur yang ditakrifkan terhadap kepada badan air seperti penternakan ikan dalam sangkar dan penternakan kerang serta tidak termasuk aktiviti akuakultur perikanan darat.
 - iii. Kelas 3 ialah standard untuk kualiti air marin yang terdedah kepada pelepasan efluen secara langsung daripada aktiviti antropogenik. Maka, ekosistem di perairan ini akan mengalami kemerosotan. Tahap perlindungan bagi kelas ini bertujuan untuk mengekalkan kesihatan ekosistem yang masih ada dan memulihara kualiti air marin di kawasan yang terjejas.
 - iv. Kelas E (Interim) adalah standard bagi kawasan muara sungai yang dipengaruhi oleh musim dan variasi diurnal. Selain itu, ciri-ciri geologi dan pergerakan air turut menyumbang kepada sifat dinamik bagi kawasan ini. Berdasarkan kepada kepelbagaian semula jadi ini, Kelas E diterbitkan berdasarkan ciri-ciri kualiti air marin di persekitaran muara sungai yang terpilih, dianggap sebagai persekitaran muara sungai yang bebas daripada pencemaran. Kawasan ini dirujuk sebagai Tapak Rujukan bagi tiga (3) jenis muara
- i. Class 1 water comprises the gazetted and statutory protected waters; and non-gazetted areas with the presence of a sensitive ecosystem including coral reefs, seagrass, turtle landing sites and habitats and feeding grounds of other sensitive marine organisms.
 - ii. Class 2 water encompasses areas of fisheries and mariculture activities, as delineated by the fishing zones established by the Department of Fisheries as a guide. Its water comprises the conservation zone (including 'Fisheries Prohibited Area') right up to the Economic Exclusive Zone (EEZ). Mariculture activities are defined within the marine water bodies such as marine cage and cockle culture; but excluding land aquaculture activities.
 - iii. Class 3 is the standard for marine water exposed to direct discharge of effluent from anthropogenic activities. Hence, ecosystems in these areas are subjected to some degree of degradation. The corresponding level of protection is therefore aimed at sustaining the health of the remaining ecosystem and to improve the water quality of the affected areas.
 - iv. Class E (Interim) is the standard for estuarine water subject to both seasonal and diurnal variations. In addition, the geological characteristics and water circulation patterns also contribute to the dynamic nature of these waters. Based on these natural variations, the standards derived from the water quality characteristic of selected estuarine waters deemed to represent relatively undisturbed environment. These sites, which are referred to as Reference Sites, are selected to represent the three (3)

sungai utama di Malaysia. Maka, Kelas E1 merujuk kepada muara sungai jenis dataran pantai, Kelas E2 mewakili muara sungai jenis laguna manakala Kelas E3 merujuk kepada jenis muara sungai yang besar serta mempunyai rangkaian taburan sungai yang kompleks dan luas.

- v. Kelas R adalah standard untuk tujuan rekreasi di persekitaran marin. Penerbitan Kelas R merujuk pada Standard Kebangsaan Kualiti Air Rekreasi Semulajadi dan Garis Panduan bagi Pemantauan Air Rekreasi Semulajadi (Air Marin dan Air Tawar) yang diterbitkan oleh Kementerian Kesihatan Malaysia.

Indeks Kualiti Air Marin Malaysia (IKAMM) merupakan pengagregatan parameter kualiti air marin yang paling relevan bagi tujuan penyampaian maklumat yang berkait dengan status kualiti air marin bagi sesebuah badan air. Indeks ini diterbitkan berdasarkan pada enam (6) parameter kualiti air iaitu oksigen terlarut, faecal coliform, ammonia tidak terion, nitrat, fosfat dan jumlah pepejal terampai.

Pengagregatan IKAMM mempunyai skala daripada 0 hingga 100, di mana 0 menunjukkan kualiti air marin yang tercemar manakala 100 menandakan kualiti air terbaik (Jadual 4.1).

Pada tahun 2025, rangkaian pengawasan kualiti air marin telah memantau kualiti air marin ke atas 188 stesen pantai, 85 stesen muara sungai dan 95 stesen pulau di seluruh negara.

Pensampelan telah dijalankan sebanyak enam (6) frekuensi bagi setiap stesen. Sebanyak 1,128 sampel stesen pantai, 510 sampel stesen muara sungai dan 570 sampel stesen pulau telah dicerap di persekitaran marin. Sampel-sampel tersebut telah dianalisa dan keputusannya dirumus berdasarkan IKAMM bagi enam (6) frekuensi persampelan.

major estuary types in Malaysia. Hence, Class E1 is taken to be representative of coastal plains, Class E2 represents the lagoon-type estuary while Class E3 is to be referred to when assessing estuaries with large and complex distributary networks.

- v. Class R is the standard for recreational use of marine waters. It is based on the National Standards for Water Quality for Nature-based Recreation and Guidelines for Monitoring for Nature-based Recreation (Marine and Freshwater) by the Ministry of Health, Malaysia.

Malaysian Marine Water Quality Index (MMWQI) is an aggregation of the most relevant marine water quality parameters aimed at providing information pertinent to the marine water quality status of a water body. The index is derived based on six (6) water quality parameters, which are dissolved oxygen, faecal coliform, unionized ammonia, nitrate, phosphate and total suspended solids.

The MMWQI aggregation is scaled from 0 to 100 where 0 indicates poor water quality while 100 indicates excellent water quality (Table 4.1).

In 2025, the manual marine water quality network surveyed marine water quality of a total 188 coastal stations, 85 estuary stations, and 95 island stations throughout the nation.

Field samplings were conducted in six (6) frequencies for each station. A total of 1,128 coastal samples, 510 estuary samples and 570 island samples were collected from the marine environment. The samples were analysed and results were summarised based on the MMWQI of the six (6) sampling frequencies.



Rajah 4.1: Pemakaian Standard Kualiti Air Marin Malaysia (SKAMM) berdasarkan Pra-penentuan Pengelasan Air Marin
 Figure 4.1: The Application of the Malaysian Marine Water Quality Standards (MMWQS) based on the Pre-determined Marine Water Classification

Jadual 4.1: Klasifikasi Indeks Kualiti Air Marin Malaysia (IKAMM)
 Table 4.1: Malaysian Marine Water Quality Index (MMWQI) Classification

KATEGORI/ CATEGORY	NILAI INDEKS / INDEX VALUE
Terbaik / Excellent	90 - 100
Baik / Good	80 - 90
Sederhana / Moderate	50 - 80
Tercemar / Poor	0 - 50

188

STESAN PANTAI / COASTAL STATIONS
PANTAI BAGAN LALANG, SELANGOR

85

STESAN MUARA SUNGAI / ESTUARY STATIONS
MUARA SUNGAI UMBAI, MELAKA

KUALITI AIR MARIN BAGI PULAU, PANTAI DAN MUARA SUNGAI
Marine Water Quality for Island, Coastal and Estuary

Bag 4

95

STESEN PULAU / ISLAND STATIONS
PULAU TEMENGGOR, PERAK



STATUS KUALITI AIR MARIN : KESELURUHAN

Marine Water Quality Status : Overview

Dalam tahun 2025, daripada 368 stesen pengawasan kualiti air marin bagi pantai, muara sungai dan pulau di negara ini, status kualiti air marin dinilai berdasarkan nilai median IKAMM bagi data yang dicerap di setiap stesen sepanjang 2025. Stesen pengawasan kualiti air marin sebanyak 157 stesen dikategorikan sebagai terbaik, 69 stesen sebagai baik, sementara kualiti air marin bagi 138 stesen dikategorikan sebagai sederhana. Pada tahun 2025, empat (4) stesen dikategorikan sebagai tercemar. Bilangan stesen tercemar menunjukkan sedikit penurunan berbanding tahun sebelumnya iaitu daripada lima (5) stesen kepada empat (4) stesen tercemar pada tahun ini.

In 2025, out of 368 marine water quality monitoring stations established at coastal, estuary and islands in the country, the marine water quality status was evaluated based on the median value of MMWQI obtained from the data collected at each station in 2025. The marine water quality of 157 stations was categorised as excellent, 69 stations categorised as good while marine water quality of 138 stations were categorised as moderate. In 2025, there are four (4) stations that categorised as poor. The number of poor marine water quality stations reduced from five (5) stations in the previous year, down to four (4) stations this year.

Daripada empat (4) stesen yang tercemar tahun 2025, dua (2) stesen terletak di Pulau Pinang manakala Selangor dan Johor masing-masing melaporkan satu (1) stesen tercemar.

Faecal coliform, nutrien dan jumlah pepejal terampai masih merupakan parameter utama yang menyebabkan kemerosotan kualiti air marin di stesen MMWQM. Semua stesen tercemar menerima kesan daripada muara sungai dan aktiviti antropogenik di hulu sungai.

Secara amnya, kualiti air marin yang dipantau di bawah rangkaian MMWQM menunjukkan status keseluruhan kualiti air yang terbaik di persekitaran marin Malaysia. Bilangan stesen tercemar telah menunjukkan sedikit penurunan berbanding tahun lalu.

Jadual 4.2, Jadual 4.3 dan Jadual 4.4 menunjukkan senarai stesen pantai, muara sungai dan pulau yang mencapai kategori terbaik berdasarkan median IKAMM bagi tahun 2025.

Rajah 4.2 - 4.7 menunjukkan status kualiti air marin berdasarkan IKAMM mengikut lokasi stesen pengawasan bagi pantai, muara sungai dan pulau bagi tahun 2025.

Out of the four (4) polluted stations in 2025, two (2) stations are located in Pulau Pinang while Selangor, and Johor each reported one (1) polluted station.

Faecal coliform, nutrients, and total suspended solids remained the main parameters that deteriorated the marine water quality at the Marine Manual Water Quality Monitoring (MMWQM) stations. All polluted stations received impacts from the river estuaries and anthropogenic activities in the upstream area of the river.

In general, the marine water quality monitored under the MMWQM network showed an overall excellent category of water quality in the marine environment of Malaysia. The number of poor stations were slightly decreased as compared with previous year.

Table 4.2, Table 4.3 and Table 4.4 show the list of coastal, estuary and island stations in the excellent category based on median value of MMWQI in 2025.

Figures 4.2 - 4.7 show the marine water quality status based on MMWQI according to coastal, estuary, and island monitoring stations in 2025.



Muara Sungai Santubong,
Sarawak



Jadual 4.2: Senarai Stesen Pengawasan Kualiti Air Marin bagi Pantai dengan Status Kategori Terbaik, 2025

Table 4.2: List of Marine Water Quality Monitoring of Coastal Stations with Excellent Status, 2025

Bil / No	Negeri / State	Lokasi / Location
1	Johor	Pantai Desaru
2	Kedah	Langkawi Island Resort
3	Kedah	Pantai Kok
4	Kedah	Pantai Teluk Burau
5	Kedah	Pantai Teluk Nibong
6	Pahang	Pantai Tanjung Batu
7	Pahang	Pantai Lanjut
8	Perak	Pantai Pasir Panjang
9	Terengganu	KIPC Utara
10	Terengganu	Pantai Rhu 10

Nota / Notes:

Senarai menunjukkan sepuluh (10) stesen teratas dengan status kategori terbaik/

The list shows the top ten (10) stations in the excellent category



Jadual 4.3: Senarai Stesen Pengawasan Kualiti Air Marin bagi Muara Sungai dengan Status Kategori Terbaik, 2025

Table 4.3: List of Marine Water Quality Monitoring of Estuary Stations with Excellent Status, 2025

Bil / No	Negeri / State	Lokasi / Location
1	Terengganu	Tioxide Utara (Kg. Bukit Kuang, Kijal)
2	Terengganu	Tioxide Tengah (Pupuk Semangat, Kijal)
3	Terengganu	Tioxide Selatan (KSB, T. Kalong)
4	Terengganu	Kuala Sungai Setiu

Nota / Notes:

Senarai menunjukkan empat (4) stesen teratas dengan status kategori terbaik/
The list shows the top four (4) stations in the excellent category

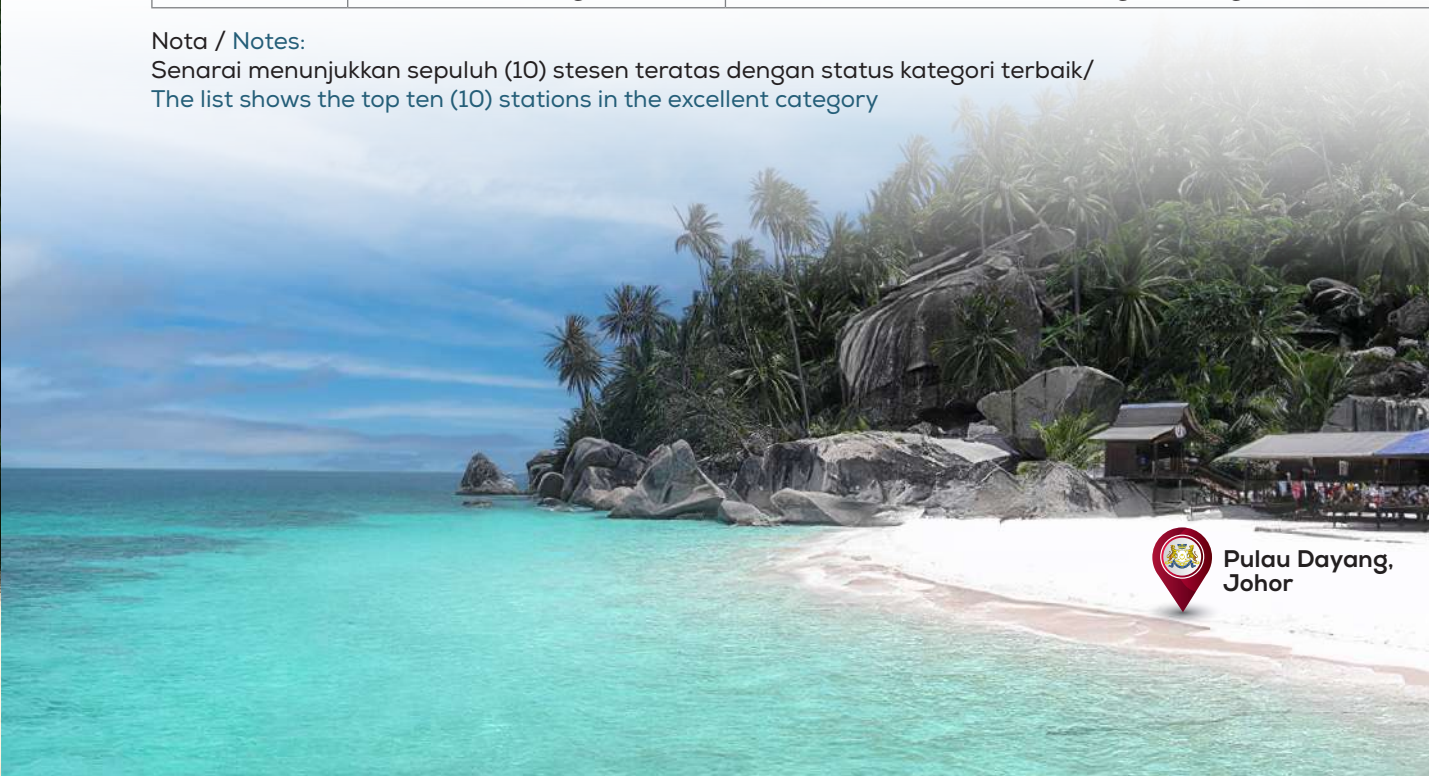
Jadual 4.4: Senarai Stesen Pengawasan Kualiti Air Marin bagi Pulau dengan Status Kategori Terbaik, 2025

Table 4.4: List of Marine Water Quality Monitoring of Island Stations with Excellent Status, 2025

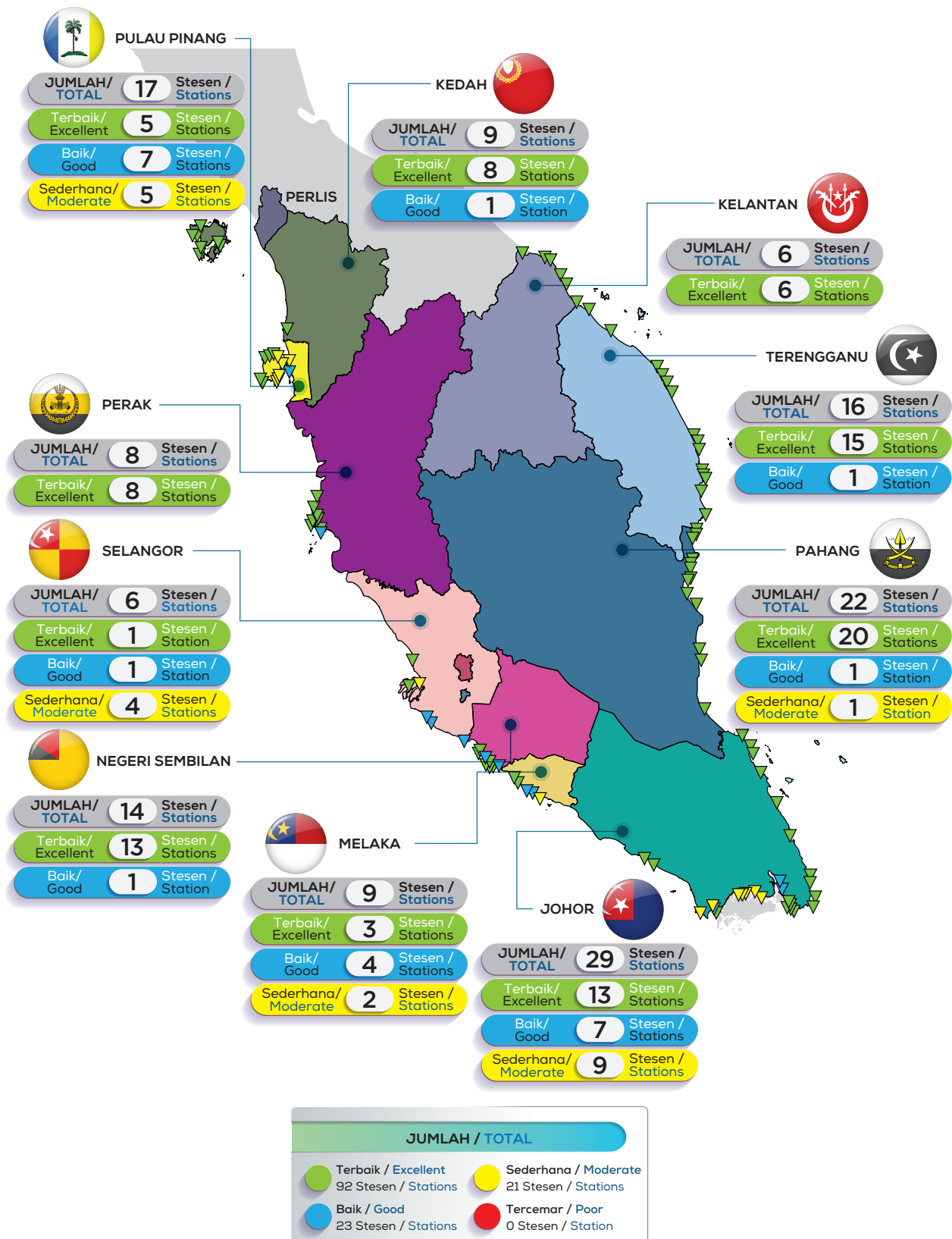
Bil / No	Negeri / State	Lokasi / Location
1	Johor	Dayang
2	Pahang	Labas
3	Pahang	Cebah
4	Pahang	Sembilang
5	Terengganu	Perhentian Besar (South)
6	Terengganu	Redang (South)
7	Terengganu	Lima
8	Kedah	Payar
9	Kedah	Kaca
10	Pahang	Pulau Tioman (Kg. Genting)

Nota / Notes:

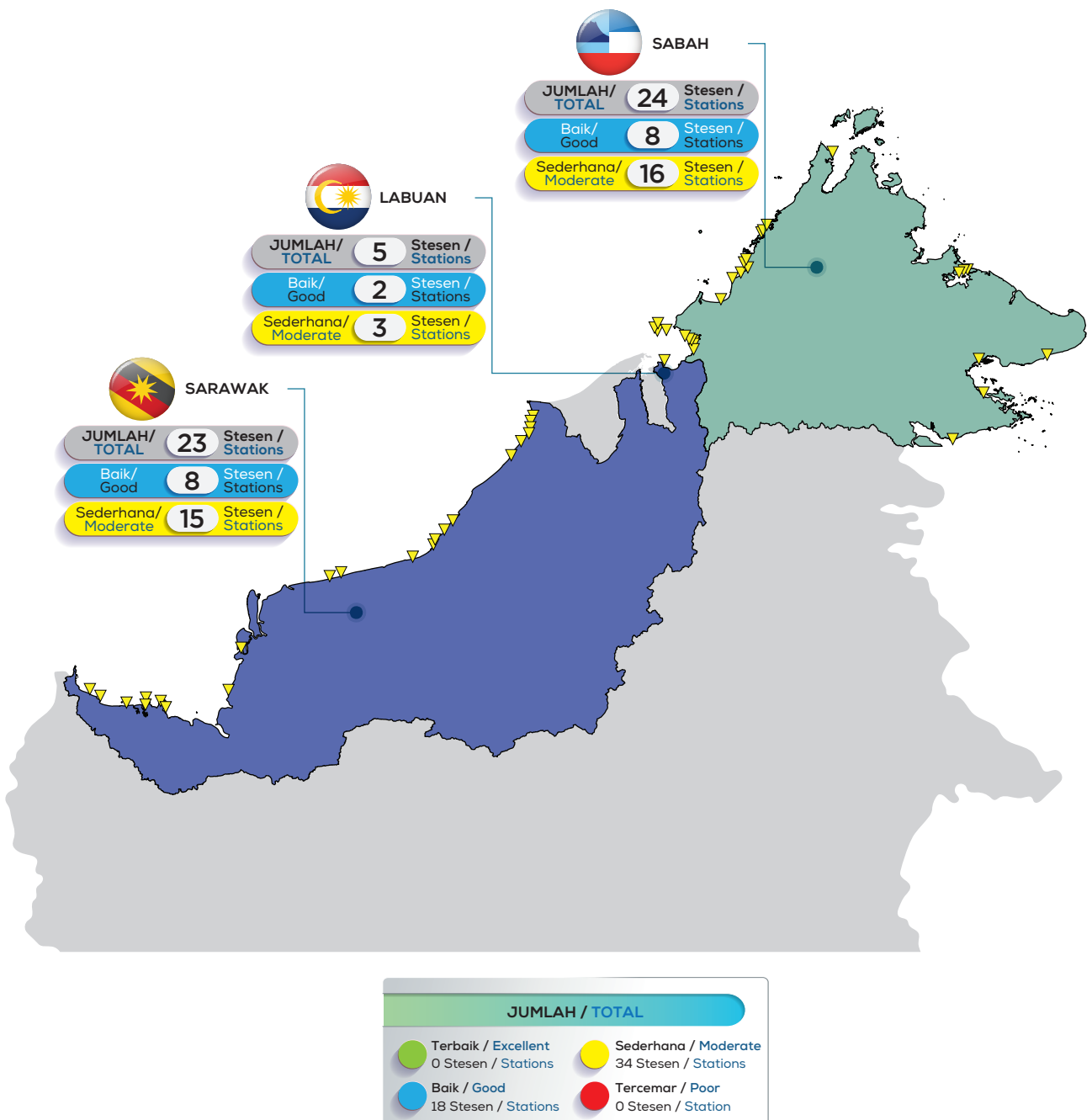
Senarai menunjukkan sepuluh (10) stesen teratas dengan status kategori terbaik/
The list shows the top ten (10) stations in the excellent category



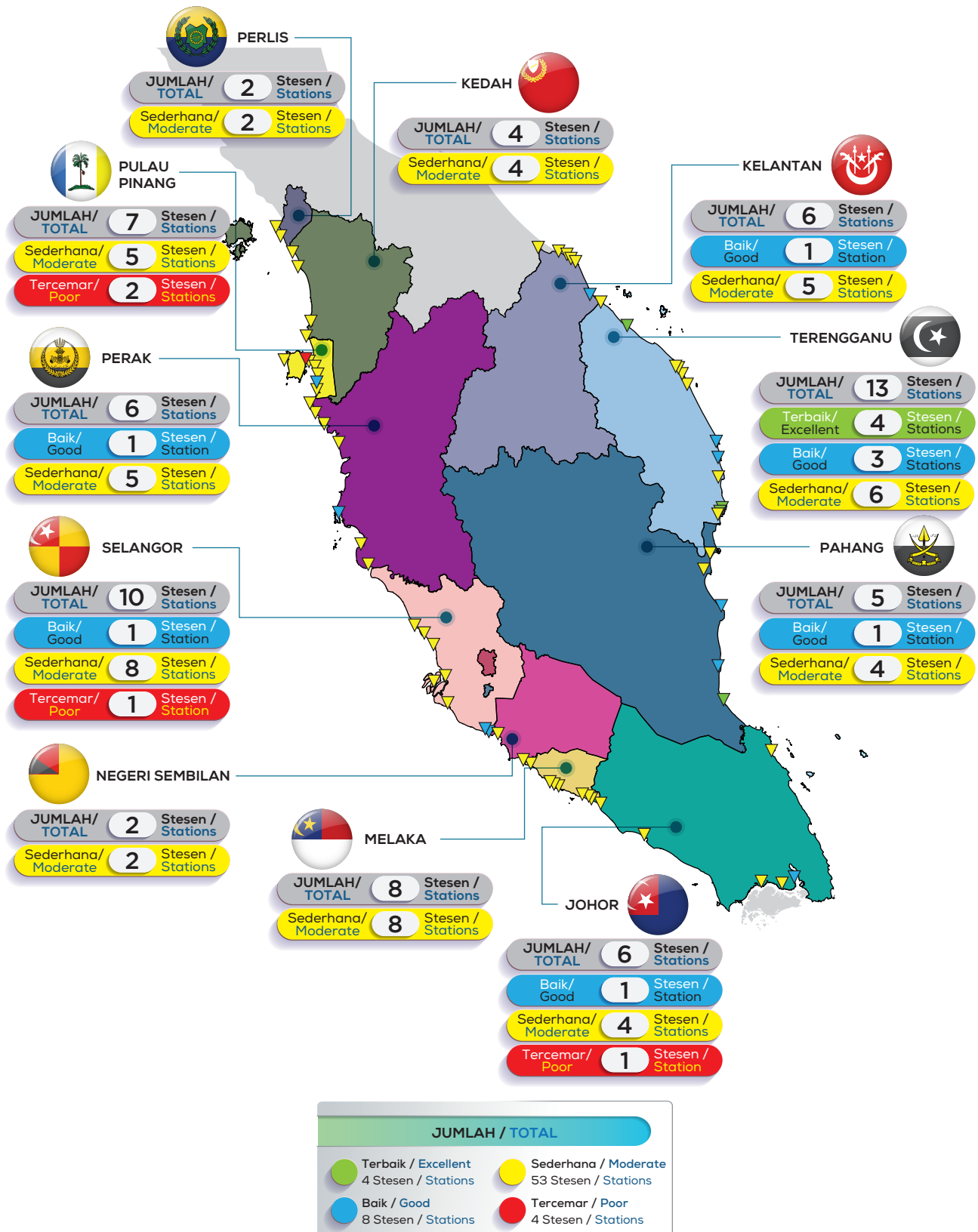
**Pulau Dayang,
Johor**



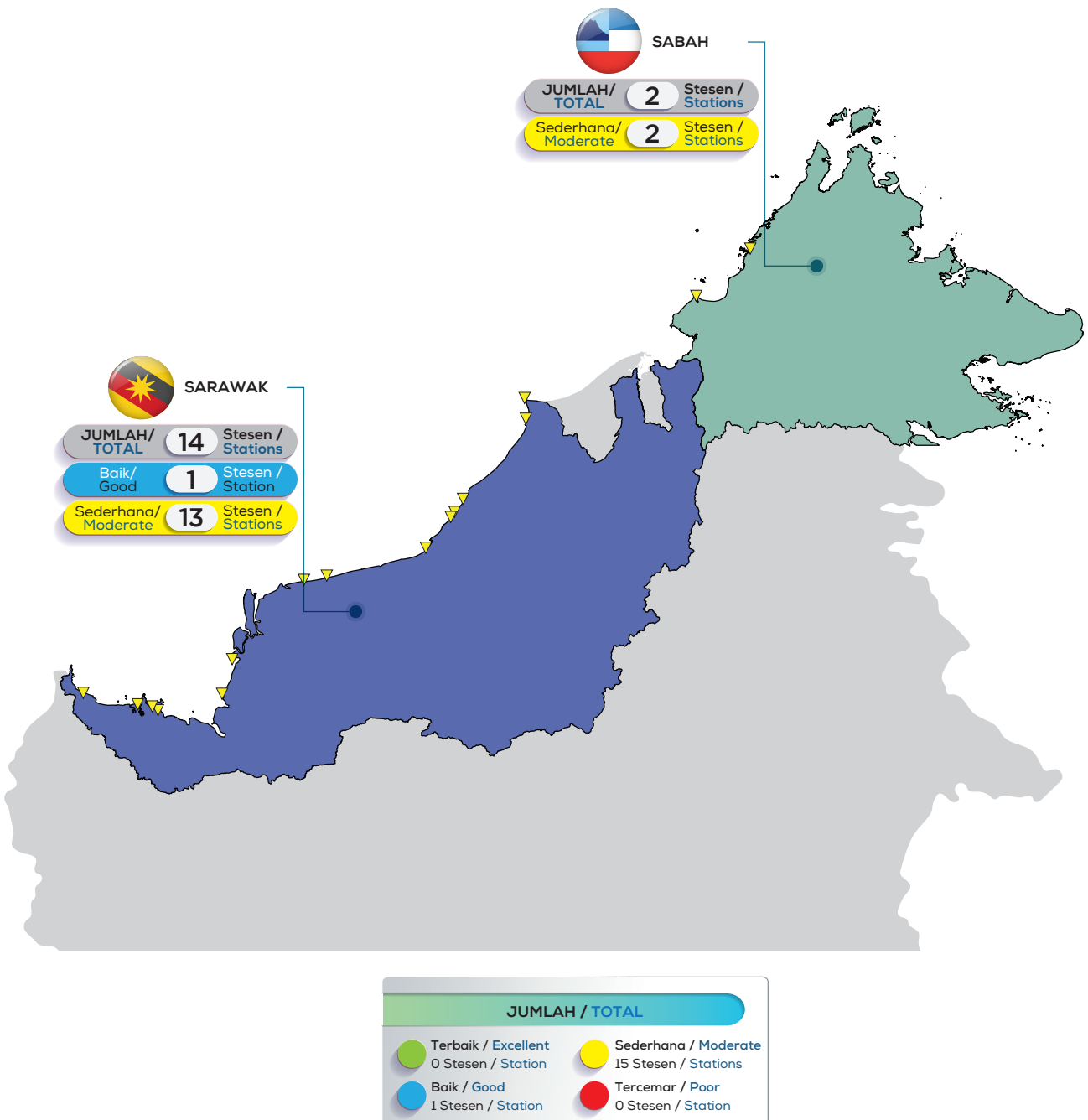
Rajah 4.2: Status Kualiti Air Marin mengikut Lokasi Stesen Pengawasan bagi Pantai di Semenanjung Malaysia, 2025
 Figure 4.2: Marine Water Quality Status based on the Location of Coastal Monitoring Stations in Peninsular Malaysia, 2025



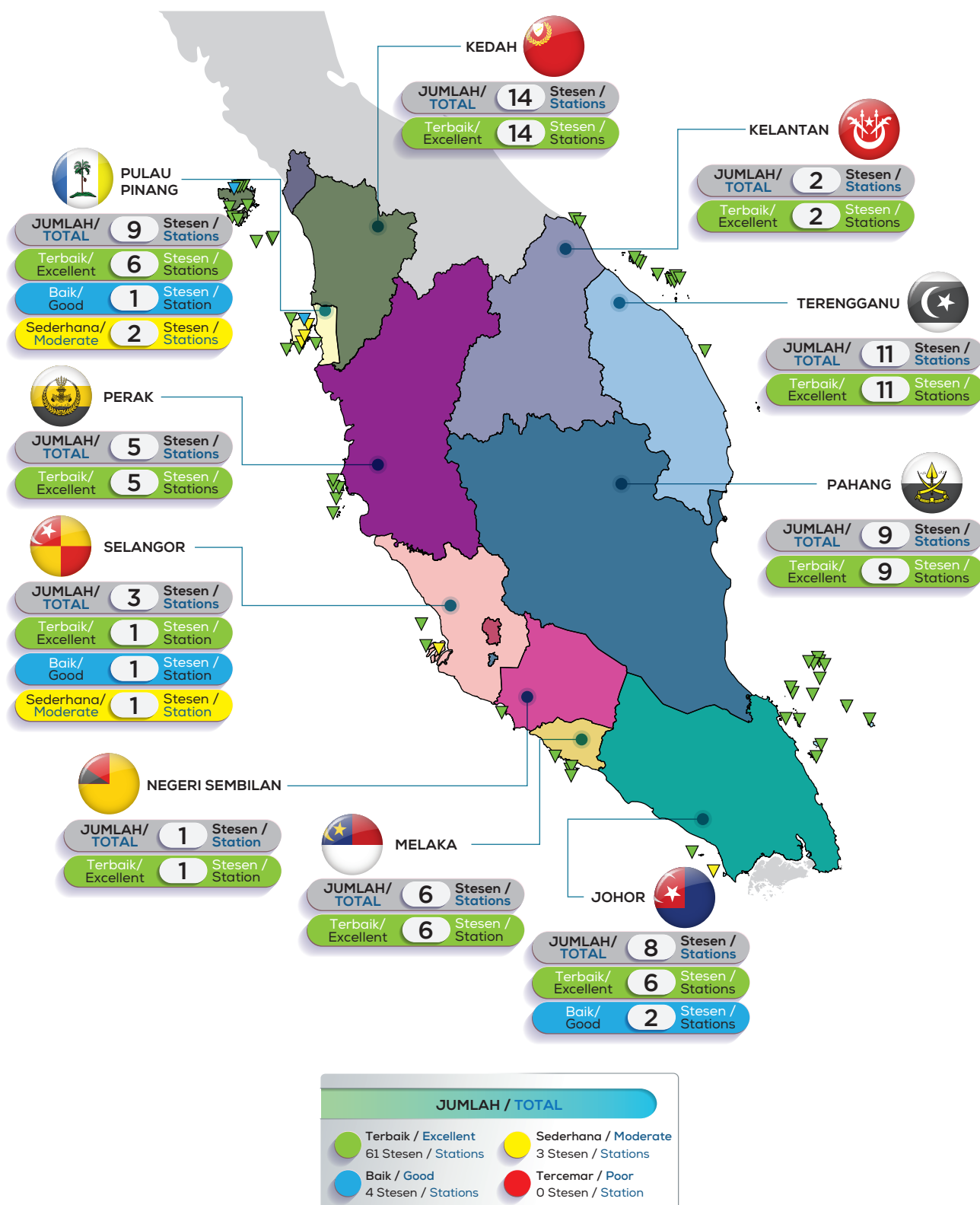
Rajah 4.3: Status Kualiti Air Marin mengikut Lokasi Stesen Pengawasan bagi Pantai di Sabah, Sarawak dan W.P. Labuan, 2025
Figure 4.3: Marine Water Quality Status based on the Location of Coastal Monitoring Stations in Sabah, Sarawak, and W.P. Labuan, 2025



Rajah 4.4: Status Kualiti Air Marin mengikut Lokasi Stesen Pengawasan bagi Muara Sungai di Semenanjung Malaysia, 2025
 Figure 4.4: Marine Water Quality Status based on the Location of Estuary Monitoring Stations in Peninsular Malaysia, 2025

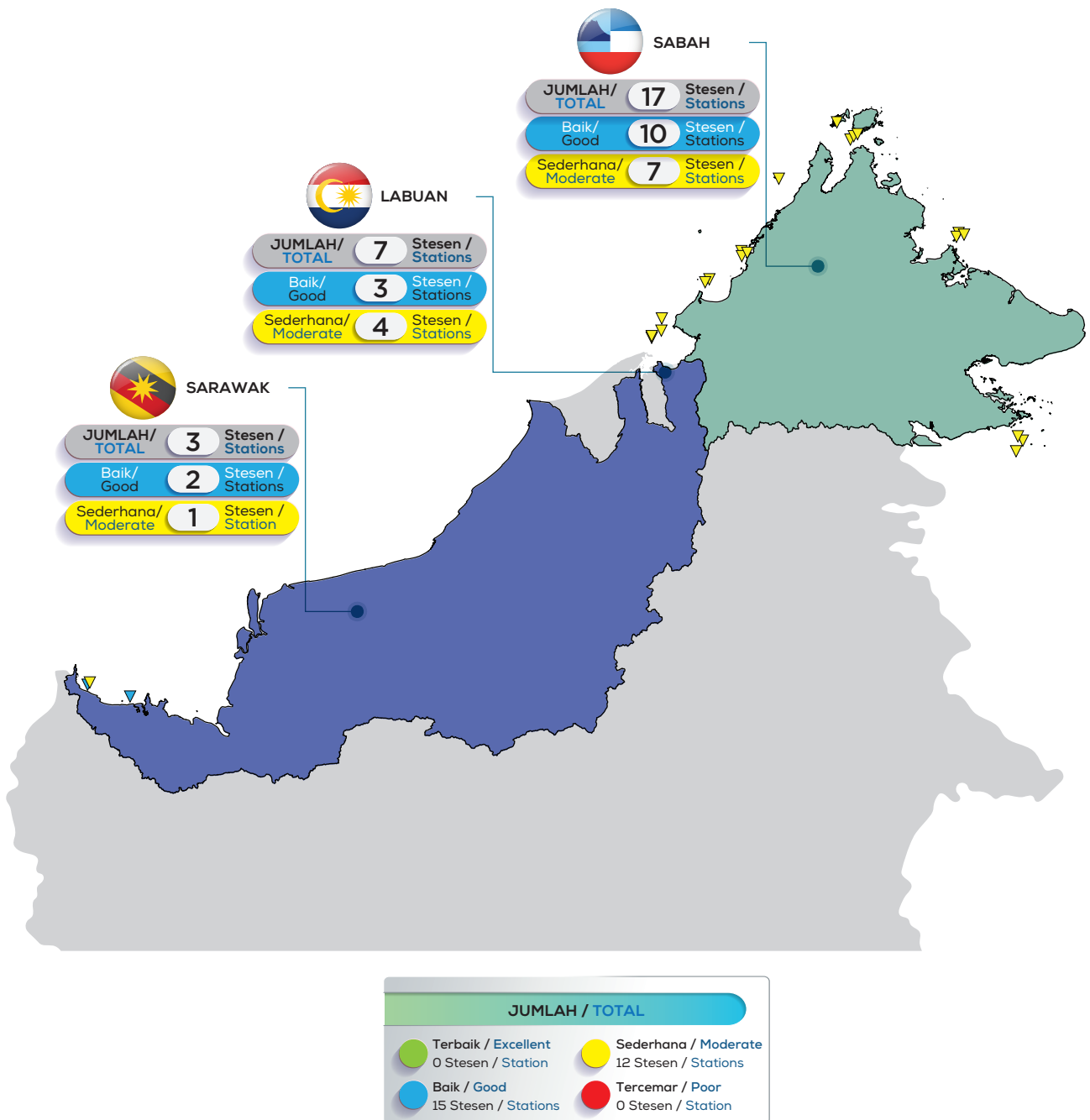


Rajah 4.5: Status Kualiti Air Marin mengikut Lokasi Stesen Pengawasan bagi Muara Sungai di Sabah dan Sarawak, 2025
Figure 4.5: Marine Water Quality Status based on the Location of Monitoring Stations for Estuary in Sabah and Sarawak, 2025



Rajah 4.6: Status Kualiti Air Marin mengikut Lokasi Stesen Pengawasan bagi Pulau di Semenanjung Malaysia, 2025

Figure 4.6: Marine Water Quality Status based on the Location of Island Monitoring Stations in Peninsular Malaysia, 2025



Rajah 4.7: Status Kualiti Air Marin mengikut Lokasi Stesen Pengawasan bagi Pulau di Sabah, Sarawak dan W.P. Labuan, 2025

Figure 4.7: Marine Water Quality Status based on the Location of Island Monitoring Stations in Sabah, Sarawak, and W.P. Labuan, 2025

STATUS KUALITI AIR MARIN BAGI KAWASAN PANTAI

Marine Water Quality Status for Coastal Areas

Pada tahun 2025, pemantauan kualiti air marin telah dilaksanakan di sebanyak 188 stesen pantai di seluruh negara. Daripada 188 stesen pantai, kualiti air marin bagi 92 stesen (49%) dikategorikan sebagai terbaik, 41 stesen (22%) baik dan 55 stesen (29%) adalah sederhana. Tiada stesen dikategorikan sebagai tercemar. Bilangan stesen bagi kategori terbaik sedikit menurun daripada 103 stesen tahun lalu kepada 92 stesen tahun ini (**Jadual 4.5**).

