



# LAPORAN TAHUNAN 2008 ANNUAL REPORT



JABATAN ALAM SEKITAR  
KEMENTERIAN SUMBER ASLI DAN ALAM SEKITAR

DEPARTMENT OF ENVIRONMENT  
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

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## Singkatan / Abbreviations

Bank Pembangunan Asia	ADB	Asian Development Bank
Tahun Alam Sekitar ASEAN	AEY	ASEAN Environment Year
Akta Kualiti Alam Sekeliling	AKAS	Environmental Quality Act.
Mesyuarat Menteri-Menteri ASEAN Mengenai Alam Sekitar	AMME	ASEAN Ministerial Meeting on the Environment
Pertubuhan Negara-Negara Asia Tenggara	ASEAN	Association of South East Asian Nations
Pegawai Kanan Alam Sekitar ASEAN	ASOEN	ASEAN Senior Officials on the Environment
Area Watch and Sanction Inspection	AWASI	Area Watch and Sanction Inspection
Buangan Terjadual	BT	Scheduled Wastes
Brunei–Indonesia–Malaysia–Filipina	BIMP	Brunei–Indonesia–Malaysia–Philippines
Keperluan Oksigen Biokimia	BOD	Biochemical Oxygen Demand
Bahan Pemusnah Ozon	BPO	Ozone Depleting Substances
Udara Bersih	CA	Clean Air
Pusat bagi Alam Sekitar, Teknologi dan Pembangunan Malaysia	CETDEM	Centre For Environmental, Technology and Development Malaysia
Kloroflourokarbon	CFC	Chlorofluorocarbon
Majlis Industri Kimia Malaysia	CICM	Chemical Industries Council of Malaysia
Pusat Pengurusan Pantai	CMC	Coastal Management Centre
Badan Penyelaras Mengenai Laut Asia Timur	COBSEA	Co-ordinating Body for the Seas of East Asia
Keperluan Oksigen Kimia	COD	Chemical Oxygen Demand
Kelapa Sawit Mentah	CPO	Crude Palm Oil
Desibel	dB	Decibel (s)
Jabatan Alam Sekitar	DOE	Department of Environment
Sistem Pengurusan Dokumen	DOKUMAS	Document Management System
Kawasan Pertumbuhan ASEAN Timur	EAGA	East ASEAN Growth Area
Escherichia coli	<i>E.coli</i>	Escherichia coli
Zon Ekonomi Eksklusif	EEZ	Exclusive Economic Zone
Penilaian Kesan Kepada Alam Sekeliling	EIA	Environmental Impact Assessment
Persatuan Perlindungan Alam Sekitar Malaysia	EPSM	Environment Protection Society of Malaysia
Unit Perancang Ekonomi	EPU	Economic Planning Unit
Majlis Kualiti Alam Sekeliling	EQC	Environmental Quality Council
Laporan Kualiti Alam Sekeliling	EQR	Environmental Quality Report
Pesuruhjaya Ekonomi & Sosial Asia Pasifik	ESCAP	Economic & Social Commission for Asia and the Pacific
Institut Alam Sekitar Malaysia	EIMAS	Environment Institute of Malaysia
Ahli Mesyuarat Kerajaan Negeri	EXCO	Executive Councillors
Persatuan Pekilang-Pekilang Malaysia	FMM	Federation of Malaysian Manufacturers
Persatuan Pertubuhan Pengguna-Pengguna Malaysia	FOMCA	Federation of Malaysian Consumer's Association
Institut Penyelidikan Hutan Malaysia	FRIM	Forest Research Institute of Malaysia
Gabungan Persatuan-Persatuan Perdagangan Getah Malaysia	FRTM	Federation of Rubber Trade Association of Malaysia

## Singkatan / Abbreviations

Kemudahan Alam Sekitar Global	GEF	Global Environment Facility
Sistem Maklumat Geografik	GIS	Geographical Information System
Hidro Klorofluorokarbon	HCFC	Hydro Chlorofluorocarbon
Pengurusan Zon Pantai Bersepadu	ICZM	Integrated Coastal Zone Management
Unit Asap Hartridge	HSU	Hartridge Smoke Unit
Institut Diplomasi & Hal Ehwal Luar	IDHL	Institute of Diplomacy & Foreign Relations
Indeks Kualiti Air Negara	IKAN	National Water Quality Index
Organisasi Maritim Antarabangsa	IMO	International Maritime Organisation
Sistem Rujukan Antarabangsa Untuk Sumber-Sumber Maklumat Mengenai Alam Sekitar	INFOTERRA	International Referral System for Sources of Environmental Information
Institut Tadbiran Awam Negara	INTAN	National Institute of Public Administration
Program Antarabangsa mengenai Keselamatan Bahan Kimia	IPCS	International Programme on Chemical Safety
Pendaftaran Antarabangsa bagi Bahan Kimia yang Berpotensi Berbahaya	IRPTC	International Register of Potentially Toxic Chemicals
Institut Kajian Strategik dan Antarabangsa	ISIS	Institute of Strategic and International Studies
Agensi Kerjasama Antarabangsa Jepun	JICA	Japan International Co-operation Agency
Jabatan Perkhidmatan Awam	JPA	Public Service Department
Jabatan Pengairan dan Saliran Malaysia	JPS	Department of Irrigation and Drainage Malaysia
Kementerian Sains, Teknologi & Inovasi	MOSTI	Ministry of Science, Technology and Innovation
Kumbahan & Effluen-Effluen Perindustrian	KEEP	Sewage & Industrial Effluents
Kilang Kelapa Sawit Mentah	KKSM	Crude Palm Oil Mill
Penyaman Udara Kenderaan	MAC	Mobile Air Conditioning
Agensi Remote Sensing Malaysia	MACRES	Malaysian Remote Sensing Agency
Minggu Alam Sekitar Malaysia	MASM	Malaysia Environment Week
Menteri dan Ahli Majlis Mesyuarat Kerajaan Negeri yang Bertanggungjawab ke atas Alam Sekitar	MEXCOE	Ministers and State Executive Councillors Responsible for Environmental Matters
Dewan Perdagangan dan Industri Antarabangsa Malaysia	MICCI	Malaysian International Chamber of Commerce and Industry
Institut Penyelidikan Ekonomi Malaysia	MICCI	Malaysian Institute of Economic Research
Agensi Nuklear Malaysia	MINT	Malaysia Nuclear Agency
Persatuan Pemasang Kenderaan Bermotor Malaysia	MMVAA	Malaysian Motor Vehicle Assemblers' Association
Persatuan Pencinta Alam Malaysia	MNS	Malaysian Nature Society
Kementerian Perdagangan Antarabangsa Dan Industri	MITI	Ministry of International Trade and Industry
Pertubuhan Kelapa Sawit Malaysia	MPOA	Malaysian Palm Oil Association
Kementerian Pertanian & Industri Asas Tani	MOA	Ministry of Agriculture & Agro-Based Industry
Kementerian Kesihatan	MOH	Ministry of Health
Kementerian Pembangunan Sumber Manusia	MOHR	Ministry of Human Resources

## Singkatan / Abbreviations

Kementerian Pengangkutan	MOT	Ministry of Transport
Memorandum Persefahaman	MOU	Memorandum of Understanding
Majlis Pengeluar-Pengeluar Getah Malaysia	MRPC	Malaysia Rubber Products Manufacturers' Council
Jawatankuasa Bersama Malaysia-Singapura Mengenai Alam Sekitar	MSJCE	Malaysia – Singapore Joint Committee on the Environment
Pertubuhan Bukan Kerajaan	NGO	Non-Governmental Organisation
Kementerian Sumber Asli Dan Alam Sekitar	NRE	Ministry of Natural Resources and Environment
Amoniakal Nitrogen	NH <sub>3</sub> N	Ammoniacal Nitrogen
Pertubuhan Kerjasama Ekonomi dan Pembangunan	OECD	Organisation for Economic Co-operation and Development
Pertubuhan Kerjasama Alam Sekitar bagi Laut Asia Timur	PEMSEA	Partnership in Environmental Management for the Seas of East Asia
Kebenaran Maklumat Awal	PIC	Prior Informed Consent
Persatuan Pekilang-Pekilang Minyak Kelapa Sawit Malaysia	POMA	Palm Oil Millers' Association
Institut Penyelidikan Minyak Kelapa Sawit	PORIM	Palm Oil Research Institute of Malaysia
Ringgit Malaysia	RM	Ringgit Malaysia
Institut Penyelidikan Getah Malaysia	RRIM	Rubber Research Institute of Malaysia
Urusetia Konvensyen BASEL	SBC	Secretariat for BASEL Convention
Agensi Pembangunan Antarabangsa Sweden	SIDA	Swedish International Development Agency
Institut Standard dan Penyelidikan Industri Malaysia	SIRIM	Standards Industrial Research Institute of Malaysia
Udara Bersih	UB	Clean Air
Universiti Islam Antarabangsa Malaysia	UIA	International Islamic University of Malaysia
Universiti Kebangsaan Malaysia	UKM	National University of Malaysia
Universiti Malaya	UM	University of Malaya
Persidangan Bangsa-Bangsa Bersatu Mengenai Alam Sekitar dan Pembangunan	UNCED	United Nations Conference on Environment and Development
Program Pembangunan Bangsa-Bangsa Bersatu	UNPD	United Nations Development Programme
Program Alam Sekitar Bangsa-Bangsa Bersatu	UNEP	United Nations Environment Programme
Universiti Tenaga Nasional	UNITEN	University of Tenaga Malaysia Nasional
Unit Perancang Ekonomi	UPE	Economic Planning Unit
Universiti Putra Malaysia	UPM	University of Putra Malaysia
Universiti Sains Malaysia	USM	University of Science Malaysia
Yang Berhormat	Y.B.	The Honourable
Polis Diraja Malaysia	PDRM	Royal Malaysian Police
Kandungan Organik Meruap	VOCs	Volatile Organic Compounds
Wilayah Kualiti Air	WQR	Water Quality Region

## Prakata



## Foreword

Laporan Tahunan 2008 Jabatan Alam Sekitar (JAS) memberi gambaran tentang pencapaian Jabatan dalam melaksanakan mandatnya untuk mentadbir Akta Kualiti Alam Sekeliling, 1974 dan dalam mempromosi dan mengurus alam sekitar dengan efektif demi mencapai sasaran pembangunan negara.

Penguatkuasaan yang merupakan tugas utama JAS terus diberikan penekanan. Pencemaran air, pencemaran udara, pencemaran tanah dan yang berkaitan dengannya dicegah dan dikawal melalui pemeriksaan disusuli dengan arahan-arahan tindakan perundangan kepada pihak terbabit. Tindakan yang diambil adalah ke arah penghapusan masalah pencemaran yang berlaku serta penambahbaikan kualiti alam sekitar. JAS juga telah melaksanakan program kesedaran dan pendidikan alam sekitar melalui pelbagai aktiviti serta penyebaran maklumat melalui mediamasa yang mengandungi mesej-mesej dan etika alam sekitar untuk pelbagai peringkat masyarakat.

Keprihatinan untuk melindungi alam sekitar wajar diterapkan di dalam kehidupan seharian setiap individu melalui penerapan amalan mesra alam di dalam setiap tindakan kita. Cabaran yang mendatang

The 2008 Annual Report of the Department of Environment (DOE) provides an overview of its accomplishments in executing its mandate to administer the Environmental Quality Act, 1974 and in promoting and managing the environment effectively to achieve the national development goals.

Enforcement being the core business of the DOE continues to be given emphasis. Water pollution, air pollution, soil pollution and others related to it, are prevented and controlled through inspection followed by legal actions to the parties involved. The actions taken are to eliminate pollution problems and to improve environmental quality. DOE has also implemented awareness and environmental education programmes through various activities and also dissemination of information via the mass media with messages and ethics to various level of society.

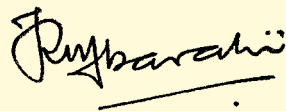
The need to protect the environment should be adopted in the lifestyle of each individual by applying environmental friendly practices in our daily activities. The challenges ahead may be daunting, but with

mungkin terlalu besar untuk dihadapi tetapi, dengan sokongan dan komitmen semua pihak, Jabatan Alam Sekitar yakin pendekatan ini dapat memupuk kesedaran alam sekitar yang tinggi dan seterusnya menggerakkan tindakan-tindakan yang lebih bersepadu, sistematik dan berterusan bagi menguruskan alam sekitar.

Pemuliharaan Alam Sekitar, Tanggungjawab Kita Bersama

the support and commitment from all parties, DOE is confident that this approach is able to inculcate environmental awareness and activate actions that are more integrated, systematic and continuous in managing the environment.

Environmental Conservation, Our Shared Responsibility



**Dato' Hajah Rosnani Ibarahim**  
Ketua Pengarah Alam Sekitar Malaysia  
Director-General of Environmental Quality Malaysia

## Visi Vision

Memastikan keunikan, kepelbagaian dan kualiti alam sekitar dikekalkan bagi menjamin kesihatan, kesejahteraan, keselamatan dan kesejahteraan hidup rakyat masa kini dan masa akan datang.

That the uniqueness, diversity and quality of the environment are conserved towards maintaining health, prosperity, security and well-being for the present and the future.

## Misi Mission

Menggalakkan, meningkatkan dan mengekalkan pengurusan alam sekitar yang baik dalam proses pembangunan negara.

To promote, ensure and sustain sound environmental management in the process of nation building.

## Fungsi Function

Mentadbir dan menguatkuasa Akta Kualiti Alam Sekeliling, 1974 dan Bahagian IV, Akta Zon Ekonomi Eksklusif, 1984.

To administer and enforce the Environmental Quality Act, 1974 and Section IV of the Exclusive Economic Zone Act, 1984.

## Strategi Strategies

Pembangunan Lestari melalui Pemuliharaan Sumber Semulajadi  
Sustainable Development through Conservation of Resources

Integrasi Faktor Alam Sekitar dalam Perancangan Pembangunan  
Integration of Environmental Factors in Development Planning

Pencegahan dan Kawalan Pencemaran  
Pollution Prevention and Control

Promosi Pendidikan dan Kesedaran Alam Sekitar  
Promotion of Environmental Education and Awareness

Kerjasama antara Agensi dan Persekutuan Negeri  
Inter-Agency and Federal-State Cooperation

Penyertaan Awam dalam Pengurusan Alam Sekitar  
Public Participation in Environmental Management

Kerjasama dan Hubungan Dua Hala, Serantau dan Antarabangsa  
Bilateral, Regional and International Cooperation

# BAB 1 / Chapter 1



## AKTIVITI MAJLIS KUALITI ALAM SEKELILING (EQC) ENVIRONMENTAL QUALITY COUNCIL (EQC) ACTIVITIES

Majlis Kualiti Alam Sekeliling telah bermesyuarat sebanyak tiga (3) kali dalam tahun 2008 iaitu:-

- i) Mesyuarat Bilangan Ke-100 telah diadakan pada 18 Februari 2008,
- ii) Mesyuarat Bilangan Ke-101 telah diadakan pada 12 Jun 2008, dan
- iii) Mesyuarat Bilangan ke-102 telah diadakan pada 15 Oktober 2008.

Mesyuarat Bilangan ke-100 telah diadakan di Kuching, Sarawak manakala mesyuarat Bilangan ke-101 dan ke-102 telah diadakan di Ibu Pejabat, Jabatan Alam Sekitar (JAS) Putrajaya. Semua mesyuarat tersebut telah dipengerusikan oleh Y.Bhg. Dato' Kok Wee Kiat.

Bermula dari Mesyuarat ke-102, Puan Ester Lew telah dilantik mewakili Ketua Setiausaha, Kementerian Pertanian dan Industri Asas Tani, manakala Prof. Madya Dr. Nasir Hasan digantikan dengan Prof. Madya Dr. Ramdzani Abdullah sebagai wakil ahli giliran kakitangan akademik. Encik Yabi Yangkat pula telah dilantik mewakili Kerajaan Negeri Sabah (Ahli Giliran) menggantikan tempat Datuk Eric Juin yang telah bersara.

Mesyuarat merakamkan penghargaan kepada semua di atas sumbangan mereka kepada EQC.

Mesyuarat telah membincangkan dan memperakukan beberapa cadangan yang dikemukakan semasa mesyuarat. Antara kertas kerja yang dibentangkan dalam tahun 2008 adalah:-

### Mesyuarat EQC ke-100 (18 Februari 2008)

1. Kertas EQC Bil.1/100/2008  
Kertas oleh Jabatan Alam Sekitar  
- Status Kualiti Alam Sekeliling Negeri Sarawak

The Environmental Quality Council (EQC) had three (3) meetings in 2008:-

- i) the 100<sup>th</sup> meeting was held on 18 February 2008,
- ii) the 101<sup>st</sup> meeting was held on 12 June 2008, and
- iii) the 102<sup>nd</sup> meeting was held on 15 October 2008.

The 100<sup>th</sup> meeting was held in Kuching, Sarawak while the 101<sup>st</sup> and 102<sup>th</sup> meetings were held at the Head Office of the Department of Environment (DOE) Putrajaya. All the meetings were chaired by Dato' Kok Wee Kiat.

Beginning from the 102<sup>nd</sup> meeting, Ms Ester Lew was elected representing Secretary-General, Ministry of Agriculture dan Agro-Base Industries, while Prof. Madya Dr. Mohd. Nasir Hassan was replaced by Prof. Madya Dr. Ramdzani Abdullah representing the alternative member for the academicians. Mr. Yabi Yangkat on the other hand, was elected representing Sabah Government (Alternate Member) replacing Datuk Eric Juin who has then retired.

The council placed on record its appreciations to all of them for their contributions to EQC.

The council had deliberated and endorsed matters presented at the meetings. Among the papers brought for their attention in 2008 were:-

### 100<sup>th</sup> EQC Meeting (18 February 2008)

1. EQC Paper No. 1/100/2008  
Paper by Department of Environment  
- Status of the Environment in Sarawak

2. Kertas EQC Bil.2/100/2008  
Kertas oleh Wakil Industri Kelapa Sawit
  - Pembangunan Kawalan Dan Pencegahan Pencemaran Oleh Industri Kelapa Sawit Sejak 1970
3. Kertas EQC Bil.3/100/2008  
Kertas oleh Jabatan Alam Sekitar
  - Penguatkuasaan Peraturan Kawalan Pencemaran Kilang Kelapa Sawit Tahun 1998-2008

#### **Mesyuarat EQC ke-101 (12 Jun 2008)**

1. Kertas EQC Bil.1/101/2008  
Kertas oleh Jabatan Alam Sekitar
  - Pelan Tindakan Udara Bersih
2. Kertas EQC Bil.2/101/2008  
Kertas oleh Jabatan Alam Sekitar
  - Cadangan Baru bagi Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2008
3. Kertas EQC Bil.3/101/2008  
Kertas oleh Jabatan Alam Sekitar
  - Pengurusan bagi Status Buangan Terjadual

#### **Mesyuarat EQC ke-102 (15 Oktober 2008)**

1. Perbincangan Maklumbalas Ahli-Ahli EQC mengenai kertas:-
  - i). Kertas EQC Bil.1/101/2008
    - Pelan Tindakan Udara Bersih
  - ii). Kertas EQC Bil.2/101/2008
    - Cadangan Baru bagi Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2008
2. Kertas EQC Bil.1/102/2008  
Kertas oleh Jabatan Alam Sekitar
  - Cadangan Baru bagi Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pencemaran Bau), 200\_

2. EQC Paper No. 2/100/2008  
Paper by the Oil Palm Industries
  - Development of Pollution Control and Prevention in Oil Palm Industries since 1970
3. EQC Paper No. 3/100/2008  
Paper by Department of Environment
  - The Enforcement of Pollution Control Regulation in Oil Palm Industries Year 1998-2008

#### **101<sup>st</sup> EQC Meeting (12 June 2008)**

1. EQC Paper No. 1/101/2008  
Paper by Department of Environment
  - Clean Air Action Plan
2. EQC Paper No. 2/101/2008  
Paper by Department of Environment
  - Proposal for New Environmental Quality Regulations (Clean Air) 2008
3. EQC Paper No. 3/101/2008  
Paper by Department of Environment
  - Management of the Scheduled Waste Status

#### **102<sup>th</sup> EQC Meeting (15 October 2008)**

1. Discussion on the feedback given by the EQC Members:-
  - i) EQC Paper No. 1/101/2008
    - Clean Air Action Plan
  - ii) EQC Paper No. 2/101/2008
    - Proposal for New Environmental Quality Regulations (Clean Air) 2008
2. EQC Paper No. 1/102/2008  
Paper By Department of Environment
  - Proposal for New Environmental Quality Regulations (Odour) 200\_



Mesyuarat Majlis Kualiti Alam Sekeliling kali ke-100, Kuching, Sarawak  
100<sup>th</sup> Environmental Quality Council Meeting, Kuching, Sarawak



Lawatan ke Trienekens (Sarawak) Sdn. Bhd.  
Visit to Trienekens (Sarawak) Sdn. Bhd.