In 2025, marine water quality was monitored at a total of 188 coastal stations nationwide. Out of the 188 stations, the marine water quality of 92 stations (49%) was ranked as excellent, 41 stations (22%) ranked as good and 55 stations (29%) ranked as moderate. No station was ranked poor. The number of stations that ranked excellent slightly reduced from 103 stations last year to 92 stations this year (**Table 4.5**).

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
 Table 4.5: Marine Water Quality Status for Coastal Area

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kedah	Pantai/Coastal	Pantai Merdeka	MMKC001	85	88	91	92	88	Baik/Good
		Langkawi Island Resort	MMKC002	94	94	96	95	96	Terbaik/Excellent
		Pantai Kok	MMKC003	90	83	95	96	96	Terbaik/Excellent
		Pantai Kuah	MMKC004	88	90	91	95	91	Terbaik/Excellent
		Pantai Pasir Tengkorak	MMKC005	96	93	93	95	95	Terbaik/Excellent
		Pantai Teluk Burau	MMKC006	94	86	96	94	96	Terbaik/Excellent
		Pantai Teluk Nibong	MMKC007	86	92	95	96	96	Terbaik/Excellent
		Pantai Tengah	MMKC008	92	92	94	96	95	Terbaik/Excellent
		Pantai Beras Basah	MMKC009	92	96	96	96	95	Terbaik/Excellent
P. Pinang	Pantai/Coastal	Gertak Sanggul	MMPC001	81	83	94	91	88	Baik/Good
		Kawasan Perindustrian Bayan Lepas 1	MMPC002	72	60	79	67	84	Baik/Good
		Pantai Bersih	MMPC003	75	86	73	84	81	Baik/Good
		Pantai Miami	MMPC004	70	86	90	88	90	Terbaik/Excellent
		Pantai Pasir Panjang	MMPC005	93	95	93	93	88	Baik/Good
		Batu Feringgi (Casuarina)	MMPC006	83	82	93	85	86	Baik/Good
		Luar Pantai Teluk Bahang	MMPC007	81	88	94	91	94	Terbaik/Excellent
		Persiaran Gurney	MMPC008	60	79	73	84	71	Sederhana/Moderate
		Rumah Pam Baru Perai	MMPC009	68	76	88	83	81	Baik/Good

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
Table 4.5: Marine Water Quality Status for Coastal Area

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
P. Pinang	Pantai/Coastal	Rumah Pam Lama Perai	MMPC010	65	59	67	72	69	Sederhana/ Moderate
		Selat PP Selatan (Jelutong)	MMPC011	59	59	59	57	57	Sederhana/ Moderate
		Tanjung Bungah	MMPC012	67	72	90	80	89	Baik/Good
		Tanjung Bungah 2	MMPC013	70	63	69	87	76	Sederhana/ Moderate
		Batu Maung 2	MMPC014	69	58	72	71	57	Sederhana/ Moderate
		Pantai Sungai Batu Ferringhi 3	MMPC015	86	92	92	91	90	Terbaik/ Excellent
		Pantai Sungai Batu Ferringhi 2	MMPC016	90	94	94	93	91	Terbaik/ Excellent
		Pantai Sungai Batu Ferringhi 1	MMPC017	91	91	92	91	93	Terbaik/ Excellent
Perak	Pantai/Coastal	Pantai Pasir Bogak	MMAC001	95	94	92	95	95	Terbaik/ Excellent
		Pantai Teluk Dalam	MMAC002	94	92	93	95	91	Terbaik/ Excellent
		Pantai Teluk Batik	MMAC003	78	89	92	95	95	Terbaik/ Excellent
		Pantai Tanjung Batu	MMAC004	93	94	93	96	92	Terbaik/ Excellent
		Pantai Teluk Rubiah	MMAC005	90	81	88	96	95	Terbaik/ Excellent
		Pantai Damai Laut	MMAC006	94	91	93	95	91	Terbaik/ Excellent
		Pantai Teluk Senangin	MMAC007	90	93	95	95	92	Terbaik/ Excellent
		Pantai Pasir Panjang	MMAC008	91	95	94	95	96	Terbaik/ Excellent
Selangor	Pantai/Coastal	Pantai Bagan Lalang	MMBC001	84	84	89	86	91	Terbaik/ Excellent
		Pantai Morib	MMBC002	68	84	88	85	72	Sederhana/ Moderate
		Selat Pulau Babi	MMBC003	87	91	95	89	71	Sederhana/ Moderate
		Selat Klang Utara	MMBC004	62	56	79	56	55	Sederhana/ Moderate
		Pantai Remis	MMBC005	83	79	92	84	80	Baik/Good
		Pantai Klanang	MMBC006	74	69	82	66	68	Sederhana/ Moderate
N. Sembilan	Pantai/Coastal	Bagan Pinang	MMNC001	91	90	95	95	90	Terbaik/ Excellent
		Telok Siting	MMNC002	87	94	89	91	90	Terbaik/ Excellent
		Port Dickson Bandar	MMNC003	88	88	93	95	91	Terbaik/ Excellent
		Port Dickson Batu 4	MMNC004	88	89	89	95	92	Terbaik/ Excellent
		Port Dickson Batu 5	MMNC005	73	81	94	95	89	Baik/Good
		Port Dickson Batu 6	MMNC006	90	93	96	93	91	Terbaik/ Excellent

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
 Table 4.5: Marine Water Quality Status for Coastal Area

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
N. Sembilan	Pantai/Coastal	Port Dickson Batu 7	MMNC007	93	95	94	93	92	Terbaik/ Excellent
		Port Dickson Batu 8	MMNC008	93	95	95	94	95	Terbaik/ Excellent
		Port Dickson Batu 10	MMNC009	92	97	95	95	91	Terbaik/ Excellent
		Port Dickson Janakuasa TNB	MMNC010	70	90	93	95	91	Terbaik/ Excellent
		Telok Pelanduk	MMNC011	91	94	92	93	91	Terbaik/ Excellent
		Pantai Cermin	MMNC012	94	94	94	92	94	Terbaik/ Excellent
		Pantai Teluk Kemang	MMNC013	91	95	95	94	94	Terbaik/ Excellent
		Pantai Seri Purnama	MMNC014	92	96	92	95	95	Terbaik/ Excellent
Melaka	Pantai/Coastal	Pantai Rombang	MMMC001	88	88	91	93	87	Baik/Good
		Pantai Kundur	MMMC002	89	83	89	90	90	Terbaik/ Excellent
		Pantai Tanjung Bidara	MMMC003	69	87	92	94	86	Baik/Good
		Teluk Gong	MMMC004	60	90	90	92	85	Baik/Good
		Pulau Melaka Point A1	MMMC005	89	83	88	88	82	Baik/Good
		Pulau Melaka Point A2	MMMC006	80	83	92	88	90	Terbaik/ Excellent
		Pulau Melaka Point B1	MMMC007	58	57	54	57	59	Sederhana/ Moderate
		Pulau Melaka Point B2	MMMC008	57	57	55	56	58	Sederhana/ Moderate
		Pantai Klebang	MMMC009	87	89	88	85	91	Terbaik/ Excellent
Johor	Pantai/Coastal	Tanjung Bin	MMJC001	90	91	93	93	87	Baik/Good
		Pelabuhan Tanjung Pelepas	MMJC002	91	82	80	92	86	Baik/Good
		Hadapan Jabatan Laut	MMJC003	82	81	69	83	73	Sederhana/ Moderate
		Pantai Stulang Laut	MMJC004	56	55	56	55	53	Sederhana/ Moderate
		Jeti Teluk Jawa	MMJC005	70	59	64	79	59	Sederhana/ Moderate
		Pelabuhan Pasir Gudang	MMJC006	59	66	58	59	57	Sederhana/ Moderate
		Hadapan HSAJB	MMJC007	58	51	56	56	53	Sederhana/ Moderate
		Pantai Lido	MMJC008	54	50	55	54	52	Sederhana/ Moderate
		Pantai Teluk Mahkota	MMJC009	93	95	93	95	91	Terbaik/ Excellent
		Pantai Tanjung Leman	MMJC010	97	94	96	96	93	Terbaik/ Excellent
		Pantai Sri Pantai	MMJC011	91	95	97	96	94	Terbaik/ Excellent

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
Table 4.5: Marine Water Quality Status for Coastal Area

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Pantai/Coastal	Tanjung Merak	MMJC012	85	89	92	95	90	Terbaik/ Excellent
		Tanjung Pengelih	MMJC013	92	88	94	95	92	Terbaik/ Excellent
		Pantai Tanjong Stapa	MMJC014	72	77	93	95	76	Sederhana/ Moderate
		Pantai Teluk Gorek	MMJC015	93	93	95	96	94	Terbaik/ Excellent
		Pantai Air Papan	MMJC016	92	93	95	95	95	Terbaik/ Excellent
		Jeti Kukup	MMJC017	62	83	70	76	77	Sederhana/ Moderate
		Pasir Gogok	MMJC018	89	89	91	93	84	Baik/Good
		Tanjung Buai	MMJC019	91	87	89	90	83	Baik/Good
		Pantai Desaru	MMJC020	94	95	96	94	96	Terbaik/ Excellent
		Tanjung Sepang	MMJC021	90	93	92	94	88	Baik/Good
		Tanjung Penyusup	MMJC022	93	93	95	94	93	Terbaik/ Excellent
		Pantai Sungai Lurus	MMJC023	88	85	94	94	84	Baik/Good
		Punggur	MMJC024	90	79	95	81	74	Sederhana/ Moderate
		Pantai Penyabung	MMJC025	95	96	94	95	95	Terbaik/ Excellent
		Tanjung Resang	MMJC026	92	94	94	95	94	Terbaik/ Excellent
		Tanjung Balau	MMJC027	94	94	97	96	94	Terbaik/ Excellent
		Batu Layar	MMJC028	92	95	97	96	94	Terbaik/ Excellent
		Tanjung Sengat	MMJC029	85	92	83	89	88	Baik/Good
Pahang	Pantai/Coastal	Pantai Cherating (Club Med A)	MMCC001	95	80	96	96	95	Terbaik/ Excellent
		Pantai Cherating (Club Med B)	MMCC002	97	87	96	97	96	Terbaik/ Excellent
		Pantai Cherating (Legend A)	MMCC003	93	93	96	95	94	Terbaik/ Excellent
		Pantai Cherating (Legend B)	MMCC004	95	94	96	97	96	Terbaik/ Excellent
		Pantai Muhibbah Balok A	MMCC005	90	93	96	94	93	Terbaik/ Excellent
		Pantai Muhibbah Balok B	MMCC006	74	90	92	94	72	Sederhana/ Moderate
		Pantai Batu Hitam A	MMCC007	92	93	92	95	93	Terbaik/ Excellent
		Pantai Batu Hitam B	MMCC008	84	96	94	97	92	Terbaik/ Excellent
		Pantai Berserah A	MMCC009	93	93	93	95	96	Terbaik/ Excellent
		Pantai Berserah B	MMCC010	90	90	94	93	95	Terbaik/ Excellent
		Pantai Teluk Cempedak A	MMCC011	94	95	95	92	93	Terbaik/ Excellent

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
 Table 4.5: Marine Water Quality Status for Coastal Area

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Pahang	Pantai/Coastal	Pantai Teluk Cempedak B	MMCC012	93	95	96	87	95	Terbaik/ Excellent
		Pantai Teluk Gelora A	MMCC013	72	70	95	91	94	Terbaik/ Excellent
		Pantai Teluk Gelora B	MMCC014	59	59	92	87	89	Baik/Good
		Pantai Sepat A	MMCC015	94	96	96	96	94	Terbaik/ Excellent
		Pantai Sepat B	MMCC016	95	95	94	95	94	Terbaik/ Excellent
		Pantai Legenda A	MMCC017	92	95	96	96	95	Terbaik/ Excellent
		Pantai Legenda B	MMCC018	92	95	97	96	96	Terbaik/ Excellent
		Pantai Kuala Api-Api	MMCC019	94	95	96	96	95	Terbaik/ Excellent
		Pantai Tanjung Batu	MMCC020	94	92	96	95	96	Terbaik/ Excellent
		Pantai Chendor	MMCC021	92	84	95	96	95	Terbaik/ Excellent
		Pantai Lanjut	MMCC022	94	91	95	93	96	Terbaik/ Excellent
Terengganu	Pantai/Coastal	Pantai Batu Buruk	MMTC001	88	95	91	97	95	Terbaik/ Excellent
		Pantai Bukit Keluang	MMTC002	96	95	96	96	95	Terbaik/ Excellent
		Pantai Chendering	MMTC003	95	95	97	96	93	Terbaik/ Excellent
		Pantai Rantau Abang	MMTC004	96	97	97	96	94	Terbaik/ Excellent
		KIPC Utara	MMTC005	95	94	96	96	96	Terbaik/ Excellent
		KIPC Tengah	MMTC006	94	94	96	96	95	Terbaik/ Excellent
		KIPC Selatan	MMTC007	95	95	96	95	93	Terbaik/ Excellent
		Pantai Rhu 10	MMTC008	97	90	97	97	96	Terbaik/ Excellent
		Pantai Tok Jembal	MMTC009	95	96	97	96	94	Terbaik/ Excellent
		Pantai Kelulut	MMTC010	96	97	97	96	89	Baik/Good
		Pantai Teluk Ketapang	MMTC011	96	96	97	96	95	Terbaik/ Excellent
		Pantai Kuala Abang	MMTC012	95	97	97	96	95	Terbaik/ Excellent
		Pantai Teluk Kalong	MMTC013	95	97	96	97	96	Terbaik/ Excellent
		Pantai Sura	MMTC014	94	96	97	96	92	Terbaik/ Excellent
		Pantai Tanjung Bidara	MMTC015	94	97	97	97	96	Terbaik/ Excellent
		Pantai Kemasik	MMTC016	97	97	96	95	95	Terbaik/ Excellent

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
Table 4.5: Marine Water Quality Status for Coastal Area

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kelantan	Pantai/Coastal	Pantai Seri Tujuh	MMDC001	93	94	95	95	94	Terbaik/ Excellent
		Pantai Cahaya Bulan	MMDC002	95	95	96	97	95	Terbaik/ Excellent
		Pantai Sabak	MMDC003	95	95	96	96	93	Terbaik/ Excellent
		Pantai Irama Bachok	MMDC004	95	93	95	96	95	Terbaik/ Excellent
		Pantai Bisikan Bayu	MMDC005	95	94	96	96	95	Terbaik/ Excellent
		Pantai Melawi	MMDC006	95	95	95	96	95	Terbaik/ Excellent
Sarawak	Pantai/Coastal	Pantai Sematan	MMQC001	93	90	66	68	79	Sederhana/ Moderate
		Pantai Pandan	MMQC002	92	86	62	60	75	Sederhana/ Moderate
		Pantai Pasir Putih	MMQC003	84	85	76	64	75	Sederhana/ Moderate
		Pantai Bako	MMQC004	89	91	70	63	80	Baik/Good
		Pantai Damai	MMQC005	86	89	75	74	89	Baik/Good
		Pantai Tanjung Kembang	MMQC006	77	90	58	70	69	Sederhana/ Moderate
		Pantai Harmoni Mukah	MMQC007	67	73	76	78	73	Sederhana/ Moderate
		Pantai Tanjung Batu	MMQC008	81	74	58	68	66	Sederhana/ Moderate
		Pantai Likau	MMQC009	88	66	58	75	83	Baik/Good
		Pantai Emas	MMQC010	75	66	58	72	76	Sederhana/ Moderate
		Pantai Piasau	MMQC011	85	74	72	58	65	Sederhana/ Moderate
		Pantai Brighton	MMQC012	75	56	61	57	74	Sederhana/ Moderate
		Pantai Esplaned	MMQC013	83	56	57	57	82	Baik/Good
		Pantai Beraya	MMQC014	83	57	58	58	81	Baik/Good
		Pantai Bungai	MMQC015	75	66	56	57	83	Baik/Good
		Pantai Belawai	MMQC016	67	92	64	61	73	Sederhana/ Moderate
		Pantai Mukah	MMQC017	89	89	76	75	79	Sederhana/ Moderate
		Tanjung Kidurong	MMQC018	80	90	58	75	69	Sederhana/ Moderate
		Pasir Pandak	MMQC019	91	91	66	74	78	Sederhana/ Moderate
		Rambungan	MMQC020	93	83	71	76	82	Baik/Good
		Sri Tanjung Lawas	MMQC021	68	67	59	59	84	Baik/Good
		Pantai Luak	MMQC022	84	56	57	57	70	Sederhana/ Moderate
		Pasir Panjang	MMQC023	86	78	58	68	75	Sederhana/ Moderate

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
 Table 4.5: Marine Water Quality Status for Coastal Area

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Pantai/Coastal	Pantai Teluk Brunei 1	MMSC001	73	61	60	74	65	Sederhana/ Moderate
		Pantai Teluk Brunei 2	MMSC002	84	67	59	75	79	Sederhana/ Moderate
		Pantai Teluk Brunei 3	MMSC003	75	67	59	66	67	Sederhana/ Moderate
		Pantai Teluk Brunei 4	MMSC004	84	60	59	66	81	Baik/Good
		Pantai Teluk Brunei 5	MMSC005	69	59	59	59	74	Sederhana/ Moderate
		Pantai Teluk Brunei 6	MMSC006	58	59	59	74	89	Baik/Good
		Borneo Golf Seawater	MMSC007	59	67	59	71	81	Baik/Good
		Pantai Manis Papar	MMSC008	59	60	62	59	74	Sederhana/ Moderate
		Pantai Melinsung	MMSC009	70	59	65	60	60	Sederhana/ Moderate
		Pantai Tanjung Aru (Roll Skating)	MMSC010	65	57	58	61	87	Baik/Good
		Pantai Tanjung Aru (No. 3)	MMSC011	76	57	59	64	87	Baik/Good
		Pantai Lok Kawi	MMSC012	65	58	59	58	83	Baik/Good
		Pantai Dalit Tuaran	MMSC013	58	58	59	74	59	Sederhana/ Moderate
		Mangrove Paradise	MMSC014	58	58	61	72	66	Sederhana/ Moderate
		Pantai Sabandar	MMSC015	58	58	59	73	62	Sederhana/ Moderate
		Pantai Bak-Bak Kudat	MMSC016	76	85	59	64	78	Sederhana/ Moderate
		Pasir Putih Sandakan	MMSC017	83	82	58	73	73	Sederhana/ Moderate
		Pantai TLDM	MMSC018	75	62	59	89	79	Sederhana/ Moderate
		Pantai Batu Sapi	MMSC019	76	75	58	77	79	Sederhana/ Moderate
		Pantai Ulu Tungku	MMSC020	57	58	59	69	65	Sederhana/ Moderate
		Pantai Sarina Kunak	MMSC021	58	58	59	62	69	Sederhana/ Moderate
		Pantai Kg. Lamak	MMSC022	57	61	59	68	80	Baik/Good
		Pantai Tinagat	MMSC023	58	68	58	88	62	Sederhana/ Moderate
		Pantai Tanjung Aru (Rest Lido)	MMSC024	69	58	59	81	89	Baik/Good

Jadual 4.5: Status Kualiti Air Marin bagi Kawasan Pantai
Table 4.5: Marine Water Quality Status for Coastal Area

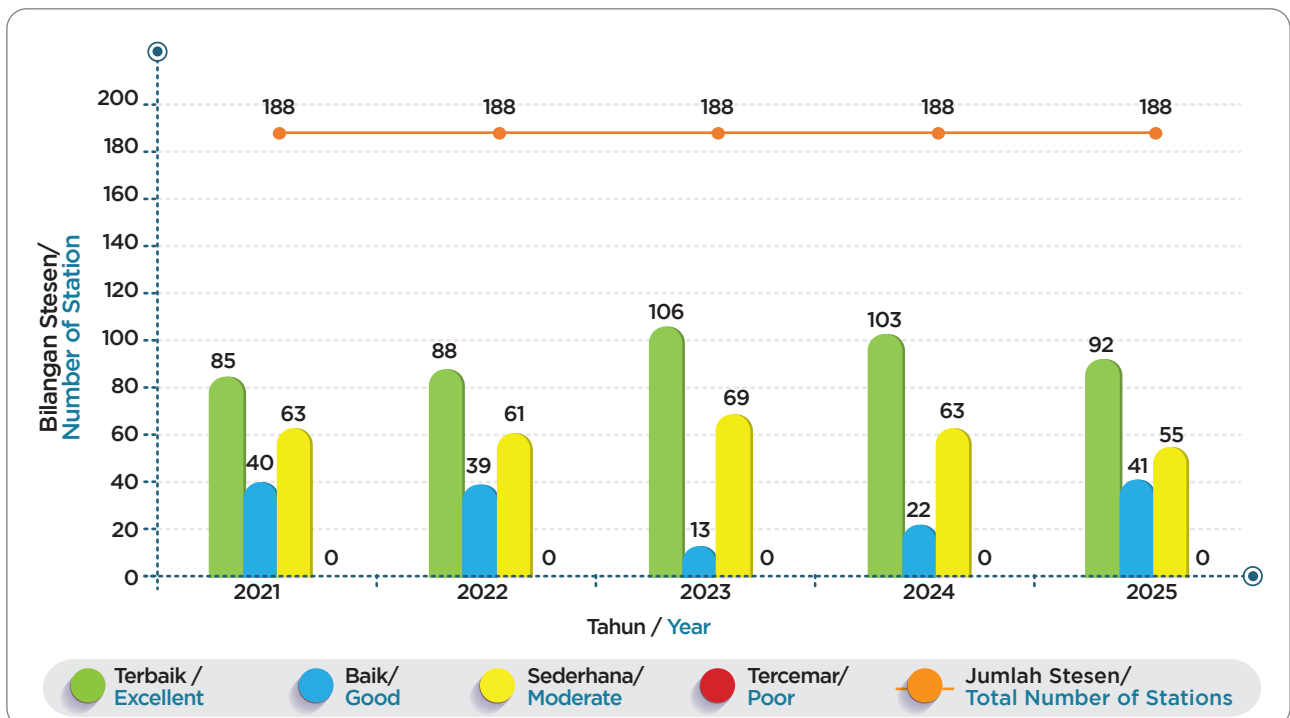
NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/ MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
W.P. Labuan	Pantai/Coastal	Pulau Papan	MMLC001	59	58	59	58	83	Baik/Good
		Kiamsam	MMLC002	58	58	59	72	79	Sederhana/ Moderate
		Sungai Pagar	MMLC003	58	59	59	76	75	Sederhana/ Moderate
		Layang-Layangan	MMLC004	57	58	59	74	88	Baik/Good
		Tanjung Aru	MMLC005	59	60	59	65	71	Sederhana/ Moderate

Nota / Notes

● Terbaik/ Excellent ● Baik/ Good ● Sederhana/ Moderate ● Tercemar/ Poor

Rajah 4.8 menunjukkan bilangan stesen MMWQM mengikut status kualiti air marin bagi kawasan pantai dari tahun 2021 hingga 2025. Bilangan stesen terbaik menurun daripada 103 stesen pada tahun 2024 kepada 92 stesen pada tahun 2025. Walau bagaimanapun, stesen dengan status kualiti air baik meningkat daripada 22 stesen pada tahun 2024 kepada 41 stesen pada tahun 2025. Tiada stesen tercemar direkodkan pada tahun 2025.

Figure 4.8 shows the number of MMWQM stations based on the marine water quality status in the coastal environment from 2021 to 2025. The number of excellent water quality stations decreased from 103 stations in 2024 to 92 stations in 2025. However, the number of stations that were classified as having good water quality increased from 22 stations in year 2024 to 41 stations in year 2025. There was no polluted station recorded in year 2025.



Rajah 4.8: Trend Status Kualiti Air Marin bagi Kawasan Pantai, 2021-2025
Figure 4.8: The Marine Water Quality Status Trend for Coastal Area, 2021 -2025

STATUS KUALITI AIR MARIN BAGI MUARA SUNGAI

Marine Water Quality Status for Estuary

Status kualiti air marin bagi 85 stesen muara sungai telah dipantau pada tahun 2025. Daripada 85 stesen yang dipantau, kualiti air marin bagi empat (4) stesen (5%) telah dikategorikan sebagai terbaik, 9 stesen (10%) baik, 68 stesen (80%) dikategorikan sebagai sederhana manakala terdapat empat (4) stesen (5%) dikategorikan sebagai tercemar (**Jadual 4.6**). Bilangan stesen yang dikategorikan sebagai baik telah menurun daripada 14 stesen tahun lalu kepada sembilan (9) stesen tahun ini. Namun, bilangan stesen yang disenaraikan sebagai tercemar telah berkurang daripada lima (5) stesen tahun lalu, kepada empat (4) stesen tahun ini.

The marine water quality status of a total of 85 estuary stations were monitored in 2025. Out of the 85 stations monitored this year, the marine water quality of four (4) stations (5%) were ranked as excellent, 9 stations (10%) ranked as good, 68 stations (80%) were ranked as moderate, while there were four (4) stations (5%) that were ranked as poor (**Table 4.6**). The number of stations that were categorised as good water quality decreased from 14 stations last year to nine (9) stations this year. However, the number of stations listed as poor slightly reduced from five (5) stations last year to four (4) stations this year.

Jadual 4.6: Status Kualiti Air Marin bagi Muara Sungai
 Table 4.6: Marine Water Quality Status for Estuary

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perlis	Muara Sungai/ Estuary	Kuala Sungai Perlis	MMRE001	57	57	55	58	57	Sederhana/ Moderate
		Kuala Sungai Baru	MMRE002	57	57	56	56	57	Sederhana/ Moderate
Kedah	Muara Sungai/ Estuary	Kuala Kedah	MMKE001	57	56	54	64	56	Sederhana/ Moderate
		Kuala Jerlun	MMKE002	55	54	56	57	56	Sederhana/ Moderate
		Kuala Segantang Garam	MMKE003	69	72	58	57	56	Sederhana/ Moderate
		Kuala Sungai Muda	MMKE004	56	57	56	57	57	Sederhana/ Moderate
P. Pinang	Muara Sungai/ Estuary	Kuala Sungai Jawi	MMPE001	43	52	72	53	69	Sederhana/ Moderate
		Kuala Sungai Juru	MMPE002	42	53	55	47	46	Tercemar/ Poor
		Kuala Sungai Kerian	MMPE003	56	73	55	68	79	Sederhana/ Moderate
		Kuala Sungai Pinang	MMPE004	52	54	48	47	47	Tercemar/ Poor
		Kuala Sungai Perai	MMPE005	55	55	56	55	52	Sederhana/ Moderate
		Kuala Sungai Tengah	MMPE006	57	81	87	65	76	Sederhana/ Moderate
		Kuala Sungai Pinang (Balik Pulau)	MMPE007	56	58	72	56	64	Sederhana/ Moderate

Jadual 4.6: Status Kualiti Air Marin bagi Muara Sungai
Table 4.6: Marine Water Quality Status for Estuary

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Perak	Muara Sungai/ Estuary	Kuala Sungai Manjung	MMAE001	73	85	89	94	86	Baik/Good
		Kuala Sungai Gula	MMAE002	54	79	57	58	69	Sederhana/ Moderate
		Kuala Sungai Kurau	MMAE003	54	64	56	58	54	Sederhana/ Moderate
		Kuala Sungai Tanjung Piandang	MMAE004	45	50	51	51	53	Sederhana/ Moderate
		Kuala Sungai Sepetang	MMAE005	55	53	53	58	56	Sederhana/ Moderate
		Kuala Sungai Perak	MMAE006	55	75	62	82	66	Sederhana/ Moderate
Selangor	Muara Sungai/ Estuary	Kuala Sungai Sepang	MMBE001	66	72	83	70	71	Sederhana/ Moderate
		Kuala Sungai Sepang (Kecil)	MMBE002	80	58	82	57	72	Sederhana/ Moderate
		Kuala Sungai Sepang (Kawalan)	MMBE003	81	91	90	84	89	Baik/Good
		Kuala Sungai Langat (Jugra)	MMBE004	54	58	63	53	54	Sederhana/ Moderate
		Kuala Sungai Klang	MMBE005	40	43	51	51	49	Tercemar/ Poor
		Kuala Sungai Langat (Lumut)	MMBE006	54	55	60	63	54	Sederhana/ Moderate
		Kuala Sungai Buloh	MMBE007	57	56	64	56	57	Sederhana/ Moderate
		Kuala Sungai Selangor	MMBE008	43	51	55	49	54	Sederhana/ Moderate
		Kuala Sungai Tengi	MMBE009	51	48	56	52	55	Sederhana/ Moderate
		Kuala Sungai Bernam	MMBE010	55	61	54	55	57	Sederhana/ Moderate
N. Sembilan	Muara Sungai/ Estuary	Kuala Sungai Linggi	MMNE001	68	55	68	67	54	Sederhana/ Moderate
		Kuala Sungai Lukut	MMNE002	56	53	55	52	52	Sederhana/ Moderate
Melaka	Muara Sungai/ Estuary	Kuala Sungai Melaka	MMME001	60	63	56	54	56	Sederhana/ Moderate
		Kuala Sungai Sri Melaka	MMME002	50	54	53	56	54	Sederhana/ Moderate
		Kuala Sungai Merlimau	MMME003	58	57	53	55	56	Sederhana/ Moderate
		Kuala Sungai Kesang	MMME004	74	57	57	56	58	Sederhana/ Moderate
		Kuala Sungai Sebatu	MMME005	63	75	57	53	59	Sederhana/ Moderate
		Kuala Sungai Melaka 2	MMME006	56	54	55	55	56	Sederhana/ Moderate
		Kuala Sungai Baru	MMME007	57	64	54	56	55	Sederhana/ Moderate
		Kuala Sungai Lereh	MMME008	55	56	53	49	55	Sederhana/ Moderate

Jadual 4.6: Status Kualiti Air Marin bagi Muara Sungai
 Table 4.6: Marine Water Quality Status for Estuary

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Muara Sungai/ Estuary	Kuala Sungai Segget	MMJE001	51	46	51	53	48	Tercemar/ Poor
		Kuala Sungai Laloh	MMJE002	55	54	52	59	54	Sederhana/ Moderate
		Kuala Sungai Johor	MMJE003	92	92	81	89	86	Baik/Good
		Kuala Sungai Batu Pahat	MMJE004	58	57	57	52	55	Sederhana/ Moderate
		Kuala Sungai Muar	MMJE005	57	55	56	56	55	Sederhana/ Moderate
		Kuala Sungai Mersing	MMJE006	59	59	78	58	59	Sederhana/ Moderate
Pahang	Muara Sungai/ Estuary	Kuala Kuantan	MMCE001	58	58	58	60	59	Sederhana/ Moderate
		Kuala Rompin Kecil	MMCE002	72	79	90	87	82	Baik/Good
		Kuala Pahang	MMCE003	57	59	81	59	59	Sederhana/ Moderate
		Kuala Nenasi	MMCE004	85	91	89	89	62	Sederhana/ Moderate
		Kuala Sungai Balok	MMCE005	55	65	54	41	51	Sederhana/ Moderate
Terengganu	Muara Sungai/ Estuary	Kuala Sungai Besut	MMTE001	74	70	60	89	71	Sederhana/ Moderate
		Kuala Sungai Dungun	MMTE002	69	59	85	87	59	Sederhana/ Moderate
		Kuala Sungai Ibai	MMTE003	90	87	73	92	87	Baik/Good
		Kuala Sungai Kerteh	MMTE004	58	75	75	85	84	Baik/Good
		Kuala Sungai Marang	MMTE005	84	84	79	86	79	Sederhana/ Moderate
		Kuala Sungai Paka	MMTE006	65	87	83	83	84	Baik/Good
		Kuala Sungai Setiu	MMTE007	92	75	92	92	90	Terbaik/ Excellent
		Kuala Sungai Terengganu	MMTE008	66	59	69	59	74	Sederhana/ Moderate
		Kuala Sungai Kemaman/ Chukai	MMTE009	58	59	60	64	75	Sederhana/ Moderate
		Tioxide Utara (Kg. Bukit Kuang, Kijal)	MMTE010	94	97	95	97	96	Terbaik/ Excellent
		Tioxide Tengah (Pupuk Semangat, Kijal)	MMTE011	93	96	95	97	96	Terbaik/ Excellent
		Tioxide Selatan (Ksb, T. Kalong)	MMTE012	86	95	95	97	96	Terbaik/ Excellent
		Pulau Duyung	MMTE013	59	60	59	59	73	Sederhana/ Moderate

Jadual 4.6: Status Kualiti Air Marin bagi Muara Sungai
Table 4.6: Marine Water Quality Status for Estuary

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kelantan	Muara Sungai/ Estuary	Kuala Sungai Golok	MMDE001	79	65	74	87	82	Baik/Good
		Kuala Sungai Kelantan	MMDE002	70	57	66	79	68	Sederhana/ Moderate
		Kuala Sungai Pengkalan Chepa	MMDE003	64	59	61	59	58	Sederhana/ Moderate
		Kuala Sungai Pengkalan Datu	MMDE004	59	69	59	87	71	Sederhana/ Moderate
		Kuala Sungai Kemasin	MMDE005	59	58	63	89	58	Sederhana/ Moderate
		Kuala Sungai Semerak	MMDE006	85	60	83	91	59	Sederhana/ Moderate
Sarawak	Muara Sungai/ Estuary	Kuala Sungai Semantan	MMQE001	90	70	71	62	78	Sederhana/ Moderate
		Kuala Sungai Sarawak	MMQE002	85	82	71	73	69	Sederhana/ Moderate
		Kuala Sungai Bako	MMQE003	79	88	70	68	65	Sederhana/ Moderate
		Kuala Sungai Santubong	MMQE004	90	90	64	73	72	Sederhana/ Moderate
		Kuala Batang Krian (Kabong)	MMQE005	71	87	58	58	77	Sederhana/ Moderate
		Kuala Batang Rejang	MMQE006	85	82	59	72	87	Baik/Good
		Kuala Mukah	MMQE007	62	70	58	80	72	Sederhana/ Moderate
		Kuala Batang Kemena	MMQE008	58	55	58	61	72	Sederhana/ Moderate
		Kuala Tanjung Similajau	MMQE009	85	67	59	59	69	Sederhana/ Moderate
		Kuala Sungai Panipah	MMQE010	83	64	58	62	65	Sederhana/ Moderate
		Kuala Pantai Nyalau	MMQE011	71	84	61	59	64	Sederhana/ Moderate
		Kuala Sungai Baram	MMQE012	76	55	61	58	57	Sederhana/ Moderate
		Kuala Sungai Miri	MMQE013	63	54	64	57	57	Sederhana/ Moderate
		Kuala Sungai Trusan	MMQE014	64	56	58	78	73	Sederhana/ Moderate
Sabah	Muara Sungai/ Estuary	Kuala Penyu	MMSE001	58	66	65	57	64	Sederhana/ Moderate
		Muara Sungai Inanam	MMSE002	59	58	59	57	56	Sederhana/ Moderate

Nota / Notes



Terbaik/ Excellent



Baik/ Good



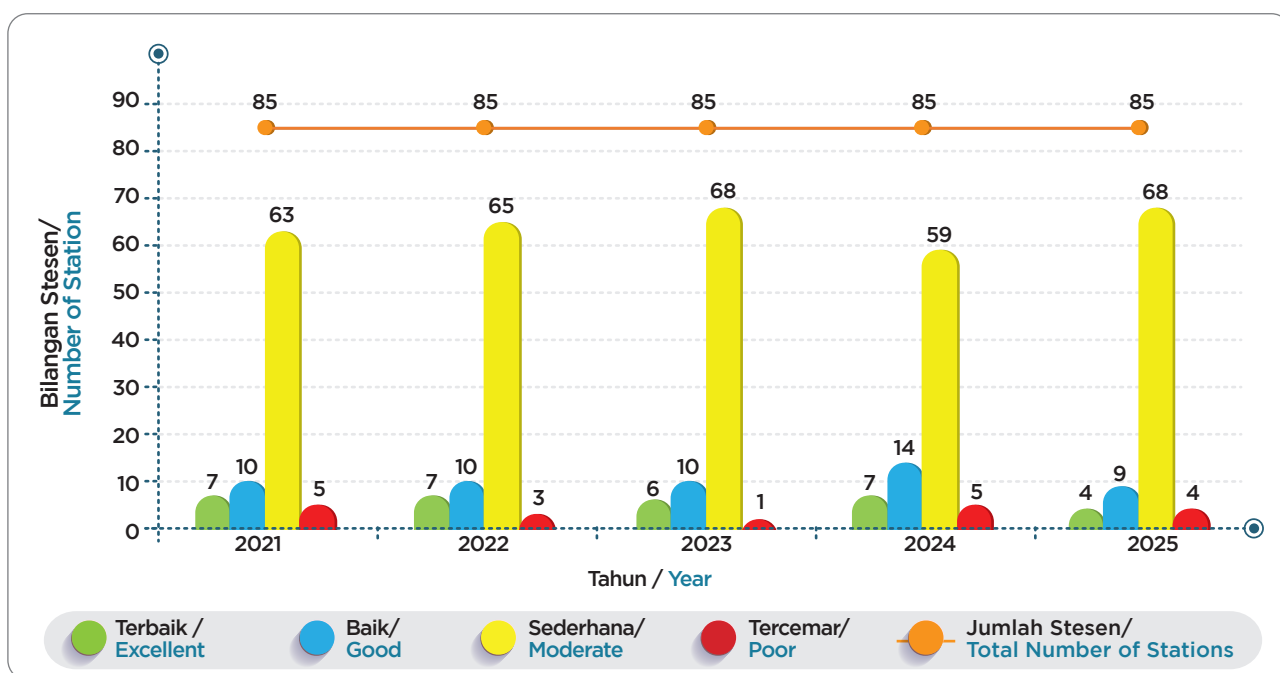
Sederhana/ Moderate



Tercemar/ Poor

Rajah 4.9 menunjukkan trend bilangan stesen pengawasan berdasarkan status kualiti air marin bagi stesen muara sungai. Pada tahun 2025, bilangan stesen yang dikategorikan sebagai terbaik (4 stesen) dan baik (9 stesen) menunjukkan sedikit penurunan. Bilangan stesen sederhana telah bertambah daripada 59 stesen pada tahun 2024 kepada 68 stesen pada tahun 2025. Namun, bilangan stesen yang dikategorikan sebagai tercemar telah berkurang sedikit daripada lima (5) stesen pada tahun 2024, kepada empat (4) stesen pada tahun 2025.

Figure 4.9 illustrates the trend of the number of monitoring stations based on the marine water quality status for estuaries stations. In 2025, the number of stations classified as excellent (4 stations) and good (9) shown a slight decreasing trend. The number of moderate stations were increased from 59 stations in year 2024 up to 68 stations in 2025. However, the number of stations that were categorised as poor reduced slightly from five (5) stations in 2024 to four (4) stations in 2025.



Rajah 4.9: Trend Status Kualiti Air Marin bagi Kawasan Muara Sungai, 2021-2025

Figure 4.9: The Marine Water Quality Status Trend for Estuary, 2021-2025

STATUS KUALITI AIR MARIN BAGI PULAU

Marine Water Quality Status for Islands

Sebanyak 95 stesen pengawasan kualiti air marin bagi pulau telah ditubuhkan meliputi 79 pulau yang telah dipantau pada tahun 2025. **Jadual 4.7** menunjukkan senarai stesen pengawasan kualiti air marin bagi pulau. Daripada 95 stesen pengawasan, 61 stesen (64%) dikategorikan terbaik, 19 stesen (20%) baik dan 15 stesen (16%) sederhana. Tiada stesen yang kualiti airnya dikategorikan sebagai tercemar pada tahun 2025 (**Jadual 4.8**).

A total of 95 island water quality monitoring stations were established for 79 islands which were monitored in the year 2025. **Table 4.7** shows the list of marine water quality monitoring stations for islands. Out of the 95 monitoring stations, the marine water quality of 61 stations (64%) were ranked as excellent, 19 stations (20%) ranked as good and the remaining 15 stations (16%) were ranked moderate. No station was ranked poor marine water quality in 2025 (**Table 4.8**).

Jadual 4.7: Stesen-Stesen Pengawasan Kualiti Air Marin bagi Pulau
Table 4.7: Marine Water Quality Monitoring Stations for Island

NEGERI / STATE	BIL. PULAU/ NO. OF ISLAND	BIL. STESEN/ NO. OF STATION	PULAU / ISLAND	ID STESEN LAMA/ OLD STATION ID	ID STESEN BARU/ NEW STATION ID	KATEGORI / CATEGORY
Kedah	11	1	Singa Besar	7KR01	MMKR001	Peranginan / Resort
		2	Dayang Bunting	7KR02	MMKR002	Peranginan / Resort
			Dayang Bunting 2*	NA	MMKR003	Peranginan / Resort
		1	Pulau Perak	7KP01	MMKP004	Dilindungi / Protected
		1	Payar	7KM03	MMKM001	Taman Laut / Marine Park
		1	Kaca	7KM04	MMKM002	Taman Laut / Marine Park
		1	Segantang	7KM06	MMKM003	Taman Laut / Marine Park
		4	Pantai Kuah	7KD07	MMKD001	Pembangunan / Development
			Pantai Chenang	7KD09	MMKD002	Pembangunan / Development
			Tanjung Rhu	7KD010	MMKD003	Pembangunan / Development
			Teluk Ewa	7KD08	MMKD004	Pembangunan / Development
		1	Lembu**	7KM05	NA	Taman Laut / Marine Park
		1	Pasir*	NA	MMKP001	Dilindungi / Protected
		1	Gasing*	NA	MMKP002	Dilindungi / Protected
		1	Dangli*	NA	MMKP003	Dilindungi / Protected
P. Pinang	7	1	Tanjung Tokong*	NA	MMPP001	Dilindungi / Protected
		3	Batu Maung	7PD01	MMPD001	Pembangunan / Development
			Padang Kota	7PD04	MMPD002	Pembangunan / Development
			Teluk Bahang	7PD03	MMPD003	Pembangunan / Development
		1	Aman	7PR05	MMPR001	Peranginan / Resort
		1	Jerejak	7PR06	MMPR002	Peranginan / Resort
		1	Kendi	7PR07	MMPR003	Peranginan / Resort
		1	Rimau	7PR08	MMPR004	Peranginan / Resort
Perak	4	2	Pantai Teluk Gedong	7AR01	MMAR001	Peranginan / Resort
			Pantai Puteri Dewi	7AR02	MMAR002	Peranginan / Resort
		1	Pangkor Laut	7AR03	MMAR003	Peranginan / Resort
		1	Sembilan	7AR04	MMAR004	Peranginan / Resort
		1	Tukun Perak	7AP05	MMAP001	Dilindungi / Protected
Selangor	3	1	Ketam	7BR01	MMBR001	Peranginan / Resort
		1	Angsa	7BR02	MMBR002	Peranginan / Resort
		1	Lumut	7BR03	MMBR003	Peranginan / Resort
N. Sembilan	1	1	Arang	7NP01	MMNP001	Dilindungi / Protected
Melaka	3	2	Upeh (Point A)	7MR02	MMMR001	Peranginan / Resort
			Upeh (Point B)	7MR02	MMMR002	Peranginan / Resort
		2	Besar (Point A)	7MR01	MMMR003	Peranginan / Resort
			Besar (Point B)	7MR01	MMMR004	Peranginan / Resort
		2	Undan (Point A)	7MR03	MMMR005	Peranginan / Resort
			Undan (Point B)	7MR03	MMMR006	Peranginan / Resort

Jadual 4.7: Stesen-Stesen Pengawasan Kualiti Air Marin bagi Pulau
Table 4.7: Marine Water Quality Monitoring Stations for Island

NEGERI / STATE	BIL. PULAU/ NO. OF ISLAND	BIL. STESEN/ NO. OF STATION	PULAU / ISLAND	ID STESEN LAMA/ OLD STATION ID	ID STESEN BARU/ NEW STATION ID	KATEGORI / CATEGORY
Johor	8	1	Setindan	7JR01	MMJR001	Peranginan / Resort
		1	Babi Tengah	7JR02	MMJR002	Peranginan / Resort
		1	Dayang	7JM03	MMJM001	Taman Laut / Marine Park
		1	Nanga Besar	7JM08	MMJM002	Taman Laut / Marine Park
		1	Sibu Tengah	7JM11	MMJM003	Taman Laut / Marine Park
		1	Pemanggil	7JM15	MMJM004	Taman Laut / Marine Park
		1	Kukup	7JP17	MMJP001	Dilindungi / Protected
		1	Pisang	7JP18	MMJP002	Dilindungi / Protected
Pahang	9	1	Pulau Tioman (Kg. Genting)	7CM02	MMCM001	Taman Laut / Marine Park
		1	Pulau Tioman (Teluk Salang)	7CM01	MMCM002	Taman Laut / Marine Park
		1	Tulai	7CM05	MMCM003	Taman Laut / Marine Park
		1	Labas	7CM07	MMCM004	Taman Laut / Marine Park
		1	Cebah	7CM04	MMCM005	Taman Laut / Marine Park
		1	Sepui	7CM06	MMCM006	Taman Laut / Marine Park
		1	Sembilang	7CM08	MMCM007	Taman Laut / Marine Park
		1	Seri Buat	7CM03	MMCM008	Taman Laut / Marine Park
		1	Tokong Bahara	7CM09	MMCM009	Taman Laut / Marine Park
Terengganu	9	1	Gemia	7TR01	MMTR001	Peranginan / Resort
		1	Perhentian Besar (South)	7TM04	MMTM001	Taman Laut / Marine Park
		2	Perhentian Besar (West)	7TM05	MMTM002	Taman Laut / Marine Park
			Perhentian Kecil	7TM06	MMTM003	Taman Laut / Marine Park
		2	Redang (North)	7TM07	MMTM004	Taman Laut / Marine Park
			Redang (South)	7TM08	MMTM005	Taman Laut / Marine Park
		1	Lang Tengah	7TM11	MMTM006	Taman Laut / Marine Park
		1	Pinang	7TM12	MMTM007	Taman Laut / Marine Park
		1	Ekor Tebu	7TM13	MMTM008	Taman Laut / Marine Park
		1	Lima	7TM14	MMTM009	Taman Laut / Marine Park
		1	Kapas	7TM09	MMTM010	Taman Laut / Marine Park
Kelantan	2	1	Panjang	7DP01	MMDP001	Dilindungi / Protected
		1	Kundur	7DP02	MMDP002	Dilindungi / Protected
Sarawak	3	1	Satang	7QP01	MMQP001	Dilindungi / Protected
		1	Talang-Talang Kecil	7QP02	MMQP002	Dilindungi / Protected
		1	Talang-Talang Besar	7QP03	MMQP003	Dilindungi / Protected

Jadual 4.7: Stesen-Stesen Pengawasan Kualiti Air Marin bagi Pulau
Table 4.7: Marine Water Quality Monitoring Stations for Island

NEGERI / STATE	BIL. PULAU/ NO. OF ISLAND	BIL. STESEN/ NO. OF STATION	PULAU / ISLAND	ID STESEN LAMA/ OLD STATION ID	ID STESEN BARU/ NEW STATION ID	KATEGORI / CATEGORY
Sabah	16	1	Gaya	7SR01	MMSR001	Peranginan / Resort
		1	Mabul	7SR03	MMSR002	Peranginan / Resort
		2	Sipadan (N)	7SR04	MMSR003	Peranginan / Resort
			Sipadan (W)	7SR05	MMSR004	Peranginan / Resort
		1	Manukan	7SM09	MMSR005	Peranginan / Resort
		1	Tiga	7SR10	MMSR006	Peranginan / Resort
		1	Kapalai	7SR12	MMSR007	Peranginan / Resort
		1	Molleangan Besar	7SR14	MMSR008	Peranginan / Resort
		1	Banggi (South)	7SR15	MMSR009	Peranginan / Resort
		1	Banggi (East)	7SR20	MMSR010	Peranginan / Resort
		1	Balambangan	7SR16	MMSR011	Peranginan / Resort
		1	Mantanani Besar	7SR21	MMSR012	Peranginan / Resort
		1	Sapi	7SM08	MMSM001	Taman Laut / Marine Park
		1	Kalampunian Besar	7SM11	MMSM002	Taman Laut / Marine Park
		1	Selingan	7SP17	MMSP001	Dilindungi / Protected
		1	Gulisan	7SP18	MMSP002	Dilindungi / Protected
		1	Bakungan Kecil	7SP19	MMSP003	Dilindungi / Protected
W. P Labuan	4	1	Kuraman	7LM05	MMLM001	Taman Laut / Marine Park
		1	Rusukan Besar	7LM07	MMLM002	Taman Laut / Marine Park
		1	Rusukan Kecil	7LM06	MMLM003	Taman Laut / Marine Park
		4	Pohon Batu	7LD01	MMLD001	Pembangunan / Development
			Water Front	7LD02	MMLD002	Pembangunan / Development
			Lubuk Temiang	7LD03	MMLD003	Pembangunan / Development
			Ranca-Ranca	7LD04	MMLD004	Pembangunan / Development

Nota / Notes:

* (Stesen baru / New station)

** (Stesen tutup / Closed station)

NA (Tidak berkenaan / Not available)



Jadual 4.8: Status Kualiti Air Marin bagi Pulau
Table 4.8: Marine Water Quality Status for Island

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Kedah	Pulau/ Island	Pantai Kuah	MMKD001	93	91	96	95	95	Terbaik/ Excellent
		Pantai Chenang	MMKD002	91	89	94	96	95	Terbaik/ Excellent
		Tanjung Rhu	MMKD003	91	91	96	96	95	Terbaik/ Excellent
		Teluk Ewa	MMKD004	92	96	88	96	95	Terbaik/ Excellent
		Payar	MMKM001	95	96	96	96	96	Terbaik/ Excellent
		Kaca	MMKM002	95	94	97	97	96	Terbaik/ Excellent
		Segantang	MMKM003	96	96	97	95	96	Terbaik/ Excellent
		Pasir	MMKP001	96	96	96	96	95	Terbaik/ Excellent
		Gasing	MMKP002	92	97	96	96	96	Terbaik/ Excellent
		Dangli	MMKP003	91	97	96	96	93	Terbaik/ Excellent
		Pulau Perak	MMKP004	92	96	96	96	96	Terbaik/ Excellent
		Singa Besar	MMKR001	88	90	96	95	95	Terbaik/ Excellent
		Dayang Bunting	MMKR002	95	91	96	95	95	Terbaik/ Excellent
		Dayang Bunting 2	MMKR003	92	94	96	96	95	Terbaik/ Excellent
P. Pinang	Pulau/ Island	Batu Maung	MMPD001	57	59	67	69	62	Sederhana/ Moderate
		Padang Kota	MMPD002	60	81	75	76	59	Sederhana/ Moderate
		Teluk Bahang	MMPD003	83	87	94	87	92	Terbaik/ Excellent
		Tanjung Tokong	MMPP001	68	83	88	93	93	Terbaik/ Excellent
		Aman	MMPR001	72	92	91	92	91	Terbaik/ Excellent
		Jerejak	MMPR002	76	59	73	70	88	Baik/Good
		Kendi	MMPR003	92	85	96	95	95	Terbaik/ Excellent
		Rimau	MMPR004	92	93	96	96	96	Terbaik/ Excellent
		Gedong	MMPR005	82	91	91	92	92	Terbaik/ Excellent
Perak	Pulau/ Island	Tukun Perak	MMAP001	96	96	92	96	95	Terbaik/ Excellent
		Pantai Teluk Gedong	MMAR001	88	84	91	96	94	Terbaik/ Excellent
		Pantai Puteri Dewi	MMAR002	95	94	94	96	94	Terbaik/ Excellent
		Pangkor Laut	MMAR003	96	95	95	94	95	Terbaik/ Excellent
		Sembilan	MMAR004	94	96	93	96	95	Terbaik/ Excellent
Selangor	Pulau/ Island	Ketam	MMBR001	72	85	94	88	81	Baik/Good
		Angsa	MMBR002	89	83	95	93	90	Terbaik/ Excellent
		Lumut	MMBR003	50	47	53	53	54	Sederhana/ Moderate
N. Sembilan	Pulau/ Island	Arang	MMNP001	94	92	94	95	95	Terbaik/ Excellent
Melaka	Pulau/ Island	Upeh (Point A)	MMMR001	77	77	94	92	90	Terbaik/ Excellent
		Upeh (Point B)	MMMR002	87	85	94	94	90	Terbaik/ Excellent
		Besar (Point A)	MMMR003	96	95	95	96	95	Terbaik/ Excellent
		Besar (Point B)	MMMR004	94	94	95	96	95	Terbaik/ Excellent
		Undan (Point A)	MMMR005	96	94	95	96	95	Terbaik/ Excellent
		Undan (Point B)	MMMR006	95	94	94	96	95	Terbaik/ Excellent

Jadual 4.8: Status Kualiti Air Marin bagi Pulau
Table 4.8: Marine Water Quality Status for Island

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Johor	Pulau/ Island	Dayang	MMJM001	95	93	97	96	97	Terbaik/ Excellent
		Nanga Besar	MMJM002	78	94	97	97	93	Terbaik/ Excellent
		Sibu Tengah	MMJM003	96	96	97	96	94	Terbaik/ Excellent
		Pemanggil	MMJM004	94	95	96	96	93	Terbaik/ Excellent
		Kukup	MMJP001	70	89	73	86	84	Baik/Good
		Pisang	MMJP002	86	90	92	95	88	Baik/Good
		Setindan	MMJR001	97	97	96	97	95	Terbaik/ Excellent
		Babi Tengah	MMJR002	93	97	97	97	96	Terbaik/ Excellent
Pahang	Pulau/Island	Pulau Tioman (Kg. Genting)	MMCM001	96	96	97	96	96	Terbaik/ Excellent
		Pulau Tioman (Teluk Salang)	MMCM002	96	97	97	96	96	Terbaik/ Excellent
		Tulai	MMCM003	97	97	97	96	96	Terbaik/ Excellent
		Labas	MMCM004	97	97	96	96	97	Terbaik/ Excellent
		Cebah	MMCM005	96	97	97	97	97	Terbaik/ Excellent
		Sepui	MMCM006	97	96	97	97	96	Terbaik/ Excellent
		Sembilang	MMCM007	97	97	97	97	97	Terbaik/ Excellent
		Seri Buat	MMCM008	97	97	97	96	96	Terbaik/ Excellent
		Tokong Bahara	MMCM009	95	97	97	95	96	Terbaik/ Excellent
Terengganu	Pulau/ Island	Perhentian Besar (South)	MMTM001	97	96	97	96	97	Terbaik/ Excellent
		Perhentian Besar (West)	MMTM002	96	97	97	97	96	Terbaik/ Excellent
		Perhentian Kecil	MMTM003	97	97	96	97	96	Terbaik/ Excellent
		Redang (North)	MMTM004	96	97	97	97	96	Terbaik/ Excellent
		Redang (South)	MMTM005	96	97	97	96	97	Terbaik/ Excellent
		Lang Tengah	MMTM006	97	97	97	97	96	Terbaik/ Excellent
		Pinang	MMTM007	96	97	97	97	96	Terbaik/ Excellent
		Ekor Tebu	MMTM008	97	97	97	96	95	Terbaik/ Excellent
		Lima	MMTM009	97	97	97	97	97	Terbaik/ Excellent
		Kapas	MMTM010	96	97	97	96	93	Terbaik/ Excellent
		Gemia	MMTR001	94	97	97	97	94	Terbaik/ Excellent
Kelantan	Pulau/ Island	Panjang	MMDP001	92	95	95	96	92	Terbaik/ Excellent
		Kundur	MMDP002	92	96	95	96	95	Terbaik/ Excellent
Sarawak	Pulau/ Island	Satang	MMQP001	86	89	81	78	88	Baik/Good
		Talang-Talang Kecil	MMQP002	93	86	84	59	81	Baik/Good
		Talang-Talang Besar	MMQP003	93	80	60	62	78	Sederhana/ Moderate

Jadual 4.8: Status Kualiti Air Marin bagi Pulau
 Table 4.8: Marine Water Quality Status for Island

NEGERI/ STATE	KLASIFIKASI STESEN/ STATION CLASSIFICATION	KAWASAN/ AREA	NOMBOR STESEN/ STATION NUMBER	NILAI IKAMM/MMWQI VALUE					KATEGORI (2025)/ CATEGORY (2025)
				2021	2022	2023	2024	2025	
Sabah	Pulau/ Island	Sapi	MMSM001	81	58	59	69	86	Baik/Good
		Kalampunian Besar	MMSM002	58	64	60	58	87	Baik/Good
		Selingan	MMSP001	74	81	59	77	87	Baik/Good
		Gulisan	MMSP002	70	72	59	59	77	Sederhana/ Moderate
		Bakungan Kecil	MMSP003	75	88	59	65	84	Baik/Good
		Gaya	MMSR001	72	58	58	71	85	Baik/Good
		Mabul	MMSR002	71	74	59	58	60	Sederhana/ Moderate
		Sipadan (N)	MMSR003	66	86	58	71	75	Sederhana/ Moderate
		Sipadan (W)	MMSR004	61	62	62	67	86	Baik/Good
		Manukan	MMSR005	86	57	59	62	86	Baik/Good
		Tiga	MMSR006	58	61	71	59	89	Baik/Good
		Kapalai	MMSR007	77	69	63	58	73	Sederhana/ Moderate
		Molleangan Besar	MMSR008	61	85	59	76	73	Sederhana/ Moderate
		Banggi (South)	MMSR009	58	81	59	60	81	Baik/Good
		Banggi (East)	MMSR010	60	85	58	68	77	Sederhana/ Moderate
		Balambangan	MMSR011	71	85	59	73	85	Baik/Good
		Mantanani Besar	MMSR012	58	58	59	61	71	Sederhana/ Moderate
W.P. Labuan	Pulau/Island	Pohon Batu	MMLD001	58	58	59	72	79	Sederhana/ Moderate
		Water Front	MMLD002	58	63	59	58	83	Baik/Good
		Lubuk Temiang	MMLD003	58	63	58	74	83	Baik/Good
		Ranca-Ranca	MMLD004	60	59	59	75	78	Sederhana/ Moderate
		Kuraman	MMLM001	58	58	59	74	87	Baik/Good
		Rusukan Besar	MMLM002	58	64	59	73	69	Sederhana/ Moderate
		Rusukan Kecil	MMLM003	58	59	59	71	65	Sederhana/ Moderate

Nota / Notes



Terbaik/ Excellent



Baik/ Good



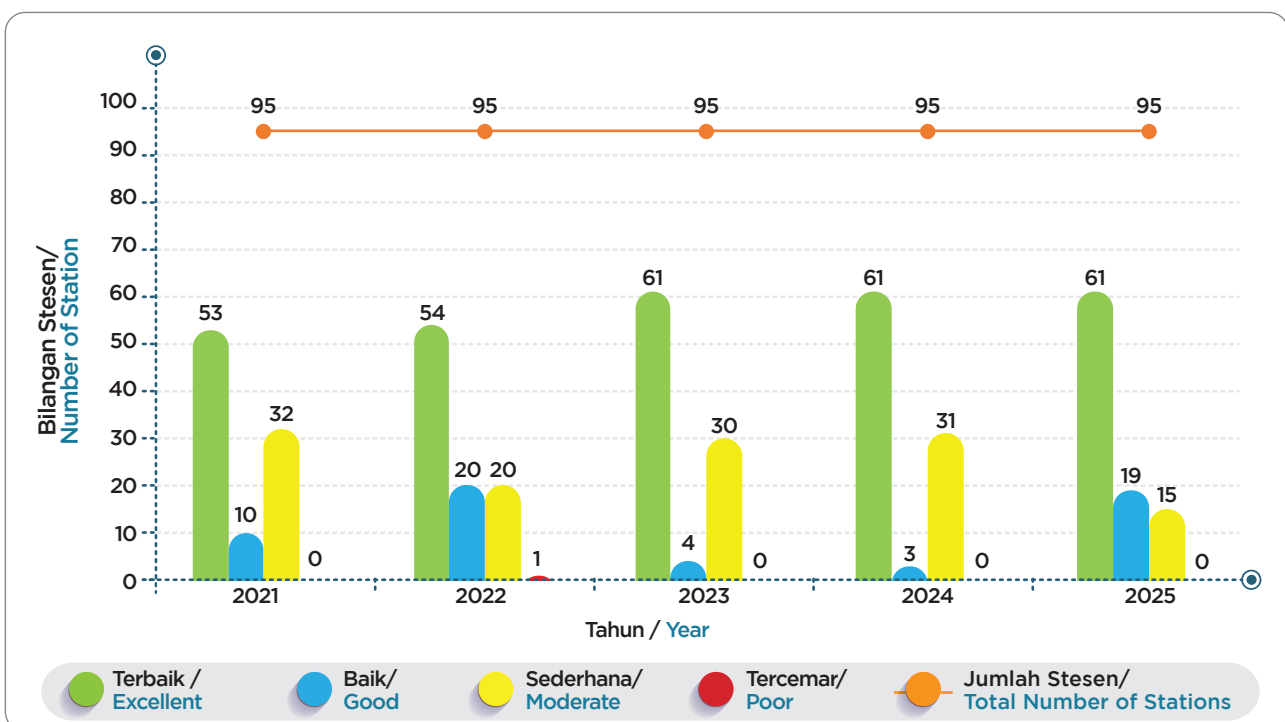
Sederhana/ Moderate



Tercemar/ Poor

Rajah 4.10 memaparkan trend bilangan stesen mengikut status kualiti air marin bagi stesen pulau. Bilangan stesen yang dikategorikan sebagai kualiti air marin terbaik kekal pada 61 stesen pada tahun 2025, sama seperti yang dilaporkan pada tahun 2024. Bilangan stesen baik meningkat daripada tiga (3) stesen pada tahun 2024 kepada 19 stesen pada tahun 2025. Bilangan stesen sederhana pula berkurang daripada 31 stesen tahun lalu kepada 15 stesen tahun ini. Tiada stesen tercemar dilaporkan pada tahun 2025.

Figure 4.10 shows the trend of the number of stations based on marine water quality status for island stations. The number of stations categorised as excellent remained at 61 stations in 2025, the same as reported in 2024. The number of stations that ranked as good slightly increased from three (3) stations in 2024 up to 19 stations in 2025. The number of stations with moderate quality were reduced from 31 stations last year to 15 stations this year. There is no poor water quality station in the year 2025.



Rajah 4.10: Trend Status Kualiti Air Marin bagi Pulau, 2021-2025

Figure 4.10: The Trend of Marine Water Quality Status for Island, 2021-2025

Jadual 4.9 menunjukkan status kualiti air marin mengikut bilangan stesen dan kategori stesen bagi tahun 2024 dan 2025. **Jadual 4.10** menunjukkan status kualiti air marin mengikut peratusan bilangan stesen dan kategori stesen bagi tahun 2024 dan 2025.

Table 4.9 shows the marine water quality status by number of stations and station categories for 2024 and 2025. **Table 4.10** shows the marine water quality status by number of stations and station categories on a percentage basis for 2024 and 2025.

Jadual 4.9: Status Kualiti Air Marin mengikut Bilangan Stesen dan Kategori Stesen, 2024-2025
Table 4.9: Marine Water Quality Status by Number of Stations and Station Categories, 2024-2025

KATEGORI STESEN / STATION CATEGORY	TERBAIK / EXCELLENT		BAIK / GOOD		SEDERHANA / MODERATE		TERCEMAR / POOR	
	2024	2025	2024	2025	2024	2025	2024	2025
Pantai / Coastal	103	92	22	41	63	55	0	0
Muara Sungai / Estuary	7	4	14	9	59	68	5	4
Pulau / Island	61	61	3	19	31	15	0	0
Pulau - Pembangunan / Island - Development	4	5	1	2	6	4	0	0
Pulau - Taman Laut / Island - Marine Park	26	26	0	3	5	2	0	0
Pulau - Dilindungi / Island - Protected	10	9	1	6	6	2	0	0
Pulau - Peranginan / Island - Resort	21	21	1	8	14	7	0	0
JUMLAH / TOTAL	171	157	39	69	153	138	5	4

Jadual 4.10: Status Kualiti Air Marin mengikut Peratusan Bilangan Stesen dan Kategori Stesen, 2024-2025

Table 4.10: Marine Water Quality Status by Number of Stations on Percentage Basis and Station Categories 2024-2025

KATEGORI STESEN / STATION CATEGORY	TERBAIK / EXCELLENT (%)		BAIK / GOOD (%)		SEDERHANA / MODERATE (%)		TERCEMAR / POOR (%)	
	2024	2025	2024	2025	2024	2025	2024	2025
Pantai / Coastal	55	49	12	22	33	29	0	0
Muara Sungai / Estuary	8	5	17	10	69	80	6	5
Pulau / Island	64	64	3	20	33	16	0	0
Pulau - Pembangunan / Island - Development	36	46	9	18	55	36	0	0
Pulau - Taman Laut / Island - Marine Park	84	84	0	10	16	6	0	0
Pulau - Dilindungi / Island - Protected	59	53	6	35	35	12	0	0
Pulau - Peranginan / Island - Resort	58	58	3	22	39	20	0	0
JUMLAH / TOTAL	46	43	11	19	42	37	1	1

Jadual 4.11 menunjukkan status kualiti air marin mengikut bilangan stesen dan kategori stesen bagi setiap negeri untuk tahun 2024 dan 2025. **Jadual 4.12** menunjukkan status kualiti air marin mengikut peratusan bilangan stesen dan kategori stesen bagi setiap negeri untuk tahun 2024 dan 2025.

Table 4.11 shows the marine water quality status by number of stations and station categories for the states for 2024 and 2025. **Table 4.12** shows the marine water quality status of stations and station categories for the state for 2024 and 2025 on a percentage basis.

Jadual 4.11: Status Kualiti Air Marin mengikut Bilangan Stesen dan Kategori Stesen untuk Negeri, 2024-2025

Table 4.11: Marine Water Quality Status by Number of Stations and Station Category for the State, 2024-2025

BIL. / NO.	NEGERI / STATE	STATUS KUALITI AIR MARIN / KATEGORI STESEN MARINE WATER QUALITY STATUS / STATION CATEGORY	TERBAIK / EXCELLENT		BAIK / GOOD		SEDERHANA / MODERATE		TERCEMAR / POOR	
			2024	2025	2024	2025	2024	2025	2024	2025
1	Perlis		0	0	0	0	2	2	0	0
		Pantai / Coastal	-	-	-	-	-	-	-	-
		Muara Sungai / Estuary	0	0	0	0	2	2	0	0
		Pulau / Island	-	-	-	-	-	-	-	-
2	P. Pinang		11	11	8	8	12	12	2	2
		Pantai / Coastal	6	5	7	7	4	5	0	0
		Muara Sungai / Estuary	0	0	0	0	5	5	2	2
		Pulau / Island	5	6	1	1	3	2	0	0
		Pulau - Pembangunan / Island - Development	0	1	1	0	2	2	0	0
		Pulau - Dilindungi / Island - Protected	1	1	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	4	4	0	1	1	0	0	0
3	Kedah		23	22	0	1	4	4	0	0
		Pantai / Coastal	9	8	0	1	0	0	0	0
		Muara Sungai / Estuary	0	0	0	0	4	4	0	0
		Pulau / Island	14	14	0	0	0	0	0	0
		Pulau - Pembangunan / Island - Development	4	4	0	0	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	3	3	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	4	4	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	3	3	0	0	0	0	0	0
4	Perak		14	13	1	1	4	5	0	0
		Pantai / Coastal	8	8	0	0	0	0	0	0
		Muara Sungai / Estuary	1	0	1	1	4	5	0	0
		Pulau / Island	5	5	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	1	1	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	4	4	0	0	0	0	0	0
5	Selangor		1	2	6	3	11	13	1	1
		Pantai / Coastal	0	1	4	1	2	4	0	0
		Muara Sungai / Estuary	0	0	1	1	8	8	1	1
		Pulau / Island	1	1	1	1	1	1	0	0
		Pulau - Peranginan / Island - Resort	1	1	1	1	1	1	0	0
6	N. Sembilan		15	14	0	1	2	2	0	0
		Pantai / Coastal	14	13	0	1	0	0	0	0
		Muara Sungai / Estuary	0	0	0	0	2	2	0	0
		Pulau / Island	1	1	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	1	1	0	0	0	0	0	0

Jadual 4.11: Status Kualiti Air Marin mengikut Bilangan Stesen dan Kategori Stesen untuk Negeri, 2024-2025
 Table 4.11: Marine Water Quality Status by Number of Stations and Station Category for the State, 2024-2025

BIL. / NO.	NEGERI / STATE	STATUS KUALITI AIR MARIN / KATEGORI STESEN MARINE WATER QUALITY STATUS / STATION CATEGORY	TERBAIK / EXCELLENT		BAIK / GOOD		SEDERHANA / MODERATE		TERCEMAR / POOR	
			2024	2025	2024	2025	2024	2025	2024	2025
7	Melaka		10	9	3	4	9	10	1	0
		Pantai / Coastal	4	3	3	4	2	2	0	0
		Muara Sungai / Estuary	0	0	0	0	7	8	1	0
		Pulau / Island	6	6	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	6	6	0	0	0	0	0	0
8	Johor		27	19	5	10	11	13	0	1
		Pantai / Coastal	20	13	3	7	6	9	0	0
		Muara Sungai / Estuary	0	0	1	1	5	4	0	1
		Pulau / Island	7	6	1	2	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	4	4	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	1	0	1	2	0	0	0	0
		Pulau - Peranginan / Island - Resort	2	2	0	0	0	0	0	0
9	Pahang		29	29	4	2	2	5	1	0
		Pantai / Coastal	20	20	2	1	0	1	0	0
		Muara Sungai / Estuary	0	0	2	1	2	4	1	0
		Pulau / Island	9	9	0	0	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	9	9	0	0	0	0	0	0
10	Terengganu		32	30	5	4	3	6	0	0
		Pantai / Coastal	16	15	0	1	0	0	0	0
		Muara Sungai / Estuary	5	4	5	3	3	6	0	0
		Pulau / Island	11	11	0	0	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	10	10	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	1	1	0	0	0	0	0	0
11	Kelantan		9	8	3	1	2	5	0	0
		Pantai / Coastal	6	6	0	0	0	0	0	0
		Muara Sungai / Estuary	1	0	3	1	2	5	0	0
		Pulau / Island	2	2	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	2	2	0	0	0	0	0	0
12	Sabah		0	0	3	18	40	25	0	0
		Pantai / Coastal	0	0	3	8	21	16	0	0
		Muara Sungai / Estuary	0	0	0	0	2	2	0	0
		Pulau / Island	0	0	0	10	17	7	0	0
		Pulau - Taman Laut / Island - Marine Park	0	0	0	2	2	0	0	0
		Pulau - Dilindungi / Island - Protected	0	0	0	2	3	1	0	0
		Pulau - Peranginan / Island - Resort	0	0	0	6	12	6	0	0

Jadual 4.11: Status Kualiti Air Marin mengikut Bilangan Stesen dan Kategori Stesen untuk Negeri, 2024-2025
Table 4.11: Marine Water Quality Status by Number of Stations and Station Category for the State, 2024-2025

BIL. / NO.	NEGERI / STATE	STATUS KUALITI AIR MARIN / KATEGORI STESEN MARINE WATER QUALITY STATUS / STATION CATEGORY	TERBAIK / EXCELLENT		BAIK / GOOD		SEDERHANA / MODERATE		TERCEMAR / POOR	
			2024	2025	2024	2025	2024	2025	2024	2025
13	Sarawak		0	0	1	11	39	29	0	0
		Pantai / Coastal	0	0	0	8	23	15	0	0
		Muara Sungai / Estuary	0	0	1	1	13	13	0	0
		Pulau / Island	0	0	0	2	3	1	0	0
		Pulau - Dilindungi / Island - Protected	0	0	0	2	3	1	0	0
14	W.P. Labuan		0	0	0	5	12	7	0	0
		Pantai / Coastal	0	0	0	2	5	3	0	0
		Muara Sungai / Estuary	-	-	-	-	-	-	-	-
		Pulau / Island	0	0	0	3	7	4	0	0
		Pulau - Pembangunan / Island - Development	0	0	0	2	4	2	0	0
		Pulau - Taman Laut / Island - Marine Park	0	0	0	1	3	2	0	0

Nota / Notes:

'-' (Tiada stesen / No station)

Jadual 4.12: Peratusan Status Kualiti Air Marin berdasarkan Kategori Stesen mengikut Negeri, 2024-2025

Table 4.12: Marine Water Quality Status of Station Categories by State on Percentage Basis, 2024-2025

BIL. / NO.	NEGERI / STATE	STATUS KUALITI AIR MARIN / KATEGORI STESEN MARINE WATER QUALITY STATUS / STATION CATEGORY	TERBAIK / EXCELLENT (%)		BAIK / GOOD (%)		SEDERHANA / MODERATE (%)		TERCEMAR / POOR (%)	
			2024	2025	2024	2025	2024	2025	2024	2025
1	Perlis		0	0	0	0	100	100	0	0
		Pantai / Coastal	-	-	-	-	-	-	-	-
		Muara Sungai / Estuary	0	0	0	0	100	100	0	0
		Pulau / Island	-	-	-	-	-	-	-	-
2	P. Pinang		33.33	33.33	24.24	24.24	36.36	36.36	6.07	6.07
		Pantai / Coastal	35.29	29.41	41.18	41.18	23.53	29.41	0	0
		Muara Sungai / Estuary	0	0	0	0	71.43	71.43	28.57	28.57
		Pulau / Island	55.56	66.67	11.11	11.11	33.33	22.22	0	0
		Pulau - Pembangunan / Island - Development	0	33.33	33.33	0	66.67	66.67	0	0
		Pulau - Dilindungi / Island - Protected	100	100	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	80.00	80.00	0	20.00	20.00	0	0	0

Jadual 4.12: Peratusan Status Kualiti Air Marin berdasarkan Kategori Stesen mengikut Negeri, 2024-2025
 Table 4.12: Marine Water Quality Status of Station Categories by State on Percentage Basis, 2024-2025

BIL. / NO.	NEGERI / STATE	STATUS KUALITI AIR MARIN/ KATEGORI STESEN MARINE WATER QUALITY STATUS/ STATION CATEGORY	TERBAIK / EXCELLENT (%)		BAIK / GOOD (%)		SEDERHANA / MODERATE (%)		TERCEMAR / POOR (%)	
			2024	2025	2024	2025	2024	2025	2024	2025
3	Kedah		85.19	81.48	0	3.71	14.81	14.81	0	0
		Pantai / Coastal	100	88.89	0	11.11	0	0	0	0
		Muara Sungai / Estuary	0	0	0	0	100	100	0	0
		Pulau / Island	100	100	0	0	0	0	0	0
		Pulau - Pembangunan / Island - Development	100	100	0	0	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	100	100	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	100	100	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	100	100	0	0	0	0	0	0
4	Perak		73.68	68.42	5.26	5.26	21.06	26.32	0	0
		Pantai / Coastal	100	100	0	0	0	0	0	0
		Muara Sungai / Estuary	16.67	0	16.67	16.67	66.66	83.33	0	0
		Pulau / Island	100	100	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	100	100	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	100	100	0	0	0	0	0	0
5	Selangor		5.26	10.53	31.58	15.79	57.89	68.42	5.27	5.26
		Pantai / Coastal	0	16.67	66.67	16.67	33.33	66.66	0	0
		Muara Sungai / Estuary	0	0	10.00	10.00	80.00	80.00	10.00	10.00
		Pulau / Island	33.33	33.33	33.33	33.33	33.34	33.34	0	0
		Pulau - Peranginan / Island - Resort	33.33	33.33	33.33	33.33	33.34	33.34	0	0
6	N. Sembilan		88.24	82.35	0	5.88	11.76	11.77	0	0
		Pantai / Coastal	100	92.86	0	7.14	0	0	0	0
		Muara Sungai / Estuary	0	0	0	0	100	100	0	0
		Pulau / Island	100	100	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	100	100	0	0	0	0	0	0
7	Melaka		43.48	39.13	13.04	17.39	39.13	43.48	4.35	0
		Pantai / Coastal	44.44	33.33	33.33	44.44	22.23	22.23	0	0
		Muara Sungai / Estuary	0	0	0	0	87.50	100	12.50	0
		Pulau / Island	100	100	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	100	100	0	0	0	0	0	0
8	Johor		62.79	44.19	11.63	23.25	25.58	30.23	0	2.33
		Pantai / Coastal	68.97	44.83	10.34	24.14	20.69	31.03	0	0
		Muara Sungai / Estuary	0	0	16.67	16.67	83.33	66.66	0	16.67
		Pulau / Island	87.50	75.00	12.50	25.00	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	100	100	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	50.00	0	50.00	100	0	0	0	0
		Pulau - Peranginan / Island - Resort	100	100	0	0	0	0	0	0