Jadual 1.1 JAS: Majlis Kualiti Alam Sekeliling, 2008  
Table 1.1 DOE: Environmental Quality Council, 2008

Bil. No.	Perwakilan Representative	Nama Name
1	Pengerusi EQC/ EQC Chairman	Y.Bhg Dato' Kok Wee Kiat
2	Ketua Setiausaha Kementerian Sumber Asli dan Alam Sekitar/ Secretary-General, Ministry of Natural Resources and the Environment	Y.Bhg. Datuk Suboh Bin Mohd. Yassin
3	Wakil Ketua Setiausaha Kementerian Perdagangan Antarabangsa dan Industri / Representative of Secretary-General, Ministry of Trade & Industry	Puan Samala a/p Santhapan
4	Wakil Ketua Setiausaha Kementerian Perdagangan Dalam Negeri dan Hal Ehwal Pengguna / Representative of Secretary-General, Ministry of Domestic Trade & Consumers Affairs	Encik Nor Azhar Manap
5	Wakil Ketua Setiausaha Kementerian Pertanian dan Industri Asas Tani / Representative of Secretary-General, Ministry of Agriculture dan Agro-Base Industries	Puan Esther Lew
6	Wakil Ketua Setiausaha Kementerian Sumber Manusia / Representative of Secretary-General, Ministry of Human Resources	Tuan Haji Mohamad Bin Jamil
7	Wakil Ketua Setiausaha Kementerian Pengangkutan / Representative of Secretary-General, Ministry of Transport	Puan Saripah Abd. Mutalib
8	Wakil Ketua Pengarah, Kementerian Kesihatan Malaysia / Representative of Director General, Ministry of Health	Y.M. Engku Azman B. Tuan Mat
9	Wakil Kerajaan Negeri Sabah / Representative from the Sabah Government Ahli Giliran / Alternate Member	Puan Suzannah Liaw Encik Yabi Yangkat
10	Wakil Kerajaan Negeri Sarawak / Representative from the Sarawak Government Ahli Giliran / Alternate Member	Datuk Wan Alwi Bin Dato' Seri Wan Hashim Dr. Penguang Manggil

Jadual 1.1 JAS: Majlis Kualiti Alam Sekeliling, 2008  
Table 1.1 DOE: Environmental Quality Council, 2008

Bil. No.	Perwakilan Representative	Nama Name
11	Wakil Industri Petroleum / Representative from the Petroleum Industry Ahli Giliran / Alternate Member	Encik Iqbal B. Abdullah Dr. Foo Say Moo
12	Wakil Industri Kelapa Sawit / Representative from the Oil Palm Industry Ahli Giliran / Alternate Member	Encik Teo Leng Encik Chew Jit Seng
13	Wakil Persekutuan Pekilang-Pekilang Malaysia / Representative from the Federation of Malaysian Manufacturers Ahli Giliran / Alternate Member	Y. Bhg. Tan Sri Datuk Clifford Francis Herbert Y.Bhg. Dato' Saw Choo Boon
14	Wakil Industri Getah / Representative from the Rubber Industry Ahli Giliran / Alternate Member	Encik Lim Sum Teck Encik Chin Hon Meng
15	Wakil Kakitangan Akademik dari Universiti atau Kolej di Malaysia / Representative from the Academic Staff of the Universities or Colleges in Malaysia Ahli Giliran / Alternate Member	Prof. Dr. Muhamad Bin Awang Prof. Madya Dr. Ramdzani Abdullah
16	Wakil Pertubuhan Berdaftar Yang Mempunyai Kepentingan dalam Perkara Berhubung Alam Sekitar / Representative from Registered Interests in Matters Pertaining to the Environment Ahli Giliran / Alternate Member	Y. Bhg. Dato' Dr. Salleh Bin Mohd. Nor Y.Bhg. Dato' Dr. Mikhaail Kavanagh Abdullah
17	Wakil Pertubuhan Berdaftar Yang Mempunyai Pengetahuan dan Mempunyai Kepentingan Dalam Perkara Berhubung Alam Sekitar / Representative from the Registered Societies Knowledgeable and having Interests in Matters Pertaining to the Environment Ahli Giliran/ Alternate Member	Ir. Gurmit Singh K.S.

## BAB 2 / Chapter 2



## PENGURUSAN SUMBER MANUSIA DAN KEWANGAN HUMAN RESOURCES AND FINANCIAL MANAGEMENT

Bahagian Pentadbiran dan Kewangan telah diberi tanggungjawab untuk merancang, melaksana dan memantau aktiviti pentadbiran am, pengurusan sumber manusia dan sumber kewangan. Bahagian ini juga memberi khidmat sokongan kepada semua kakitangan di Ibu Pejabat termasuk juga dengan Pejabat JAS Negeri. Bahagian ini terbahagi kepada tiga (3) Unit yang utama iaitu Unit Pentadbiran, Unit Sumber Manusia dan Unit Kewangan.

### Pentadbiran Am

Pada tahun 2008, Unit Pentadbiran telah menjalankan aktiviti-aktiviti seperti berikut:

- Perhimpunan Bulanan antara Ketua Pengarah dan kakitangan JAS;
- Majlis Anugerah Perkhidmatan Cemerlang 2007 dan Jasamu Dikenang pada 11 Julai 2008;
- Kursus NRE Asset untuk pegawai-pegawai JAS Negeri mengikut zon;
- Membantu menyelaraskan *booth* pameran JAS semasa Hari Bersama Pelanggan NRE;
- Majlis Sambutan Hari Raya Aidilfitri 2008;
- Ceramah AntiDadah dan pemeriksaan mengejut oleh Agensi AntiDadah Kebangsaan pada 12 Disember 2008; dan
- Kempen Derma Darah pada 12 Disember 2008.

### Kewangan

Pada tahun 2008, jumlah peruntukan yang diterima oleh JAS adalah sebanyak RM147,722,232.00. Daripada jumlah tersebut, sebanyak RM123,908,232.00 (83.9%) telah diperuntukkan bagi perbelanjaan mengurus sementara baki sebanyak RM23,814,000.00 (16.1%) merupakan peruntukan perbelanjaan pembangunan. Prestasi perbelanjaan mengurus dan pembangunan bagi tahun 2008 masing-masing pada tahap 98.7% dan 99.4 % (**Rajah 2.1 dan Rajah 2.2**).

The Administration and Finance Division is responsible for planning, executing and monitoring general administrative activities, human resource management and finance management. This division also provides support services to the different divisions of the Headquarters as well as all the State DOE offices nationwide. This division is divided into three (3) Units, namely the Administration Unit, Human Resource Management Unit and the Finance Unit.

### Administration

In 2008, the Administration Unit conducted the following activities:

- Monthly Assembly, the Director General with the staff of DOE;
- The 2007 Excellent Service Awards held in conjunction with the Jasamu Dikenang Function on 11 July 2008;
- The NRE Asset Courses for DOE state officers according to zones;
- Assist in coordinating DOE's exhibition booths during the NRE Clients Day;
- Hari Raya Aidilfitri Celebration 2008;
- Anti Drugs talk and spot-check by the National Anti Drugs Agency on 12 December 2008; and
- Blood Donation Campaign on 12 December 2008.

### Finance

In 2008, DOE received a total budget allocation of RM147,722,232.00. Of this amount, a sum of RM123,908,232.00 (83.9%) was allocated for operational expenditure while the remaining RM23,814,000.00 (16.1%) was allocated for development projects. Expenditure performances for the operational and development budgets were 98.7% and 99.4% respectively (**Figure 2.1 and Figure 2.2**).

## Pengurusan Sumber Manusia

Pada tahun 2008, Jabatan masih meneruskan pengambilan kakitangan baru untuk mengisi jawatan sedia ada dan bagi keperluan masa depan. Sehingga 31 Disember, keseluruhan perjawatan JAS adalah seramai 1,424 orang yang terdiri daripada 21.3% Kumpulan Pengurusan Dan Profesional dan 78.7% Kumpulan Sokongan (**Rajah 2.3, Rajah 2.4 dan Rajah 2.5**).

## Latihan dan Kompetensi

Pegawai dan kakitangan baru yang dilantik telah diberikan latihan asas yang berkaitan untuk memastikan sistem penyampaian Jabatan dapat dikekalkan dan dipertingkatkan.

Memperlihatkan kepentingan pengurusan sumber manusia dalam membangunkan individu yang berpengetahuan, berkemahiran dan inovatif, pegawai-pegawai juga dikehendaki melepasi Peperiksaan Penilaian Tahap Kecekapan (PTK).

Pada tahun 2008, Peperiksaan Penilaian Tahap Kecekapan (PTK) telah diadakan sebanyak tiga (3) kali bagi semua gred jawatan teknikal dan Kumpulan Sokongan II yang dilantik di bawah kuasa Ketua Setiausaha Kementerian. Beberapa siri Bengkel Pemantapan PTK telah diadakan bagi membantu mempersiapkan diri calon-calon yang akan menduduki peperiksaan tersebut.

Di samping itu, Unit Kompetensi juga mengendalikan Peperiksaan Dalam Jawatan kepada pegawai-pegawai Lantikan baru Gred C41, C27 dan J17 sebanyak 2 kali setahun (Jun dan Disember). Peperiksaan Kenaikan Pangkat secara Lantikan (KPSL) Gred C41 dan Gred C27 telah diadakan pada tahun Julai 2008 yang bertujuan untuk meningkatkan kerjaya pegawai-pegawai teknikal di JAS.

## Human Resource Management

In 2008, the Department continued to recruit new staff to fulfill its present and future needs. As of 31 December, the total strength of DOE was 1,424 of which 21.3% were from the Professional and Management Group and 78.7% from the Supporting Group (**Figure 2.3, Figure 2.4 and Figure 2.5**).

## Training and Competency

New officers and staff recruited were provided with relevant basic training to ensure that the delivery system of the Department would be maintained and further enhanced.

In view of the importance of human resource management in developing highly knowledgeable, skillful and innovative individuals, officers were required to undergo the Competency Level Assessment Examinations.

In 2008, the Competency Level Assessment Examinations (PTK) were held three (3) times for all technical officers as well as those in the Supporting Group II appointed by the Ministry's Secretary General. A series of PTK Enhancement Workshops were organized to assist the candidates for the examinations.

Two (2) service confirmation examinations for officers of Grades C41, C27 and J17 were held in June and December, 2009. The promotion examinations for officers to Grades C41 and C27 under a specific appointment scheme were held in July 2008 to allow DOE officers to further enhance their career development.



Majlis Anugerah Perkhidmatan Cemerlang dan Jasamu Dikenang, 2008  
Excellent Service Award and Jasamu Dikenang Ceremony, 2008



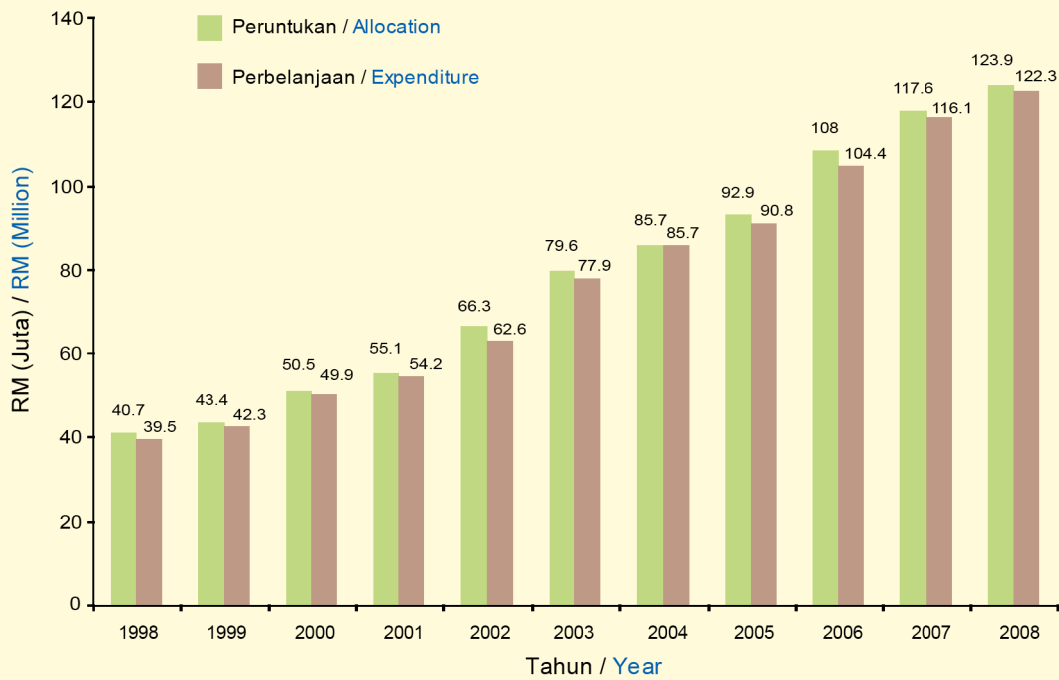
Perhimpunan Bulanan Jabatan Alam Sekitar  
Monthly Assembly of Department of Environment



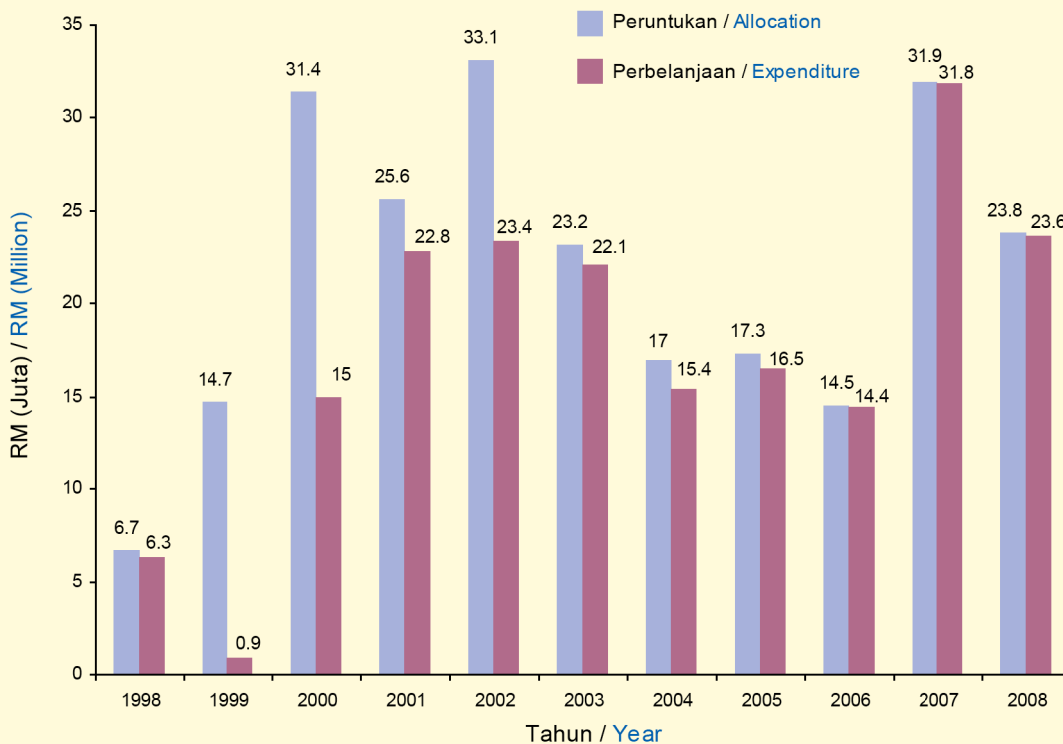
Majlis Sambutan Hari Raya Aidilfitri, 2008  
Hari Raya Aidilfitri Celebration, 2008



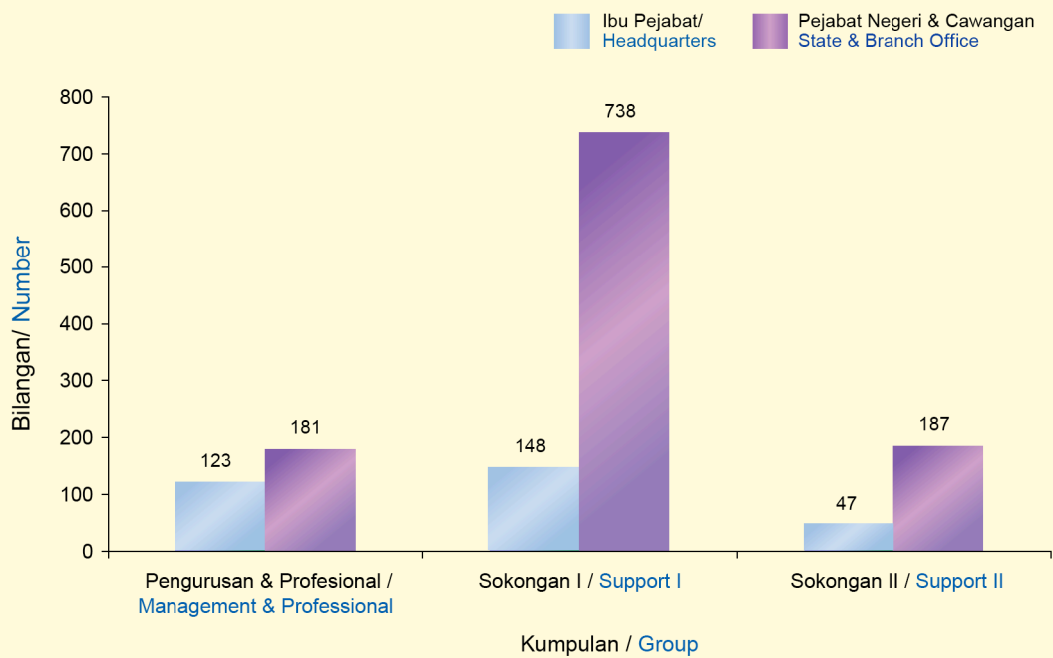
Kursus/ Bengkel Sistem HRMIS pada 8 Oktober 2008 di Melaka  
Training/ Workshop on HRMIS System, 8 October 2008 in Malacca



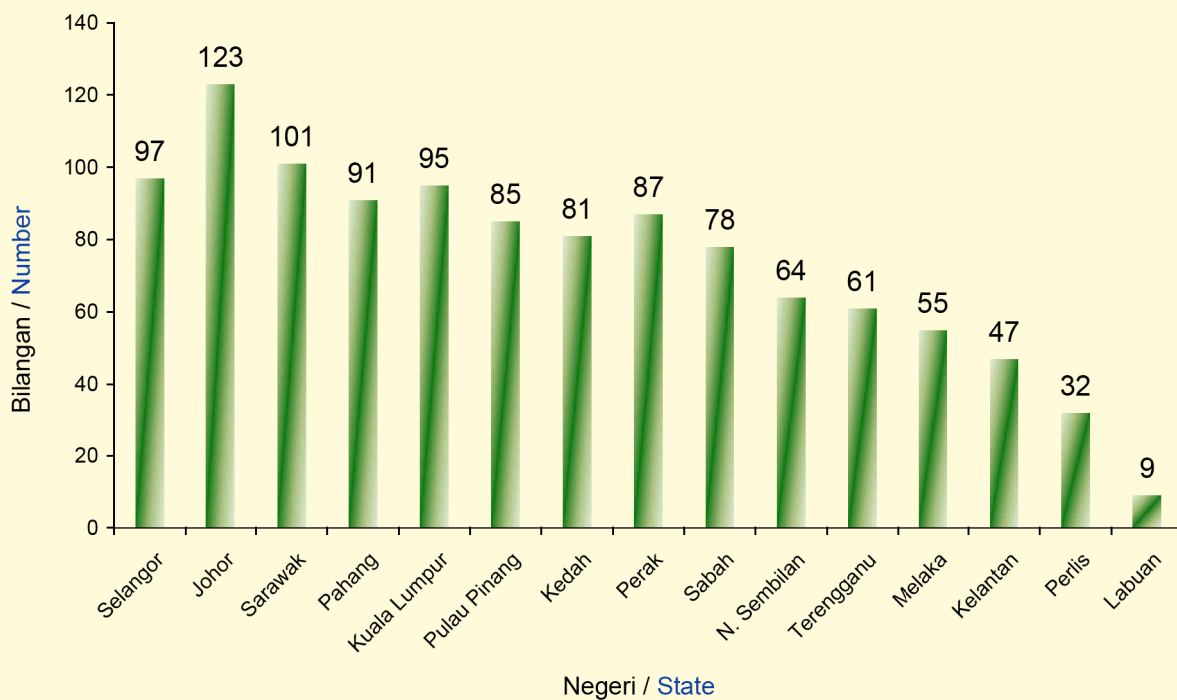
Rajah 2.1 JAS: Peruntukan dan Perbelanjaan (Mengurus), 1998-2008  
 Figure 2.1 DOE: Allocation and Expenditure (Operational), 1998-2008



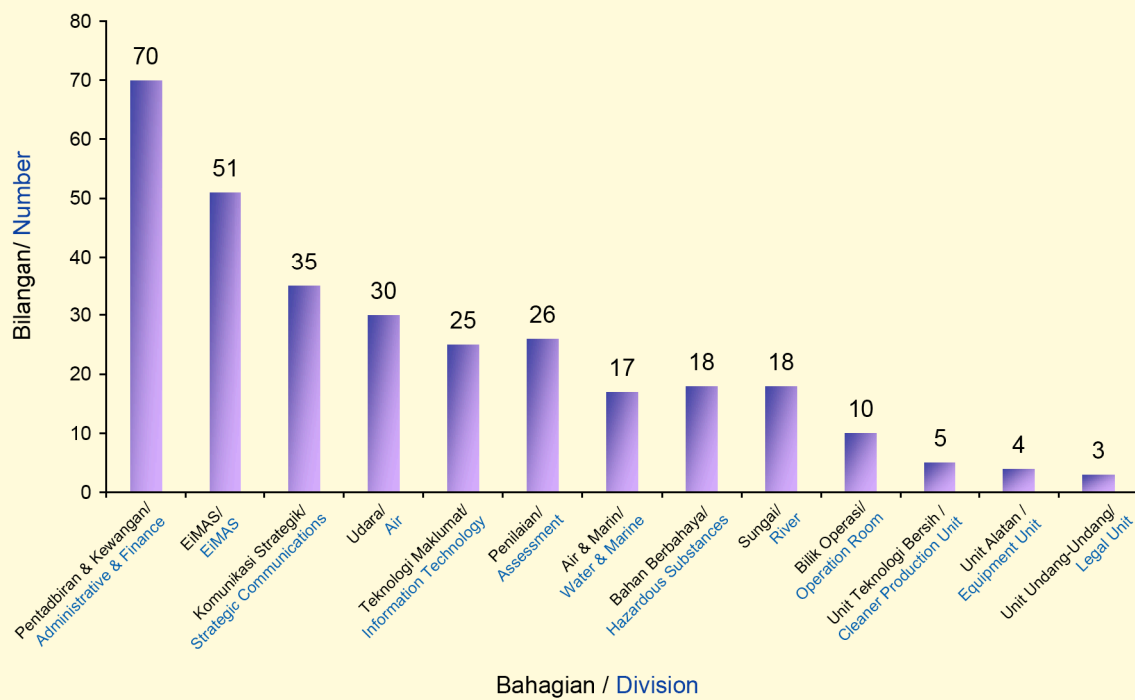
Rajah 2.2 JAS: Peruntukan dan Perbelanjaan (Pembangunan), 1998-2008  
 Figure 2.2 DOE: Allocation and Expenditure (Development), 1998-2008



Rajah 2.3 JAS: Pecahan Tenaga Kerja Mengikut Kumpulan  
 Figure 2.3 DOE: Distribution Manpower by Group



Rajah 2.4 JAS: Pecahan Tenaga Kerja Mengikut Negeri  
 Figure 2.4 DOE: Distribution Manpower by State



Rajah 2.5 JAS: Taburan Tenaga Kerja Mengikut Bahagian di Ibu Pejabat  
 Figure 2.5 DOE: Distribution Manpower at the DOE Headquarters by Division



Program Sehari Perkongsian Pintar antara JPA dan JAS, 22 Disember 2008  
 Smart Sharing Program between PSD and DOE, 22 December 2008

# BAB 3 / Chapter 3



## PENILAIAN KESAN KEPADA ALAM SEKELILING DAN INPUT KEPADA PERANCANGAN PEMBANGUNAN ENVIRONMENTAL IMPACT ASSESSMENT AND INPUT FOR DEVELOPMENT

Penilaian Kesan Kepada Alam Sekeliling (EIA) merupakan suatu alat perancangan untuk mengelakkan dan mengurangkan masalah-masalah akibat aktiviti pembangunan. Ianya juga dapat mengelakkan berlakunya kesilapan semasa projek dilaksanakan serta dapat meminimumkan kos projek.

Di Malaysia, EIA adalah sebagai alat untuk menggabungkan pertimbangan alam sekitar di dalam perancangan projek, yang mana apabila disepadukan dalam perancangan sedia ada dan proses membuat keputusan akan memberikan maklumat tambahan untuk membuat keputusan yang lebih baik.

### Laporan EIA 2008

Sebanyak 320 laporan telah diterima pada tahun 2008 (**Rajah 3.1**). Daripada bilangan ini, 279 laporan EIA telah diproses mengikut prosedur penilaian awal EIA dan 41 laporan EIA lagi melalui prosedur terperinci (**Rajah 3.2**). Negeri Johor menerima bilangan laporan EIA tertinggi pada tahun 2008, diikuti dengan Negeri Selangor (**Rajah 3.3** dan **Rajah 3.4**).

### Prosedur EIA: Piagam Pelanggan

Selaras dengan usaha Kerajaan di dalam mempertingkatkan perkhidmatan sektor awam, Jabatan Alam Sekitar telah mengambil langkah bagi mempertingkatkan serta memperkukuhkan sistem penyampaian Jabatan, khususnya di dalam prosedur dan pemprosesan EIA. Sehubungan itu, piagam pelanggan bagi memproses Laporan EIA Awal telah disingkatkan dari 12 minggu kepada 5 minggu, dan piagam pelanggan bagi Laporan EIA Terperinci telah ditambahbaik dari 20 minggu kepada 12 minggu. Usaha ini dilihat dapat membantu di dalam melancarkan pelaksanaan projek-projek pembangunan khususnya projek-projek Kerajaan dan juga projek-projek yang telah digariskan di dalam pelan-pelan pembangunan.

Environmental Impact Assessment (EIA) is essentially a planning tool for preventing environmental problems due to development activity. It also seeks to avoid costly mistakes in project implementation as well as minimizing project cost.

In Malaysia, EIA is used as a tool to incorporate environmental considerations into project planning which when integrated into existing planning and decision-making processes provides additional information for better decision-making.

### EIA Reports 2008

A total of 320 reports were received in 2008. (**Figure 3.1**). Of these, 279 were preliminary EIA procedures and 41 detailed EIA procedures (**Figure 3.2**). Johor received the highest number of EIA reports in 2008, followed by Selangor (**Figure 3.3** and **Figure 3.4**).

### EIA Procedures: Client's Charter

Consistent with the Government's effort in improving the public delivery system, the Department of Environment has taken the step to enhance as well as strengthening the Department's delivery system, in particular the EIA procedures and processes. Hence, the time taken to process a preliminary EIA report has been reduced from 12 weeks to 5 weeks; and from 20 weeks to 12 weeks for a detailed EIA report to be processed. This effort has been recognized as one of the catalysts in ensuring that government-related development projects as well as other development projects as outlined in the development plans, progress smoothly.

Beberapa langkah berterusan diambil di dalam memastikan prosedur dan pemprosesan EIA yang ditambahbaik berjalan dengan lancar, seperti berikut:-

- (i) Memperkenalkan Skim Pendaftaran Jururunding baru bagi mempertingkatkan tahap profesionalisma pengamal EIA dengan memastikan mereka mempunyai kelayakan dan kemahiran bagi melaksanakan kajian EIA. Semua jururunding EIA hendaklah berdaftar dengan Jabatan Alam Sekitar di bawah skim baru ini supaya laporan EIA yang berkualiti disediakan.
- (ii) Menyediakan beberapa dokumen panduan (guidance documents) dalam bentuk senarai semak dan "scope of work" bagi membantu penggerak projek dan jururunding EIA dalam menyediakan laporan EIA yang lengkap dan berkualiti yang menjurus kepada isu-isu kritikal dan signifikan bagi sesuatu projek. Dokumen panduan ini boleh dirujuk melalui laman web Jabatan Alam Sekitar. Laporan EIA yang tidak memenuhi skop ini (tidak lengkap) akan terus ditolak oleh Jabatan Alam Sekitar.
- (iii) Melengkapkan dan memperluaskan pengetahuan teknikal pegawai-pegawai yang memproses laporan EIA dari masa ke semasa melalui kursus-kursus teknikal dan melalui pengalaman semasa kerja di lapangan dan semasa membuat penilaian ke atas Laporan EIA yang berkualiti.

### Siasatan Penguatkuasaan Projek EIA

Sejumlah 1,211 siasatan penguatkuasaan telah dijalankan pada tahun 2008 untuk mengenalpasti status pembangunan dan pematuhan projek-projek EIA (**Rajah 3.5**). Daripada siasatan-siasatan tersebut, sebanyak 368 notis atau surat arahan dan sebanyak 69 kompaun telah dikeluarkan manakala 26 kes telah didakwa di mahkamah kerana tidak mematuhi syarat-syarat kelulusan.

Continuous measures have been taken, to assure that the improved EIA procedures and decision-making processes proceed efficiently, among others:-

- (i) Introducing a new EIA Consultant Registration Scheme to improve the standard of professionalism among EIA practitioners by ensuring that they have qualifications and skills required to conduct an EIA study. All EIA Consultants must be registered with the Department of Environment under this new scheme to guarantee good quality EIA reports being submitted.
- (ii) Developing several guidance documents in the form of checklists and scope of work, essentially to assist project proponents and EIA consultants in submitting a complete and good quality EIA report which focuses on critical and significant issues of the proposed project. These guidance documents are made available in the Department of Environment's website. Incomplete EIA reports will be rejected instantaneously by the Department of Environment.
- (iii) Enriching and expanding the technical knowledge of EIA processing officers, from time to time through various technical courses and on-the-job experiences via site investigations and quality assessment of the EIA reports.

### EIA Enforcement Investigations

A total of 1,211 enforcement investigations were conducted in 2008 to check on the progress of projects and compliance of EIA approval conditions (**Figure 3.5**). Consequently, 368 notices or written directives, and 69 compounds were served and 26 cases were charged in court for non-compliance.

## **Input Alam Sekitar Kepada Perancangan Pembangunan**

Pada tahun 2008, sejumlah 103 input alam sekitar telah dikemukakan kepada agensi-agensi yang berkaitan. Kebanyakan input-input ini adalah mengenai Penyelarasan Perancangan Pembangunan, Polisi Zon Persisiran Pantai Kebangsaan, Pelan Tempatan dan kajian-kajian lain seperti langkah-langkah kawalan banjir, dan aktiviti-aktiviti tanah tinggi.

### **Skim Pendaftaran Jururunding EIA**

Skim Pendaftaran Jururunding EIA yang baru telah mula diperkenalkan pada 1 Jun 2007. Bermula pada 1 Oktober 2007, Jabatan Alam Sekitar telah mula mewajibkan semua jururunding untuk berdaftar dengan JAS sebelum dibenarkan untuk menjalankan kajian EIA.

Pada tahun 2008, sebanyak 284 permohonan telah diterima dan 24 daripadanya telah didaftarkan sebagai Jururunding EIA, 100 sebagai Jururunding Subjek dan 124 Penolong Jururunding (**Jadual 3.1**). Sehingga 31 Disember 2008, sejumlah 852 individu telah berdaftar dengan JAS. Laporan terperinci berkaitan jumlah dan kategori ditunjukkan seperti dalam **Jadual 3.2**.

Tujuan utama skim pendaftaran ini adalah untuk memastikan hanya individu yang benar-benar kompeten sahaja dibenarkan menjalankan kajian EIA. Ini bagi memastikan kualiti laporan EIA adalah baik dan membantu pembuat keputusan membuat keputusan yang terbaik terhadap sesuatu cadangan projek. Pada tahun 2008, JAS juga telah menyediakan modul latihan yang mana ianya wajib kepada semua jururunding berdaftar. Latihan dijangka akan bermula pada tahun 2009.

### **Penyediaan Guideline on Economic Valuation of Environmental Impacts for EIA Projects**

Penyediaan draf garis panduan ini telah dijalankan dengan kerjasama Unit Perancang Ekonomi dan

## **Environmental Input For Development Planning**

In 2008, a total of 103 environmental inputs were provided to other agencies in relation to Development Planning Coordination, National Coastal Zone Policy, Local Plans and other studies regarding flood-mitigating measures, and highland development activities.

### **EIA Consultants Registration**


The EIA Consultants Registration Scheme was officially introduced on 1 June 2007. Starting from the 1 October 2007, the Department of Environment has made it a requirement for consultants to be registered before they are allowed to conduct the study.

In 2008, a total of 284 applications were reviewed and; 24 individuals have been registered as EIA Consultants, 100 individuals as Subject Consultants and 124 as Assistant Consultants (**Table 3.1**). Until 31 December 2008, a total of 852 individuals have been registered with the DOE. Details of the numbers and categories are indicated in **Table 3.2**.

The main objective of the scheme is to ensure only competent individuals are allowed to conduct EIA study. This is to ensure the quality of the EIA reports; which will later assist the decision makers making the best decision on the proposed project. In 2008, the DOE has also prepared a training module which will be made compulsory for all registered consultants. The training is expected to commence in 2009.

### **Preparation of Guideline on Economic Valuation of Environmental Impacts for EIA Projects**

The drafting of this guideline was conducted with the support from the Economic Planning Unit and the



*Danish International Development Agency (DANIDA)* di bawah Komponen Strategi Perancangan Alam Sekitar. Garispanduan ini menghuraikan pendekatan serta kaedah-kaedah yang boleh digunapakai dalam penyediaan kajian EIA. Pegawai-pegawai EIA, jururunding EIA yang berkaitan, samaada dari agensi persekutuan ataupun agensi-agensi kerajaan negeri akan dilatih menggunakan gaispanduan ini melalui beberapa siri bengkel latihan.

### **Penyediaan EIA Guideline on the Ecological Assessment**

Pada tahun 2008, Jabatan Alam Sekitar juga telah memulakan usaha penyediaan draf garis panduan EIA berkaitan dengan Penilaian Ekologi dengan dibantu oleh pihak DANIDA. Ianya dijangka siap pada tahun 2009. Objektif garispanduan ini adalah untuk membantu para jururunding dalam menjalankan kajian penilaian kesan ekologi ke atas projek yang dicadangkan.

### **Modul Latihan EIA**

Jabatan Alam Sekitar telah menyediakan satu modul latihan yang mana ianya diwajibkan kepada semua jururunding yang berdaftar. Modul latihan ini disediakan bagi membantu para jururunding menyediakan laporan EIA yang selaras dengan kehendak JAS yang turut membantu pihak mereka supaya lebih fokus kepada isu-isu yang kritikal dalam kajian EIA. Latihan ini dijangka dilaksanakan pada tahun 2009.

### **Seminar dan Bengkel**

Beberapa siri seminar dan bengkel berkaitan dengan EIA dan audit alam sekitar telah dianjurkan pada tahun 2008. Para peserta seminar dan bengkel terdiri daripada pegawai-pegawai JAS, jururunding, agensi kerajaan dan NGOs. Senarai seminar dan bengkel adalah seperti dalam **Jadual 3.3**.

Danish International Development Agency (DANIDA) under the Environmental Planning Strategies Component. This guideline describes relevant approaches and methodologies to be employed in EIA studies. All EIA officers, relevant EIA consultants, federal as well as state government agencies have been trained to use the guideline through several training workshops.

### **EIA Guideline on the Ecological Assessment**

In 2008, the Department of Environment prepared an EIA Guideline on Ecological Assessment with the assistance from DANIDA. It is expected to be completed in 2009. The objective of this guideline is to assist the EIA consultants in evaluating the ecological impacts of a propose project.

### **EIA Training Modules**

In 2008, the Department of Environment prepared training modules which will be made compulsory for all registered consultants. These modules will help the consultants to prepare EIA reports in accordance with DOE requirements as well as assisting them to focus on critical issues in the EIA studies. The training is expected to be implemented in 2009.

### **Seminars and Workshops**

Several seminars and workshops related to EIA and environmental audits were conducted in 2008. The participants of the seminars and workshops comprised of DOE officers, consultants, government agencies and NGOs. The list of events is presented in **Table 3.3**.