Jadual 4.12: Peratusan Status Kualiti Air Marin berdasarkan Kategori Stesen mengikut Negeri, 2024-2025
Table 4.12: Marine Water Quality Status of Station Categories by State on Percentage Basis, 2024-2025

BIL. / NO.	NEGERI / STATE	STATUS KUALITI AIR MARIN / KATEGORI STESEN MARINE WATER QUALITY STATUS / STATION CATEGORY	TERBAIK / EXCELLENT (%)		BAIK / GOOD (%)		SEDERHANA / MODERATE (%)		TERCEMAR / POOR (%)	
			2024	2025	2024	2025	2024	2025	2024	2025
9	Pahang		80.56	80.56	11.11	5.56	5.56	13.89	2.77	0
		Pantai / Coastal	90.91	90.90	9.09	4.55	0	4.55	0	0
		Muara Sungai / Estuary	0	0	40.00	20.00	40.00	80.00	20.00	0
		Pulau / Island	100	100	0	0	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	100	100	0	0	0	0	0	0
10	Terengganu		80.00	75.00	12.50	10.00	7.50	15.00	0	0
		Pantai / Coastal	100	93.75	0	6.25	0	0	0	0
		Muara Sungai / Estuary	38.46	30.77	38.46	23.08	23.08	46.15	0	0
		Pulau / Island	100	100	0	0	0	0	0	0
		Pulau - Taman Laut / Island - Marine Park	100	100	0	0	0	0	0	0
		Pulau - Peranginan / Island - Resort	100	100	0	0	0	0	0	0
11	Kelantan		64.29	57.14	21.43	7.14	14.28	35.72	0	0
		Pantai / Coastal	100	100	0	0	0	0	0	0
		Muara Sungai / Estuary	16.67	0	50.00	16.67	33.33	83.33	0	0
		Pulau / Island	100	100	0	0	0	0	0	0
		Pulau - Dilindungi / Island - Protected	100	100	0	0	0	0	0	0
12	Sabah		0	0	6.98	41.86	93.02	58.14	0	0
		Pantai / Coastal	0	0	12.50	33.33	87.50	66.67	0	0
		Muara Sungai / Estuary	0	0	0	0	100	100	0	0
		Pulau / Island	0	0	0	58.82	100	41.18	0	0
		Pulau - Taman Laut / Island - Marine Park	0	0	0	100	100	0	0	0
		Pulau - Dilindungi / Island - Protected	0	0	0	66.67	100	33.33	0	0
		Pulau - Peranginan / Island - Resort	0	0	0	50.00	100	50.00	0	0
13	Sarawak		0	0	2.50	27.50	97.50	72.50	0	0
		Pantai / Coastal	0	0	0	34.78	100	65.22	0	0
		Muara Sungai / Estuary	0	0	7.14	7.14	92.86	92.86	0	0
		Pulau / Island	0	0	0	66.67	100	33.33	0	0
		Pulau - Dilindungi / Island - Protected	0	0	0	66.67	100	33.33	0	0
14	W.P. Labuan		0	0	0	41.67	100	58.33	0	0
		Pantai / Coastal	0	0	0	40.00	100	60.00	0	0
		Muara Sungai / Estuary	-	-	-	-	-	-	-	-
		Pulau / Island	0	0	0	42.86	100	57.14	0	0
		Pulau - Pembangunan / Island - Development	0	0	0	50.00	100	50.00	0	0
		Pulau - Taman Laut / Island - Marine Park	0	0	0	33.33	100	66.67	0	0

Nota / Notes:

'-' (Tiada stesen / No station)

Stesen Marin Dalam Kategori Tercemar

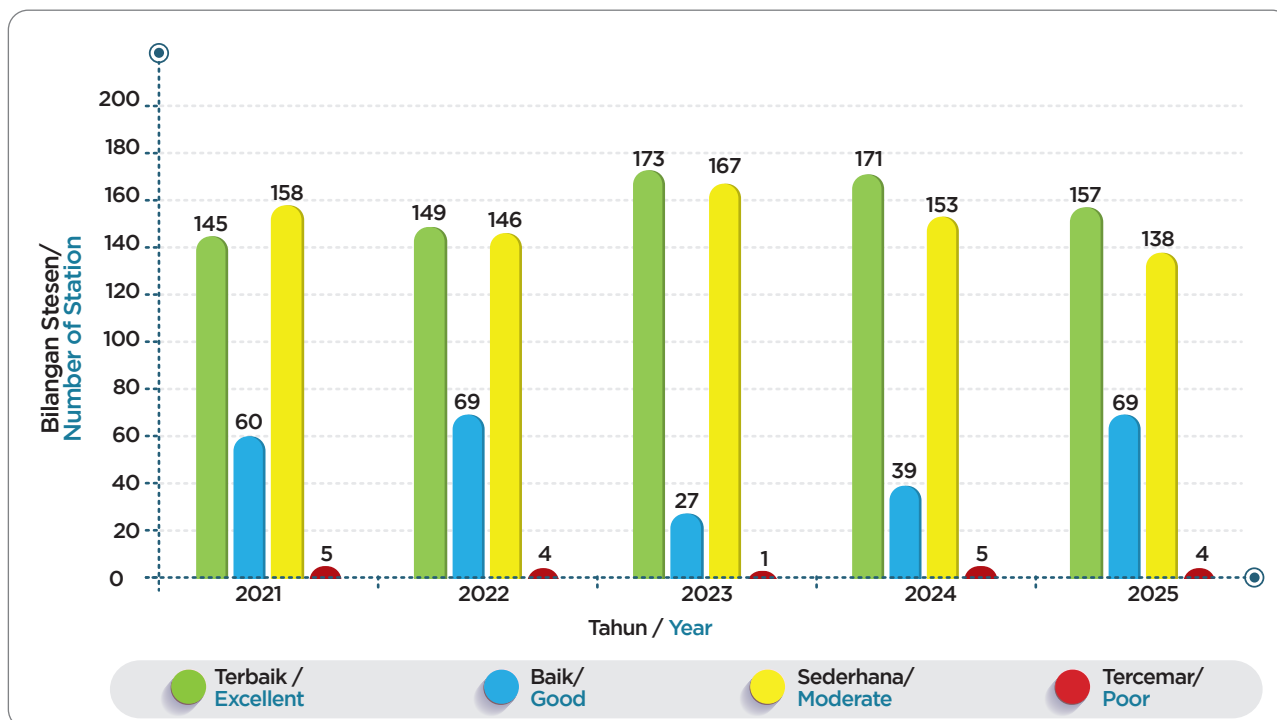
Jadual 4.13 memaparkan senarai stesen MMWQM yang dikategorikan sebagai tercemar pada tahun 2025. Nilai sub-indeks yang rendah memberi gambaran tahap impak ke atas status kualiti air marin secara keseluruhan. Justeru, *faecal coliform* merupakan faktor utama kemerosotan kualiti air marin di stesen tercemar tersebut, diikuti dengan kepekatan oksigen terlarut dan kandungan fosfat. **Rajah 4.11** menunjukkan trend stesen pengawasan kualiti air marin mengikut status dari tahun 2021 sehingga tahun 2025. Bilangan stesen tercemar pada tahun 2025 lebih rendah berbanding tahun lepas. **Jadual 4.14** menunjukkan indeks stesen pengawasan kualiti air marin dengan status kategori tercemar dari tahun 2021 ke 2025.

Marine Stations in the Poor Category

Table 4.13 shows the list of MMWQM stations that were ranked poor in 2025. The low value of a sub-index implies a greater degree of impact on the overall status of the marine water quality. Hence, faecal coliform was the primary factor that deteriorated the marine water quality of the poor stations, followed by dissolved oxygen level and phosphate concentration. **Figure 4.11** shows the trend of marine water quality monitoring stations by status from 2021 to 2025. The number of poor stations this year is slightly lower compared with the previous year. **Table 4.14** shows list of marine water quality monitoring stations under the category of poor status and their index, from 2021 to 2025.

Jadual 4.13: Senarai Stesen Pengawasan Kualiti Air Marin dengan Status Kategori Tercemar dan Sub-Indeks Mengikut Parameter, 2025
Table 4.13: List of Marine Water Quality Monitoring Stations under the Category of Poor Status and Sub-Index by Parameter, 2025

NEGERI / STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	LOKASI / LOCATION	STESEN ID / ID STATION	IKAMM / MMWQI	STATUS / STATUS	SUB-INDEKS / SUB-INDEX					
						OKSIGEN TERLARUT / DISSOLVED OXYGEN	AMMONIA TIDAK TERION / UNIONIZED AMMONIA	FAECAL COLIFORM	JUMLAH PEPEJAL TERAMPAI / TOTAL SUSPENDED SOLID	NITRAT / NITRATE	FOSFAT / PHOSPHATE
Selangor	Muara Sungai / Estuary	Kuala Sungai Klang	MMBE005	49	Tercemar / Poor	89	85	8	92	76	55
Johor	Muara Sungai / Estuary	Kuala Sungai Segget	MMJE001	48	Tercemar / Poor	95	92	8	94	65	52
P. Pinang	Muara Sungai / Estuary	Kuala Sungai Juru	MMPE002	46	Tercemar / Poor	96	92	8	90	84	44
		Kuala Sungai Pinang	MMPE004	47	Tercemar / Poor	53	94	8	93	86	80



Rajah 4.11: Trend Stesen Pengawasan Kualiti Air Marin mengikut Status, 2021- 2025
Figure 4.11: Trend of Marine Water Quality Monitoring Stations by Status, 2021-2025

Jadual 4.14: Indeks Stesen Pengawasan Kualiti Air Marin dengan Status Kategori Tercemar, 2021-2025

Table 4.14: List of Marine Water Quality Monitoring Stations under the Category of Poor Status and Index for year 2021 - 2025

NEGERI/ STATE	KLASIFIKASI STESEN / STATION CLASSIFICATION	LOKASI/ LOCATION	ID STESEN / STATION ID	IKAMM/MMWQI					
				2021	2022	2023	2024	2025	STATUS (2025)
Selangor	Muara Sungai / Estuary	Kuala Sungai Klang	MMBE005	40	43	51	51	49	Tercemar/ Poor
Johor	Muara Sungai / Estuary	Kuala Sungai Segget	MMJE001	51	46	51	53	48	Tercemar/ Poor
P. Pinang	Muara Sungai / Estuary	Kuala Sungai Juru	MMPE002	42	53	55	47	46	Tercemar/ Poor
		Kuala Sungai Pinang	MMPE004	52	54	48	47	47	Tercemar/ Poor

PENGAWASAN KUALITI AIR MARIN AUTOMATIK

Continuous Marine Water Quality Monitoring

Rangkaian Pengawasan Kualiti Air Marin Automatik (CMWQM) bertujuan untuk menyediakan data kualiti air marin hampir waktu sebenar bagi sepuluh (10) lokasi stesen yang ditetapkan.

Jadual 4.15 menyenaraikan lokasi stesen-stesen pengawasan kualiti air marin automatik dan kategori kelas kegunaan air marin berdasarkan SKAMM manakala **Rajah 4.12** menunjukkan lokasi Stesen CMWQM.

Pada tahun 2025, median untuk parameter kualiti air marin yang dipantau di semua stesen CMWQM menunjukkan kadar pematuhan yang tinggi mengikut kelas kualiti air marin seperti yang ditetapkan di dalam SKAMM, kecuali bagi paras oksigen terlarut di CM11Q Santubong, Sarawak. Seperti tahun-tahun yang lalu, kadar kepatuhan oksigen terlarut yang rendah di stesen tersebut adalah disebabkan oleh sifat muara secara semulajadi, bukan berpunca daripada kesan pencemaran.

Kepekatan parameter kualiti air laut yang direkodkan di stesen-stesen CMWQM adalah selari dengan keadaan semula jadinya, dengan mengambil kira semua faktor yang mempengaruhi di persekitaran stesen. Sementara itu, kualiti air laut di seluruh rangkaian CMWQM turut terkesan dengan kedua-dua monsun Timur Laut dan monsun Barat Daya.

Tahap kualiti air marin bagi stesen CMWQM dipengaruhi oleh Monsun Timur Laut yang disebabkan oleh hujan lebat dan juga perubahan arah angin utama, yang mana turut memberi kesan terhadap arus laut. Stesen yang berhampiran dengan muara dan aliran air permukaan daripada daratan turut menerima kesan hujan. Hampir semua stesen merekod bacaan saliniti yang lebih rendah semasa Monsun Timur Laut, petanda kepada kesan musim Timur Laut terhadap kualiti air marin di kawasan pesisir pantai.

The Continuous Marine Water Quality Monitoring (CMWQM) network aims to provide near real-time marine water quality data in ten (10) designated locations.

Table 4.15 lists the location of the continuous marine water quality monitoring stations and their respective class categories based on MMWQS while **Figure 4.12** shows the location of the CMWQM stations.

In 2025, median of all marine water quality parameters monitored by the CMWQM network showed high degree of conformance with their respective MMWQS marine water quality classes, except for the dissolved oxygen level at CM11Q Santubong, Sarawak. The lower degree of dissolved oxygen was due to the natural estuary characteristics, rather than pollution event.

The concentrations of marine water quality parameters recorded at the CMWQM stations were characteristic of natural conditions, taking into account all nearby influencing factors. Meanwhile, the marine water quality across the CMWQM network was affected by both Northeast and Southwest monsoons.

The marine water quality of the CMWQM stations was affected by the North-East Monsoon due to increased volume of precipitation and the shift in the prevailing wind direction. Monitoring stations in proximity to estuaries and surface runoff discharge points are influenced by precipitation. A decrease in salinity readings was observed across nearly all stations during the Northeast Monsoon, reflecting the monsoon's influence on coastal marine water quality.

Selain daripada kesan monsun, kualiti air marin di sekitar stesen CMWQM turut menerima kesan daripada input muara sungai yang berhampiran. Kualiti air marin di stesen CM11Q yang terletak di Santubong, Sarawak menunjukkan pengaruh pasang surut yang jelas disebabkan oleh interaksi yang kompleks antara air tawar dan air laut yang seterusnya membentuk ciri hidrologi Muara Sungai Santubong. Selain Stesen CM11Q, kualiti air marin di CM05J Tanjung Pengelih, CM04J Tanjung Piai dan CM14S Teluk Sepanggar turut menerima kesan daripada muara sungai yang berhampiran.

Dari segi pematuan SKAMM bagi Oksigen Terlarut (DO), Jumlah Pepejal Terampai (TSS) dan Hidrokarbon Aromatik Polisiklik (PAHs), ketidakpatuhan DO tertinggi direkodkan di CM11Q Santubong, berkemungkinan disebabkan oleh perubahan ciri hidrologi yang dipengaruhi oleh kitaran pasang surut. Selain CM11Q Santubong, stesen CM02M Pulau Undan, CM12A Pulau Mentagor dan CM13T Pulau Kapas turut mencatatkan kadar pematuan DO di bawah 90%. Ketidakpatuhan DO di semua stesen disebabkan oleh keadaan semula jadi, tanpa sebarang bukti yang menunjukkan kejadian pencemaran di sekitar stesen.

Pada tahun 2025, TSS dan PAHs mencatatkan lebih daripada 90% pematuan terhadap SKAMM di semua stesen CMWQM.

Jadual 4.16 menunjukkan tahap pematuan stesen CMWQM terhadap kelas masing-masing pada tahun 2025.

Other than the monsoonal effect, the marine water quality of the CMWQM station was also impacted by nearby estuarine inputs. The marine water quality of CM11Q in Santubong, Sarawak shows a clear tidal influence due to the complex interaction between freshwater and seawater at the river mouth, which shaped the hydrological characteristics of Santubong Estuary. Besides CM11Q, the marine water quality of CM05J Tanjung Pengelih, CM04J Tanjung Piai, and CM14S Teluk Sepanggar were also impacted by nearby estuary.

With regard to compliance with the MMWQS for Dissolved Oxygen (DO), Total Suspended Solids (TSS), and Polycyclic Aromatic Hydrocarbons (PAHs), the highest DO non-compliance was observed at CM11Q Santubong, likely due to changes in hydrological characteristics influenced by the tidal cycle. In addition to CM11Q Santubong, CM02M Pulau Undan, CM12A Pulau Mentagor and CM13T Pulau Kapas also recorded DO compliance rates below 90%. The DO non-compliance at all stations was attributed to natural conditions, with no evidence indicating a pollution event.

In 2025, TSS and PAHs recorded more than 90% compliance with the MMWQS in all the CMWQM stations.

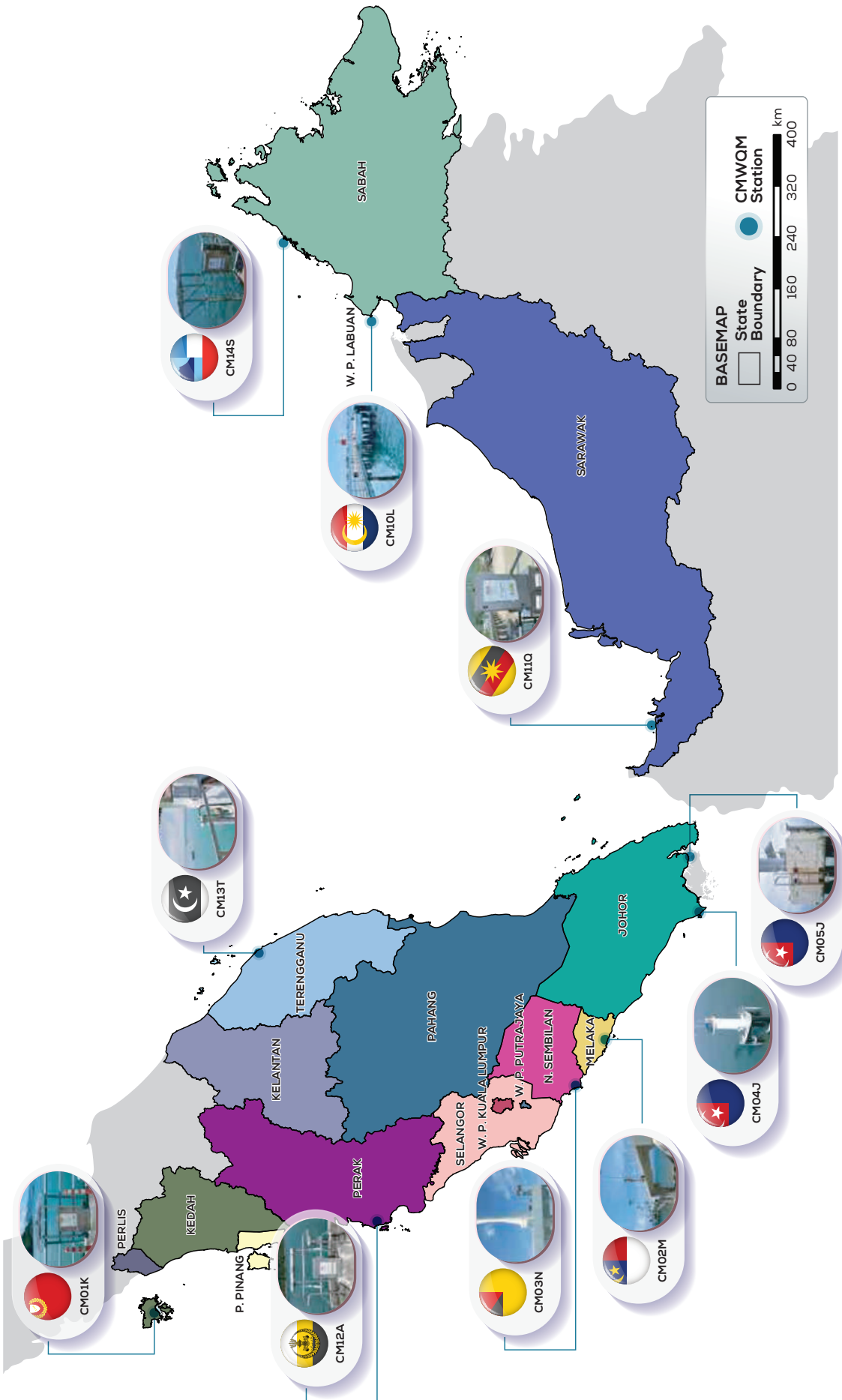
Table 4.16 shows the compliance level of CMWQM stations with their respective classes in 2025.

Jadual 4.15: Stesen Pengawasan Kualiti Air Marin Automatik
 Table 4.15: Continuous Marine Water Quality Monitoring Stations

BIL. / NO.	LOKASI STESEN / STATION LOCATION	ID STESEN / STATION ID	STRUKTUR / STRUCTURE	KATEGORI STESEN / STATION CATEGORY	KEGUNAAN BERFAEDAH / BENEFICIAL USES
1	Pulau Langkawi, Kedah	CM01K	Jeti / Jetty	Kelas 2 / Class 2	Perikanan (Termasuk Marikultur) / Fisheries (Including Mariculture)
2	Pulau Undan, Melaka	CM02M	Jeti / Jetty	Kelas 1 / Class 1	Habitat Sensitif Marin / Sensitive Marine Habitats
3	Port Dickson, Negeri Sembilan	CM03N	Beacon	Kelas 2 / Class 2	Perikanan (Termasuk Marikultur) / Fisheries (Including Mariculture)
4	Tanjung Piai, Johor	CM04J	Beacon	Kelas 2 / Class 2	Perikanan (Termasuk Marikultur) / Fisheries (Including Mariculture)
5	Tanjung Pengelih, Johor	CM05J	Jeti / Jetty	Kelas 3 / Class 3	Industri, Aktiviti Komersial & Kawasan Kediaman Pesisir Pantai / Industrial, Commercial Activities & Coastal Settlements
6	W. P. Labuan	CM10L	Jeti / Jetty	Kelas 3 / Class 3	Industri, Aktiviti Komersial & Kawasan Kediaman Pesisir Pantai / Industrial, Commercial Activities & Coastal Settlements
7	Santubong, Sarawak	CM11Q	Jeti / Jetty	Kelas E3 / Class E3	Muara Sungai (Rangkaian Kompleks) / Estuaries (Complex Distributary Network)
8	Pulau Mentagor, Perak	CM12A	Jeti / Jetty	Kelas 2 / Class 2	Perikanan (Termasuk Marikultur) / Fisheries (Including Mariculture)
9	Pulau Kapas, Terengganu	CM13T	Jeti / Jetty	Kelas 1 / Class 1	Habitat Sensitif Marin / Sensitive Marine Habitats
10	Teluk Sepanggar, Sabah	CM14S	Jeti / Jetty	Kelas 3 / Class 3	Industri, Aktiviti Komersial & Kawasan Kediaman Pesisir Pantai / Industrial, Commercial Activities & Coastal Settlements

Jadual 4.16: Peratusan Pemuatan Parameter DO, TSS dan PAHs mengikut Kelas (SKAMM)
 Table 4.16: Percentage of DO, TSS and PAHs Parameters Compliance according to Station Classes (MMWQS)

NEGERI / STATE	LOKASI STESEN / STATION LOCATION	ID STESEN / STATION ID	KELAS / CLASS	PERATUSAN PEMATUHAN (%) / PERCENTAGE OF COMPLIANCE (%)		
				OKSIGEN TERLARUT / DISSOLVED OXYGEN (DO)	JUMLAH PEPEJAL TERAMPAI / TOTAL SUSPENDED SOLID (TSS)	HIDROKARBON AROMATIK POLISIKLIK (PAHs) / POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)
Kedah	Pulau Langkawi	CM01K	2	98.28	99.68	100
Melaka	Pulau Undan	CM02M	1	85.09	99.92	100
N. Sembilan	Port Dickson	CM03N	2	99.87	99.92	99.96
Johor	Tanjung Piai	CM04J	2	99.78	96.80	99.99
	Tanjung Pengelih	CM05J	3	100	99.80	100
W.P. Labuan	W.P. Labuan	CM10L	3	99.98	99.98	100
Sarawak	Santubong	CM11Q	E3	48.37	96.99	93.81
Perak	Pulau Mentagor	CM12A	2	79.02	99.88	100
Terengganu	Pulau Kapas	CM13T	1	77.93	98.94	99.87
Sabah	Teluk Sepanggar	CM14S	3	100	99.63	100



Rajah 4.12: Lokasi Stesen Pengawasan Kualiti Air Marin Automatik
Figure 4.12: Location of Continuous Marine Water Quality Monitoring Stations





5

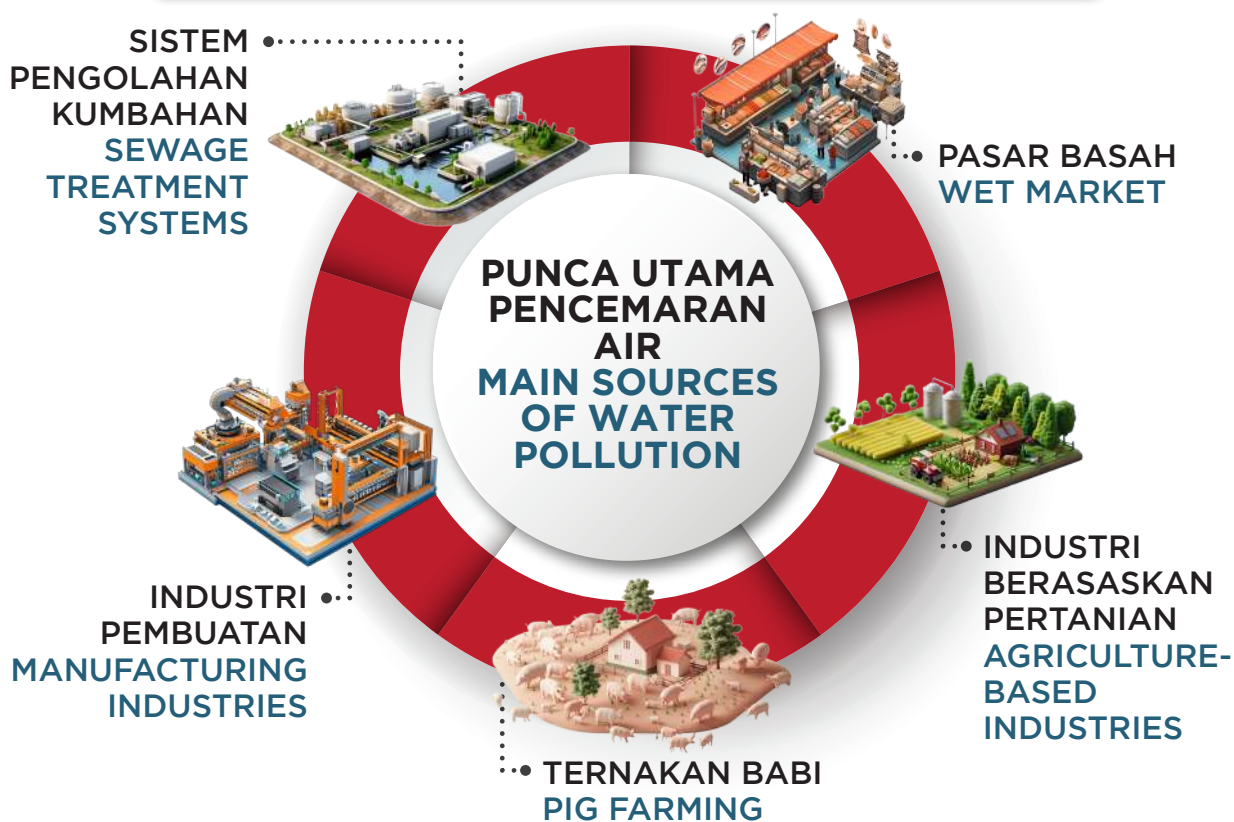
**BAB/
CHAPTER**

INVENTORI PUNCA PENCEMARAN

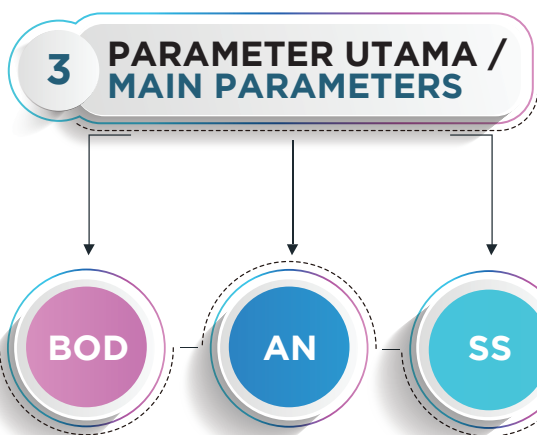
Inventory of
Pollution
Sources

INVENTORI PUNCA PENCEMARAN

Inventory of Pollution Sources



PARAMETER/ PARAMETERS	PUNCA UTAMA/ MAIN SOURCES
BOD & AN	Sistem Pengolahan Kumbahan/ Sewage Treatment Systems
SS	Ternakan Babi/ Pig Farming



JUMLAH BEBAN DALAM TAN/HARI

TOTAL LOAD IN TONNES/DAY



65

KUALITI UDARA/AIR QUALITY

Stesen Pengawasan Kualiti Udara Automatik/
Automatic Air Quality Monitoring Stations

4

**PUNCA UTAMA
PENCEMARAN UDARA /
MAIN SOURCES OF
AIR POLLUTION**

- » Loji Janakuasa/ Power Plants
- » Industri/ Industry
- » Kenderaan Bermotor/ Motor Vehicle
- » Lain-lain / Others

4

**PARAMETER UTAMA /
MAIN PARAMETERS**

SO₂

NO₂

PM

CO

PARAMETER/ PARAMETERS

PUNCA UTAMA/ MAIN SOURCES

SO₂

Loji Janakuasa/ Power Plants

NO₂

Loji Janakuasa/ Power Plants

PM

Loji Janakuasa/ Power Plants

CO

Kenderaan Bermotor/ Motor Vehicle

Jumlah Beban dalam Tan Metrik/
Total Load in Metric Tonnes

CO 2,378,861

NO₂ 1,007,873

SO₂ 283,906

PM 27,208

BUANGAN TERJADUAL/SCHEDULED WASTE

5,840,761.85 MT

**Buangan Terjadual yang Terhasil/
Scheduled Waste Generated**

Debu, sanga, dros atau abu merupakan kategori buangan yang dihasilkan dengan kuantiti tertinggi iaitu =
Dust, slag, dross or ash is the category of waste produced with the highest quantity which is =

62.60%

Jumlah BT yang mengaplikasikan konsep 4R (Reduce, Reuse, Recycle, Recover) =
Total BT that applies the 4R concept (Reduce, Reuse, Recycle, Recover) =

3.09 MT x 10⁶



Peningkatan sebanyak 8.58% berbanding 5,378,977.55 tan metrik yang dilaporkan pada 2024/
Increase of 8.58% compared to the 5,378,977.55 tons metric reported in 2024

BEBAN PENCEMARAN AIR

Water Pollution Load

Sungai merupakan antara ekosistem utama yang mempunyai keupayaan asimilasi untuk mengurangkan kesan pencemaran melalui proses daripada penguraian, penyebaran dan pelarutan. Walau bagaimanapun, keupayaan ini mempunyai had dan jika melebihi had tersebut, kualiti air sungai akan merosot.

Keupayaan asimilasi sungai ini berkait rapat dengan beban pencemaran yang dilepaskan ke dalam sungai pada sesuatu masa. Ia dipengaruhi oleh kadar aliran jasad air dan kepekatan bahan pencemar yang dibawa oleh jasad air.

Beban pencemaran air merupakan salah satu kriteria penting dalam menentukan strategi dan perancangan tindakan untuk mencegah dan mengawal pencemaran air. Pelaksanaan kawalan beban pencemaran air merupakan usaha untuk meningkatkan kualiti air sungai demi mengekalkan kegunaan berfaedah sungai sebagai sumber bekalan air, rekreasi, akuakultur, pertanian serta menampung keperluan sistem ekologi.

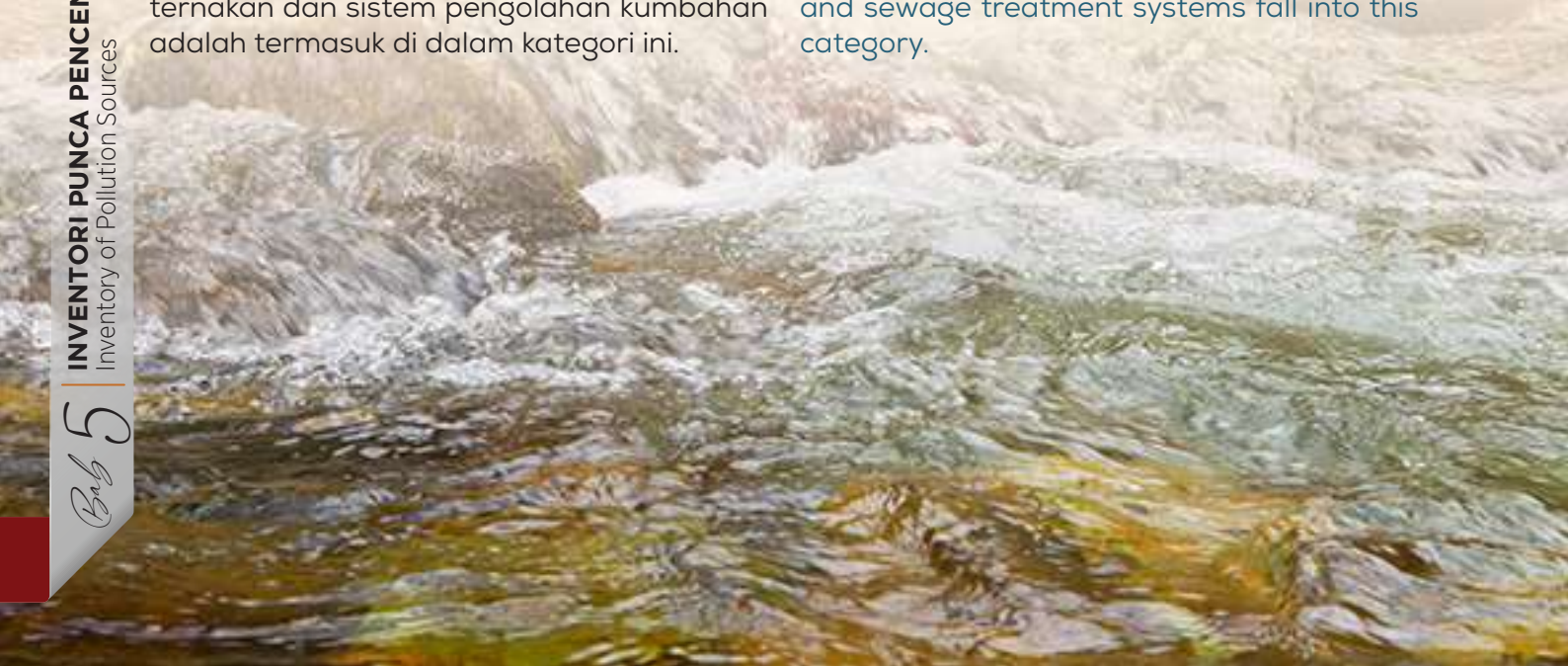
Punca beban pencemaran air terbahagi kepada dua (2) kategori iaitu punca tetap dan punca tidak tetap. Punca tetap beban pencemaran air adalah punca yang mempunyai takat pelepasan yang tetap dan tidak berubah dalam tempoh masa yang singkat. Sektor seperti industri pembuatan, ternakan dan sistem pengolahan kumbahan adalah termasuk di dalam kategori ini.

Rivers are one of the ecosystems that have the assimilation capacity to reduce the impacts from pollution through the processes of degradation, dispersion and dilution. However, this ability has a limit and if exceeded, the quality of river water will deteriorate.

The assimilation capacity of the river is closely related to the pollution load discharged into the river at a certain time. It is influenced by the flow rate of the water body and the concentration of pollutants carried by the water body.

The water pollution load is one of the important criteria in determining strategies and planning for actions to prevent and control water pollution. The implementation of water pollution load control is one of the efforts to enhance the river water quality in order to maintain the beneficial uses of the river as a source of water supply, recreation, aquaculture, agriculture as well as to sustain the needs of the ecological system.

The sources of water pollution load can be divided into two (2) categories which are point sources and non-point sources. Point sources are pollution sources that have specific identifiable discharge points and do not change in a short period of time. Sectors such as manufacturing industries, livestock and sewage treatment systems fall into this category.



Manakala punca tidak tetap pula merupakan punca yang tidak mempunyai takat pelepasan yang tetap dan sering berubah-ubah yang menyukarkan anggaran pelepasan beban pencemaran. Aktiviti pertanian, kerja tanah, perlombongan dan kumbahan bukan najis (air cucian dapur dan bilik air selain kumbahan) merupakan punca bagi kategori ini. Pada masa ini, kajian berkaitan beban pencemaran dari sumber bagi kategori ini masih belum banyak tersedia sebagai rujukan, khususnya di Malaysia.

On the other hand, non-point sources are the sources that do not have specific identifiable discharge points and the locations are varied which makes it difficult to estimate the amount of pollution loads discharged. Agricultural activities, earthworks, mining, and sullage (domestic wastewater other than sewage such as kitchen and bathroom wastewater) are the sources under this category. Currently, studies related to the pollution load from sources for this category are not widely available for reference particularly in Malaysia.

PENGIRAAN BEBAN PENCEMARAN AIR

Water Pollution Load Calculation

Beban pencemaran air yang dilaporkan adalah berdasarkan kepada lima (5) jenis punca pencemaran iaitu industri pembuatan, industri berasaskan pertanian, sistem pengolahan kumbahan, ternakan babi dan pasar basah yang mempunyai aktiviti penyembelihan.

Sumber data industri pembuatan dan industri berasaskan pertanian diperolehi daripada laporan yang dikemukakan oleh pihak industri melalui sistem atas talian (*Online Environmental Reporting*, OER) yang dibangunkan oleh Jabatan Alam Sekitar (JAS) manakala bagi sistem pengolahan kumbahan pula, data yang diperolehi adalah daripada pihak operator loji iaitu Indah Water Konsortium Sdn. Bhd., Suruhanjaya Perkhidmatan Air Negara (SPAN), Jabatan Perkhidmatan Pembentukan Sabah dan JAS Negeri Sarawak. Data berkaitan aktiviti ternakan babi diperolehi daripada Jabatan Perkhidmatan Veterinar manakala data berkaitan pasar basah adalah diperolehi daripada Kementerian Perumahan dan Kerajaan Tempatan.

Pengiraan beban pencemaran air adalah berdasarkan kepada tiga (3) parameter yang memberikan kesan ketara kepada kualiti air sungai iaitu Keperluan Oksigen Biokimia (BOD), Pepejal Terampai (SS) dan Ammoniakal Nitrogen (AN).

The water pollution load reported is based on five (5) types of pollution sources, namely manufacturing industries, agriculture-based industries, sewage treatment system, pig farming and wet market which have slaughtering activities.

The source of data for manufacturing industry and for agricultural-based industry are obtained from the report submitted by the industry through the online system (*Online Environmental Reporting*, OER) developed by Department of Environment (DOE) while data for sewage treatment system are from plant operators namely Indah Water Konsortium Sdn. Bhd., Suruhanjaya Perkhidmatan Air Negara (SPAN), Sabah Sewerage Services Department and DOE Sarawak. Data related to pig farming activity is acquired from the Department of Veterinary Services, while data related to wet markets is obtained from the Ministry of Housing and Local Government.