### **Pembangunan Profesional Berterusan (CPD)**

Keperluan bagi Pembangunan Profesional Berterusan (CPD) telah diwajibkan di bawah Skim Pendaftaran Jururunding EIA, dimana jururunding berdaftar perlu mengumpul jumlah jam latihan yang tertentu bagi membolehkan mereka memperbaharui pendaftaran. Mana-mana penyedia latihan boleh memohon bagi mendapatkan jam kredit. Maklumat berkenaan program-program ini kemudiannya disebarkan kepada semua jururunding berdaftar. Senarai program-program yang diberikan kredit bagi 2008 adalah seperti di **Jadual 3.4**.

### **Penilaian Awal Tapak Projek**

Bagi projek-projek pembangunan yang tidak tertakluk di bawah Perintah-Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan)(Penilaian Kesan Kepada Alam Sekeliling), 1987, penilaian awal tapak dicadangkan untuk menentukan kesesuaian tapak projek yang dicadangkan.

Pada tahun 2008, sejumlah 11,405 permohonan telah diterima di mana Negeri Johor mencatat permohonan PAT (2,859) paling tinggi, diikuti oleh Selangor (2,017) dan lain-lain negeri (**Rajah 3.5**). Permohonan-permohonan ini dirujuk kepada JAS oleh pihak berkuasa tempatan dan Pejabat Tanah. Aspek teknikal membabitkan alam sekitar diberi pertimbangan yang sewajarnya dalam membuat keputusan.

### **Kebenaran Dan Kelulusan Bertulis**

Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan dan Effluen-Effluen Perindustrian), 1979 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih), 1978 menghendaki supaya kebenaran dan kelulusan bertulis diperolehi terlebih dahulu daripada Ketua Pengarah Alam Sekitar sebelum apa-apa loji rawatan sisa kumbahan dan alat kawalan pencemaran udara dipasang.

Pada tahun 2008, Jabatan Alam Sekitar telah menerima 1,082 permohonan bagi pembinaan loji rawatan sisa

### **Continuous Professional Development (CPD)**

The mandatory requirement for Continuous Professional Development (CPD) has been included under the EIA Consultant Registration Scheme. Registered consultants are required to obtain a certain number of training (CPD) hours every year to enable them to renew their registration. Any related organiser or course provider may apply for CPD hours for their programmes. The information about the programmes was disseminated to all registered consultants. The list of approved programmes is presented in **Table 3.4**.

### **Project Pre-Siting Evaluation**

Where development projects were not subjected to the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987, pre-siting evaluation of proposed sites suitability were carried out.

In 2008, a total of 11,405 such applications were received, where Johor recorded the highest number (2,895), followed by Selangor (2,017), and other states (**Figure 3.5**). These applications were mainly referred to the DOE by Local Authorities and Land Offices. Technical environmental inputs were given due consideration in decision making.

### **Written Permission and Approval**

The Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979 and the Environmental Quality (Clean Air) Regulations, 1978 require written permissions and approvals to be obtained from the Director-General of Environment before construction of wastewater treatment plants and installation of air pollution control systems.

In 2008, 1,082 such applications were received for construction of effluent treatment plants (**Figure 3.6**)

kumbahan (**Rajah 3.6**) dan 1,899 permohonan bagi pemasangan alat kawalan pencemaran udara (**Rajah 3.7**). Selain itu, 2,223 permohonan untuk kelulusan bertulis untuk pemasangan bahan api peralatan panas seperti dandang dan set-set penjana telah diproses (**Rajah 3.8**).

### **Sistem Maklumat Geografi (GIS)**

Pelbagai program pembangunan GIS terus dipergiatkan dan dilaksanakan pada tahun 2008 bertujuan supaya teknologi GIS dapat dimanfaatkan sepenuhnya oleh JAS dalam menguruskan alam sekitar di Malaysia.

Program Pembangunan Data termasuk pembangunan data spatial bagi negeri Sabah dan Sarawak serta pembangunan data lembangan sungai bagi Semenanjung Malaysia telah dilaksanakan untuk melengkapkan pangkalan data spatial. Program melengkapkan dan mengemaskini lokasi punca-punca pencemaran, stesen-stesen pengawasan kualiti alam sekitar, projek-projek pembangunan dan premis-premis yang tertakluk kepada Akta Kualiti Alam Sekeliling (AKAS) 1974 terus dilaksanakan.

Pada tahun 2008, program latihan GIS termasuk taklimat dan latihan *hands-on* diberikan secara berterusan kepada pegawai-pegawai JAS untuk memantapkan pengetahuan dan kemahiran pegawai-pegawai JAS dalam menggunakan kemudahan GIS. Sebanyak dua (2) kursus asas GIS telah diadakan di EiMAS dan enam (6) siri bengkel penggunaan aplikasi GIS telah dilaksanakan.

Disamping itu, GIS digunakan untuk memberikan maklumat harian berkaitan dengan lokasi titik panas bagi pemantauan pembakaran terbuka. GIS juga membekalkan input berkaitan dengan data spatial yang diperlukan oleh Bahagian-Bahagian di IbuPejabat, Pejabat JAS Negeri/Cawangan dan lain-lain agensi.

### **Pusat Khidmat Nasihat JAS Di MIDA**

Pusat Khidmat Nasihat JAS di Ibu Pejabat Lembaga Kemajuan Perindustrian Malaysia (MIDA) berperanan

and 1,899 applications for installation of air pollution control equipment (**Figure 3.7**). In addition, 2,223 applications for written approvals for installation of fuel burning equipment such as boilers and generator sets were processed (**Figure 3.8**).

### **Geographical Information System (GIS)**

Various GIS programs were developed and undertaken in 2008, in order to enable the GIS technology to be fully utilized by the DOE in the environmental management in Malaysia.

Data development programs which include the spatial data development for Sabah and Sarawak states and river basins for West Malaysia were conducted in order to develop a complete and updated spatial data center. The location of pollution sources, environmental monitoring stations and development projects prescribed under the Environmental Quality Act (EQA) 1974 have been continuously updated.

In 2008, training courses are continuously provided to DOE personnel to ensure they have the knowledge and skills in using the GIS technologies. Two (2) basic GIS courses in EiMAS and six (6) series of workshops on GIS application had been conducted.

Besides that, GIS had been used to supply daily information on hotspot locations in the monitoring of open burning. GIS also provided input relating to spatial information required by the various Divisions in the Headquarters, State/Branch Offices and other agencies.

### **DOE Advisory Services Desk at MIDA**

The DOE Advisory Services Desk at the Head Office of the Malaysian Industrial Development Authority

untuk memberi maklumat dan nasihat mengenai alam sekitar kepada pelabur-pelabur tempatan dan dari luar negara.

Dalam tahun 2008, sejumlah 161 ulasan bertulis telah dikemukakan kepada MIDA, 44 khidmat nasihat telah diberi melalui telefon dan 85 mesyuarat dengan pelabur telah diadakan. Ulasan-ulasan bertulis yang diberi kepada MIDA dan nasihat-nasihat yang diberi kepada pelabur meliputi kehendak-kehendak alam sekitar yang perlu dipatuhi oleh industri baru atau sedia ada seperti penilaian awal tapak, penilaian kesan kepada alam sekeliling (EIA), kelulusan/ kebenaran bertulis bagi pemasangan alat kawalan pencemaran, dan lesen bagi pengimportan/ pengeksportan buangan terjadual. Lain-lain keperluan alam sekitar spesifik yang sering ditanya termasuklah: piawai-piawai alam sekitar yang perlu dipatuhi, zon penampungan, dan keperluan alam sekitar bagi penubuhan kemudahan pemerolehan kembali separa dan penuh bagi buangan elektrik dan elektronik.

Penasihat JAS di MIDA juga bertindak sebagai *resource person* Jabatan dalam enam (6) dialog yang berlangsung sepanjang tahun, termasuk Dialog Tahunan MITI dan Dialog Pelaburan dan Perdagangan serta Seminar Peringkat Lembah Klang, yang dipengerusikan oleh Y.B. Menteri Perdagangan Antarabangsa dan Industri. Dialog-dialog lain yang dihadiri adalah bersama dengan pertubuhan-pertubuhan industri, yang dipengerusikan oleh Ketua Pengarah MIDA.

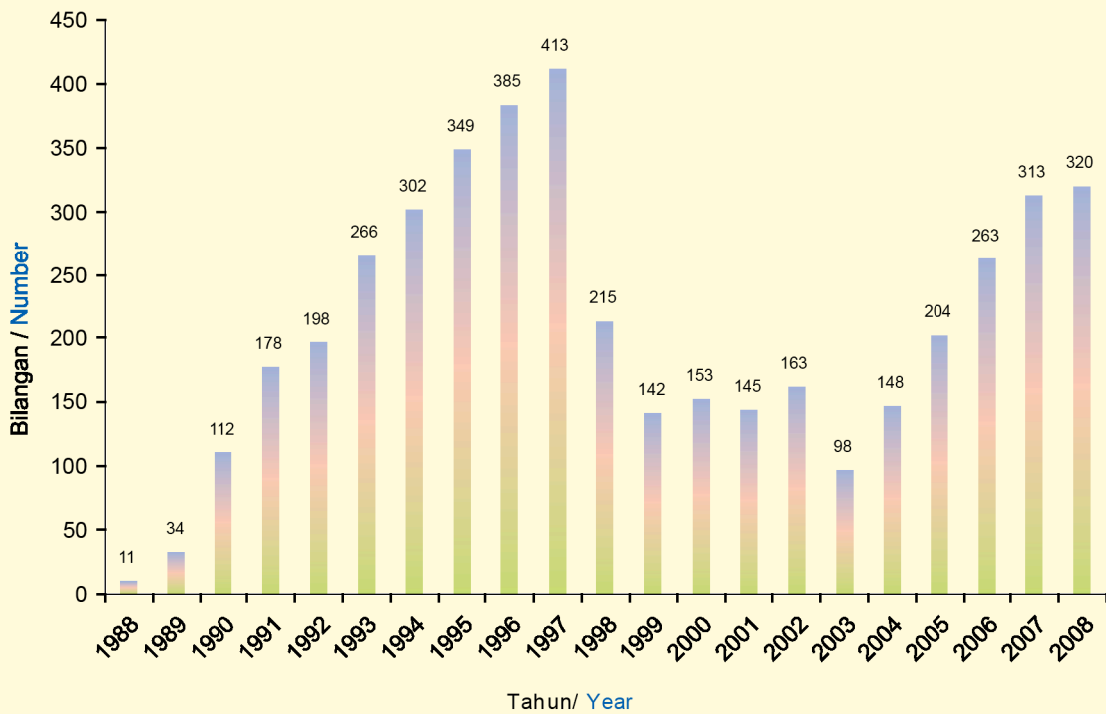
JAS telah julung-julung kalinya menghadiri Misi Perdagangan dan Pelaburan ke Amerika Syarikat (Detroit dan New York) pada 13-20 Mei 2008, yang diketuai oleh Yang Berhormat Menteri Perdagangan Antarabangsa dan Industri. Peranan JAS dalam Misi Perdagangan dan Pelaburan ini adalah untuk memberi khidmat nasihat mengenai kehendak-kehendak alam sekitar semasa mesyuarat secara individu diadakan dengan bakal-bakal pelabur.

(MIDA) serves to provide environmental information and advice to prospective local and foreign investors.

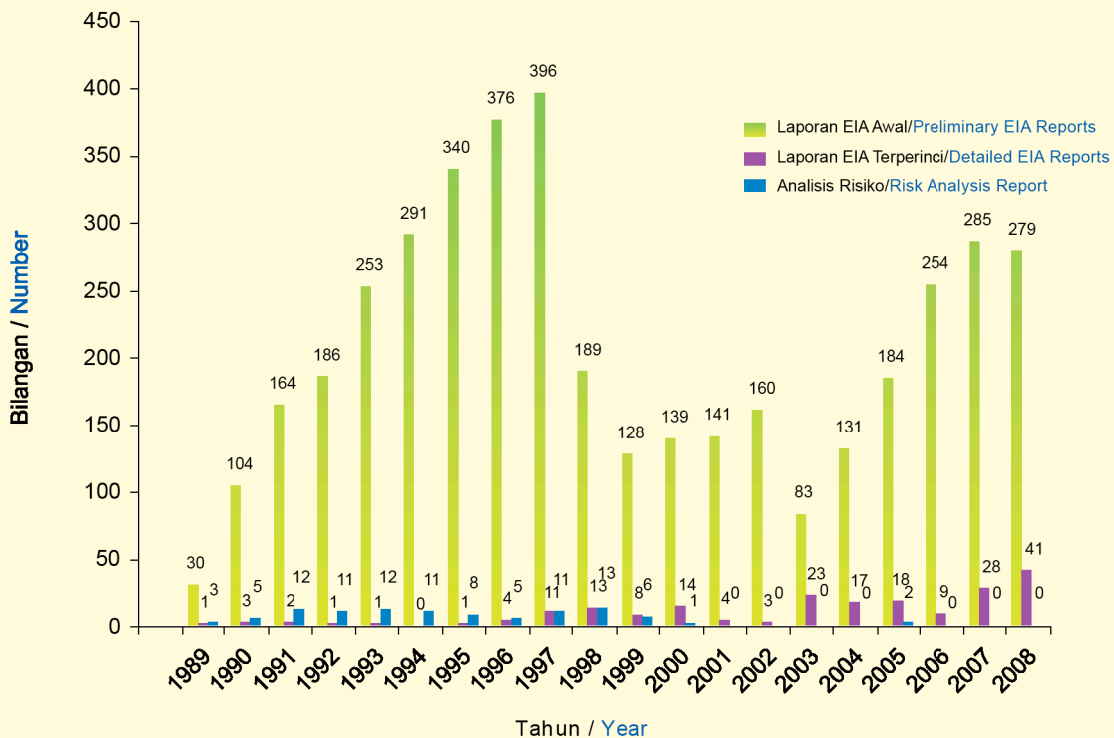
In 2008, a total of 161 written comments were submitted to MIDA, 44 telephone enquiries were attended to and 85 meetings with investors were held. Written inputs given to MIDA as well as advices given to investors pertained to environmental requirements that need to be complied with by a new or existing industry, such as site suitability evaluation, environmental impact assessment (EIA), written approvals / permissions for the installation of pollution control equipment, and licences for the importation / exportation of scheduled wastes. Other specific requirements frequently asked include: environmental standards to be complied with, buffer zone, as well as environmental requirements for the setting up of partial and full recovery facilities for electrical and electronic wastes (e-wastes).

The DOE Advisor at MIDA also acted as the Department's resource person in six (6) dialogues, including MITI's Annual Dialogue and the Klang Valley Investment and Trade Dialogue and Seminar, chaired by the Honourable Minister of International Trade and Industry. The other dialogues were held with industrial associations, and chaired by the Director-General of MIDA.

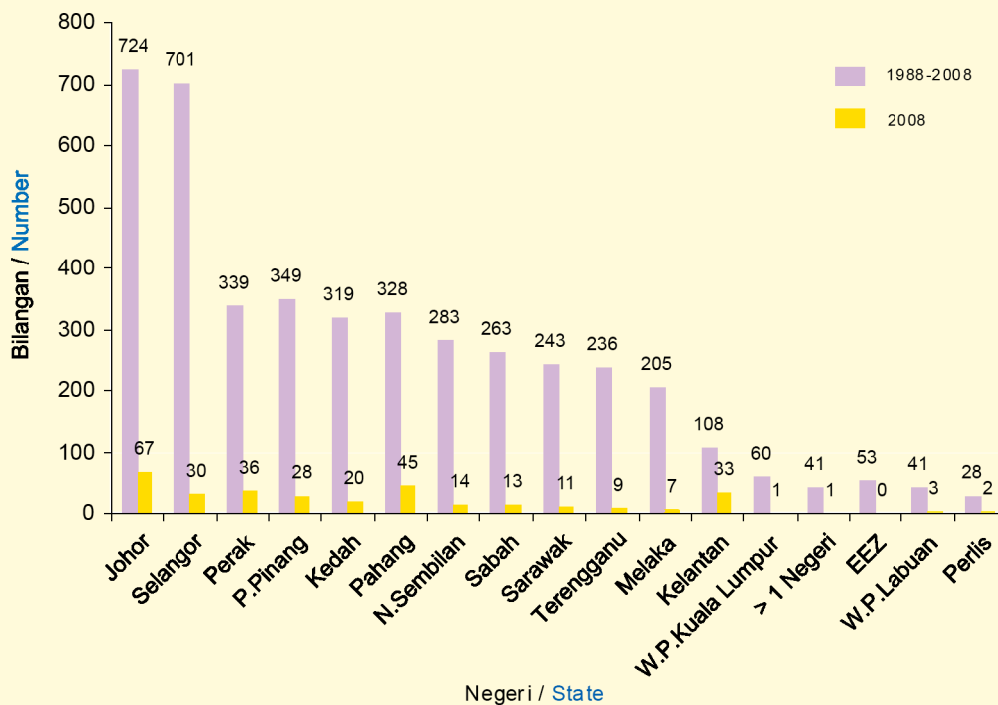
For the first time ever, the DOE participated in the Trade and Investment Mission to the United States (Detroit and New York), on 13-20 May 2008, led by the Honourable Minister of International Trade and Industry. DOE's role during this Trade and Investment Mission was to give advice and information pertaining to environmental requirements to potential investors during the individual business meetings.



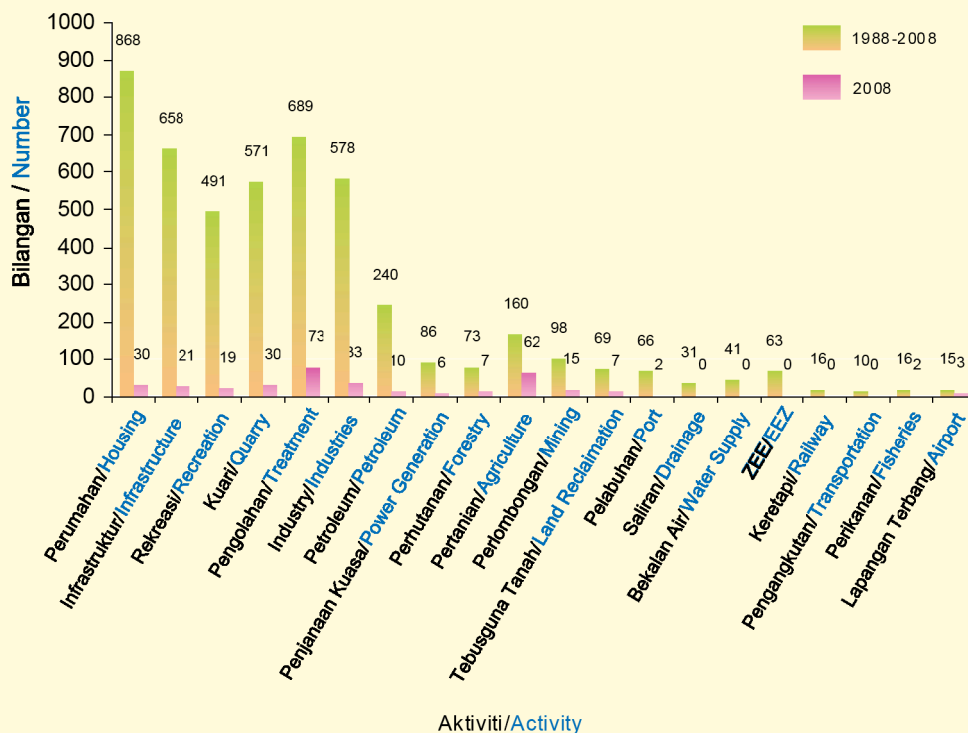
Rajah 3.1 JAS: Bilangan Laporan EIA Yang Diterima Mengikut Tahun, 1998-2008  
 Figure 3.1 DOE: Number of EIA Reports Received by Year, 1988-2008



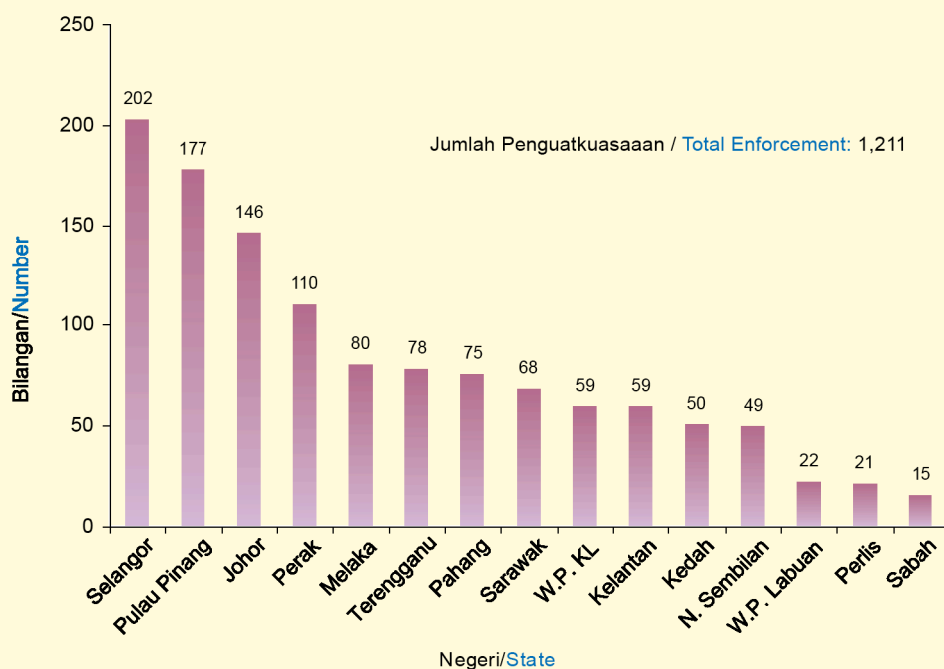
Rajah 3.2 JAS: Bilangan Laporan EIA dan Jenis Laporan Diterima, 1989-2008  
 Figure 3.2 DOE: Number and Type of EIA Reports Received, 1989-2008



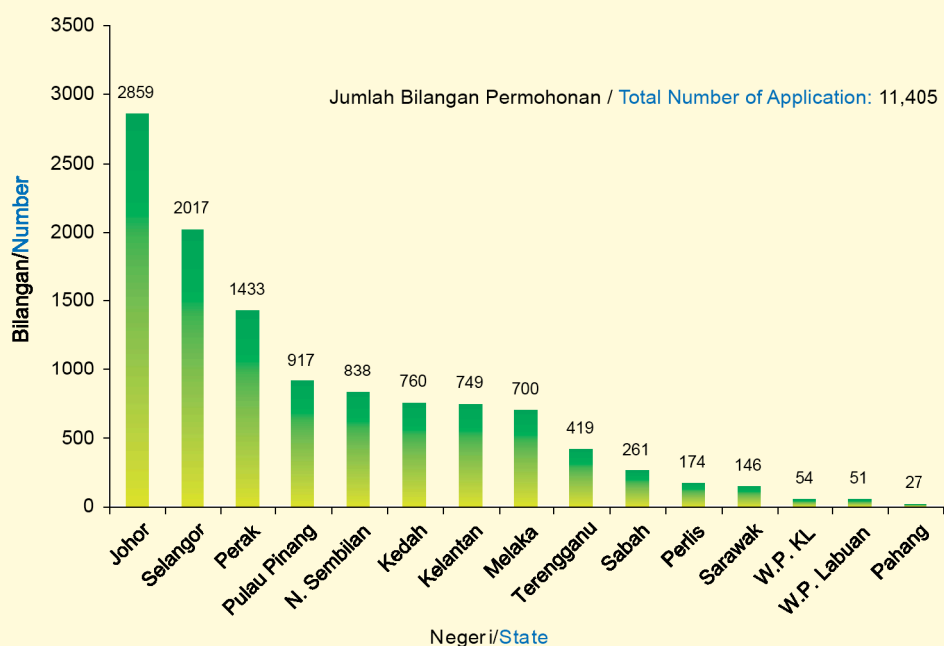
Rajah 3.3 JAS: Bilangan Laporan EIA Yang Diterima Mengikut Negeri, 1988-2008  
 Figure 3.3 DOE: Number of EIA Reports Received By State, 1988-2008



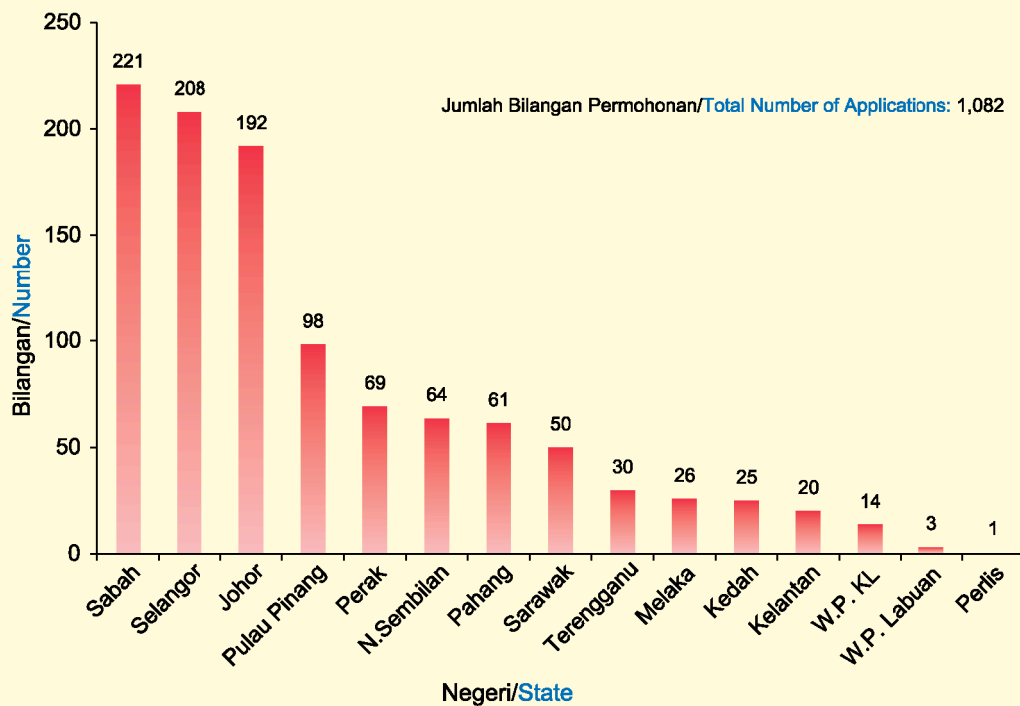
Rajah 3.4 JAS: Bilangan Laporan EIA Yang Diterima Mengikut Aktiviti, 1988-2008  
 Figure 3.4 DOE: Number of EIA Reports Received By Activity, 1988-2008



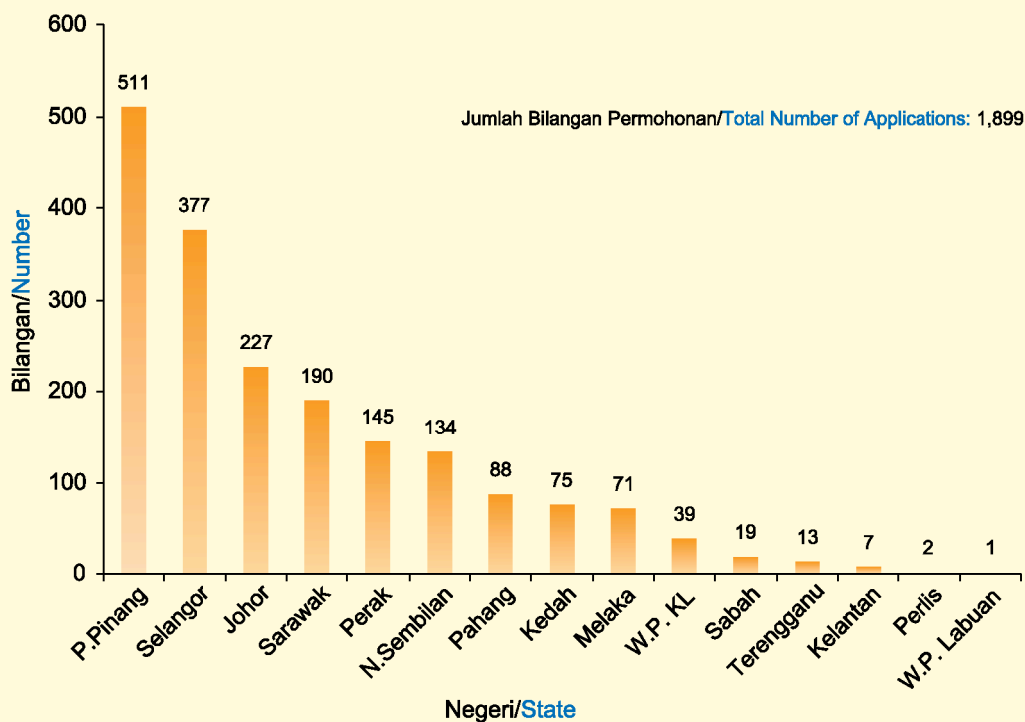
Rajah 3.5 JAS: Siasatan Penguatkuasaan Projek EIA, 2008  
 Figure 3.5 DOE: Post EIA Enforcement Investigations, 2008



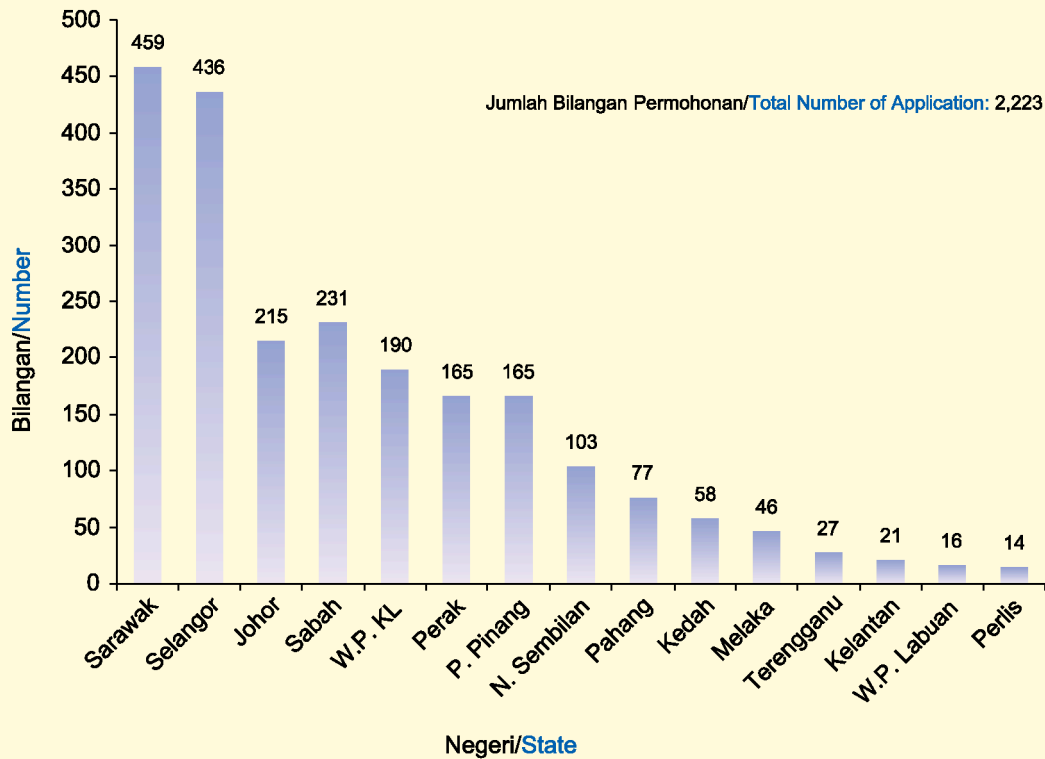
Rajah 3.6 JAS: Penilaian Awal Tapak Untuk Projek Pembangunan Mengikut Negeri, 2008  
 Figure 3.6 DOE: Pre-Siting Evaluation of Development Projects by State, 2008



Rajah 3.7 JAS: Kebenaran Bertulis Untuk Pembinaan Loji Pengolahan Effluen Mengikut Negeri, 2008  
 Figure 3.7 DOE: Application for Construction of Wastewater Treatment Plants by State, 2008



Rajah 3.8 JAS: Permohonan Bagi Pemasangan Alat Kawalan Pencemaran Udara Mengikut Negeri, 2008  
 Figure 3.8 DOE: Applications for Installation of Air Pollution Control Equipment by State, 2008



Rajah 3.9 JAS: Permohonan Bagi Pemasangan Alat Pembakaran Bahan Api Mengikut Negeri, 2008  
 Figure 3.9 DOE: Applications for Installation of Fuel Burning Equipment by State, 2008



Projek Pembangunan di Kawasan Tanah Tinggi  
 Development Project on Highland Areas

Jadual 3.1 JAS: Jumlah Permohonan Yang Diluluskan, 2008  
Table 3.1 DOE: Number of Approved Applications, 2008

Kategori Category	Jumlah Permohonan Total of Applications	Jumlah Permohonan diluluskan / No. of Applications Approved	Peratusan Lulus (%) Percentage Approved (%)
Jururunding EIA / EIA Consultant	46	24	52%
Jururunding Subjek / Subject Consultant	114	100	88%
Penolong Jururunding Assistant Consultant	124	117	94%
Jumlah/ Total	284	241	84.80%

Jadual 3.2 JAS: Jumlah Keseluruhan Jururunding Berdaftar sehingga 31 Disember 2008  
Table 3.2 DOE: Number of Registered Consultants until 31 December 2008

Perkara Items	Jumlah Diluluskan Total Approved	Peratusan (%) Percentage (%)
Jururunding EIA / EIA Consultant	233	27.30%
Jururunding Subjek / Subject Consultant	298	35%
Penolong Jururunding / Assistant Consultant	321	37.70%
Jumlah / Total	852	100%

Jadual 3.3 JAS: Senarai Aktiviti Bagi Skim Pendaftaran Jururunding EIA, 2008  
Table 3.3 DOE : List of Seminars and Workshops, 2008

Bil. No.	Aktiviti Activities	Tarikh Date	Tempat Venue
1	Seminar EIA & Audit Alam Sekitar Untuk Agensi-Agensi Kerajaan	28 April 2008	Hotel Marriott, Putrajaya
2	Bengkel berkenaan Guideline on The Economic Valuation of The Environmental Impact of EIA Projects For DOE Officer (dengan kerjasama EPU dan DANIDA)	25 & 28 Mei / May 2007	Heritage Bay Club & Resort, Kuala Terengganu
3	Workshop on Guideline on The Economic Valuation of The Environmental Impact of EIA Projects For EIA Consultants (dengan kerjasama EPU dan DANIDA)	3 - 4 Jun / June 2008	Sunway Hotel & Resort, Petaling Jaya
4	Workshop on Guideline on The Economic Valuation of The Environmental Impact of EIA Projects For Government Agencies (dengan kerjasama EPU dan DANIDA)	28 Ogos / August 2008	Hotel Marriott, Putrajaya
5	Working Group Workshop for Socio-Economic Study in EIA	22 Okt. / Oct. 2008	Hotel Marriott, Putrajaya
6	Working Group Workshop for Health Study in EIA	28 Okt. / Oct. 2008	Hotel Marriott, Putrajaya

Jadual 3.4 JAS : Program yang Mendapat Kelulusan CPD Hours

Table 3.4 DOE: Programmes Approved for CPD Hours

Bil. No.	Program Programme	Penganjur Organiser	Tarikh Date	Tempat Venue
1	General Principles of Environmental Impact Assessment (EIA) Training	ENSEARCH	27 - Feb. 2008	ENSEARCH Training Centre
2	Visit to Sustainable Technology Facilities in Johor & Singapore	ENSEARCH	25 - 27 Feb. 2008	Johor & Singapore
3	Visit to Bukit Tagar Landfill	ENSEARCH	28 Feb. 2008	Bukit Tagar Landfill
4	Seminar on Understanding of Scheduled Waste Management	Environment Institute of Malaysia (EiMAS)	19 Feb. 2008 22 Apr. 2008 24 Jun / June 2008 28 Okt. / Oct. 2008	Hotel Crowne Plaza, Kuching Sutera Harbour Resort, Kota Kinabalu Hotel Grand Continental, Terengganu Hotel Equatorial, Melaka
5	Seminar on Understanding of Environmental Requirement for Industrial Effluent Treatment System and Pollution Control System Tahun 2008	Environment Institute of Malaysia (EiMAS)	20 - 21 Feb. 2008 23 - 24 Apr. 2008	Hotel Crowne Plaza, Kuching Sarawak Sutera Harbour Resort, Kota Kinabalu Sabah
6	Environmental Legislation Training	ENSEARCH	26 Mac / March 2008	ENSEARCH Training Centre
7	Workshop on River Water Quality Modeling	Universiti Kuala Lumpur,	3 - 5 Mac / March 2008	Universiti Kuala Lumpur
8	Seminar on Strategic Environmental Assessment (SEA) Using RIAM	Cetre for Built Environment, International Islamic University Malaysia & Envirolink Sdn. Bhd. supported by: National Institute of Public Administration (INTAN) Malaysia	6 - 8 Mac / March 2008	MATRADE Exhibition & Convention Centre, Kuala Lumpur
9.	Certification Course For Scheduled Waste Managers Year 2008	Environment Institute of Malaysia (EiMAS)	3 - 7 Mac / March 2008 16 - 20 Jun / June 2008 13 - 17 Okt. / Oct. 2008	Hotel Equatorial, Bangi
10.	Colloquium on Air Pollution Control Technologies	JAS Ibu Pejabat	1 Apr. 2008	Bilik Cempaka, JAS Ibu Pejabat
11.	Certification Course For Operators of APCS Year 2008	Environment Institute of Malaysia (EiMAS)	5 - 9 Mei / May 2008 18 - 22 Ogos / August 2008	Hotel Residen, UNITEN, Bangi
12.	Seminar Kejuruteraan Awam	UTM	20 - 21 Mei / May 2008	Mahkota Century Hotel, Melaka
13.	Water Quality Analysis - Mastering the Technique	Institut Pengurusan Alam Sekitar & Sumber Air (IPASA) dan UTM	24 - 26 Jun / June 2008	UTM, Skudai