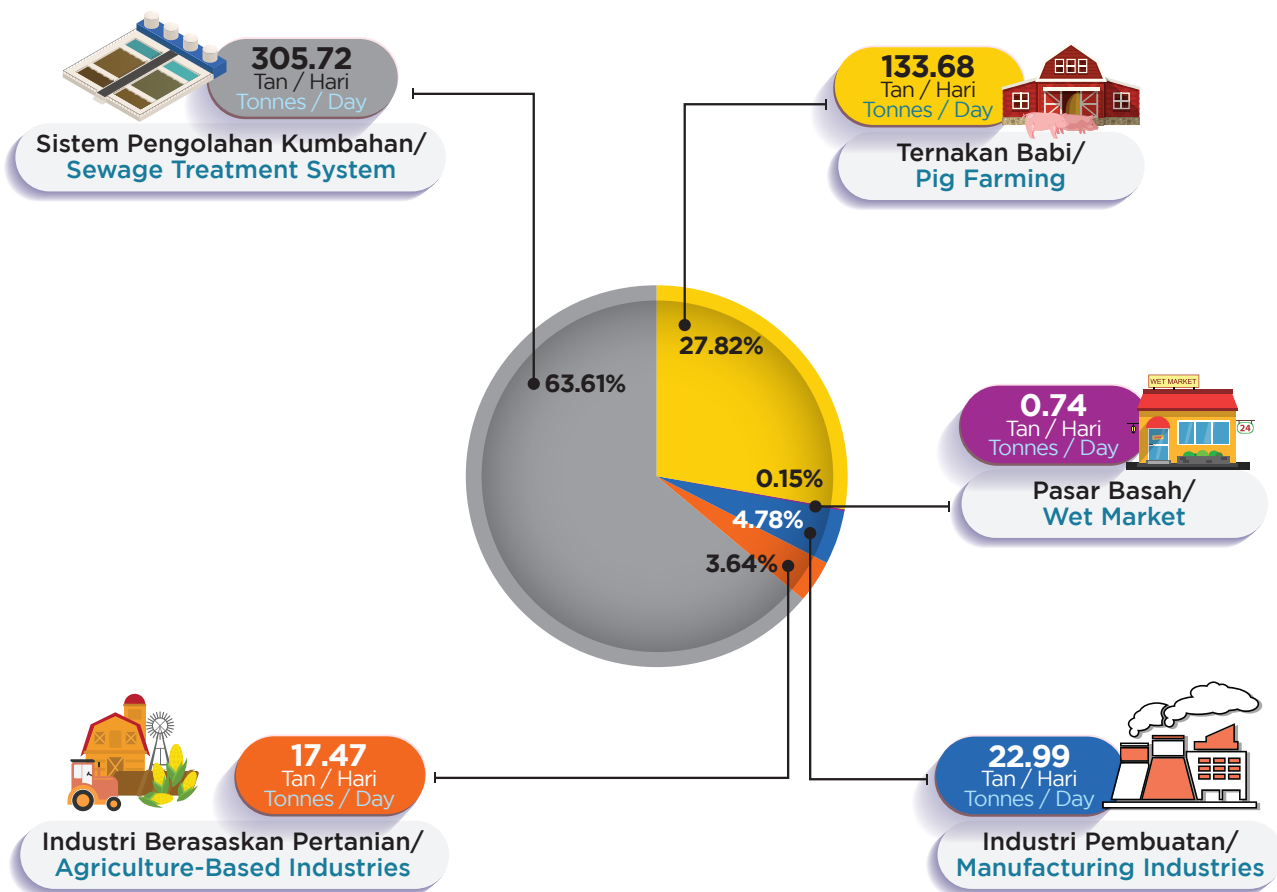
The calculation of water pollution load is based on three (3) parameters that have significant impact on river water quality, namely Biochemical Oxygen Demand (BOD), Suspended Solids (SS) and Ammoniacal Nitrogen (AN).

Beban Keperluan Oksigen Biokimia

Pada tahun 2025, anggaran jumlah beban pencemaran bagi BOD yang dilepaskan ke sungai adalah sebanyak 480.60 tan/hari. Pelepasan daripada sistem pengolahan kumbahan adalah penyumbang beban pencemaran BOD tertinggi iaitu sebanyak 305.72 tan/hari (63.61%), diikuti dengan aktiviti ternakan babi 133.68 tan/hari (27.82%), industri pembuatan 22.99 tan/hari (4.78%), industri berasaskan pertanian 17.47 tan/hari (3.64%) dan pasar basah 0.74 tan/hari (0.15%) (Rajah 5.1).

Biochemical Oxygen Demand Load

In year 2025, the estimated total pollution load for BOD discharged into the river is 480.60 tonnes/day. Discharge from sewage treatment system is the highest BOD load contributor with a total load of 305.72 tonnes/day (63.61%), followed by pig farming activities 133.68 tonnes/day (27.82%), manufacturing industries 22.99 tonnes/day (4.78%), agriculture-based industries 17.47 tonnes/day (3.64%) and wet markets 0.74 tonnes/day (0.15%) (Figure 5.1).



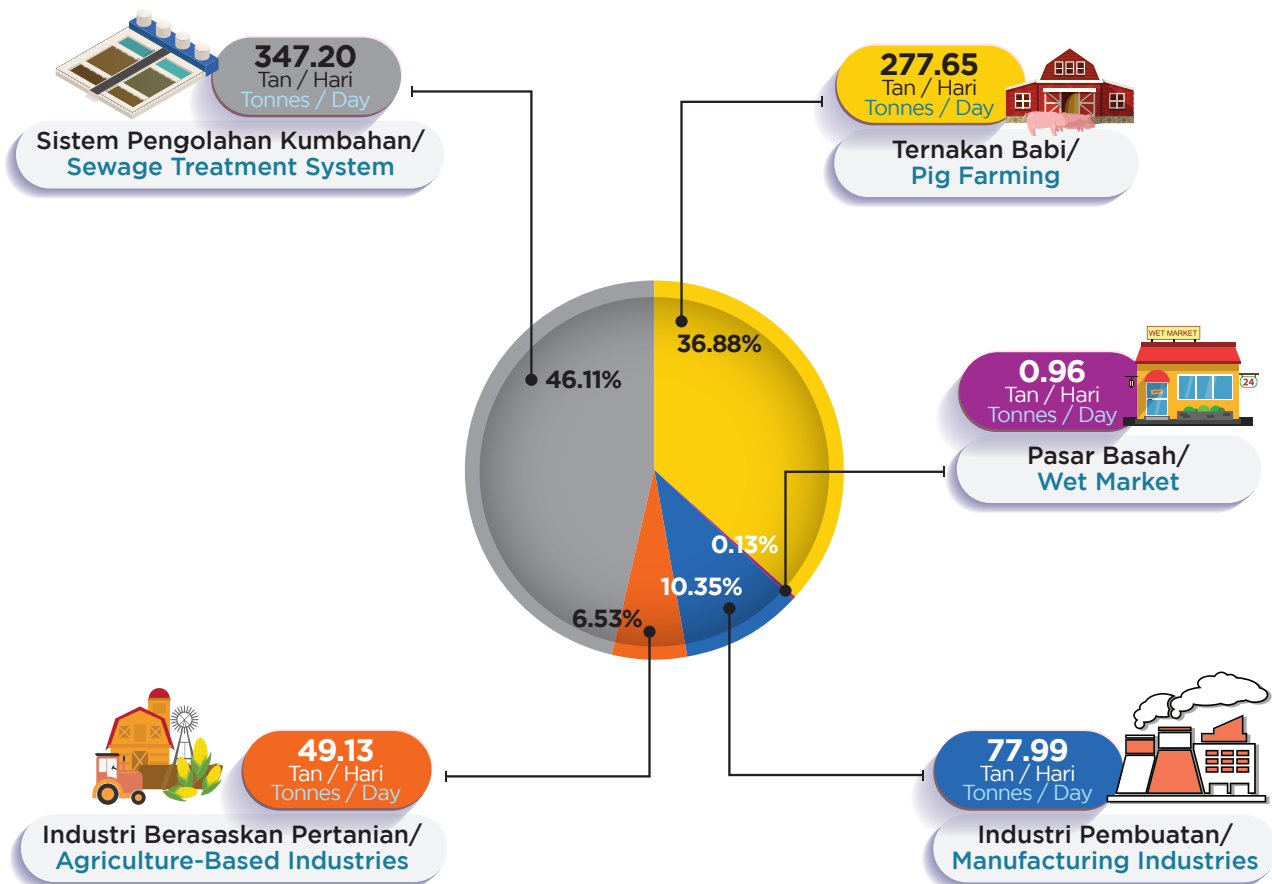
Rajah 5.1: Anggaran Beban BOD (tan/hari) mengikut Punca Pencemaran Air, 2025
 Figure 5.1: Estimation of BOD Load (tonnes/day) by Sources of Water Pollution, 2025

Beban Pepejal Terampai

Pada tahun 2025, anggaran jumlah beban pencemaran bagi SS yang dilepaskan ke sungai adalah sebanyak 752.93 tan/hari. Pelepasan daripada sistem pengolahan kumbahan adalah penyumbang beban pencemaran SS tertinggi iaitu sebanyak 347.20 tan/hari (46.11%), diikuti dengan ternakan babi 277.65 tan/hari (36.88%). Industri pembuatan pula menyumbang sebanyak 77.99 tan/hari (10.35%) diikuti industri berasaskan pertanian 49.13 tan/hari (6.53%) dan pasar basah 0.96 tan/hari (0.13%) (Rajah 5.2).

Suspended Solids Load

In year 2025, the estimated total pollution load for SS discharged into the river is 752.93 tonnes/day. Discharge from sewage treatment system shows the highest SS load contributor with a total load of 347.20 tonnes/day (46.11%) followed by pig farming activities with 277.65 tonnes/day (36.88%). Manufacturing industry contributed 77.99 tonnes/day (10.35%) followed by Agriculture based industry 49.13 tonnes/day (6.53%) and wet market 0.96 tonnes/day (0.13%) (Figure 5.2).



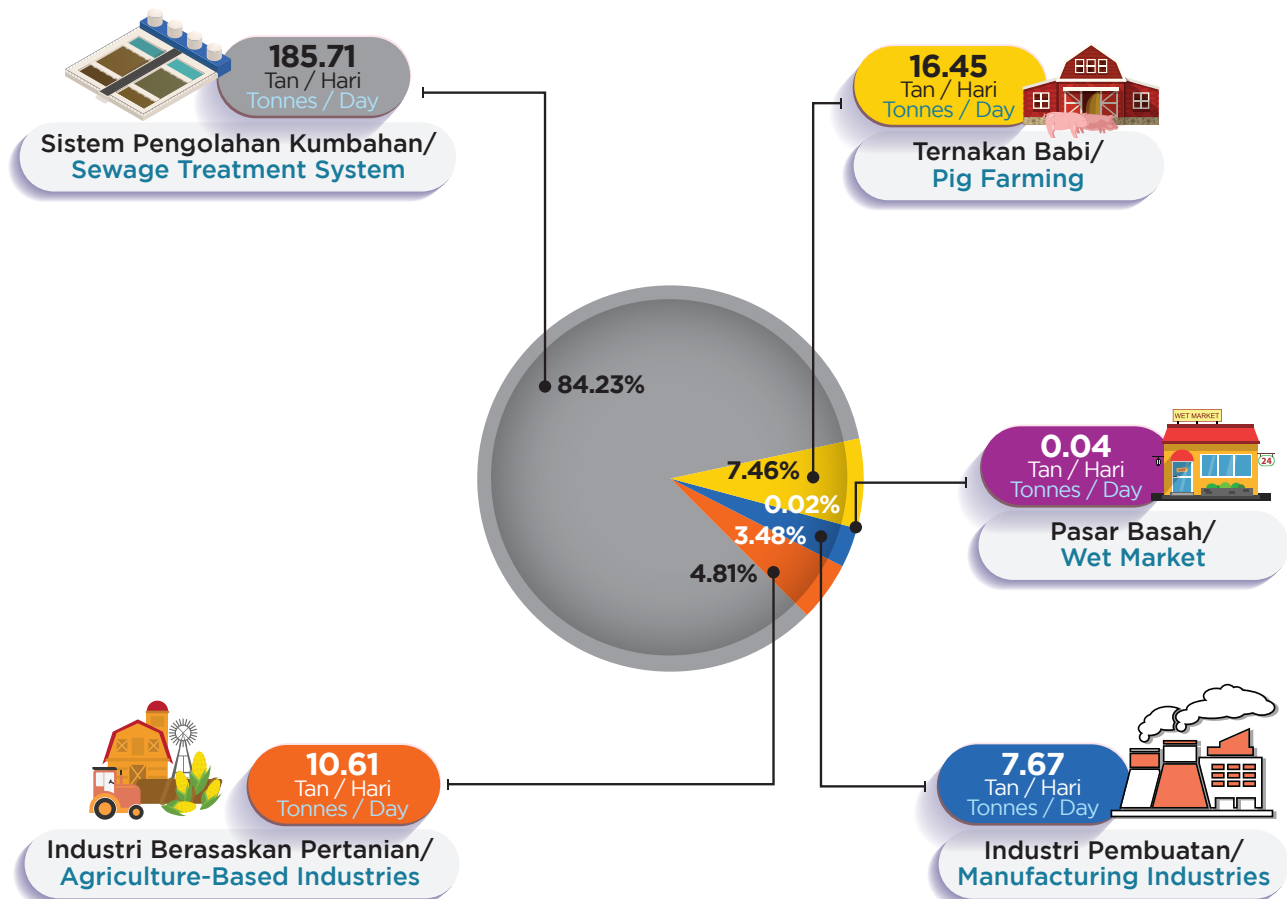
Rajah 5.2: Anggaran Beban SS (tan/hari) mengikut Punca Pencemaran Air, 2025
Figure 5.2: Estimation of SS load (tonnes/day) by Sources of Water Pollution, 2025

Beban Ammoniakal Nitrogen

Pada tahun 2025, anggaran jumlah beban pencemaran bagi AN yang dilepaskan ke sungai adalah sebanyak 220.48 tan/hari. Pelepasan daripada sistem pengolahan kumbahan adalah penyumbang beban pencemaran AN tertinggi iaitu sebanyak 185.71 tan/hari (84.23%), diikuti ternakan babi 16.45 tan/hari (7.46%), industri berasaskan pertanian 10.61 tan/hari (4.81%), industri pembuatan 7.67 tan/hari (3.48%) dan pasar basah 0.04 tan/hari (0.02%) (Rajah 5.3).

Ammoniacal Nitrogen Load

In year 2025, the estimated total pollution load for AN discharged into the river is 220.48 tonnes/day. Discharge from sewage treatment system shows the highest AN load contributor with a total load of 185.71 tonnes/day (84.23%) followed by pig farming activities with 16.45 tonnes/day (7.46%), agriculture-based industries 10.61 tonnes/day (4.81%), manufacturing industries 7.67 tonnes/day (3.48%) and wet markets 0.04 tonnes/day (0.02%) (Figure 5.3).



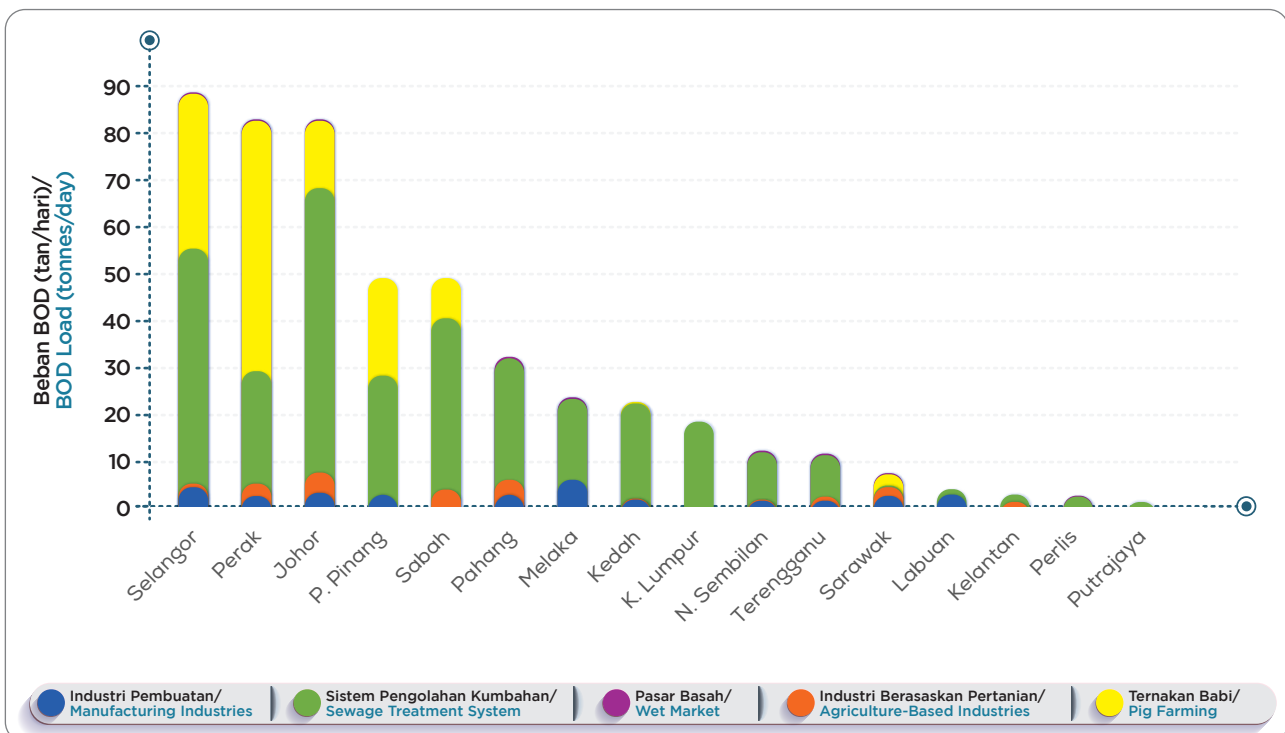
Rajah 5.3: Anggaran Beban AN (tan/hari) mengikut Punca Pencemaran Air, 2025
Figure 5.3: Estimation of AN Load (tonnes/day) by Sources of Water Pollution, 2025

Beban Pencemaran Keperluan Oksigen Biokimia mengikut Negeri

Pada tahun 2025, negeri yang melepaskan beban pencemaran BOD ke sungai yang tertinggi adalah negeri Selangor iaitu sebanyak 88.62 tan/hari, diikuti oleh negeri Perak 82.89 tan/hari, Johor 82.78 tan/hari, Pulau Pinang 48.65 tan/hari dan Sabah 48.58 tan/hari. Beban BOD bagi lain-lain negeri termasuk Wilayah Persekutuan Labuan dan Putrajaya adalah kurang daripada 40.00 tan/hari. Beban pencemaran BOD mengikut negeri ditunjukkan pada Rajah 5.4.

Biochemical Oxygen Demand Load by States

In 2025, the state that discharge the highest BOD pollution load into the river is Selangor with a 88.62 tonnes/day, followed by Perak 82.89 tonnes/day, Johor 82.78 tonnes/day, Pulau Pinang 48.65 tonnes/day and Sabah 48.58 tonnes/day. The BOD load for other states including the Federal Territory of Labuan and Putrajaya is less than 40.00 tonnes/day. The BOD pollution loads by states are shown in Figure 5.4.



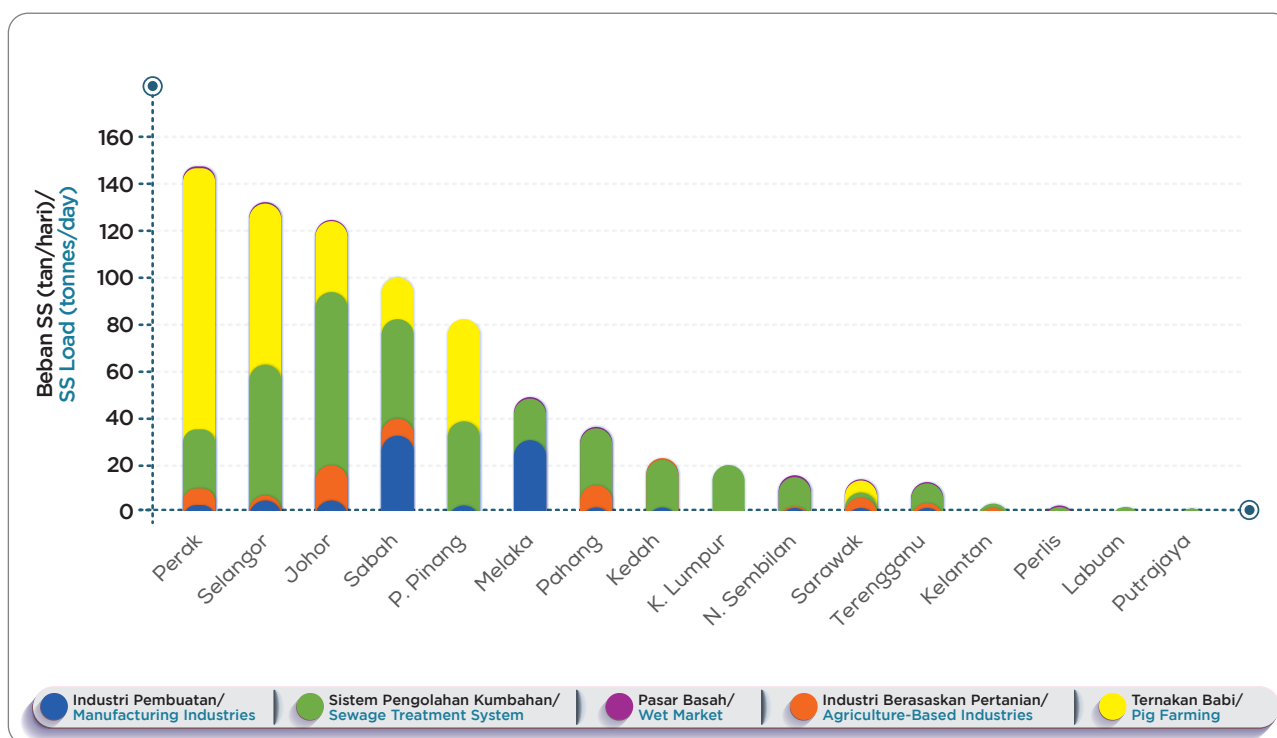
Rajah 5.4: Taburan Anggaran Beban BOD (tan/hari) dan Punca Pencemaran Air mengikut Negeri, 2025
Figure 5.4: Estimation Distribution of BOD Load (tonnes/day) and Sources of Water Pollution by States, 2025

Beban Pencemaran Pepejal Terampai mengikut Negeri

Anggaran pelepasan beban pencemaran SS ke sungai di negeri Perak adalah yang tertinggi iaitu sebanyak 147.12 tan/hari, diikuti Selangor 131.88 tan/hari, Johor 124.26 tan/hari, Sabah 99.41 tan/hari dan Pulau Pinang 81.19 tan/hari. Beban pencemaran SS untuk lain-lain negeri termasuk Wilayah Persekutuan Labuan dan Putrajaya adalah kurang daripada 80.00 tan/hari. Beban pencemaran SS mengikut negeri ditunjukkan pada **Rajah 5.5**.

Suspended Solids Load by States

The estimated SS pollution load discharged to the river in Perak is the highest which is 147.12 tonnes/day, followed by Selangor 131.88 tonnes/day, Johor 124.26 tonnes/day, Sabah 99.41 tonnes/day, and Pulau Pinang 81.19 tonnes/day. The SS pollution load for other states including the Federal Territory of Labuan and Putrajaya is less than 80.00 tonnes/day. The SS pollution loads by states are shown in **Figure 5.5**.



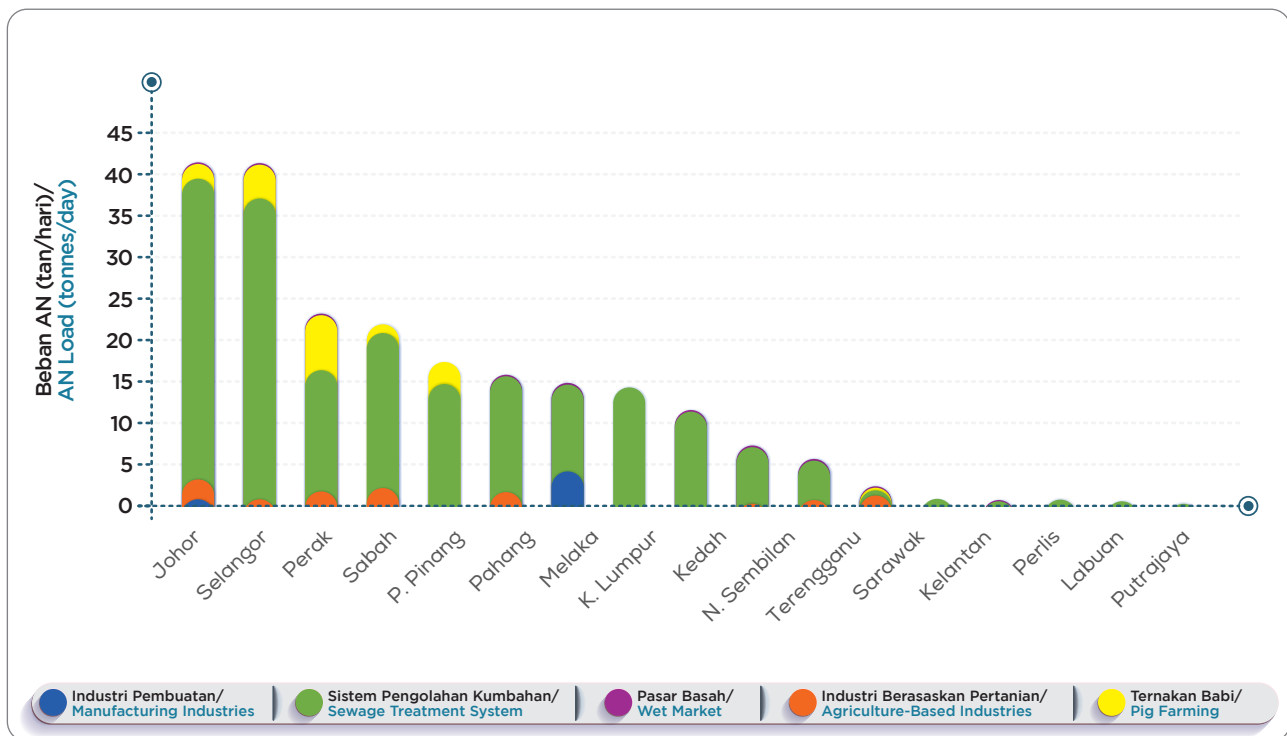
Rajah 5.5: Taburan Anggaran Beban SS (tan/hari) dan Punca Pencemaran Air mengikut Negeri, 2025
Figure 5.5: Estimation Distribution of SS Load (tonnes/day) and Sources of Water Pollution by States, 2025

Beban Pencemaran Ammoniakal Nitrogen mengikut Negeri

Anggaran pelepasan beban pencemaran AN ke sungai di negeri Johor adalah yang tertinggi iaitu sebanyak 41.40 tan/hari, diikuti Selangor 41.26 tan/hari, Perak 23.20 tan/hari, Sabah 22.02 tan/hari, dan Pulau Pinang 17.47 tan/hari. Beban pencemaran AN untuk lain-lain negeri termasuk Wilayah Persekutuan Labuan dan Putrajaya adalah kurang daripada 17.00 tan/hari. Beban pencemaran AN mengikut negeri ditunjukkan pada **Rajah 5.6**.

Ammoniacal Nitrogen Load by States

The estimated AN pollution load discharge to the river in Johor is the highest which is 41.40 tonnes/day, followed by Selangor 41.26 tonnes/day, Perak 23.20 tonnes/day, Sabah 22.02 tonnes/day and Pulau Pinang 17.47 tonnes/day. The AN pollution load for other states including the Federal Territory of Labuan and Putrajaya is less than 17.00 tonnes/day. AN pollution loads by states are shown in **Figure 5.6**.



Rajah 5.6: Taburan Anggaran Beban AN (tan/hari) dan Punca Pencemaran Air mengikut Negeri, 2025
Figure 5.6: Estimation Distribution of AN Load (tonnes/day) and Sources of Water Pollution by States, 2025

PUNCA-PUNCA PENCEMARAN UDARA

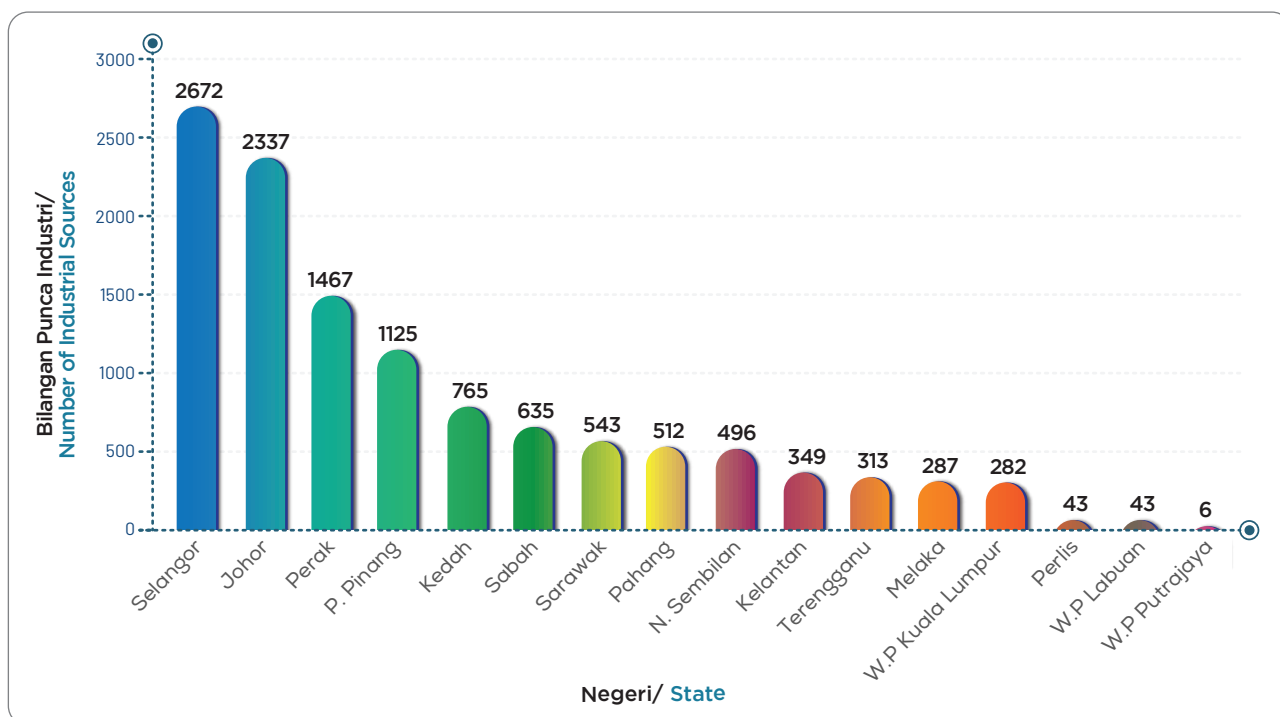
Sources of Air Pollution

Peningkatan punca industri hendaklah dikawal secara sistematik untuk mengurangkan pencemaran udara. Pemasangan sistem kawalan pencemaran udara yang sesuai sangat kritikal bagi setiap punca baharu yang berpotensi melepaskan pencemar udara.

The growth of Industrial sources should be systematically controlled to reduce air pollution. The installation of suitable air pollution control equipment is very critical for every potential new source of emission.

Sehingga Disember 2025, jumlah punca industri yang melepaskan bahan pencemar ke udara adalah sebanyak 11,875. Bilangan punca pencemar yang tertinggi direkodkan di Selangor (2,672:22.5%) diikuti Johor (2,337:19.7%) dan Perak (1,467:12.4%) seperti ditunjukkan dalam Rajah 5.7.

As of December 2025, a total of 11,875 industrial sources were emitting air pollutants. The highest pollution sources recorded in Selangor (2,672:22.5%) followed by Johor (2,337:19.7%) and Perak (1,467:12.4%) as indicated in Figure 5.7.



Rajah 5.7 : Punca Pencemaran Udara Industri mengikut Negeri Tahun 2025
 Figure 5.7 : Industrial Air Pollution Sources by State in Year 2025

Kenderaan Bermotor

Malaysia merupakan salah satu pasaran besar di Asia Tenggara untuk sektor kenderaan, dengan jumlah jualan kenderaan yang terus meningkat dari tahun ke tahun. Senario kenderaan aktif di Malaysia menunjukkan perkembangan yang pesat, dengan pelbagai jenis kenderaan yang digunakan dalam kehidupan seharian termasuklah kenderaan persendirian, pengangkutan awam, kenderaan perdagangan dan komersial, hingga kenderaan berteknologi canggih seperti kenderaan elektrik. Peningkatan dalam penggunaan kenderaan juga membawa kepada keperluan untuk mempertingkatkan pemantauan beban pencemaran dan peningkatan aktiviti penguatkuasaan.

Pada tahun 2025, terdapat peningkatan bagi jumlah terkumpul keseluruhan kenderaan bermotor di jalan raya yang berdaftar berbanding tahun sebelumnya. Jumlah terkumpul keseluruhan kenderaan bermotor di jalan raya yang berdaftar bagi tahun 2025 adalah sebanyak 38,832,263 unit sementara tahun 2024 adalah sebanyak 37,274,187 unit. Motosikal dan motokar masing-masing menunjukkan peningkatan sebanyak 3.98% dan 4.55%. Bilangan terkumpul kenderaan bermotor yang berdaftar yang direkodkan oleh Jabatan Pengangkutan Jalan pada tahun 2024 dan 2025 adalah seperti yang ditunjukkan dalam **Rajah 5.8**.

Sementara itu, jumlah bilangan pendaftaran kenderaan baru menunjukkan peningkatan yang konsisten di mana untuk tahun 2025 adalah sebanyak 1,558,076 unit dengan bilangan tertinggi adalah kenderaan jenis motokar iaitu sebanyak 825,331. Berbanding jumlah bilangan pendaftaran kenderaan baru untuk tahun sebelumnya adalah sebanyak 1,533,667 unit dengan bilangan pendaftaran tertinggi juga dari jenis motokar dengan bilangan 833,218 unit.

Motor Vehicles

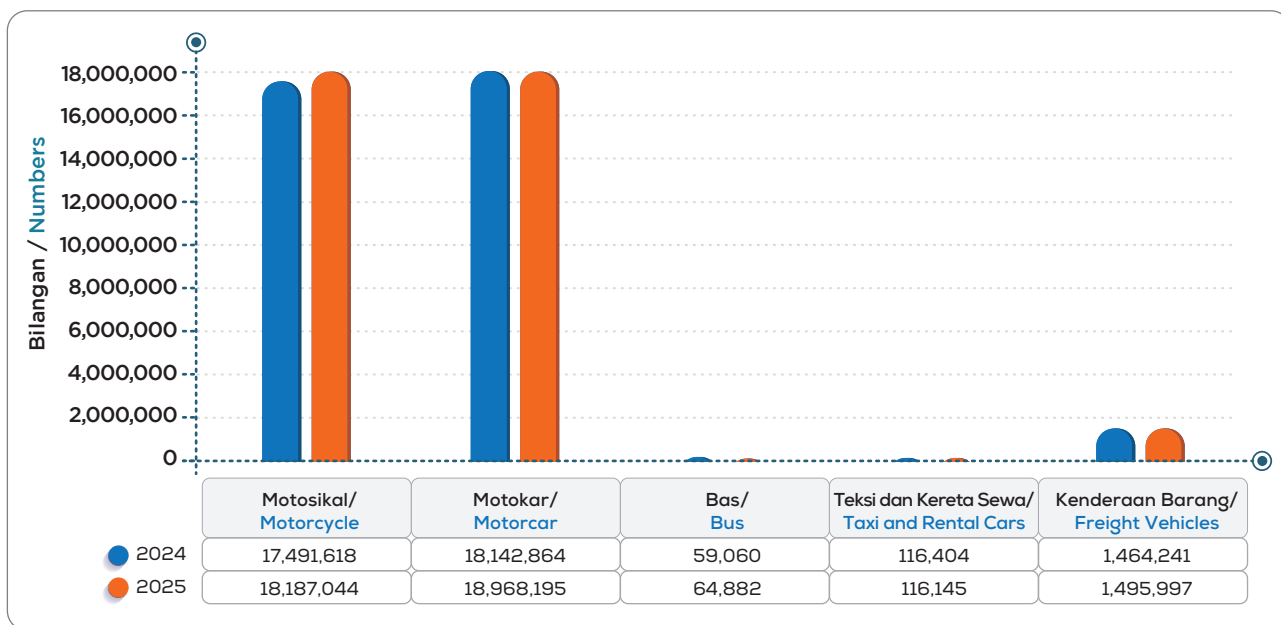
Malaysia is one of the largest markets in Southeast Asia for the automotive sector, with vehicle sales continuing to increase year by year. The scenario of active vehicles in Malaysia shows rapid development, with various types of vehicles being used in daily life, including private vehicles, public transportation, commercial and freight vehicles, as well as advanced technology vehicles such as electric cars. The rise in vehicle usage leads to the need to enhance monitoring of pollution loads and enforcement activities.

In 2025, there was an increase in the overall number of cumulative registered motor vehicles compared to 2024. Total cumulative registered motor vehicles for 2025 were 38,832,263 units compared to 2024 which was 37,274,187 units. Registered motorcycles and motorcars increased by 3.98% and 4.55%. The cumulative number of registered motor vehicles recorded by the Road Transport Department in 2024 and 2025 is as shown in **Figure 5.8**.

The total number of new vehicle registrations was also found to consistently increase, where for the year 2025 it was 1,558,076 units, which the highest number was 825,331 units from motorcar registration. Compared to the total number of new vehicle registrations for the previous year was 1,533,667 units with the highest number was 833,218 units from motorcar registration as well.

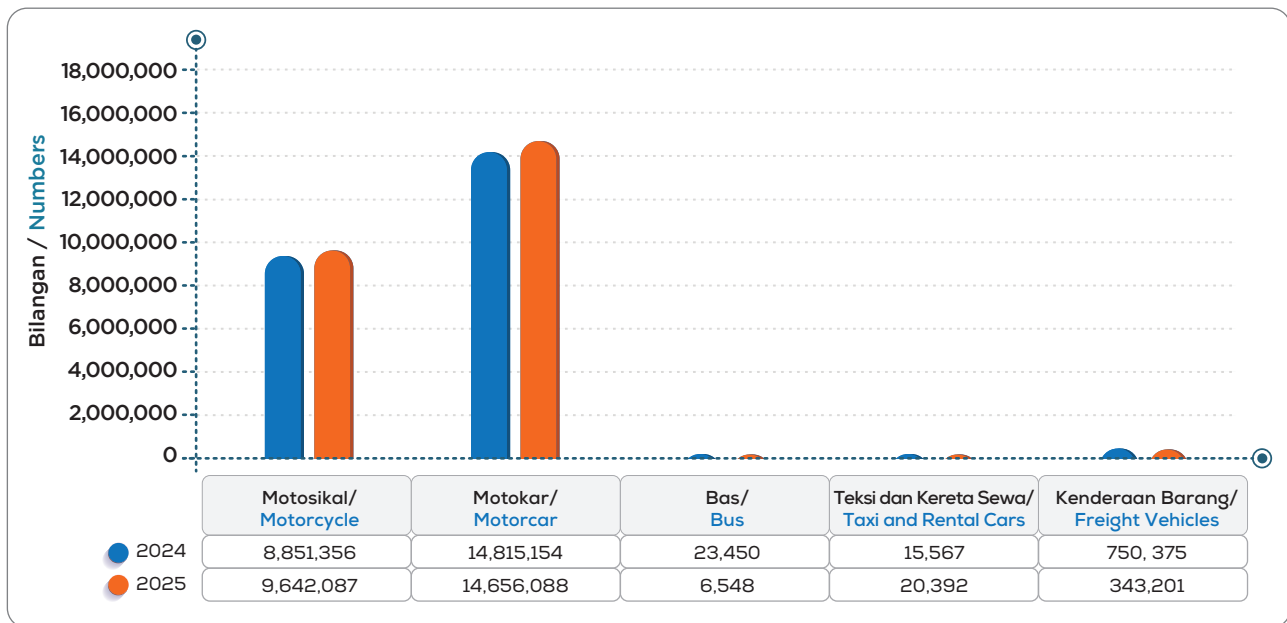
Jumlah kenderaan berdaftar yang sedang digunakan (aktif) didapati meningkat sebanyak 0.87% berbanding dengan tahun 2024 di mana jumlah kenderaan berdaftar aktif yang dilaporkan pada tahun 2025 adalah sebanyak 24,668,316 unit sementara tahun sebelumnya adalah sebanyak 24,455,902 unit. Motokar menunjukkan penurunan iaitu sebanyak 14,656,088 unit aktif bagi tahun 2025 berbanding 14,815,154 unit yang aktif pada tahun yang sebelumnya diikuti dengan motosikal yang merekodkan sebanyak 9,642,087 unit bagi tahun 2025 berbanding 8,851,356 unit pada tahun sebelumnya. Manakala bagi bilangan aktif kenderaan seperti kenderaan perdagangan dan komersil didapati menurun. Bilangan kenderaan berdaftar yang sedang digunakan (aktif) adalah seperti ditunjukkan dalam Rajah 5.9.

Meanwhile, the number of registered in-use (active) vehicles also increased by 0.87% compared to the year 2024 where number of registered in-use vehicles in 2025 was 24,668,316 units compared to 2024 which was 24,455,902 units. Motocars showed a decrease, which was 14,656,088 unit in 2025 compared to 14,815,154 in 2024, followed by motorcycles 9,642,087 in 2025 compared to 8,851,356 in 2024. Meanwhile for good vehicles show decreasing. Number of registered in use active vehicle are shown in Figure 5.9.



Rajah 5.8 : Bilangan Kenderaan Berdaftar Terkumpul, 2024-2025
Figure 5.8 : Number of Registered Vehicle, 2024-2025

(Sumber: Jabatan Pengangkutan Jalan, Malaysia 2025)
(Source: Road Transport Department, Malaysia, 2025)



Rajah 5.9 : Bilangan Kenderaan Berdaftar Yang Sedang Digunakan (Aktif), Tahun 2024-2025
Figure 5.9 : Number of Registered in-Use Vehicle (Active), 2024-2025

(Sumber: Jabatan Pengangkutan Jalan, Malaysia 2025)
(Source: Road Transport Department, Malaysia, 2025)

BEBAN PENCEMARAN PENCEMAR UDARA

Air Pollution Emission Load

Beban Pencemaran Secara Menyeluruh

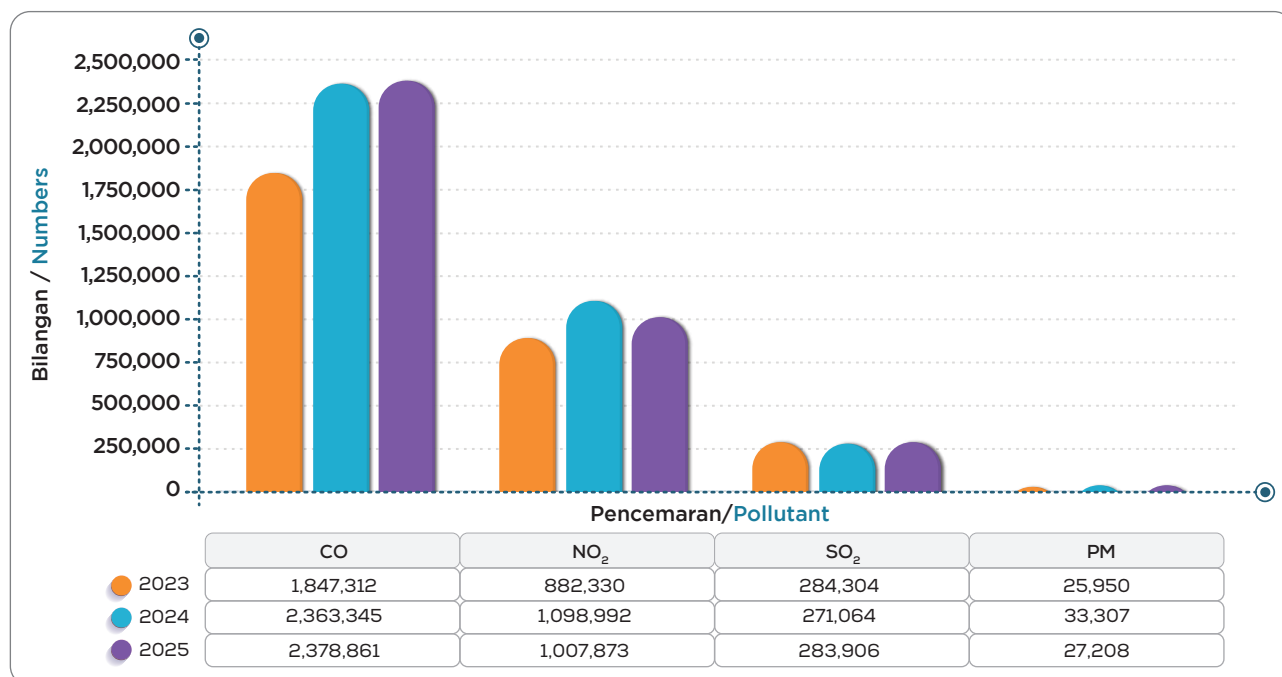
Dianggarkan pada tahun 2025, keseluruhan beban pencemaran yang terkumpul bagi pencemar karbon monoksida (CO) adalah 2,378,861 tan metrik, 1,007,873 tan metrik bagi nitrogen dioksida (NO₂), 283,906 tan metrik bagi sulfur dioksida (SO₂) dan 27,208 tan metrik bagi jirim zarah (PM). Perbandingan keseluruhan beban pencemaran bagi tahun 2023, 2024 dan 2025 seperti ditunjukkan dalam **Rajah 5.10**.

Secara keseluruhannya, beban pencemar bagi parameter CO dan SO₂, adalah meningkat pada tahun 2025 kecuali bagi parameter NO₂ dan PM menunjukkan penurunan. Peningkatan adalah sebanyak 4.7% bagi beban pencemar SO₂. Manakala, beban pencemar CO menunjukkan peningkatan sebanyak 0.7% berbanding dengan tahun 2024.

Overall Emission Load

It was estimated that in 2025 the overall cumulative air pollutant emission load was 2,378,861 metric tonnes of carbon monoxide (CO), 1,007,873 metric tonnes of nitrogen dioxide (NO₂), 283,906 metric tonnes of sulphur dioxide (SO₂) and 27,208 metric tonnes of particulate matter (PM). A comparison of the combined air pollutants emission load in 2023, 2024 and 2025 is shown in **Figure 5.10**.

Overall, there was an increase in emission loads for CO and SO₂. However, NO₂ and PM emissions decreased slightly during that period. The increment of emission load for SO₂ was 4.7%, while emission load of CO pollutants increased by up to 0.7% compared to the year 2024.



Rajah 5.10 : Beban Pencemaran Bahan Pencemar Udara dari Semua Punca, 2023-2025
Figure 5.10 : Air Pollutant Emission Load from All Sources, 2023-2025

(Sumber: Daripada National Energy Balance 2022)
(Source: From National Energy Balance 2022)

Punca Beban Pencemaran

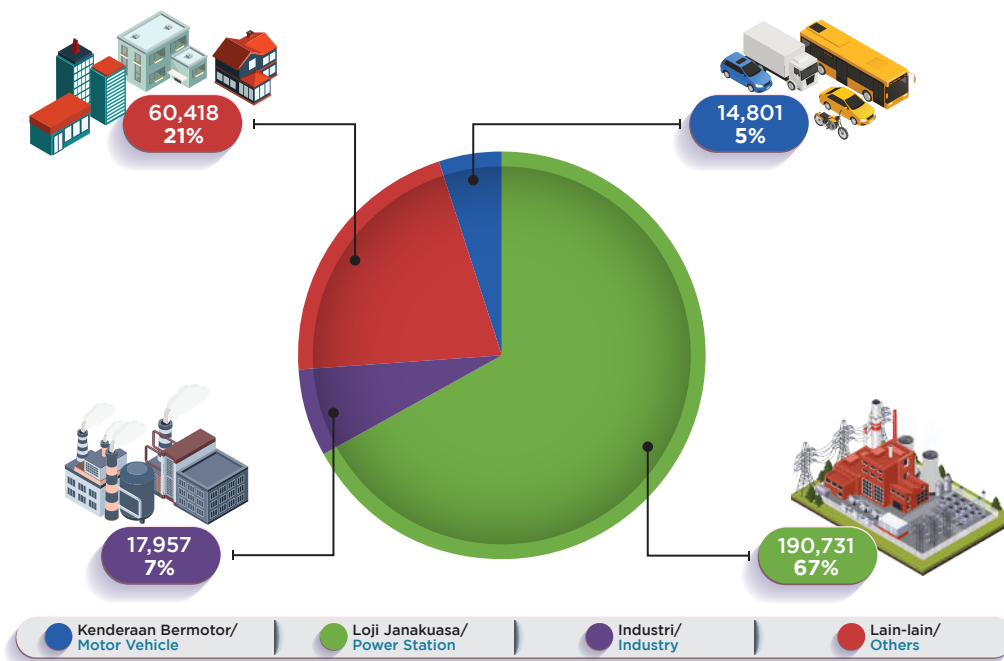
Loji janakuasa merupakan penyumbang utama kepada beban pencemar SO_2 (67%), diikuti dengan lain-lain kategori (21%), industri (7%) dan kenderaan bermotor (5%) (Rajah 5.11). Bagi beban pencemar PM pula, penyumbang terbesar adalah daripada loji janakuasa (44%), lain-lain kategori (25%), diikuti industri (17%) dan kenderaan bermotor (14%) (Rajah 5.12).

Penyumbang terbesar bagi NO_2 adalah daripada loji janakuasa (67%) diikuti kenderaan bermotor (22%), industri (8%) dan lain-lain kategori (3%) (Rajah 5.13). Walau bagaimanapun, kenderaan bermotor masih merupakan penyumbang terbesar kepada CO (96%) (Rajah 5.14). Punca-punca bagi kategori 'Lain-lain' yang dinyatakan di dalam rajah-rajah adalah merupakan pelepasan bahan pencemar udara dari kawasan perumahan, komersial dan penggunaan bukan tenaga. Anggaran pencemaran yang dihasilkan oleh beban pencemar udara daripada kenderaan bermotor iaitu HC, CO, PM, NO_2 dan SO_2 pada tahun 2021 hingga 2025 ditunjukkan dalam Rajah 5.15.

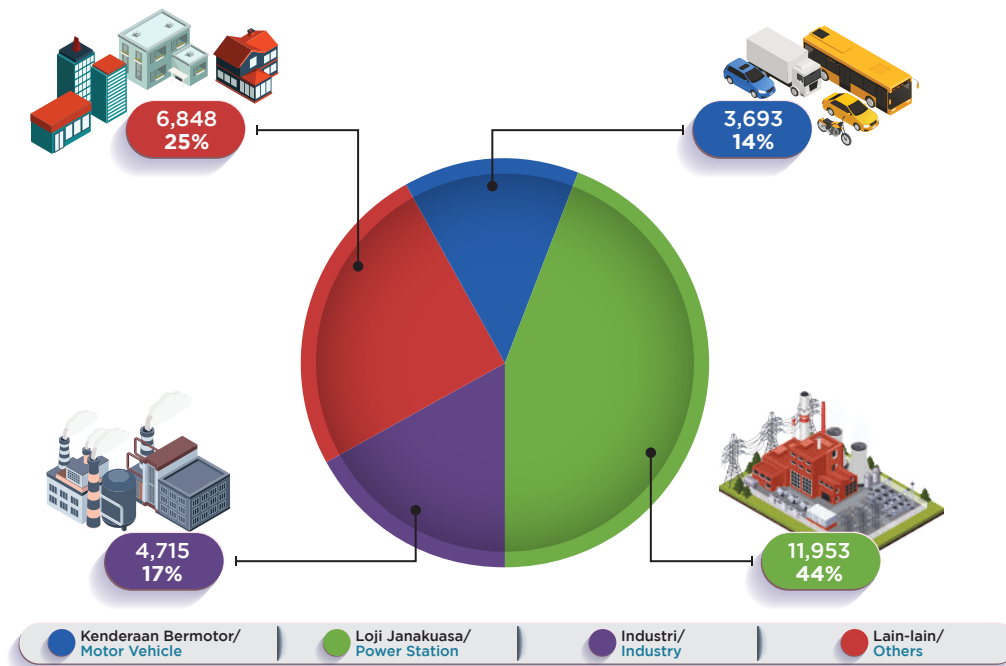
Emission Load by Sources

Power plants contributed the highest SO_2 emission load (67%), followed by other categories (21%), industries (7%) and motor vehicles (5%) (Figure 5.11). As for PM, the highest contributors were power plants (44%) followed by other categories (25%), industries (17%) and motor vehicles (14%) (Figure 5.12).

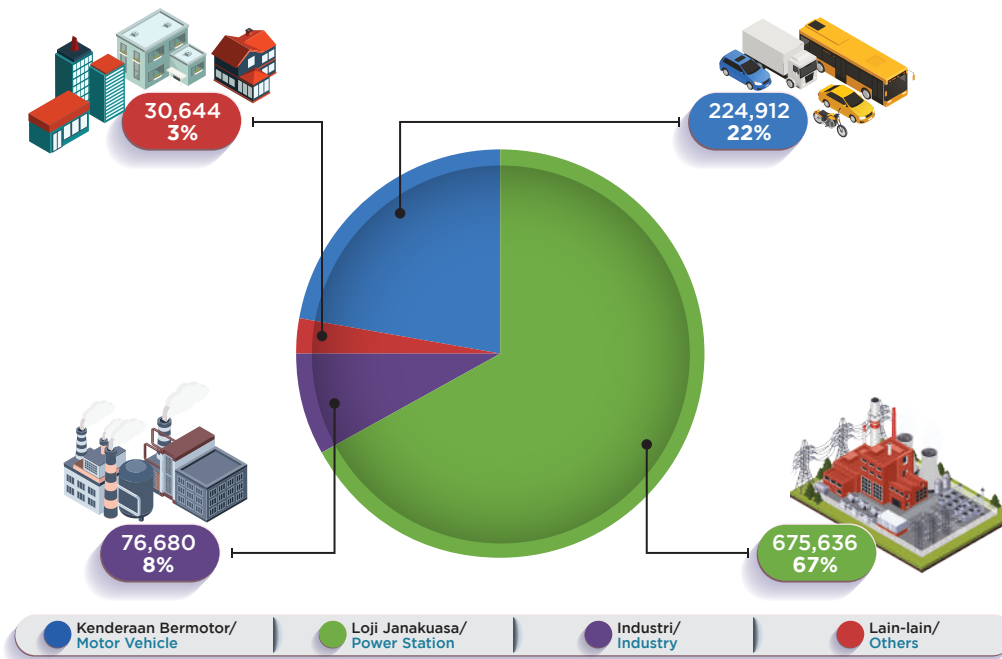
The highest contributors of NO_2 were power plants (67%) followed by motor vehicles (22%), industries (8%), and others (3%) (Figure 5.13). However, motor vehicles remained the highest contributor of CO (96%) (Figure 5.14). 'Others' in the figures represent air pollutant emissions from residential, commercial and non-energy use sources. The estimated annual air pollutant emission loads of HC, CO, PM, NO_2 and SO_2 from motor vehicles for 2021 until 2025 are shown in Figure 5.15.



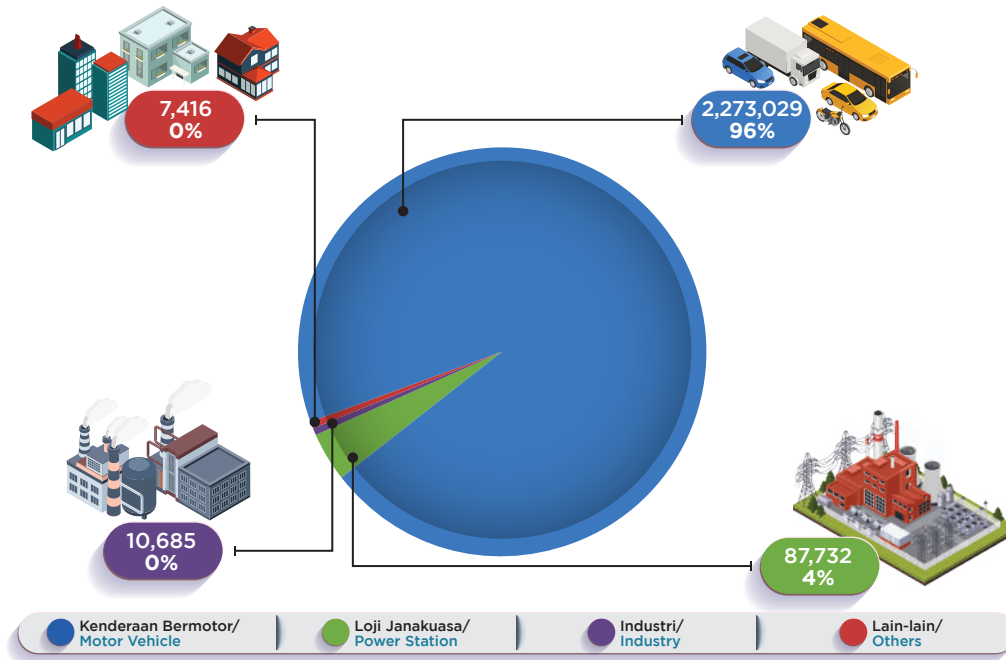
Rajah 5.11 : Punca Beban Pencemaran SO_2 (Tan Metrik), 2025
Figure 5.11 : SO_2 Emission Load by Sources (Metric Tonnes), 2025



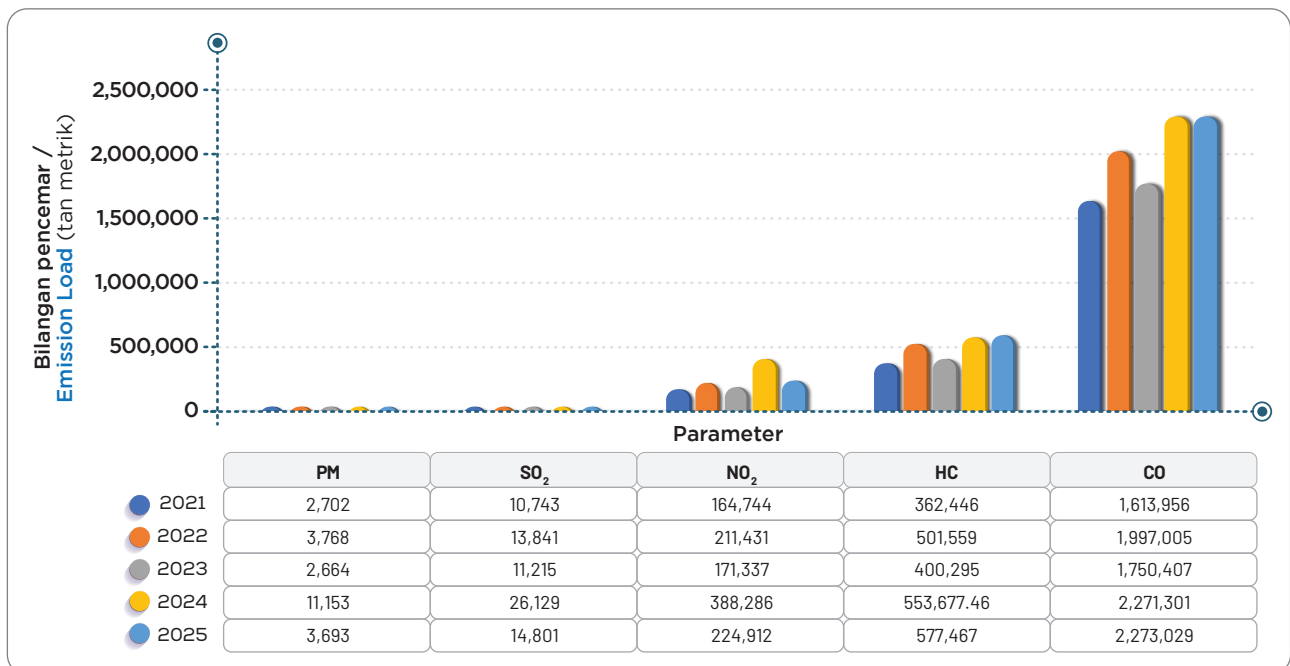
Rajah 5.12 : Punca Beban Pencemaran PM (Tan Metrik), 2025
Figure 5.12 : PM Emission Load by Sources (Metric Tonnes), 2025



Rajah 5.13 : Punca Beban Pencemaran NO₂ (Tan Metrik), 2025
Figure 5.13 : NO₂ Emission Load by Sources (Metric Tonnes), 2025



Rajah 5.14 : Punca Beban Pencemaran CO (Tan Metrik), 2025
Figure 5.14 : CO Emission Load by Sources (Metric Tonnes), 2025



Rajah 5.15 : Beban Pencemar Udara dari Kenderaan Bermotor, 2021-2025 (Metrik Tan)
Figure 5.15 : Air Pollutant Emission Load from Motor Vehicles, 2021-2025 (Metric Tonnes)

INVENTORI BUANGAN TERJADUAL

Scheduled Waste Inventory

Berdasarkan **Jadual 5.1**, Malaysia telah menjana sebanyak 5,840,761.85 tan metrik buangan terjadual pada tahun 2025. Ini menunjukkan peningkatan sebanyak 8.58% daripada 5,378,977.55 tan metrik yang direkodkan pada tahun 2024. Penjana buangan terjadual tertinggi di Malaysia ialah daripada buangan dros/ sanga/ klinker/ abu (SW 104) iaitu sebanyak 3,656,253.91 tan metrik. Selain itu, penjana buangan terjadual yang tinggi juga adalah daripada enap cemar logam berat (SW 204) iaitu sebanyak 358,032.97 tan metrik dan diikuti buangan gypsum (SW 205) iaitu sebanyak 235,532.43 tan metrik.

Based on **Table 5.1**, Malaysia generated a total of 5,840,761.85 metric tons of scheduled waste in 2025, marking an 8.58% increase compared to 5,378,977.55 metric tons recorded in 2024. The largest share of scheduled waste originated from dross/ slag/ clinker/ ash (SW 104) at 3,656,253.91 metric tons, followed by significant contributions from heavy metal sludge (SW 204) amounting to 358,032.97 metric tons, and gypsum waste (SW 205) totalling 235,532.43 metric tons.

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
 Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
1	Debu, sanga, dros atau abu yang mengandungi arsenic, raksa, plumbum, kadmium, kromium, nikel, kuprum, vanadium, berilium, antimony, tellurium, talium, atau selenium, tidak termasuk sanga daripada kilang besi dan keluli / Dust, slag, dross or ash containing arsenic, mercury, lead, cadmium, chromium, nickel, copper, vanadium, beryllium, antimony, tellurium, thallium or selenium excluding slag from iron and steel factory	SW 104	3,656,253.91	62.60
2	Enap cemar yang mengandungi satu atau beberapa logam termasuklah kromium, kuprum, nikel, zink, plumbum, kadmium, aluminium, timah vanadium dan berilium / Sludges containing one or several metals including chromium, copper, nickel, zinc, lead, cadmium, aluminium, tin, vanadium and beryllium	SW 204	358,032.97	6.13
3	Buangan gypsum yang terhasil daripada proses industri kimia atau loji janakuasa / Waste gypsum arising from chemical industry or power plant	SW 205	235,532.43	4.03
4	Campuran buangan terjadual dan buangan tidak terjadual / Mixture of scheduled waste & non-scheduled waste	SW 422	174,950.29	3.00

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
5	Minyak pelincir terpakai / Spent lubricating oil	SW 305	166,040.83	2.84
6	Enap cemar mineral termasuklah enap cemar kalsium hidroksida, enap cemar pemfosfatan, enap cemar kalsium sulfit dan enap cemar karbonat / Mineral sludges including calcium hydroxide sludges, phosphating sludges, calcium sulphite sludges and carbonates sludges	SW 427	152,116.63	2.60
7	Buangan atau enap cemar getah atau lateks yang mengandungi pelarut organik atau logam berat / Rubber or latex wastes or sludge containing organic solvents or heavy metals	SW 321	143,385.45	2.45
8	Buangan minyak atau enap cemar berminyak / Waste oil or oily sludges	SW 311	130,023.33	2.23
9	Kain buruk, plastik, kertas atau turas yang dicemari dengan buangan terjadual / Rags, plastics, papers or filters contaminated with scheduled wastes	SW 410	115,699.30	1.98
10	Asid tidak organik terpakai / Spent inorganic acids	SW 206	87,314.58	1.49
11	Bekas, beg atau kelengkapan yang dilupuskan yang dicemari dengan bahan kimia, racun makhluk perosak, minyak mineral atau buangan terjadual / Disposed containers, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled wastes	SW 409	86,546.41	1.48
12	Enap cemar yang mengandungi fluorida / Sludge containing fluoride	SW 207	79,211.02	1.36
13	Buangan daripada pemasangan elektrik dan elektronik yang mengandungi komponen seperti akumulator, suis raksa, kaca daripada tiub sinar katod dan kaca teraktif atau kapasitor bifenil terpoliklorin yang lain, atau yang dicemari dengan kadmium, raksa, plumbum, nikel, kromium, kuprum, litium, perak, mangan, atau bifenil terpoliklorin / Waste from electrical and electronic assemblies containing components such as accumulators, mercury-switches, glass from cathode-ray tubes and other activated glass or polychlorinated biphenyl-capacitors, or contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese or polychlorinated biphenyl	SW 110	77,783.32	1.33

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
 Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
14	Buangan pelarut organik bukan terhalogen / Waste of non-halogenated solvent	SW 322	54,656.30	0.94
15	Buangan patogenik, buangan klinikal atau bahan yang dikuarantinkan / Pathogenic wastes, clinical wastes or quarantined materials	SW 404	48,677.80	0.83
16	Buangan dakwat, cat, pigmen, lakuer, perwarna atau varnis / Waste of inks, paints, pigments, lacquer, dye or varnish	SW 417	30,578.43	0.52
17	Buangan bateri asid plumbum dalam bentuk sempurna atau hancur / Waste of lead acid batteries in whole or crushed form	SW 102	25,604.32	0.44
18	Enap cemar dakwat, cat pigmen, lakuer, perwarna atau varnis / Sludges of inks, paints, pigments, lacquer, dye or varnish	SW 416	25,172.67	0.43
19	Tanah, puing, atau bahan tercemar yang terhasil daripada pembersihan tumpahan bahan kimia, minyak mineral, atau buangan terjadual / Contaminated soil, debris or matter resulting from cleaning-up of a spill of chemical, mineral oil or scheduled wastes	SW 408	22,021.16	0.38
20	Larutan pemprosesan terpakai, bahan kimia fotografi terbuang atau buangan fotografi terbuang / Spent processing solution, discarded photographic chemicals or discarded photographic wastes	SW 423	21,806.44	0.37
21	Emulsi minyak mineral-air terpakai / Spent mineral oil-water emulsion	SW 307	20,639.87	0.35
22	Produk dakwat, cat, pigmen, lakuer, perwarna atau varnish yang terbuang atau yang tidak mengikut spesifikasi yang mengandungi pelarut organik / Discarded or off-specification inks, paints, pigments, lacquer, dye or varnish products containing organic solvent	SW 418	17,432.08	0.30
23	Klinker, sanga, abu dari penunu buangan terjadual / Clinker, slag and ashes from scheduled wastes incinerator	SW 406	14,876.58	0.25
24	Apa-apa sisa daripada pengolahan atau pemerolehan kembali buangan terjadual / Any residues from treatment or recovery of scheduled wastes	SW 501	13,984.63	0.24

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
25	Campuran minyak-air seperti air ballast / Oil-water mixture such as ballast water	SW 309	8,883.77	0.15
26	Bahan kimia yang terbuang atau tidak mengikut spesifikasi / Chemicals that are discarded or off- specification	SW 429	8,140.53	0.14
27	Campuran buangan terjadual / A mixture of scheduled wastes	SW 421	6,435.44	0.11
28	Minyak hidraulik terpakai / Spent hydraulic oil	SW 306	6,047.47	0.1
29	Buangan mangkin / Waste catalyst	SW 202	5,869.65	0.1
30	Buangan pelarut organik terhalogen / Waste of halogenated organic solvents	SW 323	4,937.19	0.08
31	Alkali terpakai dengan pH yang lebih daripada atau sama dengan 11.5 yang mengakis atau berbahaya / Spent alkalis with pH more or equal to 11.5 which are corrosive or hazardous	SW 402	4,888.12	0.08
32	Buangan cecair terma (pemindahan haba) seperti glikol etilena / Waste of thermal fluids (heat transfer) such as ethylene glycol	SW 327	4,636.48	0.08
33	Minyak atau enap cemar daripada operasi penyenggaraan loji penapisan minyak / Oil or sludge from oil refinery plant maintenance operation	SW 314	4,245.36	0.07
34	Karbon teraktif yang terpakai tidak termasuk karbon daripada pengolahan air boleh diminum dan proses industri makanan dan penghasilan vitamin / Spent activated carbon excluding carbon from the treatment of potable water and processes of the food industry and vitamin production	SW 411	3,790.02	0.06
35	Alkali terpakai yang mengandungi logam berat / Spent alkalis containing heavy metals	SW 401	3,493.75	0.06
36	Sisa berminyak dari bengkel automotif, stesen servis minyak atau perangkap gris / Oily residue from automotive workshop, service station, oil or grease interceptor	SW 312	3,229.13	0.06
37	Larutan alkali berair terpakai yang mengandungi sianida / Spent aqueous alkaline solution containing cyanide	SW 414	3,205.32	0.05

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
 Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
38	Buangan bateri yang mengandungi kadmium dan nikel atau raksa atau litium / Waste of batteries containing cadmium and nickel or mercury or lithium	SW 103	2,912.09	0.05
39	Buangan resin tidak matang yang mengandungi pelarut organik atau logam berat termasuklah resin epoksi dan resin fenolik / Uncured resin waste containing organic solvents or heavy metals including epoxy resin and phenolic resin	SW 325	1,863.58	0.03
40	Buangan yang mengandungi raksa atau sebatianannya / Waste containing mercury or its compound	SW 109	1,842.12	0.03
41	Buangan pelekat atau glu yang mengandungi pelarut organik tidak termasuk bahan polimer pepejal / Adhesive or glue waste containing organic solvents excluding solid polymeric materials	SW 303	1,728.49	0.03
42	Buangan fenol atau sebatian fenol termasuklah klorofenol dalam bentuk cecair atau enap cemar / Waste of phenols or phenol compounds including chlorophenol in the form of liquids or sludges	SW 319	1,454.33	0.02
43	Diisosianat terpakai dan sisa sebatian isosianat tidak termasuk bahan berpolimer pepejal daripada proses pengilangan busa / Spent di-isocyanates and residues of isocyanate compounds excluding solid polymeric material from foam manufacturing process	SW 419	1,280.41	0.02
44	Buangan asbestos dalam bentuk enap cemar, debu atau gentian / Asbestos wastes in sludges, dust or fibre forms	SW 201	449.61	0.01
45	Buangan yang mengandungi formadehid / Waste containing formaldehyde	SW 320	398.83	0.01
46	Enap cemar dari tangki penyimpanan minyak mineral / Sludge from mineral oil storage tank	SW 310	398.27	0.01
47	Enap cemar dari tangki minyak / Oil tankers sludges	SW 308	368.08	0.01
48	Buangan yang terhasil daripada penyediaan dan pengeluaran barangan farmaseutikal / Waste arising from the preparation and production of pharmaceutical product	SW 405	361.18	0.01

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
49	Dadah terbuang yang mengandungi bahan psikotrofik atau yang mengandungi bahan yang bertoksik berbahaya, karsinogenik, mutagenik atau teratogenik / Discarded drugs containing psychotropic substances or containing substances that are toxic, harmful, carcinogenic, mutagenic or teratogenic	SW 403	336.37	0.01
50	Asid organik terpakai dengan pH yang kurang daripada atau sama dengan 2 yang mengakis atau berbahaya / Spent organic acids with pH less or equal to 2 which are corrosive or hazardous	SW 301	256.82	0.00
51	Bahan kimia makmal yang usang / Obsolete laboratory chemicals	SW 430	173.72	0.00
52	Buangan, bahan dan artikel yang mengandungi atau yang dicemari dengan bifenil terpoliklorin (BFT) atau trifenil terpoliklorin (TFT) / Waste, substances and articles containing or contaminated with polychlorinated biphenyls (PCB) or polychlorinated triphenyls (PCT)	SW 318	168.00	0.00
53	Buangan sisa penyulingan tidak berair terhalogen atau bukan terhalogen yang terhasil daripada proses pemerolehan kembali pelarut organik / Waste of halogenated or unhalogenated nonaqueous distillation residues arising from organic solvents recovery process	SW 324	130.75	0.00
54	Buangan terjadual tidak boleh bergerak termasuklah enap cemar yang ditetapkan secara kimia, dikapsulkan, dipejalkan atau distabilkan / Immobilized scheduled wastes including chemically fixed, encapsulated, solidified or stabilized sludges	SW 203	116.07	0.00
55	Buangan fluks yang mengandungi campuran asid organik, pelarut atau sebatian ammonium klorida / Flux waste containing mixture of organic acids, solvents or compounds of ammonium chloride	SW 302	108.15	0.00
56	Tanah yang dicemari minyak daripada penapisan semula minyak pelincir terpakai / Oil contaminated earth from re-refining of used lubricating oil	SW 313	74.09	0.00

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
 Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
57	Produk yang tidak mengikut spesifikasi daripada pengeluaran, formulasi, perdagangan, atau penggunaan racun makhluk perosak, racun herba, atau biosid / Off-specification products from the production, formulation, trade or use of pesticides, herbicides or biocides	SW 426	28.33	0.00
58	Buangan daripada pengeluaran, formulasi, perdagangan atau penggunaan racun makhluk perosak, racun herba atau biosid / Wastes from the production, formulation, trade or use of pesticides, herbicides or biocides	SW 425	26.50	0.00
59	Buangan daripada pengilangan atau pemprosesan atau penggunaan bahan letupan / Waste from manufacturing or processing or use of explosives	SW 431	26.16	0.00
60	Sisa daripada pemerolehan kembali likuor penjerukan asid / Residues from recovery of acid pickling liquor	SW 106	25.85	0.00
61	Enap cemar galvanik / Galvanic sludges	SW 105	17.59	0.00
62	Enap cemar asid / Acid sludges	SW 316	16.14	0.00
63	Buangan yang mengandungi arsenik atau sebatianannya / Waste containing arsenic or its compound	SW 101	12.06	0.00
64	Buangan yang mengandungi, yang terdiri daripada, atau yang dicemari dengan peroksida / Waste containing, consisting of or contaminated with, peroxides	SW 432	10.32	0.00
65	Tar atau sisa bertar dari loji penapisan minyak atau loji petrokimia / Tar or tarry residues from oil refinery or petrochemical plant	SW 315	9.73	0.00
66	Enap cemar yang mengandungi sianida / Sludges containing cyanide	SW 412	8.45	0.00
67	Buangan daripada operasi pengawetan kayu yang menggunakan garam tidak organik yang mengandungi kuprum, kromium, atau arsenik daripada sebatian fluoride atau yang menggunakan sebatian yang mengandungi fenol berklorin atau kreosot / Wastes from wood preserving operation using inorganic salts containing copper, chromium or arsenic of fluoride compounds or using compound containing chlorinated phenol or creosote	SW 428	5.26	0.00

Jadual 5.1: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Kod Kategori Buangan Terjadual, 2025
Table 5.1: Quantity of Scheduled Wastes Generated by Scheduled Waste Category Code, 2025

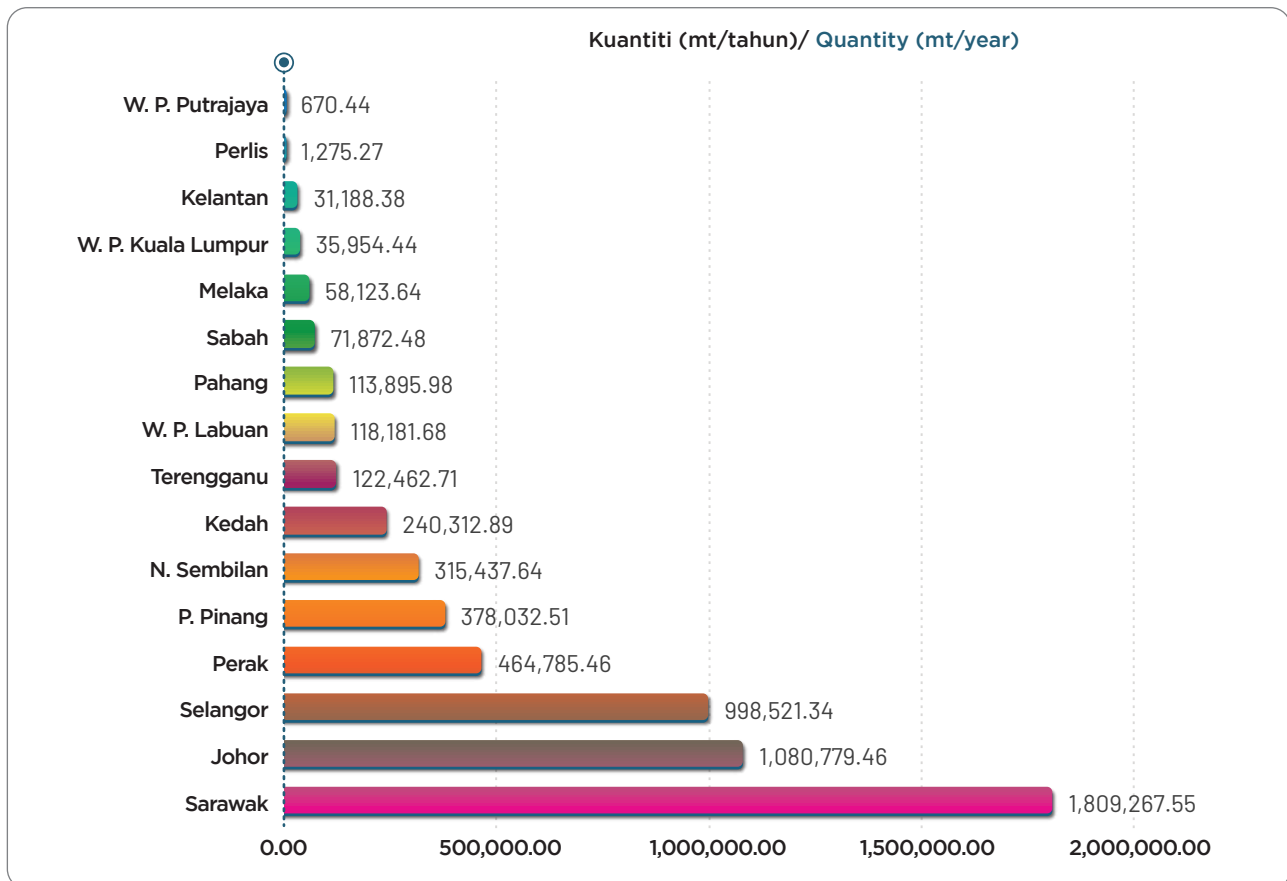
BIL/ NO.	NAMA BUANGAN/ WASTE NAME	KOD BUANGAN/ WASTE CODE	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
68	Agen pengoksidaan terpakai / Spent oxidizing agent	SW 424	4.68	0.00
69	Sisa larutan resap daripada pemprosesan zink dalam bentuk debu dan enap cemar / Leaching residues from zinc processing in dust and sludges form	SW 108	4.55	0.00
70	Buangan sebatian fosforus organik / Waste of organic phosphorus compound	SW 326	1.33	0.00
71	Sanga daripada pemprosesan kuprum bagi pemprosesan lanjut atau penapisan yang mengandungi arsenic, plumbum, atau kadmium / Slags from copper processing for further processing or refining containing arsenic, lead or cadmium	SW 107	0.68	0.00
72	Garam terpakai yang mengandungi sianida / Spent salt containing cyanide	SW 413	0.12	0.00
73	Sebatian organologam terpakai termasuklah plumbum tetraetil, plumbum tetrametil dan sebatian organotimah / Spent organometallic compounds including tetraethyl lead, tetramethyl lead and organotin compounds	SW 317	0.10	0.00
74	Kek tekan daripada prapengolahan lai sabun gliserol / Press cake from pretreatment of glycerol soap lye	SW 304	0.07	0.00
75	Buangan yang mengandungi dioksin dan furan / Waste containing dioxins or furans	SW 407	0.02	0.00
76	Minyak pelindapan terpakai yang mengandungi sianida / Spent quenching oils containing cyanides	SW 415	0.00	0.00
77	Larutan resap dari tapak pelupusan buangan terjadual / Leachate from scheduled waste landfill	SW 420	0.00	0.00
JUMLAH/TOTAL			5,840,761.85	100.00

Nota/Note:

Jumlah Keseluruhan Peratus (%) Buangan Terjadual bagi Kod dari Bil. 50 hingga Bil. 77 adalah 0.02%.
The Overall Percentage (%) of Scheduled Waste for Code from No. 50 to No. 77 is 0.02%.