Jadual 3.4 JAS : Program yang Mendapat Kelulusan CPD Hours

Table 3.4 DOE: Programmes Approved for CPD Hours

Bil. No.	Program Programme	Penganjur Organiser	Tarikh Date	Tempat Venue
14.	Visit to Jaring Metal Industries Sdn Bhd. (Electronic Waste Recycling Management)	ENSEARCH	18 Julai / July 2008	Jaring Metal Industries Sdn. Bhd.
15.	Seminar on Treatment of Textiles Effluent - Ensuring Compliance with Discharge Standards	Environment Institute of Malaysia (EiMAS)	21 Julai / July 2008	Hotel Katerina, Batu Pahat Johor
16.	Seminar on Continuous Emission Monitoring Systems (CEMSs)	Environment Institute of Malaysia (EiMAS)	23 Julai / July 2008 11 Ogos / August 2008 29 Okt. / Oct. 2008 12 Nov. 2008 27 Nov. 2008 17 Dis. / Dec. 2008	Johor Negeri Sembilan Sabah Pulau Pinang Terengganu Sarawak
17.	EIA for Infrastructure Development Training	ENSEARCH	30 Julai / July 2008	ENSEARCH Training Centre
18.	Waste Management Conference 2008	Asia Executive Programs Sdn. Bhd.	4 Ogos / August 2008	Concorde Hotel, Kuala Lumpur
19.	Scheduled Waste Management 2008	ENSEARCH	13 -14 Ogos / August 2008	ENSEARCH Training Centre
20.	Seminar on Strategic Environmental Assessment (SEA) Using RIAM	EnviroLink Sdn. Bhd. supported by : Environment Protection Department (EPD), Sabah Natural Resource & Environment Board (NREB), Sarawak	15 - 17 Sept. 2008	Promenade Hotel, Kota Kinabalu
21.	FMM / DOE Selangor Seminar on Complying With Environmental Regulations on Industrial Effluents and Clean Air	Federation of Malaysian Manufacturers (FMM) Selangor	14 Okt. / Oct. 2008	Concorde Hotel, Kuala Lumpur
22.	Technical Seminar on Sustainable Waste Management: Addressing Future Challenges and Seizing New Opportunities	The Waste Management Association of Malaysia (WMAM)	30 Okt. / Oct. 2008	Legend Hotel, Kuala Lumpur
23.	Waste Management Conference and Exhibition 2008	ENSEARCH	11 - 12 Nov. 2008	Sime Darby Convention Centre, Kuala Lumpur
24.	International Conference & Expo on Environmental Management and Technologies 2008 - 'Sustainable Environment through Affordable Technologies'	Institut Pengurusan Alam Sekitar & Sumber Air (IPASA) dan UTM	10 - 12 Dis. / Dec. 2008	Putra World Trade Centre, Kuala Lumpur

**BAB 4 / Chapter 4**



## PENGAWASAN KUALITI UDARA AIR QUALITY MONITORING

Malaysia mempunyai 51 buah rangkaian stesen pengawasan kualiti udara yang ditempatkan di seluruh negara bagi memantau dan mengesan sebarang perubahan ketara kepada status kualiti udara yang mungkin memberi kesan negatif kepada kesihatan awam dan alam sekitar. Stesen-stesen pengawasan ini ditempatkan di lokasi yang strategik (**Peta 4.1 dan 4.2**) bagi mencapai objektif pengawasan yang spesifik.

Kebanyakan stesen ditempatkan dalam kawasan perumahan bagi memastikan tahap pendedahan pencemar udara kepada orang awam sentiasa diawasi. Sebahagiannya pula, ditempatkan dalam kawasan industri dan kawasan yang sibuk dengan trafik. Rangkaian Stesen Pengawasan Kualiti Udara ini turut dilengkapi dengan stesen-stesen pengawasan kualiti udara manual yang ditempatkan di 21 buah lokasi yang berbeza. Dalam pengawasan ini, jumlah pepejal terampai, habuk halus bersaiz kurang 10 mikron (PM<sub>10</sub>) dan beberapa jenis logam berat termasuk plumbum diukur setiap enam (6) hari menggunakan alat "High Volume Samplers".

### Status Kualiti Udara

Secara keseluruhannya, status kualiti udara di seluruh negara pada tahun 2008 bertambah baik berbanding tahun sebelumnya dan tiada episod jerebu berlaku. Keadaan cuaca lembap serantau dengan peningkatan jumlah hujan yang dialami dalam negara menyebabkan pengurangan bilangan titik panas atau kejadian pembakaran terbuka yang berlaku dalam negara seperti yang dilaporkan oleh ASEAN Specialized Meteorological Centre (ASMC).

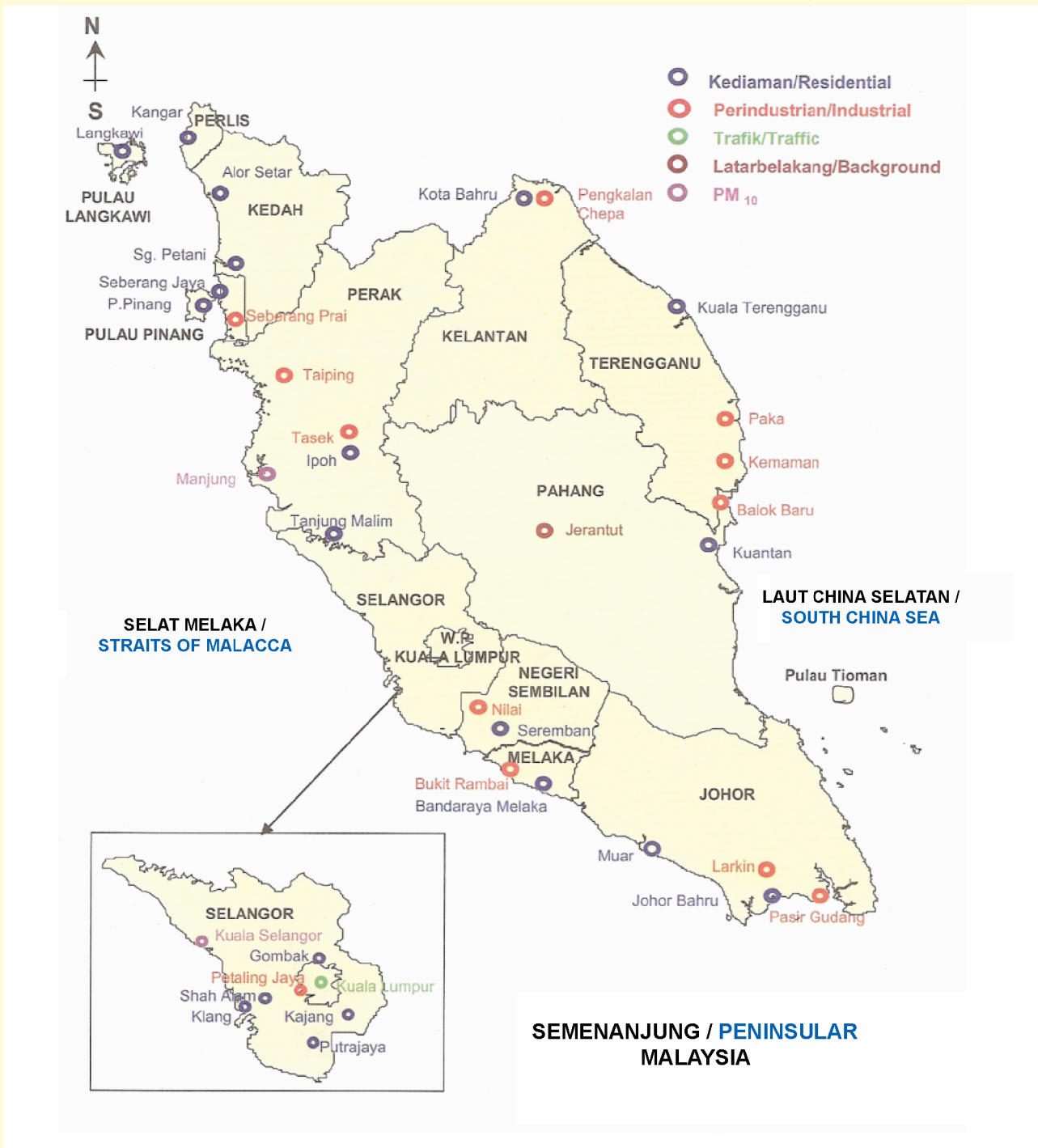
Malaysia's air quality monitoring network consists of 51 stations that are located throughout the country to monitor and to detect any significant change in air quality that can contribute to the negative impact to human health and the environment. The monitoring stations are strategically located (**Map 4.1 and 4.2**) to meet specific monitoring objectives.

Most stations are located in residential areas to ensure the air quality exposed to the public is continuously monitored. The rest of the stations are located within industrial areas and areas with high traffic volume. The National Air Quality Monitoring Network is also complemented by manual air quality monitoring stations located at 21 different sites. At these sites, total suspended particulate, particulate matter (PM<sub>10</sub>) and several heavy metals including lead are measured at intervals of six (6) days using High Volume Samplers.

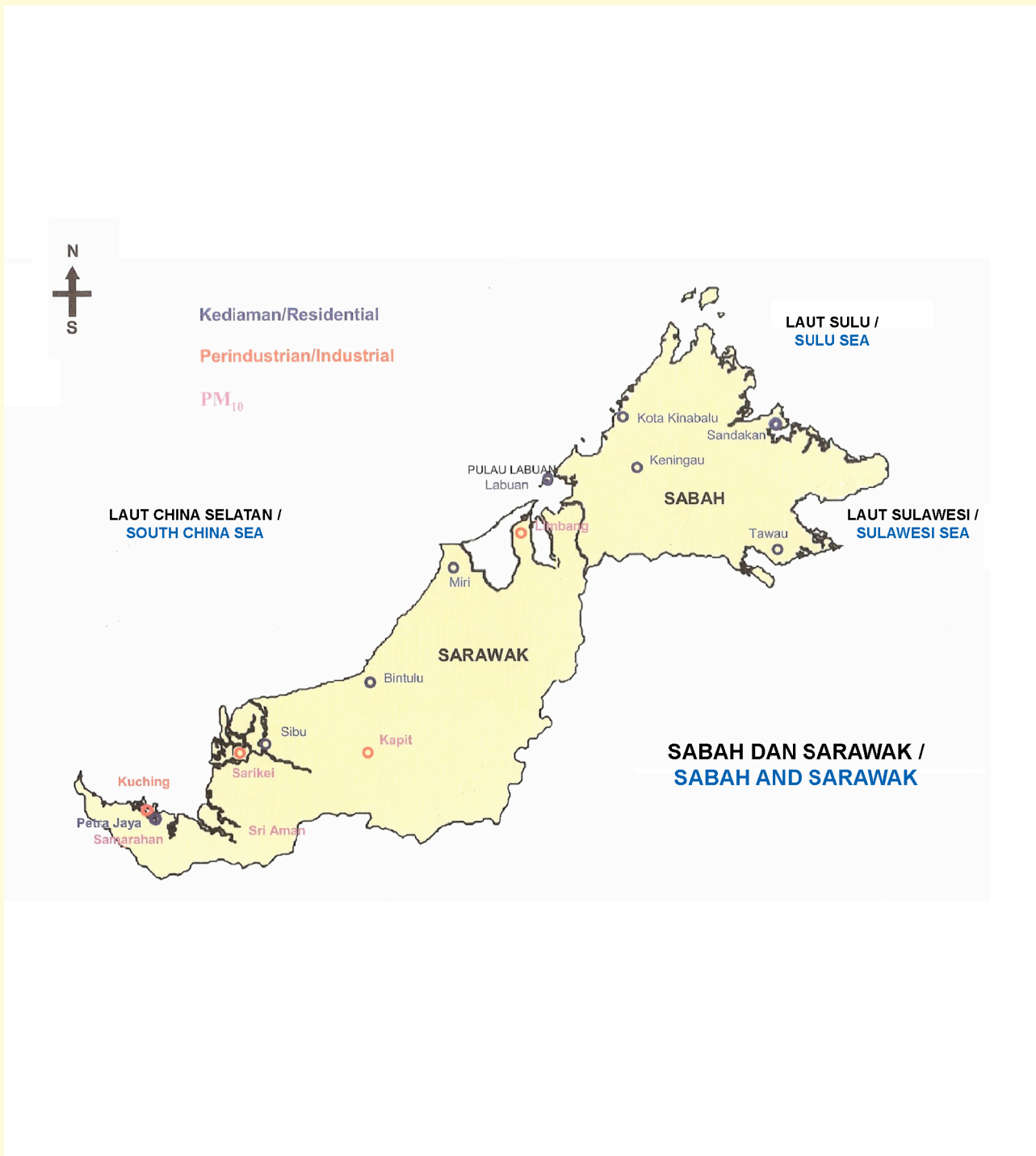
### Air Quality Status

The overall air quality status for Malaysia in 2008 had improved slightly compared to the previous year and no haze episodes recorded. The wetter than normal regional weather condition with increased amount of rainfall experienced in the country had resulted in decreased number of open burning activities or hotspots detected in the country as reported by the ASEAN Specialized Meteorological Centre (ASMC).

STATUS KUALITI UDARA  
AIR QUALITY STATUS



Peta 4.1 Semenanjung Malaysia: Lokasi Stesen Pengawasan Udara Automatik, Semenanjung Malaysia, 2008  
Map 4.1 Peninsular Malaysia: Location of Continuous Air Quality Monitoring Station, Peninsular Malaysia, 2008



Peta 4.2 Sabah & Sarawak: Lokasi Stesen Pengawasan Udara Automatik, Malaysia Timur, 2008  
 Map 4.2 Sabah & Sarawak: Location of Continuous Air Quality Monitoring Station, East Malaysia, 2008

## PENGAWASAN BUNYI BISING AMBIEN AMBIENT NOISE MONITORING

### Punca dan Kesan Pencemaran Bunyi Bising

Aktiviti-aktiviti perindustrian, projek-projek pembangunan dan trafik boleh menghasilkan kesan bunyi yang ketara. Pencemaran bunyi boleh menjejaskan kesihatan dan mengurangkan produktiviti. Selain daripada menjadi kacauganggu terhadap masyarakat, bunyi yang disertai dengan amplitud getaran yang tinggi berpunca dari aktiviti-aktiviti seperti letupan batu dari kuari boleh mengakibatkan kemusnahan pada infrastruktur jalan dan bangunan. Pengukuran paras bunyi biasanya dilakukan di lokasi punca bunyi bising seperti di kawasan yang padat dan sesak dengan trafik serta kawasan perindustrian. Pengukuran juga dilakukan di kawasan penerima bunyi seperti di sekolah dan hospital untuk menilai kesannya terhadap penerima.

### Program Pengawasan Bunyi Bising Kebangsaan

Jabatan Alam Sekitar telah memulakan Program Pengawasan Bunyi Bising Kebangsaan pada bulan Jun 2006. Program ini telah diteruskan sepanjang tahun 2008 dengan tujuan utama untuk mewujudkan data garis dasar bagi input pembangunan pada masa akan datang. Pengukuran paras bunyi bising ambient tertumpu kepada tiga (3) kategori utama; trafik jalanraya (17 stesen), perindustrian (10 stesen) dan kawasan sensitif seperti hospital, sekolah dan tempat ibadat (5 stesen) (**Jadual 4.1**). Bagi kes aduan, pengawasan berkala telah dijalankan oleh pejabat JAS Negeri.

Pematuhan bunyi bising ambien adalah berdasarkan had-had yang disyorkan dalam "The Planning Guidelines for Environmental Noise Limits and Control". Hasil pengukuran menunjukkan kebanyakan kawasan daripada ketiga-tiga kategori mencatatkan bacaan bunyi bising melebihi garispanduan yang ditetapkan.

### Sources and Effect of Noise Pollution

Activities such as industrial, development projects and traffic generate excessive noise. Noise pollution has an impact on health and reduces productivity. Besides being a nuisance to public, noise together with vibrations of very high amplitudes from activities such as blasting of rocks during quarrying can cause damage to infrastructure such as roads and buildings. Normally, measurement of noise level is carried out at source for example in areas with heavy traffic and noise from factories. The measurement could also be done at the receiver locations such as at schools and hospitals, so as to assess impacts of noise to the recipients.

### National Ambient Noise Monitoring Programme

The Department of Environment started the National Ambient Noise Monitoring Programme in June 2006. The programme continued throughout 2008 with the aim of collecting baseline data as inputs to future development projects. The ambient noise monitoring programme focused at three (3) major sources of noise; road traffic (17 stations), industrial areas (10 stations) and noise sensitive areas such as hospitals, schools and places of worship (5 stations) (**Table 4.1**). For complaint cases, periodic monitoring had also been carried by DOE States Offices.

Compliance to the noise level is based on the limits recommended in "The Planning Guidelines for Environmental Noise Limits and Control". Generally, the results showed that most areas at the above three (3) categories exceeded the guideline limits.

## Latihan Praktikal

Satu latihan praktikal bagi pegawai-pegawai dari JAS Negeri berkaitan penggunaan peralatan untuk mengukur bunyi bising persekitaran telah diadakan pada 23-24 September 2008 di Institut Alam Sekitar Malaysia (EIMAS), Bangi Selangor.

## Hands-On Training

A practical training for DOE States officers on handling and operating of sound level meter was held on 23-24 September 2008 at the Environment Institute of Malaysia (EIMAS), Bangi Selangor.

Jadual 4.1 JAS: Pengawasan Bunyi Bising Ambien, 2008  
Table 4.1 DOE: Ambient Noise Monitoring, 2008

Kategori/ Category	Lokasi/Location	Bilangan Pengukuran/ No. of Measurement	Pematuhan (%)/ Compliance (%)
Trafik/Traffic	Terengganu		
	1. Kompleks Sri Iman, Jalan Bukit Besar	24	4
	Pahang		
	1. Jalan Endau-Rompin, Tg. Gemok, Kuala Rompin	30	0
	2. KM. 4, Jalan Gambang-Kuantan, Tanah Puteh	30	0
	Selangor		
	1. Lebuhraya Persekutuan, Petaling Jaya	21	14
	Pulau Pinang		
	1. Batching Plan, Jambatan Pulau Pinang	2	50
	Melaka		
	1. Lapangan Terbang Batu Berendam, Melaka	8	75
	Kedah		
	1. Simpang Empat Tandop, Alor Setar	15	0
	Sabah		
	1. Jalan UMS-Sulaman	12	17
	2. Jalan Tunku Abdul Rahman	12	0
	Kelantan		
1. Pasaraya TESCO, Kota Bharu	4	0	
2. Jalan Kota Bharu-Kuala Krai	10	0	
3. Jalan Sultan Yahya Petra	10	0	
Negeri Sembilan			
1. Stesen Taman Warisan Puteri-Projek Lebuhraya Kajang Seremban, LEKAS	10	50	
2. Stesen Jalan Kuala Pilah-Seremban	4	0	
Kuala Lumpur			
1. Technology Park Malaysia, Bukit Jalil	6	33	
2. Jalan 2/149K, Taman Sri Petaling	6	33	
3. Apartment Ixora, Bulatan Kg. Pandan	7	0	

Jadual 4.1 JAS: Pengawasan Bunyi Bising Ambien, 2008  
Table 4.1 DOE: Ambient Noise Monitoring, 2008

Kategori/ Category	Lokasi/Location	Bilangan Pengukuran/ No. of Measurement	Pematuhan (%)/ Compliance (%)
Industri/ Industries	Pahang 1. Kawasan Perindustrian Mentakab	30	100
	Selangor 1. Kawasan Perindustrian Seksyen 15, Shah Alam	18	56
	Pulau Pinang 1. Kuari SP Setia, Pulau Pinang	2	50
	Kedah 1. Kawasan Perindustrian Bakar Arang, Sg. Petani 2. Kawasan Perindustrian Bukit Kayu Hitam 3. Sempadan Taman Perumahan & Kawasan Perindustrian Taman Ria, Sg. Petani	3	0
		15	40
		12	0
	Sabah 1. Kawasan Perindustrian Inanam	12	67
	Kelantan 1. Kawasan Perindustrian Gua Musang (Industri)	10	50
1. Stesen Taman Marida-Kawasan Perindustrian Senawang 2. Stesen Taman Bukit Mahkota, Kawasan Perindustrian Arab Malaysian	12	50	
	4	75	
Kawasan Sensitif/ Sensitive Areas	Selangor 1. Hospital Tengku Ampuan Rahimah, Klang	21	0
	Pulau Pinang 1. Sek. Keb. Taman Senangan	2	50
	Johor 1. Masjid Jamek Raudatul Jannah, Taman Damai Jaya Skudai 2. Sek. Ren. Keb. Taman Damai Jaya, Skudai	2	0
		2	0
	Kuala Lumpur 1. International Medical University, Bukit Jalil	7	0

# PROTOKOL MONTREAL DAN PERLINDUNGAN LAPISAN OZON

## MONTREAL PROTOCOL AND PROTECTION OF THE OZONE LAYER

### Latarbelakang

Setelah ratifikasi Konvensyen Vienna bagi Perlindungan Lapisan Ozon dan Protokol Montreal pada 29 Ogos 1989, Malaysia dikategorikan sebagai Negara Artikel 5 di bawah Protokol Montreal untuk Bahan-Bahan Yang Menipiskan Lapisan Ozon. Berdasarkan Pelan Kebangsaan Penghapusan CFC, Malaysia sebagai Parti kepada Protokol Montreal mempunyai obligasi untuk menghapuskan penggunaan CFC menjelang 1 Januari 2010.