Analisis penghasilan buangan terjadual mengikut negeri di Malaysia menunjukkan Sarawak merupakan negeri dengan penghasilan buangan terjadual yang tertinggi, iaitu sebanyak 1,809,267.55 tan metrik (30.98%) diikuti oleh Johor sebanyak 1,080,779.46 tan metrik (18.50%), Selangor sebanyak 998,521.34 (17.10%), Perak sebanyak 464,785.46 (7.96%), P. Pinang dengan jumlah 378,032.51 tan metrik (6.47%) dan seterusnya negeri-negeri lain seperti yang dipaparkan dalam **Rajah 5.16**.

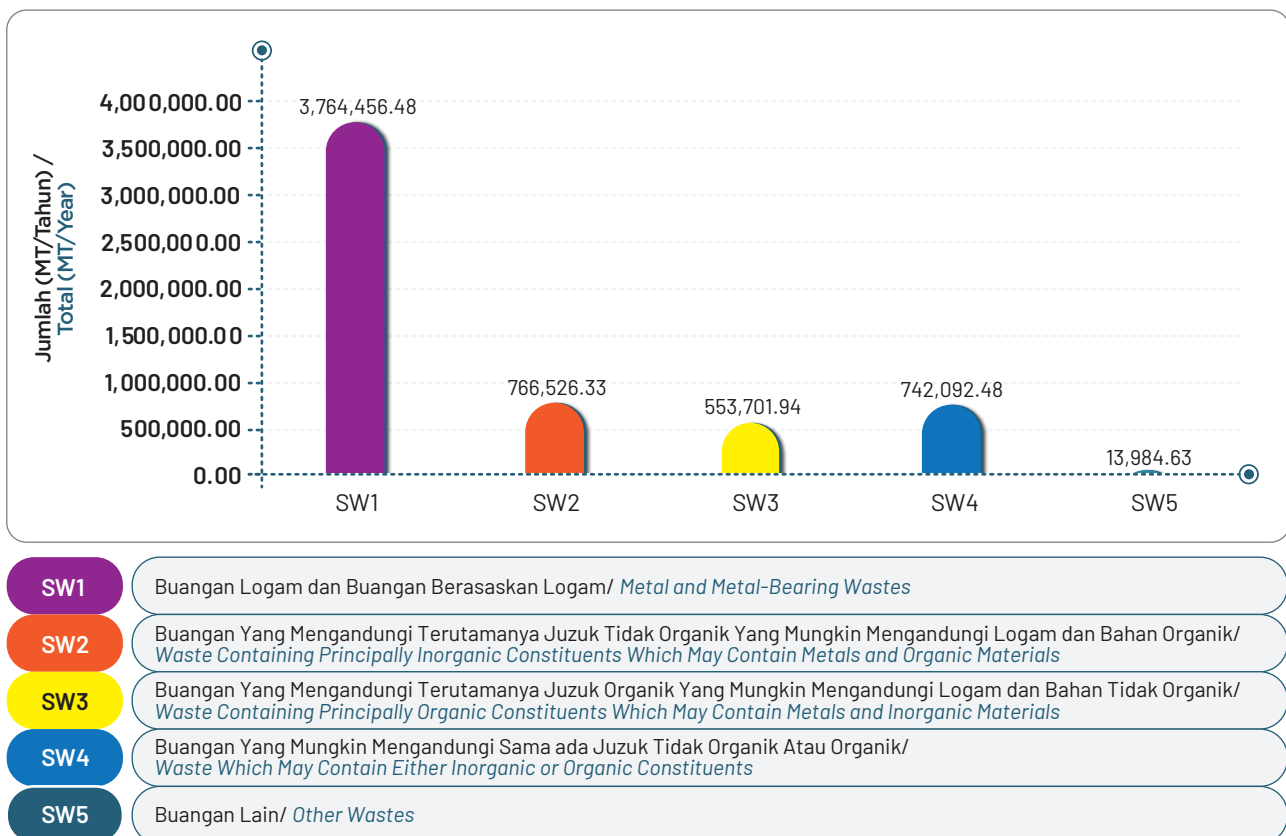
Analysis of scheduled waste generation by state in Malaysia shows that Sarawak recorded the highest amount, with 1,809,267.55 metric tons (30.98%), followed by Johor with 1,080,779.46 metric tons (18.50%), Selangor with 998,521.34 metric tons (17.10%), Perak with 464,785.46 metric tons (7.96%), and Penang with 378,032.51 metric tons (6.47%), while other states contributed smaller proportions as illustrated in **Figure 5.16**.



Rajah 5.16: Penghasilan Buangan Terjadual (Tan Metrik) Mengikut Negeri 2025
Figure 5.16: Distribution of Scheduled Waste (Metric Tonnes) generated by State 2025

Rajah 5.17 menggambarkan jumlah penghasilan buangan terjadual mengikut kumpulan seperti yang ditetapkan dalam Jadual Pertama, Peraturan 2, di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005. Kumpulan SW yang mencatatkan jumlah penghasilan yang paling tinggi ialah kumpulan SW 1 iaitu sebanyak 3,764,456.48 tan metrik dengan menunjukkan peningkatan sebanyak 44.17% berbanding 2,611,081.56 tan metrik pada tahun 2024. Seterusnya, diikuti Kumpulan SW 2 yang merekodkan penghasilan sebanyak 766,526.33 tan metrik, menurun sebanyak 37.95% berbanding 1,235,299.63 tan metrik yang dilaporkan pada tahun sebelumnya.

Figure 5.17 illustrates the total generation of scheduled waste by groups as stipulated in the First Schedule, Regulation 2, under the Environmental Quality (Scheduled Wastes) Regulations 2005. The group recording the highest generation was SW 1, amounting to 3,764,456.48 metric tons, representing an increase of 44.17% compared to 2,611,081.56 metric tons in 2024. This was followed by SW 2, which recorded 766,526.33 metric tons, showing a decrease of 37.95% compared to 1,235,299.63 metric tons reported in the previous year.



Rajah 5.17: Jumlah Penghasilan Buangan Terjadual Mengikut Kumpulan Buangan Dalam Jadual Pertama, Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005

Figure 5.17: Total Scheduled Wastes Generation According to the First Scheduled Environmental Quality (Schedule Wastes) Regulations 2005

Bagi kategori industri, sektor pembuatan merupakan penyumbang utama yang menjana buangan terjadual tertinggi seperti yang direkodkan dalam **Jadual 5.2** iaitu sebanyak 3,544,309.98 tan metrik (60.68%) diikuti dengan sektor bekalan elektrik, gas, wap dan penyaman udara iaitu sebanyak 1,578,158.27 tan metrik (27.02%). Seterusnya, industri bekalan air termasuk pembentungan, pengurusan sisa dan aktiviti pemulihan menyumbang sebanyak 351,931.46 tan metrik (6.03%) dari jumlah keseluruhan buangan terjadual yang dihasilkan.

For the industrial category, the manufacturing sector was the main contributor, generating the highest amount of scheduled waste as recorded in **Table 5.2**, with a total of 3,544,309.98 metric tons (60.68%), followed by the electricity, gas, steam, and air conditioning supply sector with 1,578,158.27 metric tons (27.02%). In addition, the water supply industry including sewerage, waste management, and remediation activities, contributed 351,931.46 metric tons (6.03%) of the overall scheduled waste generated.

Jadual 5.2: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Jenis Industri 2025
Table 5.2: Quantity of Scheduled Wastes Generated by Industry 2025

BIL/ NO.	JENIS INDUSTRI/ TYPE OF INDUSTRIES	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
1	Pembuatan / Manufacturing	3,544,309.98	60.68
2	Bekalan elektrik, gas, wap dan penyaman udara / Electricity, gas, steam and air conditioning supply	1,578,158.27	27.02
3	Bekalan air; pembentungan, pengurusan sisa dan aktiviti pemulihan / Water supply; sewerage, waste management and remediation activities	351,931.46	6.03
4	Perdagangan borong dan runcit; pembaikan kenderaan bermotor dan motosikal / Wholesale and retail trade; repair of motor vehicles and motorcycles	127,178.55	2.18
5	Sektor kesihatan manusia dan kerja sosial / Human health and social work activities	108,376.75	1.86
6	Pembinaan / Construction	55,493.96	0.95
7	Aktiviti profesional, saintifik dan teknikal / Professional, scientific and technical activities	23,442.17	0.40
8	Maklumat dan komunikasi / Information and communication	18,234.72	0.31
9	Perlombongan dan pengkuarian / Mining and quarrying	11,706.83	0.20
10	Pengangkutan dan penyimpanan / Transportation and storage	10,767.63	0.18
11	Pertanian, perhutanan dan perikanan / Agriculture, forestry and fishing	7,609.26	0.13
12	Aktiviti perkhidmatan lain / Other service activities	2,277.15	0.04

Jadual 5.2: Jumlah Buangan Terjadual Yang Dihasilkan Mengikut Jenis Industri 2025
Table 5.2: Quantity of Scheduled Wastes Generated by Industry 2025

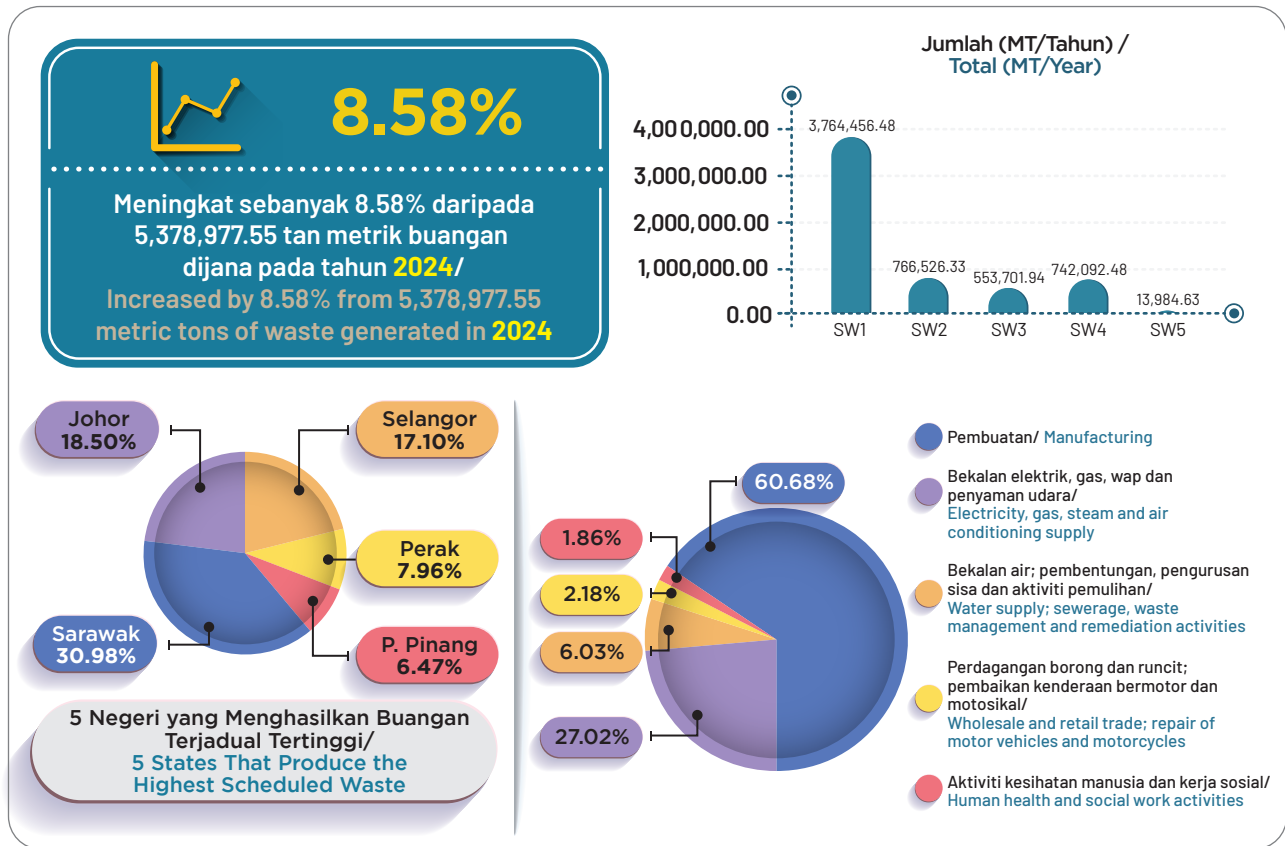
BIL/ NO.	JENIS INDUSTRI/ TYPE OF INDUSTRIES	MT/TAHUN / MT/YEAR	PERATUS (%) / PERCENTAGE (%)
13	Pentadbiran awam dan pertahanan; keselamatan sosial wajib / Public administration and defence; compulsory social security	892.10	0.02
14	Pendidikan / Education	193.50	0.00
15	Aktiviti perkhidmatan pentadbiran dan sokongan / Administrative and support service activities	112.56	0.00
16	Aktiviti isi rumah sebagai majikan; aktiviti pengeluaran barangan dan perkhidmatan isi rumah untuk kegunaan sendiri / Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	29.58	0.00
17	Aktiviti hartanah / Real estate activities	26.73	0.00
18	Aktiviti penginapan dan perkhidmatan awam / Accommodation and food service activities	17.41	0.00
19	Aktiviti badan dan organisasi luar wilayah / Activities of extraterritorial organizations and bodies	1.82	0.00
20	Kesenian, hiburan dan rekreasi / Arts, entertainment and recreation	1.06	0.00
21	Aktiviti kewangan dan insurans/takaful / Financial and insurance/takaful activities	0.37	0.00
JUMLAH		5,840,761.85	100

Statistik penghasilan buangan terjadual di Malaysia bagi tahun 2025 secara ringkasnya dapat dilihat melalui **Rajah 5.18** yang memberikan gambaran menyeluruh mengenai trend, taburan negeri dan sumbangan industri terhadap penghasilan buangan terjadual pada tahun 2025.

The statistics of scheduled waste generation in Malaysia for 2025 can be briefly observed through **Figure 5.18**, which provides a comprehensive overview of the trends, state distribution, and industrial contributions to scheduled waste generation in that year.



Stesen Janakuasa
Sultan Azlan Shah,
Perak



Rajah 5.18: Statistik Penghasilan Buangan Terjadual 2025
Figure 5.18: Statistic of Scheduled Waste Generation 2025

KAEDAH PENGENDALIAN BUANGAN TERJADUAL DI MALAYSIA

Scheduled Waste Management in Malaysia

Sebanyak 2,636,342.35 tan metrik daripada 5,840,761.85 tan metrik buangan terjadual yang dihasilkan pada tahun 2025 masih lagi distorkan di dalam premis sebelum dilupuskan pada tahun 2026 kepada premis yang dilesenkan oleh Jabatan Alam Sekitar. Ini merupakan peningkatan sebanyak 31.92% berbanding yang direkodkan pada tahun 2024.

Buangan terjadual yang diuruskan secara khas pada tahun 2025 adalah sebanyak 1,908,941.94 tan metrik, meningkat kepada 1.55% berbanding pada tahun 2024. Buangan yang diuruskan secara khas ini digunakan semula oleh industri sebagai bahan api alternatif atau bahan mentah, ataupun dilupuskan di tapak pelupusan sanitari, seperti yang ditunjukkan dalam Rajah 5.19.

Out of the 5,840,761.85 metric tons of scheduled waste generated in 2025, a total of 2,636,342.35 metric tons remained stored at premises before being disposed of in 2026 to facilities licensed by the Department of Environment. This represents an increase of 31.92% compared to that recorded in 2024.

Scheduled waste managed under special waste management in 2025 amounted to 1,908,941.94 metric tons, reflecting a 1.55% increase compared to 2024. Such specially managed waste was either reused by industries as alternative fuel or raw materials, or disposed of at designated sanitary landfill sites, as shown in Figure 5.19.

Pendekatan pengurusan khas ini bukan sahaja mengurangkan kebergantungan kepada kaedah pelupusan konvensional, tetapi juga menyokong usaha kitar semula dan pemulihan sumber dalam sektor industri.

Pengolahan dalam tapak merupakan satu kaedah rawatan buangan terjadual, di mana pengeluar buangan melaksanakan proses pengolahan sendiri di dalam premis. Pada tahun 2025, sebanyak 513,254.84 tan metrik buangan terjadual telah diolah di dalam tapak oleh premis pengeluar buangan, berkurang sebanyak 35.95% berbanding tahun sebelumnya. Sementara itu, buangan terjadual yang diperoleh kembali secara luar tapak mencatatkan jumlah sebanyak 357,056.85 tan metrik berkurang sebanyak 22.15%.

Berdasarkan rekod tahun 2025, sejumlah 210,226.07 tan metrik buangan terjadual (tidak termasuk sisa klinikal) telah diuruskan di Kemudahan Pengurusan Buangan Terjadual Bersepadu melalui pelbagai kaedah seperti pembakaran, dilupuskan di tapak pelupusan selamat, rawatan secara fizikal dan kimia, serta solidifikasi.

Angka ini menunjukkan peningkatan sebanyak 10.64% berbanding tahun 2024 selaras dengan perkembangan infrastruktur dan fasiliti Kemudahan Pengurusan Buangan Terjadual Bersepadu di Malaysia.

Pengeksportan buangan terjadual ke luar negara bagi tujuan pemerolehan kembali mencatatkan jumlah sebanyak 166,262.00 tan metrik, meningkat berbanding yang direkodkan pada tahun 2024.

Buangan sisa klinikal diklasifikasikan sebagai buangan terjadual SW 404, iaitu buangan yang terhasil daripada kemudahan penyediaan perkhidmatan kesihatan. Pada tahun 2025, penjaan buangan sisa klinikal mencatatkan jumlah sebanyak 48,677.80 tan metrik, meningkat sebanyak 4.16%.

This approach not only reduces reliance on conventional disposal methods but also supports recycling and resource recovery efforts within the industrial sector.

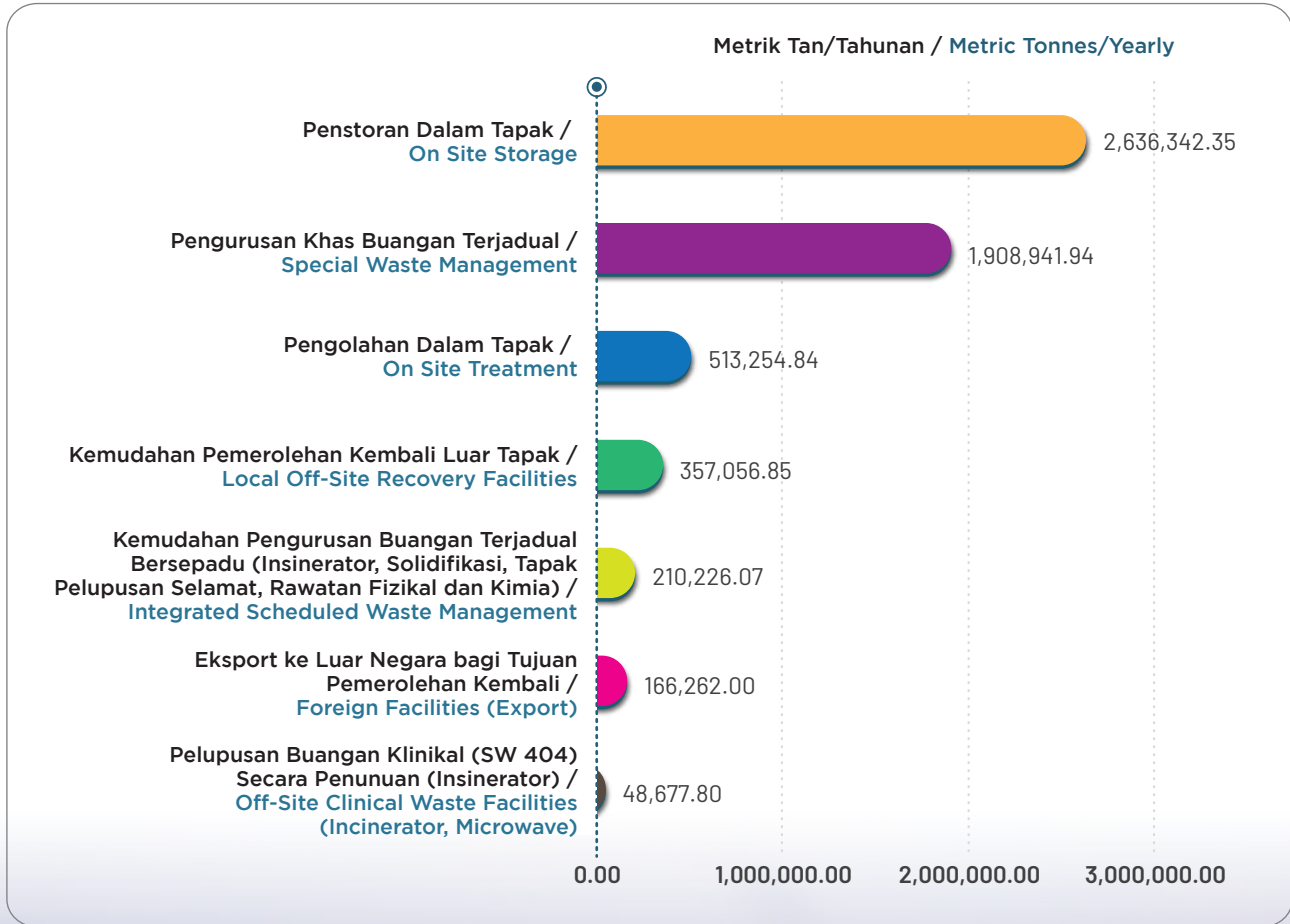
On-site treatment is another method of scheduled waste management whereby waste generators carry out treatment processes within their own premises. In 2025, a total of 513,254.84 metric tons of scheduled waste were treated on-site, marking a 35.95% decrease compared to the previous year. Meanwhile, scheduled waste recovered off-site recorded 357,056.85 metric tons, a reduction of 22.15%.

Based on records for 2025, a total of 210,226.07 metric tons of scheduled waste (excluding clinical waste) were managed at Integrated Scheduled Waste Management Facilities through various methods such as incineration, secure landfill disposal, physical and chemical treatment, and solidification.

This figure represents an increase of 10.64% compared to 2024, in line with the expansion of infrastructure and facilities for Integrated Scheduled Waste Management in Malaysia.

The export of scheduled waste abroad for recovery purposes amounted to 166,262.00 metric tons, showing an increase compared to that recorded in 2024.

Clinical waste, classified as scheduled waste SW 404, refers to waste generated from healthcare service facilities. In 2025, the generation of clinical waste totalled 48,677.80 metric tons, reflecting a 4.16% increase.



Rajah 5.19: Kemudahan Yang Mengendalikan Buangan Terjadual 2025
 Figure 5.19: Facilities Handling Scheduled Wastes 2025



Kuala Langat Power
 Plant, Selangor



PENGURUSAN KHAS BUANGAN TERJADUAL

Special Management Of Scheduled Waste

Dari perspektif pengurusan khas, jumlah buangan terjadual yang dikendalikan melalui pengurusan khas pada tahun 2025 adalah sebanyak 1,908,941.94 tan metrik berbanding 1,879,787.21 tan metrik yang dijana pada tahun 2024 iaitu kenaikan sebanyak 1.55%. Jadual 5.3 menunjukkan pecahan buangan terjadual yang dikendalikan secara khas mengikut kod buangan, sumber buangan dan kaedah pengurusan buangan. Berdasarkan kepada jadual tersebut, sebanyak 1,756,963.09 tan metrik buangan kod SW 104 telah dikendalikan secara khas di mana ianya digunakan semula sebagai bahan mentah oleh pihak industri untuk pembuatan produk.

Sebanyak 127,279.71 tan metrik buangan enap cemar yang mengandungi logam berat yang dikategorikan sebagai buangan terjadual kod SW 204 telah dikendalikan secara pengurusan khas. Daripada jumlah tersebut, sebanyak 69,256.11 tan metrik telah dilupuskan di tapak pelupusan sanitari dan 58,023.60 tan metrik telah digunakan semula sebagai bahan mentah oleh pihak industri untuk pembuatan produk.

Buangan klinker, sanga, abu, dari penunu buangan terjadual merupakan buangan yang dikategorikan sebagai buangan terjadual kod SW 406. Sebanyak 12,820.62 tan metrik buangan tersebut telah dilupuskan ke tapak pelupusan sanitari pada tahun 2025.

From the perspective of special management, the total scheduled waste handled under this approach in 2025 amounted to 1,908,941.94 metric tons, compared to 1,879,787.21 metric tons generated in 2024, representing an increase of 1.55%. Table 5.3 presents the breakdown of scheduled waste managed under special management according to waste codes, sources, and management methods. Based on the table, a total of 1,756,963.09 metric tons of waste under code SW 104 was managed through special management, where it was reused as raw material by industries for product manufacturing.

A total of 127,279.71 metric tons of sludge containing heavy metals, categorized as scheduled waste code SW 204, was managed under special management. Of this amount, 69,256.11 metric tons were disposed of at sanitary landfill sites, while 58,023.60 metric tons were reused as raw materials by industries for product manufacturing.

Scheduled waste in the form of clinker, slag, and ash from scheduled waste incinerators, categorized under waste code SW 406, was also managed under special management. In 2025, a total of 12,820.62 metric tons of such waste was disposed of at sanitary landfill sites.

Jadual 5.3: Buangan Terjadual Yang Diuruskan Di Bawah Pengurusan Khas 2025
Table 5.3: Scheduled Waste Managed Under Special Waste Management 2025

NO./ NO.	KATEGORI BUANGAN/ WASTE CATEGORY	KOD BUANGAN/ WASTE CODE	SUMBER/ SOURCE	TAN METRIK/ TONNES	PERATUSAN (%)/ PERCENTAGE (%)	CARA PENGURUSAN/ METHOD OF HANDLING
1.	Enap cemar yang mengandungi satu atau beberapa logam termasuklah kromium, kuprum, nikel, zink, plumbum, kadmium, aluminium, timah vanadium dan berilium / Sludges containing one or several metals including chromium, copper, nickel, zinc, lead, cadmium, aluminium, tin, vanadium and beryllium	SW 204	Loji Rawatan Air/ Water Treatment Plant	67,332.65	3.53	Tapak pelupusan sanitari / Sanitary landfill
			Industri/ Industry	1,923.46	0.10	
				58,023.60	3.04	Digunakan semula sebagai bahan mentah dalam penghasilan produk / Reuse as raw material for product
2.	Debu, sanga, dros atau abu yang mengandungi arsenic, raksa, plumbum, kadmium, kromium, nikel, kuprum, vanadium, berilium, antimony, tellurium, talium, atau selenium, tidak termasuk sanga daripada kilang besi dan keluli / Dust, slag, dross or ash containing arsenic, mercury, lead, cadmium, chromium, nickel, copper, vanadium, beryllium, antimony, tellurium, thallium or selenium excluding slag from iron and steel factory	SW 104	Loji Janakuasa Arang Batu/ Coal-Fired Power Plant	1,148,047.48	60.14	Digunakan semula sebagai bahan mentah dalam penghasilan produk / Reuse as raw material for product
			Industri/ Industry	608,915.61	31.90	

Jadual 5.3: Buangan Terjadual Yang Diuruskan Di Bawah Pengurusan Khas 2025
Table 5.3: Scheduled Waste Managed Under Special Waste Management 2025

NO./ NO.	KATEGORI BUANGAN/ WASTE CATEGORY	KOD BUANGAN/ WASTE CODE	SUMBER/ SOURCE	TAN METRIK/ TONNES	PERATUSAN (%)/ PERCENTAGE (%)	CARA PENGURUSAN/ METHOD OF HANDLING
3.	Buangan pelarut organik bukan terhalogen / Waste of non-halogenated solvent	SW 322	Industri/ Industry	149.52	0.01	Tapak pelupusan sanitari / Sanitary landfill
4.	Klinker, sanga, abu, dari penunu buangan terjadual / Clinker, slag and ashes from scheduled wastes incinerator	SW 406	Industri/ Industry	12,820.62	0.67	Tapak pelupusan sanitari / Sanitary landfill
5.	Bekas, beg atau kelengkapan yang dilupuskan yang dicemari dengan bahan kimia, racun makhluk perosak, minyak mineral atau buangan terjadual / Disposed containers, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled wastes	SW 409	Industri/ Industry	21.51	0.00	Digunakan semula sebagai bahan mentah dalam penghasilan produk / Reuse as raw material for product
6.	Karbon teraktif yang terpakai tidak termasuk karbon daripada pengolahan air boleh diminum dan proses industri makanan dan penghasilan vitamin / Spent activated carbon excluding carbon from the treatment of potable water and processes of the food industry and vitamin production	SW 411	Industri/ Industry	2,808.00	0.15	Digunakan semula sebagai bahan mentah dalam penghasilan produk / Reuse as raw material for product

Jadual 5.3: Buangan Terjadual Yang Diuruskan Di Bawah Pengurusan Khas 2025
 Table 5.3: Scheduled Waste Managed Under Special Waste Management 2025

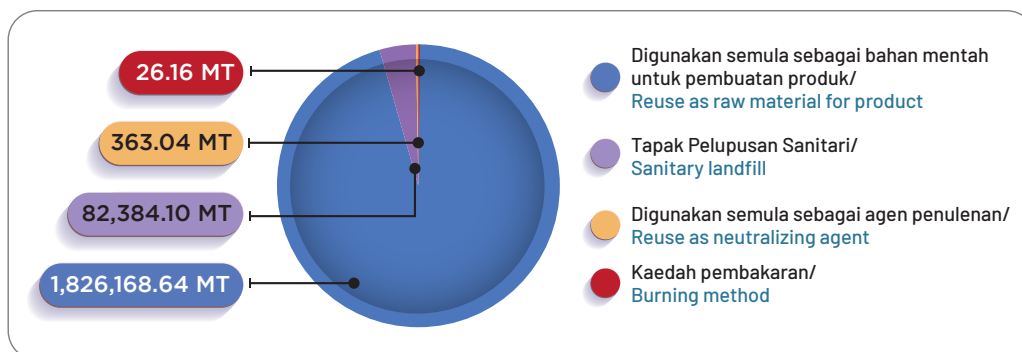
NO./ NO.	KATEGORI BUANGAN/ WASTE CATEGORY	KOD BUANGAN/ WASTE CODE	SUMBER/ SOURCE	TAN METRIK/ TONNES	PERATUSAN (%)/ PERCENTAGE (%)	CARA PENGURUSAN/ METHOD OF HANDLING
7.	Campuran buangan terjadual/ A mixture of scheduled wastes	SW 421	Industri/ Industry	1,334.62	0.07	Digunakan semula sebagai bahan mentah dalam penghasilan produk / Reuse as raw material for product
8.	Enap cemar mineral termasuklah enap cemar kalsium hidroksida, enap cemar pemfosfatan, enap cemar kalsium sulfid dan enap cemar karbonat / Mineral sludges including calcium hydroxide sludges, phosphating sludges, calcium sulphite sludges and carbonates sludges	SW 427	Industri/ Industry	363.04	0.02	Digunakan semula sebagai agen penulenan/ Reused as neutralizing agent
9.	Buangan daripada pengilangan atau pemprosesan atau penggunaan bahan letupan / Waste from manufacturing or processing or use of explosives	SW 431	Industri/ Industry	26.16	0.00	Kaedah pembakaran/ Burning method
10.	Buangan gypsum yang terhasil daripada proses industri kimia atau loji janakuasa / Waste gypsum arising from chemical industry or power plant	SW 205	Industri/ Industry	7,017.82	0.37	Digunakan semula sebagai bahan mentah dalam penghasilan produk / Reuse as raw material for product

Jadual 5.3: Buangan Terjadual Yang Diuruskan Di Bawah Pengurusan Khas 2025
Table 5.3: Scheduled Waste Managed Under Special Waste Management 2025

NO./ NO.	KATEGORI BUANGAN/ WASTE CATEGORY	KOD BUANGAN/ WASTE CODE	SUMBER/ SOURCE	TAN METRIK/ TONNES	PERATUSAN (%)/ PERCENTAGE (%)	CARA PENGURUSAN/ METHOD OF HANDLING
11.	Buangan resin tidak matang yang mengandungi pelarut organik atau logam berat termasuklah resin epoksi dan resin fenolik / Uncured resin waste containing organic solvents or heavy metals including epoxy resin and phenolic resin	SW 325	Industri/ Industry	157.85	0.01	Tapak pelupusan sanitari / Sanitary landfill
JUMLAH/TOTAL				1,908,941.94	100.00	

Rajah 5.20 merupakan ringkasan yang menunjukkan kaedah pengurusan khas bagi buangan terjadual di mana sebanyak 82,384.10 tan metrik (4.32%) buangan terjadual dilupuskan di tapak pelupusan sanitari, 1,826,168.64 tan metrik (95.66%) digunakan semula sebagai bahan mentah untuk pembuatan produk dan sebanyak 363.04 tan metrik (0.02%) buangan terjadual digunakan semula sebagai agen penulenan. Sebanyak 26.16 tan metrik buangan daripada pengilangan atau pemprosesan atau penggunaan bahan letupan (SW431) telah mendapat kebenaran bertulis untuk dilupuskan menggunakan kaedah pembakaran.

Figure 5.20 provides a summary of the special management methods for scheduled waste, where a total of 82,384.10 metric tons (4.32%) were disposed of at sanitary landfill sites, 1,826,168.64 metric tons (95.66%) were reused as raw materials for product manufacturing, and 363.04 metric tons (0.02%) were reused as purification agents, while an additional 26.16 metric tons of waste from the manufacturing, processing, or use of explosives (SW 431) was granted written approval to be disposed of through the incineration method.



Rajah 5.20 : Kaedah Pengendalian Buangan Terjadual di Bawah Pengurusan Khas
Figure 5.20 : Handling Method of Scheduled Wastes Under Special Management

TREND PENGURUSAN BUANGAN TERJADUAL 2025

Scheduled Wastes Management Trend 2025

Rajah 5.21 menunjukkan trend bagi penghasilan buangan terjadual, buangan terjadual yang mengaplikasikan 4R iaitu *Reduce, Reuse, Recycle and Recovery*, buangan terjadual yang dilupuskan menggunakan penunu buangan terjadual dan buangan yang dilupuskan di tapak pelupusan sanitari bagi tempoh 10 tahun bermula tahun 2016.

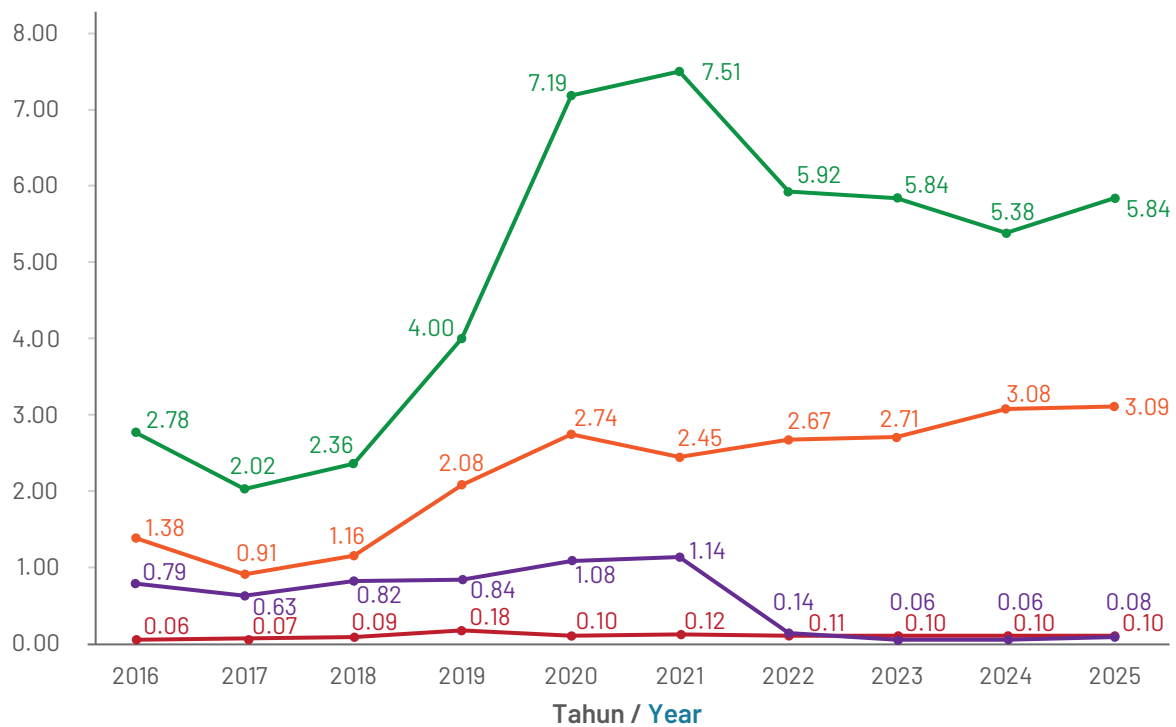
Figure 5.21 illustrates the trend of scheduled waste generation, scheduled waste applying the 4R approach (Reduce, Reuse, Recycle, and Recovery), scheduled waste disposed of through incineration, and waste disposed of at sanitary landfill sites over a ten-year period beginning in 2016.

Buangan terjadual yang dihasilkan di Malaysia meningkat dengan drastik bermula pada tahun 2019 dan mencapai paras tertinggi pada 2021 iaitu sebanyak 7.51 juta tan metrik, sebelum menurun dan kukuh sekitar 5 juta tan metrik sehingga 2025. Pengurusan buangan menggunakan kaedah 4R menunjukkan peningkatan berterusan sejak 2021, dengan kemuncak pada tahun 2025 sebanyak 3.09 juta tan metrik. Ini menandakan usaha yang semakin giat dalam pemulihan sumber serta pengurangan kebergantungan kepada pelupusan buangan secara konvensional.

Scheduled waste generation in Malaysia rose sharply starting in 2019 and reached its peak in 2021 at 7.51 million metric tons, before declining and stabilizing at around 5 million metric tons up to 2025. Waste management through the 4R method showed continuous growth since 2021, peaking in 2025 at 3.09 million metric tons, reflecting intensified efforts in resource recovery and reduced reliance on conventional disposal methods.

Manakala trend bagi buangan terjadual yang dilupuskan menggunakan penunu buangan pula kekal konsisten sepanjang tempoh 2016 sehingga 2025, sekitar 0.06 hingga 0.10 juta tan metrik. Pelupusan buangan terjadual di tapak pelupusan sanitari pula menunjukkan penurunan pada tahun 2017 sebelum meningkat secara beransur-ansur kepada 1.14 juta tan metrik pada tahun 2021. Walau bagaimanapun, jumlah tersebut menurun pada paras yang lebih rendah bagi tahun-tahun seterusnya.

Meanwhile, the trend for scheduled waste disposed of through incineration remained consistently low throughout 2016 to 2025, at around 0.06 to 0.10 million metric tons. Disposal of scheduled waste at sanitary landfill showed a decline in 2017 before gradually increasing to 1.14 million metric tonnes in 2021. However, this amount decreased to lower levels in subsequent years.



Rajah 5.21: Trend Pengurusan Buangan Terjadual 2016-2025
Figure 5.21: Scheduled Waste Management Trend 2016-2025



Telok Gong Power
Station, Melaka



2014

90%

25%

50%

75%

2013

2014

2015

-1.80

-0.65

-5.77

+9.48

+7.36

+81.96

3.39

-12.45

-0.76

-5.77

-19.56

+4.19

-19.56

-0.08



ANNEX

PENGIRAAN INDEKS PENCEMAR UDARA (IPU) Air Pollutant Index (API) Calculation

Pengiraan IPU ini berdasarkan kaedah Pollution Standard Index (PSI) yang diterimapakai di peringkat antarabangsa oleh United States Environmental Protection Agency (USEPA).

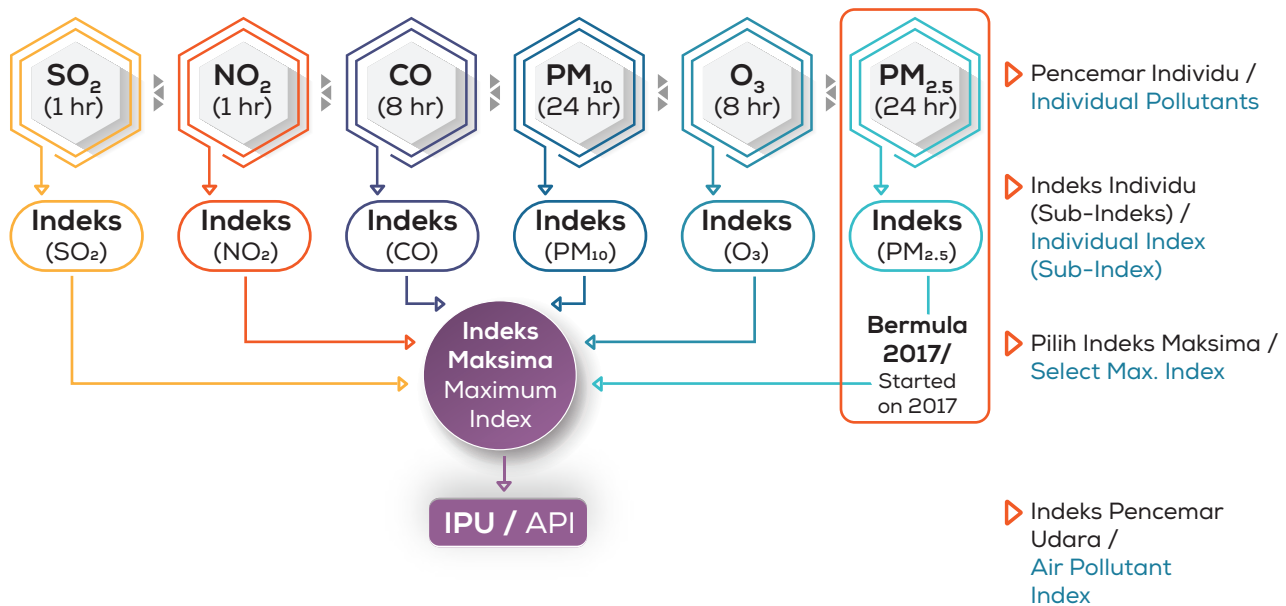
API calculation is based on Pollution Standard Index (PSI) method that has been accepted at the international level by United States Environmental Protection Agency (USEPA).

PENGUKURAN 6 PARAMETER PENCEMAR / MEASUREMENT OF 6 POLLUTANT PARAMETERS

PARAMETER PENCEMAR / POLLUTANT PARAMETERS	TEMPOH PURATA / AVERAGING PERIOD
Sulfur Dioksida / Sulphur Dioxide	1 Jam / 1 Hour
Habuk Halus (PM ₁₀) / Particulate Matter (PM ₁₀)	24 Jam / 24 Hour
Habuk Halus (PM _{2.5}) / Particulate Matter (PM _{2.5})	24 Jam / 24 Hour
Ozon / Ozone	8 Jam / 8 Hour
	1 Jam / 1 Hour
Nitrogen Dioksida / Nitrogen Dioxide	1 Jam / 1 Hour
Karbon Monoksida / Carbon Monoxide	8 Jam / 8 Hour

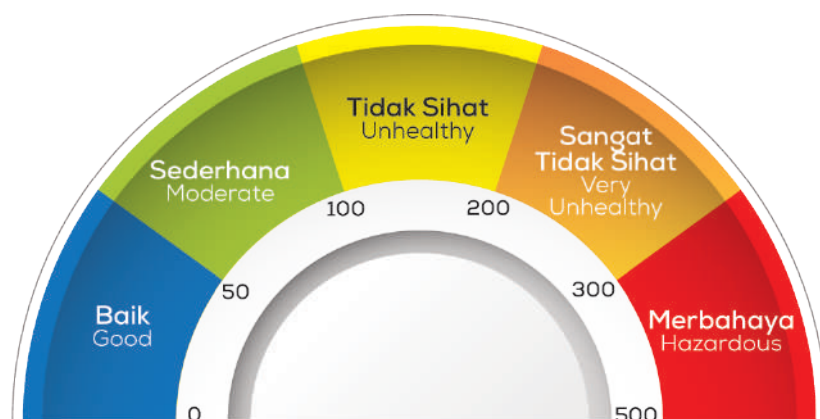
- » Kiraan purata bagi setiap parameter diambil mengikut tempoh masa berlainan.
 The average calculation for each parameter is taken at different range of periods.
- » Hal ini kerana had tempoh pendedahan yang berlainan yang boleh diterima oleh manusia.
 This is because they have different exposure periods that are acceptable to humans.
- » Purata kepekatan bagi setiap pencemar mengikut tempoh yang tertentu ini seterusnya diseragamkan menggunakan formula matematik khusus bagi menghasilkan satu nilai yang tidak berunit yang dinamakan sebagai **SUB-INDEKS**.
 The average concentration of each pollutant over a given period is then standardized using a specific mathematical formula to produce a non-unitary value called **SUB-INDEX**.
- » Setiap pencemar akan menghasilkan sub-indeks tersendiri.
 Each pollutant will produce its sub-index.
- » Sub-index tertinggi secara relatif akan diambilkira sebagai bacaan IPU.
 The highest relative sub-index will be considered as API reading.
- » Lazimnya, bacaan IPU adalah ditentukan oleh **kepekatan habuk halus** yang merupakan pencemar dominan pada kebanyakan masa terutamanya semasa berlakunya jerebu di Malaysia.
 Usually, API readings are determined by the **concentration of particulate matter** that is the dominant pollutant most of the time especially during haze in Malaysia.

PENENTUAN PENGIRAAN INDEKS PENCEMAR UDARA (IPU) / DETERMINATION OF AIR POLLUTANT INDEX (API) CALCULATION



FORMULA SUB-INDEKS BAGI $\text{PM}_{2.5}$ YANG TELAH DIMODIFIKASI MENGIKUT STANDARD USEPA / SUB-INDEX FORMULA FOR $\text{PM}_{2.5}$ THAT HAS BEEN MODIFIED ACCORDING TO USEPA STANDARD

API	BREAKPOINT OF CONCENTRATION	EQUATION FOR API
$X = \text{PM}_{2.5}$ (24 h average, unit: $\mu\text{g}/\text{m}^3$)		
0 - 50	$0 \leq X \leq 12.0$	$\text{API} = 4.1667 \times X$
51 - 100	$12.1 \leq X \leq 75.5$	$\text{API} = 0.7741 \times (X - 12.1) + 51$
101 - 200	$75.5 \leq X \leq 150.4$	$\text{API} = 1.3218 \times (X - 75.5) + 101$
201 - 300	$150.5 \leq X \leq 250.4$	$\text{API} = 0.9909 \times (X - 150.5) + 201$
301 - 400	$250.4 \leq X \leq 350.4$	$\text{API} = 0.9909 \times (X - 250.5) + 301$
401 - 500	$350.5 \leq X \leq 500.4$	$\text{API} = 0.6604 \times (X - 350.5) + 401$



PETUNJUK STATUS KUALITI UDARA
AIR QUALITY STATUS INDICATION

NATIONAL WATER QUALITY STANDARDS FOR MALAYSIA

PARAMETER	UNIT	CLASS				
		I	IIA/IIB	III#	IV	V
Al	mg/l	NATURAL LEVEL OR ABSENT	-	(0.06)	0.5	LEVEL ABOVE IV
As	mg/l		0.05	0.4 (0.05)	0.1	
Ba	mg/l		1	-	-	
Cd	mg/l		0.01	0.01* (0.001)	0.01	
Cr (VI)	mg/l		0.05	1.4 (0.05)	0.1	
Cr (III)	mg/l		-	2.5	-	
Cu	mg/l		0.02	-	0.2	
Hardness	mg/l		250	-	-	
Ca	mg/l		-	-	-	
Mg	mg/l		-	-	-	
Na	mg/l		-	-	3 SAR	
K	mg/l		-	-	-	
Fe	mg/l		0.3	1	1 (Leaf) 5 (Others)	
Pb	mg/l		0.05	0.02* (0.01)	5	
Mn	mg/l		0.1	0.1	0.2	
Hg	mg/l		0.001	0.004 (0.0001)	0.002	
Ni	mg/l		0.05	0.9*	0.2	
Se	mg/l		0.01	0.25 (0.04)	0.02	
Ag	mg/l		0.05	0.0002	-	
Sn	mg/l		-	0.004	-	
U	mg/l		-	-	-	
Zn	mg/l		5	0.4*	2	
B	mg/l		1	(3.4)	0.8	
Cl	mg/l		200	-	80	
Cl ₂	mg/l		-	(0.02)	-	
CN	mg/l		0.02	0.06 (0.02)	-	
F	mg/l		1.5	10	1	
NO ₂	mg/l		0.4	0.4 (0.03)	-	
NO ₃	mg/l		7	-	5	
P	mg/l		0.2	0.1	-	
Silica	mg/l		50	-	-	
SO ₄	mg/l		250	-	-	
S	mg/l		0.05	(0.001)	-	
CO ₂	mg/l		-	-	-	
Gross- α	Bq/l		0.1	-	-	
Gross- β	Bq/l		1	-	-	
Ra-226	Bq/l		< 0.1	-	-	
Sr-90	Bq/l		< 1	-	-	
CCE	μg/l		500	-	-	-
MBAS/BAS	μg/l		500	5000 (200)	-	-
O & G (Mineral)	μg/l		40; N	N	-	-
O & G (Emulsified Edible)	μg/l		7000; N	N	-	-
PCB	μg/l		0.1	6 (0.05)	-	-
Phenol	μg/l		10	-	-	-

PARAMETER	UNIT	CLASS				
		I	IIA/IIB	III#	IV	V
Aldrin/Dieldrin	µg/l		0.02	0.2 (0.01)	-	-
BHC	µg/l		2	9 (0.1)	-	-
Chlordane	µg/l		0.08	2 (0.02)	-	-
t-DDT	µg/l		0.1	(1)	-	-
Endosulfan	µg/l		10	-	-	-
Heptachlor/Epoxide	µg/l		0.05	0.9 (0.06)	-	-
Lindane	µg/l		2	3 (0.4)	-	-
2,4-D	µg/l		70	450	-	-
2,4,5-T	µg/l		10	160	-	-
2,4,5-TP	µg/l		4	850	-	-
Paraquat	µg/l		10	1800	-	-

Notes:

* = At hardness 50 mg/l CaCO

= Maximum (unbracketed) and 24-hour average (bracketed) concentrations

N = Free from visible film sheen, discolouration and deposits

NATIONAL WATER QUALITY STANDARDS FOR MALAYSIA

PARAMETER	UNIT	CLASS					
		I	IIA	IIB	III	IV	V
Ammoniacal Nitrogen	mg/l	0.1	0.3	0.3	0.9	2.7	> 2.7
Biochemical Oxygen Demand	mg/l	1	3	3	6	12	> 12
Chemical Oxygen Demand	mg/l	10	25	25	50	100	> 100
Dissolved Oxygen	mg/l	7	5 - 7	5 - 7	3 - 5	< 3	< 1
pH	-	6.5 - 8.5	6 - 9	6 - 9	5 - 9	5 - 9	-
Colour	TCU	15	150	150	-	-	-
Electrical Conductivity*	µS/cm	1000	1000	-	-	6000	-
Floatables	-	N	N	N	-	-	-
Odour	-	N	N	N	-	-	-
Salinity	%	0.5	1	-	-	2	-
Taste	-	N	N	N	-	-	-
Total Dissolved Solid	mg/l	500	1000	-	-	4000	-
Total Suspended Solid	mg/l	25	50	50	150	300	300
Temperature	°C	-	Normal + 2 °C	-	Normal + 2 °C	-	-
Turbidity	NTU	5	50	50	-	-	-
Faecal Coliform**	count/100 ml	10	100	400	5000 (20000) ^a	5000 (20000) ^a	-
Total Coliform	count/100 ml	100	5000	5000	50000	50000	> 50000

Notes:

N : No visible floatable materials or debris, no objectional odour or no objectional taste

* : Related parameters, only one recommended for use

** : Geometric mean

a : Maximum not to be exceeded

WATER CLASSES AND USES

CLASS	USES
Class I	Conservation of natural environment. Water Supply I – Practically no treatment necessary. Fishery I – Very sensitive aquatic species.
Class IIA	Water Supply II – Conventional treatment required. Fishery II – Sensitive aquatic species.
Class IIB	Recreational use with body contact.
Class III	Water Supply III – Extensive treatment required. Fishery III – Common of economic value and tolerant species; livestock drinking.
Class IV	Irrigation.
Class V	None of the above.

DOE WATER QUALITY CLASSIFICATION BASED ON WATER QUALITY INDEX

SUB INDEX & WATER QUALITY INDEX	INDEX RANGE		
	CLEAN	SLIGHTLY POLLUTED	POLLUTED
Biochemical Oxygen Demand (BOD)	91 - 100	80 - 90	0 - 79
Ammoniacal Nitrogen (NH ₃ - N)	92 - 100	71 - 91	0 - 70
Suspended Solids (SS)	76 - 100	70 - 75	0 - 69
Water Quality Index (WQI)	81 - 100	60 - 80	0 - 59

DOE WATER QUALITY INDEX CLASSIFICATION

PARAMETER	UNIT	CLASS				
		I	II	III	IV	V
Ammoniacal Nitrogen	mg/l	< 0.1	0.1 - 0.3	0.3 - 0.9	0.9 - 2.7	> 2.7
Biochemical Oxygen Demand	mg/l	< 1	1 - 3	3 - 6	6 - 12	> 12
Chemical Oxygen Demand	mg/l	< 10	10 - 25	25 - 50	50 - 100	> 100
Dissolved Oxygen	mg/l	> 7	5 - 7	3 - 5	1 - 3	< 1
pH	-	> 7	6 - 7	5 - 6	< 5	> 5
Total Suspended Solid	mg/l	< 25	25 - 50	50 - 150	150 - 300	> 300
Water Quality Index (WQI)		> 92.7	76.5 - 92.7	51.9 - 76.5	31.0 - 51.9	< 31.0

WQI FORMULA AND CALCULATION

Formula

$$WQI = (0.22 * SIDO) + (0.19 * SIBOD) + (0.16 * SICOD) + (0.15 * SIAN) + (0.16 * SISS) + (0.12 * SlpH)$$

where;

SIDO = Subindex DO (% saturation)

SIBOD = Subindex BOD

SICOD = Subindex COD

SIAN = Subindex NH_3 -N

SISS = Subindex SS

SlpH = Subindex pH

$0 \leq WQI \leq 100$

Best Fit Equations for the Estimation of Various Subindex Values

Subindex for DO (in % saturation)

$$SIDO = 0$$

for $x \leq 8$

$$SIDO = 100$$

for $x \geq 92$

$$SIDO = -0.395 + 0.030x^2 - 0.00020x^3$$

for $8 < x < 92$

Subindex for BOD

$$SIBOD = 100.4 - 4.23x$$

for $x \leq 5$

$$SIBOD = 108 * \exp(-0.055x) - 0.1x$$

for $x > 5$

Subindex for COD

$$SICOD = -1.33x + 99.1$$

for $x \leq 20$

$$SICOD = 103 * \exp(-0.0157x) - 0.04x$$

for $x > 20$

Subindex for NH_3 -N

$$SIAN = 100.5 - 105x$$

for $x \leq 0.3$

$$SIAN = 94 * \exp(-0.573x) - 5 * |x - 2|$$

for $0.3 < x < 4$

$$SIAN = 0$$

for $x \geq 4$

Subindex for SS

$$SISS = 97.5 * \exp(-0.00676x) + 0.05x$$

for $x \leq 100$

$$SISS = 71 * \exp(-0.0016x) - 0.015x$$

for $100 < x < 1000$

$$SISS = 0$$

for $x \geq 1000$

Subindex for pH

$$SlpH = 17.2 - 17.2x + 5.02x^2$$

for $x < 5.5$

$$SlpH = -242 + 95.5x - 6.67x^2$$

for $5.5 \leq x < 7$

$$SlpH = -181 + 82.4x - 6.05x^2$$

for $7 \leq x < 8.75$

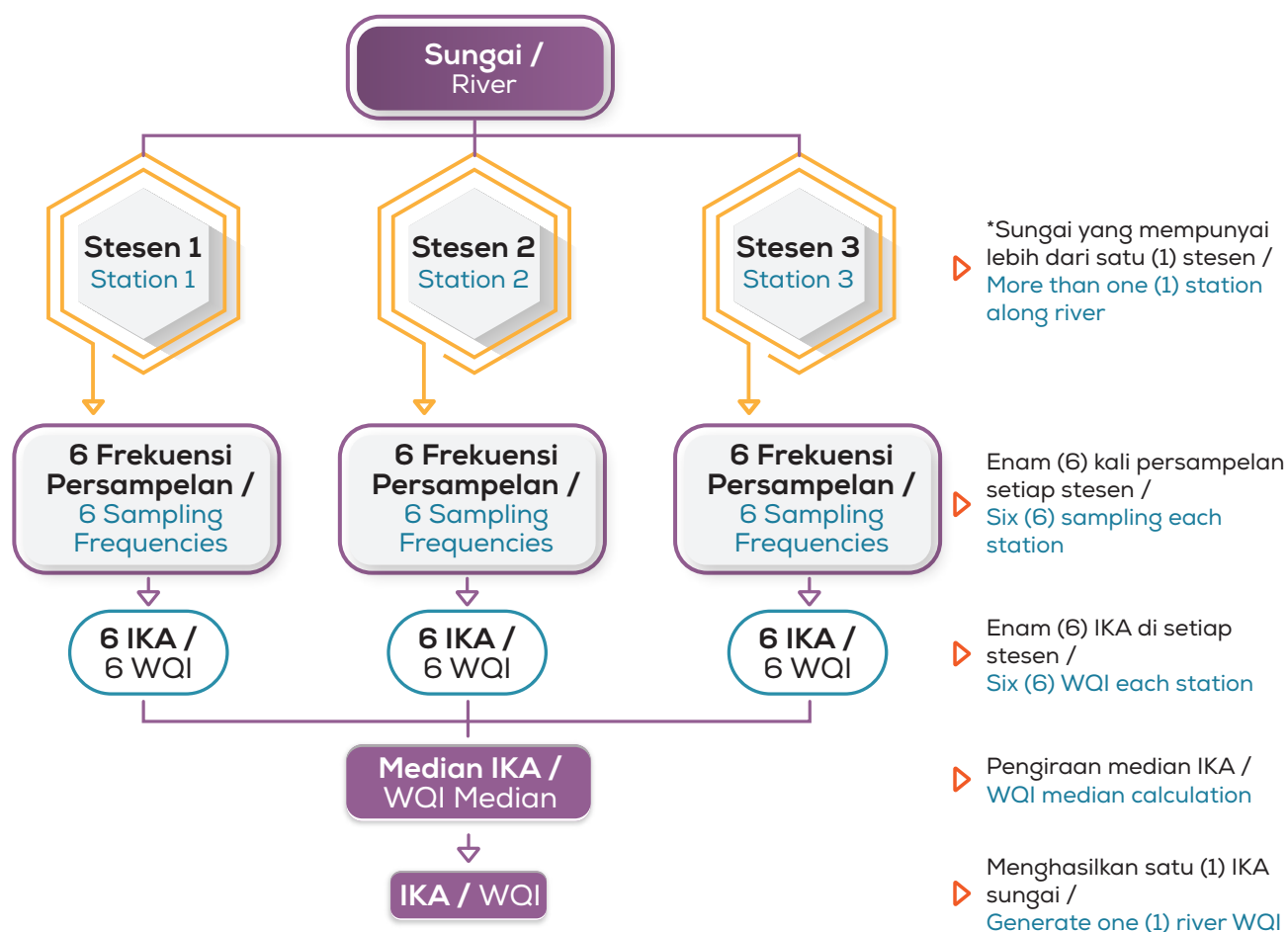
$$SlpH = 536 - 77.0x + 2.76x^2$$

for $x \geq 8.75$

Note:

*means multiply with

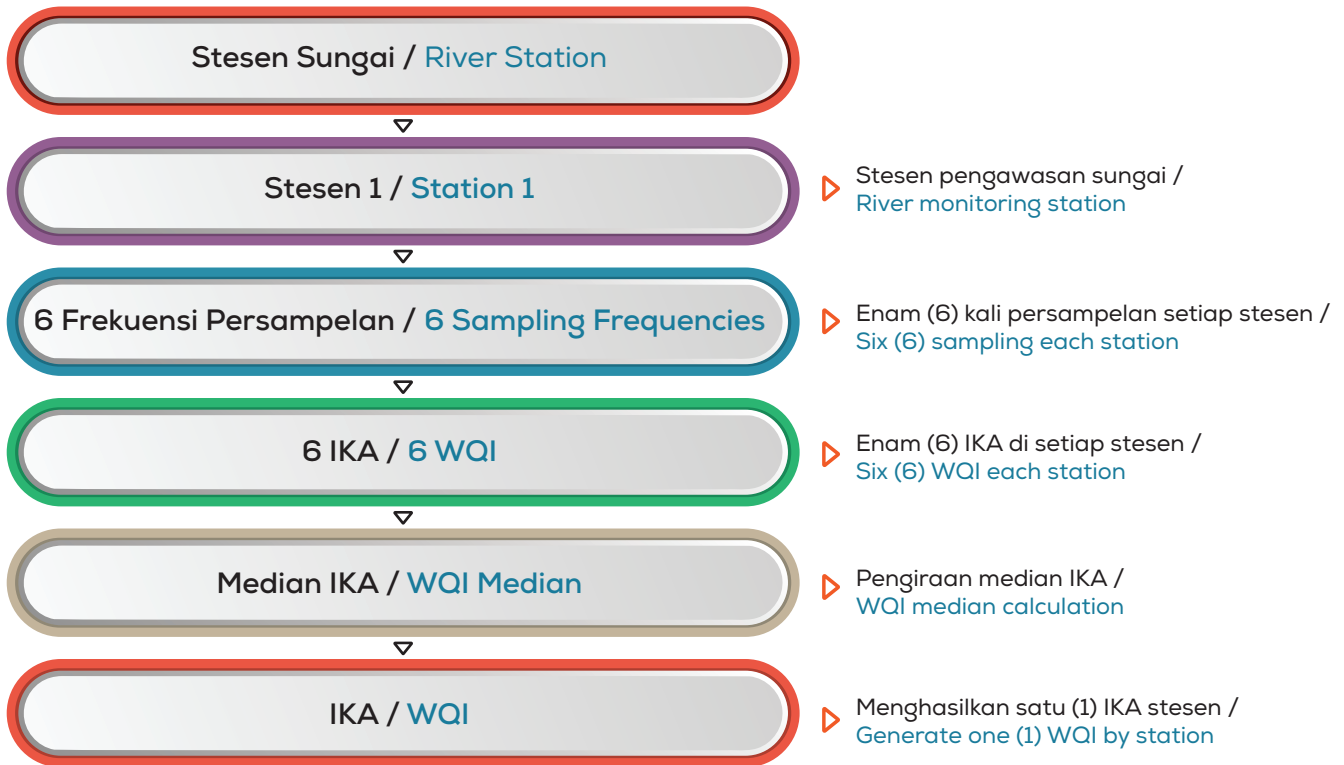
PENENTUAN INDEKS KUALITI AIR MENGIKUT SUNGAI / DETERMINATION OF WATER QUALITY INDEX BY RIVER



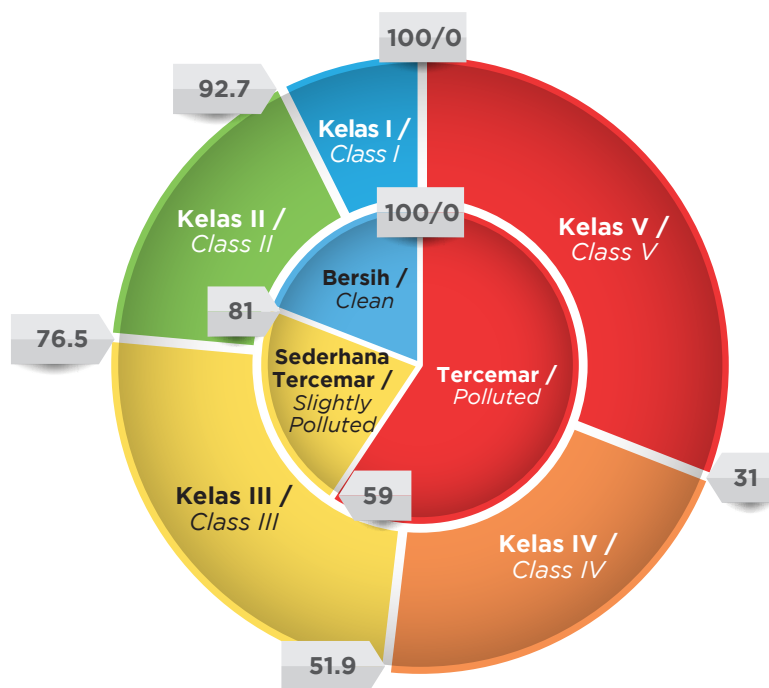
* Bilangan stesen adalah berbeza mengikut sungai yang dipantau. Bagi contoh ini, pengiraan median adalah ke atas 18 data IKA

* The number of stations varies according to the river monitored. For this example, the median calculation is on 18 WQI data

PENENTUAN INDEKS KUALITI AIR MENGIKUT STESEN / DETERMINATION OF WATER QUALITY INDEX BY STATION



PENKELASAN SUNGAI BERDASARKAN INDEKS KUALITI AIR (IKA) / RIVER CLASSIFICATION BASED ON WATER QUALITY INDEX (WQI)



GROUNDWATER QUALITY STANDARDS FOR CONVENTIONAL RAW WATER TREATMENT (DRINKING WATER)

PARAMETER	STANDARD
Total coliform	5000 MPN/100 ml
E coli	5000 MPN/100 ml
Kekeruhan	1000 NTU
Warna	300 TCU
pH	5.5-9.0
Suhu	Normal $\pm 2^{\circ}\text{C}$
Konduktiviti	1000 $\mu\text{S}/\text{cm}^{\#}$
Jumlah Pepejal Terlarut	1500 mg/l
Klorida	250 mg/l
Ammonia	1.5 mg/l
Nitrat	10 mg/l
Besi	1.0 mg/l
Fluorida	1.5 mg/l
Kekerasan	500 mg/l
Mangan	0.2 mg/l
COD	10 mg/l
MBAS	1.0 mg/l
BOD	6 mg/l
Nitrit	0.4 $^{\#}$ mg/l
Raksa	0.001 mg/l
Kadmium	0.003 mg/l
Arsenik	0.01 mg/l
Sianida	0.07 mg/l
Plumbum	0.05 mg/l
Kromium	0.05 mg/l
Kuprum	1.0 mg/l
Zink	3.0 mg/l
Natrium	200 mg/l
Sulfat	250 mg/l
Selenium	0.01 mg/l
Perak	0.05 mg/l
Magnesium	150 mg/l
Minyak	0.3 mg/l
Racun Perosak (Pesticides)	0.00003-0.03* mg/l
Fenol	0.002 mg/l
Nikel	0.05 mg/l
Gross alpha	0.1 Bq/l
Gross beta	1.0 Bq/l

* Aldrin / Dieldrin, DDT, Heptachlor, Methoxychlor, Lindane, Chlordane, Endosulfan, Hexachlorobenzene, 2,4,5 -T, 2,4 -D, 2, 4 -DB, Alachlor, Aldicarb, Carbofuran, MCPA, Permethrin

Diambil dari Class IIA, National Water Quality Standards

GROUNDWATER QUALITY INDEX (GWQI) FORMULA AND CALCULATION

To calculate the GWQI, the additive equation is used as follows:

$$GWQI = \sum W_i q_i$$

or

$$GWQI = 0.13Si(pH) + 0.17Si(Fe) + 0.17Si(E. coli) + 0.04Si(TDS) + 0.09Si(SO_4^{2-}) + 0.22Si(NO_3^-) + 0.17Si(Phenol)$$

The sub-indices of all the parameters used for generating the GWQI are as follows

pH Sub Index

pH	Si(pH)	
<3.0	0	Acidic
3 – 4	10	
4 – 5.5	30	
5.5 – 9	100	
9 – 10	30	Alkaline
10 – 11	10	
>11.0	0	

Iron Sub Index

$$Si(Fe) = (1 - C_i / 5.0) \times 100$$

Si (Fe) = 0, if C_i exceeds 5.0 mg/L; C_i is the concentration of iron determined in the groundwater sample.

Total Dissolved Solid Sub Index

$$Si(TDS) = (1 - C_i / 3000) \times 100$$

Si (TDS) = 0, if C_i exceeds 3000 mg/L; C_i is the concentration of total dissolved solid determined in the groundwater sample.

Nitrate Sub Index

$$Si(NO_3^-) = (1 - C_i / 100) \times 100$$

Si (NO_3^-) = 0, if C_i exceeds 100 mg/L; C_i is the concentration of nitrate determined in the groundwater sample.

Sulfate Sub Index

$$Si(SO_4^{2-}) = (1 - C_i / 1000) \times 100$$

Si (SO_4^{2-}) = 0, if C_i exceeds 1000 mg/L; C_i is the concentration of sulfate determined in the groundwater sample.

Phenol Sub Index

$$Si(Phenol) = (1 - C_i / 0.015) \times 100$$

Si (Phenol) = 0, if C_i exceeds 0.015 mg/L; C_i is the concentration of phenol determined in the groundwater sample.

E.coli Sub Index

$$Si(E.coli) = (1 - C_i / 5000) \times 100$$

Si ($E.coli$) = 0, if C_i exceeds 5000 MPN/100ml; C_i is the MPN $E.coli$ measured in the groundwater sample.

MALAYSIAN MARINE WATER QUALITY STANDARDS

PARAMETER (µg/l) UNLESS OTHERWISE STATED	CLASSIFICATION					
	CLASS 1	CLASS 2	CLASS 3	INTERIM CLASS E1	INTERIM CLASS E2	INTERIM CLASS E3
	SENSITIVE MARINE HABITATS	FISHERIES (INCLUDING MARICULTURE)	INDUSTRY, COMMERCIAL ACTIVITIES & COASTAL SETTLEMENTS	ESTUARIES		
				COASTAL PLAIN	LAGOON	COMPLEX DISTRIBUTARY NETWORK
Dissolved Oxygen (mg/l)	>6.0	>5.0	>3.0	>5.0	>5.0	>5.0
Suspended Solids (mg/l)	25.0	50.0	100.0	30.0	30.0	30.0
Phosphate	5.0	75.0	670.0	100.0	180.0	180.0
Nitrate	10.0	60.0	700.0	200.0	570.0	430.0
Ammonia	35.0	50.0	320.0	5.0	10.0	10.0
Mercury	0.04	0.04	0.04	0.04	0.04	0.04
Cadmium	0.50	2.00	3.00	1.00	1.00	1.00
Chromium (VI)	0.14	10.00	20.00	10.00	10.00	10.00
Copper	1.30	2.90	8.00	1.00	1.00	1.00
Cyanide	2.00	7.00	14.00	5.00	5.00	5.00
Lead	2.20	8.50	12.00	1.30	2.00	2.00
Zinc	7.00	50.00	100.00	16.00	5.00	5.00
Arsenic (III)	1.00	3.00	3.00	3.00	1.00	1.00
Aluminium	27.00	27.00	55.00	27.00	27.00	27.00
TBT	0.001	0.010	0.050	0.002	0.002	0.002
PAH	100.0	200.0	1000.0	5.0	5.0	5.0
Total Phenol	1.0	10.0	100.0	10.0	10.0	10.0
Oil & Grease (mg/l)	0.01	0.14	5.00	1.00	1.00	1.00
Faecal Coliform (cfu/100ml)	70	70	70	70	70	70
Temperature (°C)	≤ 2 °C increase over maximum ambient					
pH	6.5 - 9.0					
Marine Litter	Free from marine litter					

MALAYSIAN MARINE WATER QUALITY INDEX (MMWQI) FORMULA AND CALCULATION

$$\text{MMWQI}^* = q_{i\text{DO}}^{0.18} \times q_{i\text{FC}}^{0.19} \times q_{i\text{NH}_3}^{0.15} \times q_{i\text{NO}_3}^{0.16} \times q_{i\text{PO}_4}^{0.17} \times q_{i\text{TSS}}^{0.15}$$

whereby;

- $q_{i\text{DO}}$ = Subindex Dissolved Oxygen
- $q_{i\text{FC}}$ = Subindex Faecal Coliform
- $q_{i\text{NH}_3}$ = Subindex Unionized Ammonia
- $q_{i\text{NO}_3}$ = Subindex Nitrate
- $q_{i\text{PO}_4}$ = Subindex Phosphate
- $q_{i\text{TSS}}$ = Subindex Total Suspended Solids

Best Fit Equations for the Estimation of Various Subindex Values

Dissolved Oxygen (DO) in mg/l

$$q_{iDO} = -85.816 + 55.4768(DO) - 4.142(DO^2)$$

If DO is less than (<) 3 mg/l, or more than (>) 10 mg/l, $q_{iDO} = 10$

Faecal Coliform (FC) in cfu/100ml

$$q_{iFC} = 100 * \text{EXP}^{(-0.005(\text{Faecal Coliform}))}$$

If FC is more than (>) 500 cfu/100ml, $q_{iFC} = 8$

Unionized Ammonia (NH₃) in µg/l

$$q_{iNH_3} = 100 \text{ EXP}^{(-0.0046(\text{Unionized Ammonia}))}$$

If Ammoniacal Nitrogen (NH₃-N) is measured, convert the value into unionized ammonia.

Nitrate (NO₃) in µg/l

$$q_{iNO_3} = 94.8 \text{ EXP}^{(-0.00035(\text{Nitrate}))}$$

Phosphate (PO₄) in µg/l

$$q_{iPO_4} = 95.2 \text{ EXP}^{(-0.002(\text{Phosphate}))}$$

If PO₄ is more than (>) 900 µg/l, $q_{iPO_4} = 10$

Total Suspended Solids (TSS) in mg/l

$$q_{iTSS} = 95.8 \text{ EXP}^{(-0.0043(\text{Total Suspended Solid}))}$$

If TSS is more than (>) 100 mg/l, $q_{iTSS} = 20$

* Salinity of the marine water quality data shall be higher than 10 ppt

Unionized Ammonia Calculation

In order to convert the concentration of total ammoniacal nitrogen into unionized ammonia, calculate (a), (b), (c) and (d). Substitute the results into Equation 1.

a. Calculation of Ionic Strength (IS)

$$IS = \frac{19.9273 * \text{Salinity}}{(1000 - 1.005109 * \text{Salinity})}$$

Salinity in part per thousand (ppt)

b. Calculation of PKa

$$PKa = (0.0901821 + \frac{2729.92}{(Temp + 273.15)}) + IS(0.1552 - 0.000314 * Temp)$$

Temperature in °C

c. Calculation of working pH

$$pH_{sw} = pH - (0.0007 * IS) - 0.131$$

d. Calculation of mole fraction for unionized ammonia

Mole Fraction =

Equation 1:

$$\text{Ammoniacal nitrogen (NH}_3\text{-N) x mole fraction x 17/14}$$

Ammoniacal nitrogen should be measured in µg/l



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