### Pematuhan Terhadap Protokol Montreal

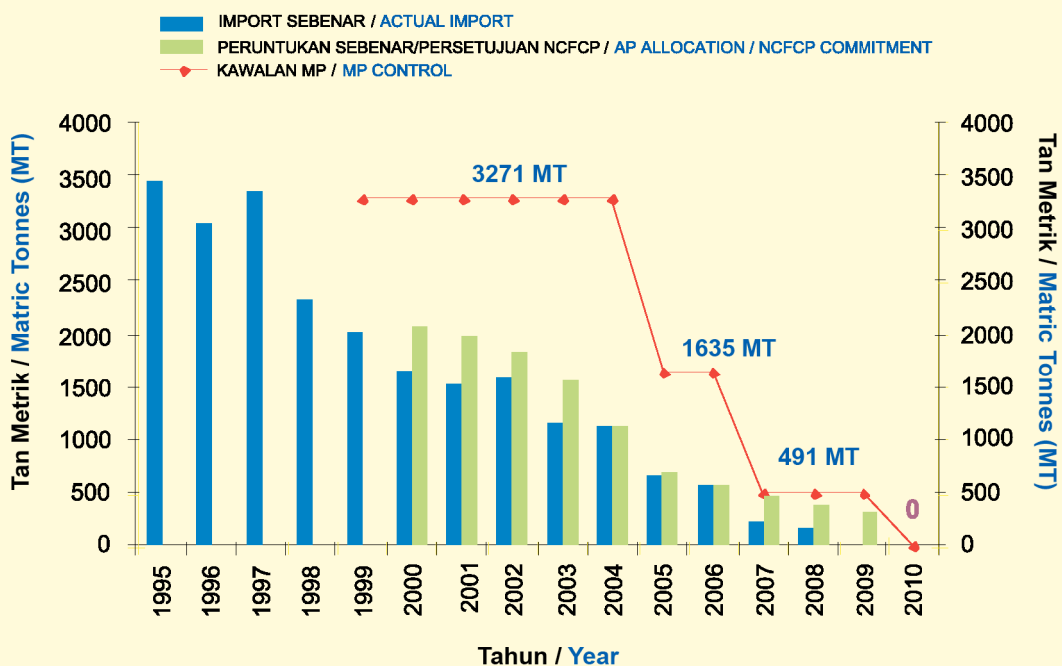
Bagi tahun 2008 peruntukan kuota yang diagihkan untuk mengimport bahan CFC ialah sebanyak 236 metrik tan dan pengimportan sebenar ialah sebanyak 173.67 metrik tan. Tren Penggunaan CFC bagi Malaysia (sebenar dan diunjurkan) adalah seperti ditunjukkan dalam **Rajah 4.1**.

### Background

Upon ratification of the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on 29 August 1989, Malaysia became an Article 5 country under the Montreal Protocol for Substances That Deplete the Ozone Layer. According to the National CFC Phase-out Plan, Malaysia as a party to Montreal Protocol has the obligation to phase-out the usage of CFC by 1 January 2010.

### Compliance to Montreal Protocol

In 2008, the approved quota for the importation of CFC was 236 metric tonnes and the amount of CFC imported was 173.67 metric tonnes. Malaysia's CFC consumption trend (actual and projected) is shown in **Figure 4.1**.



Rajah 4.1 JAS: Tren Penggunaan CFC Di Malaysia, 1995-2010  
Figure 4.1 DOE: Malaysia CFC Consumption Trend, 1995-2010



Program Latihan Teori dan Praktikal Bagi Sektor "Mobile Air Conditioning" (MAC) dan Pengurusan Refrigeran  
Theory and Practical Training Programme under the Mobile Air Conditioning Sector (MAC) and Refrigerant Management



Program Latihan Teori dan Praktikal Bagi Sektor Refrigerant Services (RSS) dan Pengurusan  
Theory and Practical Training Programme under the Refrigeration Service Sector (RSS) and Refrigerant Management

### Pelan Kebangsaan Penghapusan CFC (NCFCP) 2002 – 2010

Di bawah Pelan NCFCP 2002 – 2010, baki sebanyak 2,125 ton "ozone depleting potential (ODP)" (termasuk Halon dan Metil Bromida) akan dihapuskan dalam tempoh sembilan tahun. Peruntukan tambahan sejumlah USD 11.5 juta (RM43.7 juta) telah diluluskan oleh "Multilateral Ozone Trust Fund" (MLF) melalui Bank Dunia. Sehingga kini, terdapat beberapa projek bantuan teknikal dan program-program industri yang dijalankan oleh JAS, selaku agensi pelaksana, termasuklah :

- i. CFCs-Metered Dosed Inhaler (MDIs) Programme;
- ii. Mobile Air Conditioning (MAC) Inspection Programme oleh PUSPAKOM;
- iii. Program Latihan Kastam (COTP);
- iv. Program Sektor Servis MAC ;
- v. Program Sektor Bahan Pelarut;
- vi. Program Sektor Pendingin;
- vii. Program Sektor Bursa; dan
- viii. Program Kesedaran Alam Sekitar.

Sepanjang tahun 2008, sejumlah USD 848,290.49 (RM 2,922,492.25) dana telah dibelanjakan bagi pelaksanaan projek-projek di bawah program ini seperti tersenarai dalam **Jadual 4.2**.

### National Chlorofluorocarbons Phaseout Plan (NCFCP) 2002 - 2010

Under the NCFCP 2002 – 2010 the remaining 2,125 tonnes of ozone depleting potential (including Halon and Methyl Bromide) would be phased out over a period of nine years. An additional allocation of USD 11.5 million (RM43.7 million) had been approved for Malaysia under the Multilateral Ozone Trust Fund(MLF) through the World Bank. To date various on-going technical assistance projects and industrial programmes undertaken by DOE as the implementing agency include the following :

- i. CFCs-Metered Dosed Inhaler (MDIs) Programme;
- ii. Mobile Air Conditioning (MAC) Inspection Programme by PUSPAKOM;
- iii. Custom-ODS Training Programme (COTP);
- iv. MAC Servicing Sector Programme;
- v. ODS Solvent Sector Programme;
- vi. Refrigeration Service Sector Programme;
- vii. Foam Sector Programme; and
- viii. Public Awareness Programme.

In 2008, a total of USD 848,290.49 (RM 2,922,492.25) funds were utilized for the implementation of projects as tabulated in **Table 4.2**.

Jadual 4.2 JAS : Aktiviti-Aktiviti Kesedaran NCFCP, 2008  
 Table 4.2 DOE : Public Awareness Activities NCFCP, 2008

Tarikh Date	Aktiviti & Program Activities & Programme	Tempat Venue
4 Mac / March, 4	Seminar HCFC / Seminar on HCFC	IOI Resort Putrajaya
13-15 Mac / March, 13-15	Bengkel Pelupusan CFC-MDI / Regional Workshop on Phasing-Out CFC Based Metered Dose Inhaler	Holiday Villa, Langkawi
15-16 Mac / March, 15-16	Pameran Perlindungan Lapisan Ozon sempena Education Fair / Exhibition on Ozone Layer Protection during Education Fair	KLCC, Kuala Lumpur
15 Mac – 5 Disember/ March, 15 – December, 5	Iklan Perlindungan lapisan ozon di dalam keretapi / In-train Panel Advertisement on Ozone Layer Protection	30 panel dalaman keretapi PUTRA LRT/ 30 In-train panels PUTRA LRT
26-27 Mac / March, 26-27	Program Latihan Pusat Latihan Bertauliah MAC (10 Agensi Kerajaan) / Training Programme for MAC Authorised Training Center (10 Government Agencies)	Hotel Crowne Princess, KL
8, 15, 24 April / April, 8, 15, 24	Program Kesedaran perlindungan lapisan ozon Peringkat Negeri Kedah / Ozone Protection Awareness Programme – Kedah	Stesen Radio Negeri Kedah, Dewan Menara Zakat Negeri Kedah
28-30 April / April, 28-30	Latihan Kawalan Pengimportan Dan Penggunaan Bahan Pemusnah Ozon / Training Programme on Importation and Consumption Control of Ozone Depleting Substances	Hotel The Zon Regency, Johor Bahru
4-6 Jun / June, 4-6	Pameran bersempena Majlis Penyampaian Anugerah Langkawi / Exhibition on Ozone Layer Protection during 'Anugerah Langkawi' Award Giving Ceremony	PICC, Putrajaya
13-15 Jun / June, 13-15	Pameran Perlindungan Lapisan Ozon sempena MAPEX KL / Exhibition on Ozone Layer Protection during MAPEX KL	MidValley Megamall
21-22 Jun / June, 21-22	Pameran Perlindungan Lapisan Ozon sempena MY Career & Education Fair / Exhibition on Ozone Layer Protection during MY Career & Education Fair	Persada Johor Bahru
3 Julai / July, 3	Program Kesedaran perlindungan lapisan ozon Peringkat Negeri Perlis / Ozone Protection Awareness Programme – Perlis	Dewan Perpustakaan Awam Negeri Perlis
3-6 Ogos / August, 3-6	Latihan Kawalan Pengimportan Dan Penggunaan Bahan Pemusnah Ozon / Training Programme on Importation and Consumption Control of Ozone Depleting Substances	Hotel Concorde, Shah Alam
12 Ogos / August, 12	Program Kesedaran perlindungan lapisan ozon Peringkat Negeri Pahang / Ozone Protection Awareness Programme – Pahang	Dewan Wisma Belia, Indera Mahkota, Kuantan
15 Ogos-15 Oktober / August, 15 – October, 15	Iklan di badan bas tentang perlindungan ozon dan sambutan hari Ozon Antarabangsa / Advertisement on buses panel for International Ozone day celebration	7 Bas Rapid KL/ 7 Rapid KL Buses

Jadual 4.2 JAS : Aktiviti-Aktiviti Kesedaran NCFCP, 2008  
Table 4.2 DOE : Public Awareness Activities NCFCP, 2008

Tarikh Date	Aktiviti & Program Activities & Programme	Tempat Venue
28-30 Ogos / August, 28-30	Program Kesedaran perlindungan lapisan ozon Peringkat Negeri Kedah / <i>Ozone Protection Awareness Programme – Kedah</i>	Kuala Gula dan Kuala Sepetang
1-30 September / September 1 - 30	Iklan Hari Ozon Antarabangsa di televisyen / <i>TV Commercial on International Ozone Day Celebration</i>	RTM1, RTM2, TV3, TV7, TV8 & TV9
1-30 September / September 1 - 30	Iklan Perlindungan Lapisan Ozon (Infocapsule) di radio / <i>Radio Commercial (Infocapsule) on Ozone layer Protection</i>	Klasik FM, Muzik FM, KL FM, Traxx FM
5 September / September, 5	Pameran Perlindungan Lapisan Ozon bersempena sambutan Hari Kemerdekaan Malaysia / <i>Exhibition on Ozone Layer Protection during Malaysia Independence Day</i>	Dewan Marjan, NRE
7 September / September, 7	Pameran bersempena Hari Ozon Antarabangsa / <i>Exhibition on Ozone Layer Protection during International Ozone Day Celebration</i>	Pusat Sains Negara
14-16 September / September, 14-16	Iklan Hari Ozon Antarabangsa di surat khabar / <i>Newspaper Advertisement on International Ozone Day Celebration</i>	New Straits Time, Utusan Malaysia, Sin Chew Jit Poh
25 September / September, 25	Majlis pelancaran Edukit 'Pengembaraan Ozi ke Malaysia' / <i>Launching of Edukit 'Pengembaraan ozi ke Malaysia'</i>	Dewan Sekolah Menengah Kebangsaan Putrajaya Presint 11 (1)
20 Oktober / October, 20	Pameran Perlindungan Lapisan Ozon sempena Pelancaran Minggu Alam Sekitar Malaysia ( MASM) / <i>Exhibition on Ozone Layer Protection during Launching of Malaysia Environment Week (MASM)</i>	Paya Indah Wetland, Dengkil
30 Oktober– 2 November / <i>October, 30 – November, 2</i>	Pameran Perlindungan Lapisan Ozon bersempena MAPEX Pahang 2008 / <i>Exhibition on Ozone Layer Protection during MAPEX Pahang 2008</i>	Kuantan Parade
1-2 November / November, 1-2	Pameran Perlindungan Lapisan Ozon bersempena ECO Film Festival / <i>Exhibition on Ozone Layer Protection during ECO Film Festival</i>	Akademi Seni Kebangsaan Malaysia, KL
26 November / November, 26	Program Kesedaran perlindungan lapisan ozon Peringkat Negeri Perak/ <i>Ozone Protection Awareness Programme – Perak</i>	Stadium Indra Mulia, Ipoh
28 November / November, 28	Program Kesedaran Penggunaan Metered dose Inhalers Tanpa Klorofluorokarbon / <i>Awareness Programme on Non CFC Metered Dose Inhalers</i>	Hotel Grand Continental, Melaka
2-3 Disember / December, 2-3	Bengkel Pengasasan Pelan Pengurusan Pelupusan HCFC / <i>HCFC Phase-Out Management Plan (HPMP) Inception Workshop/ Program Kesedaran Penggunaan Metered dose Inhalers Tanpa Klorofluorokarbon</i>	Hotel Holiday Villa, Subang
5 Disember / December, 5	<i>Awareness Programme on Non CFC Metered Dose Inhalers</i>	Klana Resort, Negeri Sembilan

## **Pengurusan Halon**

Halon tidak lagi digunakan bagi pemasangan baru sistem mengawal kebakaran dan alat-alat pemadam api di Malaysia. Sebaliknya, karbon dioksida atau serbuk kimia kini digunakan sebagai alternatif. Walaubagaimanapun kegunaan halon masih dibenarkan untuk tujuan terhad kepada sistem keselamatan kawalan kebakaran tentera dan penerbangan awam sepertimana dipersetujui di bawah Program Protokol Montreal. Sehingga tahun 2008 sebanyak 10,287 kg Halon 1211 dan sebanyak 168,377 kg Halon 1301 yang dikumpulkan disimpan di Pusat Bank Halon Kebangsaan di Kuala Kubu Bahru, Selangor. Penggunaan sebarang sistem pencegahan kebakaran yang menggunakan alternatif kepada halon perlu merujuk kepada Jabatan Bomba Dan Penyelamat Malaysia untuk mendapatkan kelulusan bertulis terlebih dahulu sebelum sistem tersebut dilaksanakan.

## **Penghapusan Metil Bromida**

Tabung MLF telah menyediakan dana projek sebanyak USD 200,000 bagi bantuan teknikal penggunaan alternatif untuk menghapuskan penggunaan Metil Bromida di Malaysia di dalam aktiviti bukan kuarantin dan sebelum penghantaran kapal. Jabatan Pertanian sedang menyediakan pelebelan baru untuk pengimportan metil bromida bagi kedua-dua penggunaan kuarantin dan sebelum penghantaran kapal serta bukan kuarantin dan sebelum penghantaran kapal yang akan berkuatkuasa 1 Januari 2009.

## **Penggunaan ODS dan Permit Kawalan Import**

Kaedah utama yang dilaksanakan untuk mengawal penggunaan ODS di negara ini ialah melalui Sistem Permit Import (AP). Jumlah kuantiti ODS yang dibenarkan diimport setahun ditetapkan oleh Kementerian Perindustrian dan Perdagangan Antarabangsa setelah perundingan dengan JAS dan Jabatan Kastam. Sebanyak sembilan (9) Syarikat yang berdaftar telah diberi kuota import bahan CFC bagi tahun 2008 berjumlah 236 metrik ton.

## **Halon Management**

Halon is no longer used in Malaysia for new installation of fire protection system and fire extinguishers. Instead, carbon dioxide or chemical powders are now being used as alternatives. However, halon is still allowed and restricted for use in military and civil aviation fire safety protection systems, as agreed under the Montreal Protocol. Until 2008, 10,287 kg Halon 1211 and 168,377 kg Halon 1301 were collected and stored at the National Halon Bank Centre at Kuala Kubu Bahru, Selangor. Prior written approval from the Fire And Rescue Department of Malaysia is required for usage of alternatives to halon in any new fire fighting system.

## **Methyl Bromide Phase Out**

The MLF provided a project grant of USD 200,000 for technical assistance to install alternatives to phase out all remaining non-quarantine and pre-shipment (non-QPS) uses of Methyl Bromide in Malaysia.

The new labeling introduced by the Department of Agriculture for the importation of methyl bromide for both quarantine and pre-shipment and non-quarantine and pre-shipment will come into force by 1 January 2009.

## **Consumption of ODS and Import Control Permit**

The main instrument of control for ODS consumption in Malaysia is the Approved Permit (AP) System. The total quantity of ODS that can be imported in any year is set by the Ministry of International Trade and Industry (MITI) after consultations with DOE and the Customs Department. In 2008, a total of 236 metric tones of import quota for CFC were given to nine (9) registered companies.

## Program dan Kempen Kesedaran

Sempena sambutan Hari Ozon Antarabangsa iaitu pada 16 September 2008, pengumumannya telah dibuat di stesen televisyen utama dari bulan Mac sehingga Disember 2008. Tema Hari Ozon 2008 ialah **Montreal Protocol – Global Partnership For Global Benefits**. Sempena sambutan Hari Ozon Antarabangsa satu majlis pelancaran Edukit 'Pengembaraan Ozi ke Malaysia' telah diadakan pada 25 September 2008 di Dewan Sekolah Menengah Kebangsaan Putrajaya Presint 11 (1). Risalah-risalah mengenai perlindungan lapisan ozon dan penghapusan bahan pemusnah ozon diterbitkan untuk sebaran umum termasuk Buletin Ozon. Bengkel Pengasasan Pelan Pengurusan Pelupusan HCFC telah diadakan pada 2 dan 3 Disember 2008 di Hotel Holiday Villa, Subang Jaya untuk penyediaan Pelan Pengurusan Penghapusan HCFC (HPMP) dengan kerjasama United Nations Development Programme (UNDP). Perincian program kesedaran yang dijalankan sepanjang tahun 2008 disenaraikan di **Jadual 4.3**. Manakala **Jadual 4.4** menyenaraikan mesyuarat-mesyuarat berkaitan di peringkat serantau dan antarabangsa yang dihadiri oleh pegawai JAS.

## Awareness Programme and Campaign

In conjunction with the International Ozone Day Celebration on 16 September 2008, announcements were made on television from March to December 2008. The theme for the Ozone Day 2008 was **Montreal Protocol – Global Partnership For Global Benefits**. An Edukit of 'Pengembaraan Ozi ke Malaysia' was launched at Dewan Sekolah Menengah Kebangsaan Putrajaya Presint 11 (1) on 25 September 2008 to mark the occasion. Pamphlets on ozone layer protection, the ozone depleting substances phase out plan and the Ozone Bulletin were published. An Inception Workshop on HCFC Phase-Out Management Plan (HPMP) in collaboration with the United Nations Development Programme (UNDP) was held at Holiday Villa Hotel, Subang Jaya on 2<sup>nd</sup> and 3<sup>rd</sup> December 2008. Overall awareness programme carried out in 2008 is shown in **Table 4.3**. Various meetings at regional and international level attended by DOE officers are listed in **Table 4.4**.



Bengkel Pengasasan Pelan Pengurusan Penghapusan HCFC (HPMP)  
HCFC Phase out Management Plan (HPMP) Inception Workshop



Pelancaran Edukit "Pengembaraan Ozi Ke Malaysia"  
 Launching of Edukit "Pengembaraan Ozi Ke Malaysia"

Jadual 4.3 JAS : Projek-projek dan Aktiviti-aktiviti yang dilaksanakan di bawah NCFCP 2008  
 Table 4.3 DOE : Projects and Activities Implemented under NCFCP 2008

Sektor / Sector	Bil. Aktiviti/Lawatan Yang Selesai No. of Completed Activities	Bil. Lawatan Pemeriksaan / Penguatkuasaan 2008 No. of Inspection / Enforcement Visits 2008
1. Metered Dosed Inhaler (MDI)	2	-
2. Program Pemeriksaan Penghawa Dingin Kenderaan (MAC) oleh PUSPAKOM / Mobile Air Conditioning (MAC) Inspection Programme by PUSPAKOM	Projek selesai (2004)/ Project Completed (2004)	-
3. Program Kursus Kastam-ODS (COTP) / Customs ODS Training Programme (COTP)	2	-
4. Sektor Servis Penhawadingin Kenderaan / Mobile Air condi Servising Sector (MAC)		
Sesi Latihan Operator Service MAC (CSTP)/ Certification Service Technicians (CSTP)	12	
Jumlah peserta / Number of participants	261	238
Lawatan Verifikasi untuk bengkel MAC / Verification visits for MAC workshops	238	
Baucer Mesin R&R t MAC / Vouchers for MAC R&R machines	76	

Jadual 4.3 JAS : Projek-projek dan Aktiviti-aktiviti yang dilaksanakan di bawah NCFCP 2008  
Table 4.3 DOE : Projects and Activities Implemented under NCFCP 2008

Sektor / Sector	Bil. Aktiviti/Lawatan Yang Selesai No. of Completed Activities	Bil. Lawatan Pemeriksaan/Penguatkuasaan 2008 No. of Inspection / Enforcement Visits 2008
5. Pelarut / Solvent	Projek Selesai (2006) / Project completed (2006)	
6. Sektor Servis Sektor Penyejukan / Refrigeration Service Sector (RSS) Sesi Latihan Operator Service (CSTP) / Certification Service Technicians (CSTP) Jumlah peserta / Number of Participants Lawatan Verifikasi untuk bengkel RSS / Verification visits for RSS workshops Baucer Basic Tools / Vouchers for Basic Tools	36 1,000 366 249	366
7. Busar/ Foam Projek Kumpulan/individu / Group Sub-Project Individual Sub-Project	Projek Selesai (2005) / Project Completed (2005)	
8. Aktiviti Kesedaran / Awareness Activity	Sila rujuk Jadual 4.2 / Please refer to table 4.2	

Jadual 4.4 JAS : Mesyuarat-Mesyuarat Peringkat Serantau dan Antarabangsa  
Table 4.4 DOE : Regional and International Meetings

Tarikh Date	Aktiviti & Program Activities & Programme	Tempat Venue
18-20 Februari / February, 18-20	Seminar on Alternative Substances and Technologies to Phase-Out in A5 Countries and Countries with Economies in Transition	Vienna, Austria
13-15 Mac / March, 13-15	Regional Workshop on Phasing-Out CFC Based Metered Dose Inhaler	Pulau Langkawi, Malaysia
17-19 Mac / March, 17-19	Southeast Asia And The Pacific (SEAP) And South Asia (SA) Network Meeting of Ozone Officers	Pulau Langkawi, Malaysia
5-6 April / April, 5-6	Technical Meeting on HCFCs	Montreal, Canada
7-11 April / April, 7-11	The 54 <sup>th</sup> Meeting of Executive Committee For Implementation of the Montreal Protocol	Montreal, Canada
7-11 Julai / July, 7-11	Meeting of Open-Ended Working Group on Montreal Protocol	Bangkok, Thailand
14-18 Julai / July, 14-18	The 55 <sup>th</sup> Meeting of Executive Committee For Implementation of the Montreal Protocol	Bangkok, Thailand
20-23 September / September, 20-23	SEAP Network Meeting of ODS Officers	Pattaya, Thailand
24-26 September / September, 24-26	2 <sup>nd</sup> MEA Regional Enforcement Network Meeting	Bangkok, Thailand
8-12 November / November, 8-12	The 56 <sup>th</sup> Meeting of Executive Committee For Implementation of the Montreal Protocol	Doha, Qatar
16-20 November / November, 16-20	The 20 <sup>th</sup> Meeting of Parties (MOP) to The Montreal Protocol	Doha, Qatar

## PROGRAM PENCEGAHAN PENCEMARAN DAN PENINGKATAN KUALITI AIR SUNGAI

### RIVER POLLUTION PREVENTION AND WATER QUALITY IMPROVEMENT PROGRAMME

Program Pencegahan Pencemaran dan Peningkatan Kualiti Air Sungai mula dilaksanakan sejak tahun 2001 di bawah Rancangan Malaysia Kelapan (RMK-8) dan masih diteruskan di bawah Rancangan Malaysia Kesembilan (RMK-9). Program ini mempunyai dua aktiviti utama yang bertujuan meningkatkan kualiti air lembangan-lembangan sungai yang telah dikategorikan sebagai tercemar atau sederhana tercemar berdasarkan hasil pemantauan kualiti air sungai yang telah dijalankan oleh Jabatan Alam Sekitar. Aktiviti pertama ialah pelaksanaan kajian pencemaran lembangan sungai yang tercemar dan aktiviti kedua adalah tindakan penguatkuasaan serta kesedaran awam dalam lembangan-lembangan sungai yang terpilih. Bagi tahun 2008, sebanyak 33 lembangan sungai telah dipilih untuk program ini dengan tambahan Lembangan Sungai Kinabatangan di Sabah (**Peta 4.3**).

Kriteria pemilihan sungai-sungai tersebut adalah berdasarkan kepada kegunaan berfaedah sumber-sumber airnya seperti bekalan air minuman, perikanan, rekreasi dan potensi untuk pelancongan dan juga sungai yang menghadapi pencemaran yang serius atau yang berada di tahap Kelas III dan ke bawah yang perlu dipulihkan ke tahap Kelas II iaitu sesuai sebagai bekalan air minuman dengan rawatan konvensional.

#### Kajian Pencemaran Lembangan Air Sungai


Pada tahun 2008, kajian terperinci terhadap pencemaran tiga (3) sungai telah dijalankan iaitu di Lembangan Sungai Merbok di Kedah, Lembangan Sungai Sepetang di Perak dan Lembangan Sungai Kinabatangan di Sabah. Tujuan kajian adalah untuk mengenalpasti punca-punca pencemaran yang menyebabkan kemerosotan kualiti air sungai dan merumuskan pelan-pelan tindakan bagi pencegahan pencemaran dan peningkatan kualiti air sungai

River Pollution Prevention and Water Quality Improvement Programme had been implemented since the year 2001 under the 8<sup>th</sup> Malaysia Plan (8<sup>th</sup>MP) and continued under the 9<sup>th</sup> Malaysia Plan (9<sup>th</sup>MP). The programme has two main activities to improve the water quality of the river which has been categorised as polluted or slightly polluted based on the Department of Environment's monitoring programme. The first activity is the implementation of a study on a polluted river basin and the second activity is the enforcement action and public awareness for the selected river basin. In 2008, 33 river basins have been selected for this programme together with the implementation of the detailed study of the Kinabatangan River Basin in Sabah (**Peta 4.3**).

The selection criteria for the river were based on their beneficial uses such as water supply, fisheries, recreational and tourism potential as well as those rivers which are seriously affected by pollutions or categorised as Class III and below which need to be improved to Class II which is suitable for drinking water supply with only conventional treatment.

#### Study on Pollution of the River Basin

In 2008, a detailed study on river pollution was implemented for three (3) river basins namely Merbok River Basin in Kedah, Sepetang River Basin in Perak and Kinabatangan River Basin in Sabah. The purpose of the study was to identify the pollution sources responsible for the deterioration of the river water quality and to formulate action plans to prevent pollution and improve its water quality. The study on Pollution Prevention and Water Quality Improvement Programme for the



berkenaan. Projek Kajian Pencegahan Pencemaran dan Peningkatan Kualiti Air Lembangan Sungai Merbok dan Sungai Sepetang telah disambung perlaksanaannya dari tahun 2007 dan selesai pada tahun 2008 manakala bagi Sungai Kinabatangan dimulakan pada tahun 2008 dan dijangka selesai pada tahun 2009. Pelan-pelan tindakan yang dirumuskan itu akan dikemukakan kepada agensi-agensi yang berkaitan untuk pertimbangan peruntukan dan pelaksanaan.

### Penguatkuasaan

Penguatkuasaan berkesan adalah merupakan salah satu hasil rumusan pelan-pelan tindakan yang dicadangkan oleh kajian bagi mengurangkan beban pencemaran dan seterusnya meningkatkan kualiti air sungai. Pada tahun 2008, sebanyak 9,943 punca-punca pencemaran di 33 lembangan sungai di bawah program ini telah dikenalpasti tertakluk di bawah Akta Kualiti Alam Sekeliling 1974. Dari jumlah ini, sebanyak 236 premis telah diberi notis arahan supaya mempertingkatkan keupayaan sistem rawatan dan 117 premis telah dihadapkan ke mahkamah (**Rajah 4.2**).

Selaras dengan Indikator Prestasi Utama (KPI) yang disasarkan di bawah RMK-9, bagi tahun 2008, empat (4) lembangan sungai telah berjaya mencapai sasaran 100% pematuhan bagi punca-punca yang tertakluk di bawah Akta Kualiti Alam Sekeliling (AKAS) 1974 lebih awal dari yang disasarkan iaitu di penghujung tahun 2010. Sebanyak 17 lembangan telah mencapai melebihi 90% pematuhan terhadap AKAS 1974 berbanding hanya 12 lembangan sungai pada tahun lepas. Pematuhan punca pencemaran terhadap AKAS 1974 yang agak rendah dicatatkan di Lembangan Sungai Pengkalan Chepa dengan 57% pematuhan yang menunjukkan keperluan bagi memperkemaskan strategi penguatkuasaan oleh pihak JAS di negeri yang berkenaan (**Rajah 4.3**).

Selain daripada itu, bagi memantapkan lagi tindakan penguatkuasaan di 33 lembangan sungai ini, aktiviti kajian inventori punca-punca tetap yang tertakluk di

Merbok and Sepetang River Basin were completed in 2008 while the study for the Kinabatangan River Basin started in 2008 and will be completed in 2009. The formulated action plans will be presented to all relevant agencies for financial consideration and implementation.

### Enforcement

Effective enforcement is one of the essential measures formulated in the action plans under the study to reduce pollution loads and improve river water quality. In 2008, a total of 9,943 premises within the 33 river basins were identified to be subjected to the Environmental Quality Act 1974. Of these premises, 236 premises were given notices to upgrade their treatment systems and 117 premises were taken to court (**Figure 4.2**).

In line with the Key Performance Indicator (KPI) set for the programme in 2008, four (4) river basins had achieved 100% compliance for the pollution sources subjected to the Environmental Quality Act (EQA) 1974 earlier than the actual expected time frame which is before the end of 2010. Seventeen (17) river basins had achieved more than 90% compliance towards the EQA 1974 compared to only 12 river basins last year. A low percentage of compliance of 57% is observed in Pengkalan Chepa River Basin, indicating the need for DOE to strengthen up the enforcement strategy for this river basin (**Figure 4.3**).

Besides enforcement activities, the inventory of polluting point sources within these 33 river basins subjected to the Environmental Quality Act 1974 was

bawah AKAS 1974 bagi 33 lembangan sungai ini juga dikemaskini dari masa ke semasa bagi memperkemas dan memantapkan program penguatkuasaan yang dijalankan.

### Kesedaran Awam

Kesedaran awam merupakan satu lagi langkah yang berkesan dalam mencegah pencemaran dan meningkatkan kualiti air sungai. Pada tahun 2008, Jabatan Alam Sekitar telah menjalankan aktiviti-aktiviti kesedaran awam kepada berbagai kumpulan sasaran seperti pihak industri, pihak pelaksana-pelaksana projek pembangunan, murid-murid sekolah dan juga penduduk setempat. Aktiviti-aktiviti kesedaran awam yang dijalankan adalah seperti di **Rajah 4.4**. Sebanyak 350 aktiviti kesedaran awam seperti sesi dialog/seminar/pameran telah dilaksanakan termasuk 13 aktiviti gotong-royong yang dijalankan oleh penduduk-penduduk setempat di sepanjang sungai yang berkenaan.

Sejak tahun 2006 sehingga tahun 2008, sejumlah 370 sesi dialog/seminar/pameran dan 15 aktiviti gotong-royong telah dilaksanakan. Sejumlah 660 sesi dialog/seminar/pameran dan 33 aktiviti gotong royong yang perlu dilaksanakan sebelum tamatnya RMK-9 (2010).

regularly updated to enhance and strengthen the implementation of the enforcement programme.

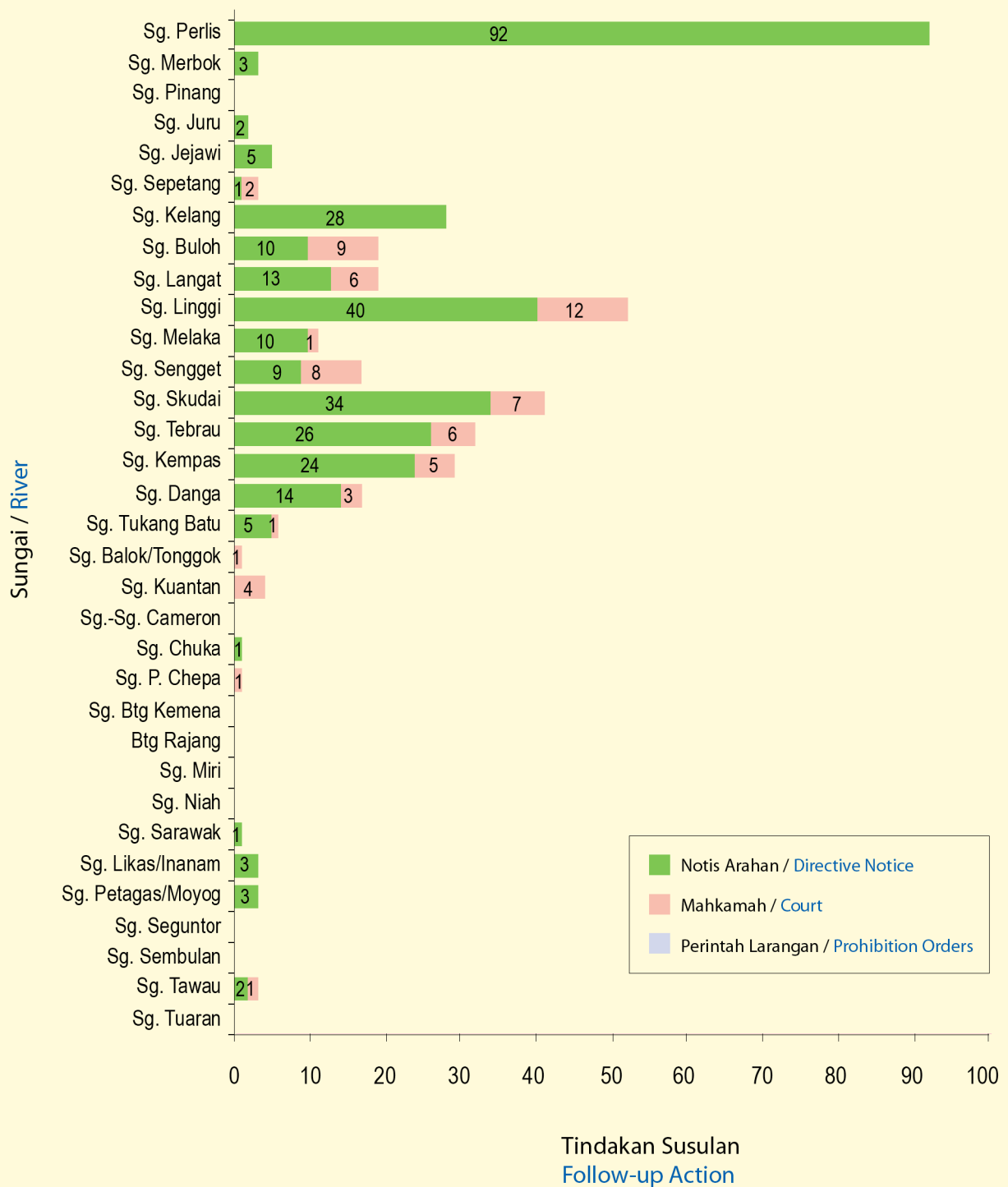
### Public Awareness

Promoting awareness is another effective measure to prevent pollution and improves the river water quality. In 2008, the Department of Environment had organised awareness programmes to various target groups namely the industries, developers, school children and also to local communities. Public awareness activities implemented are listed in **Figure 4.4**. A total 350 awareness activities such as dialogue sessions/seminars/exhibitions had been organised in these 33 river basins including 13 clean-up activities organised by the local communities along the river system.

Since 2006 until 2008, 370 dialogue sessions/seminars/exhibitions and 15 clean-up activities had been organised. A total of 660 dialogue sessions/seminars/exhibitions and 33 clean-up activities are expected to be achieved at the end of the 9<sup>th</sup> MP (2010).

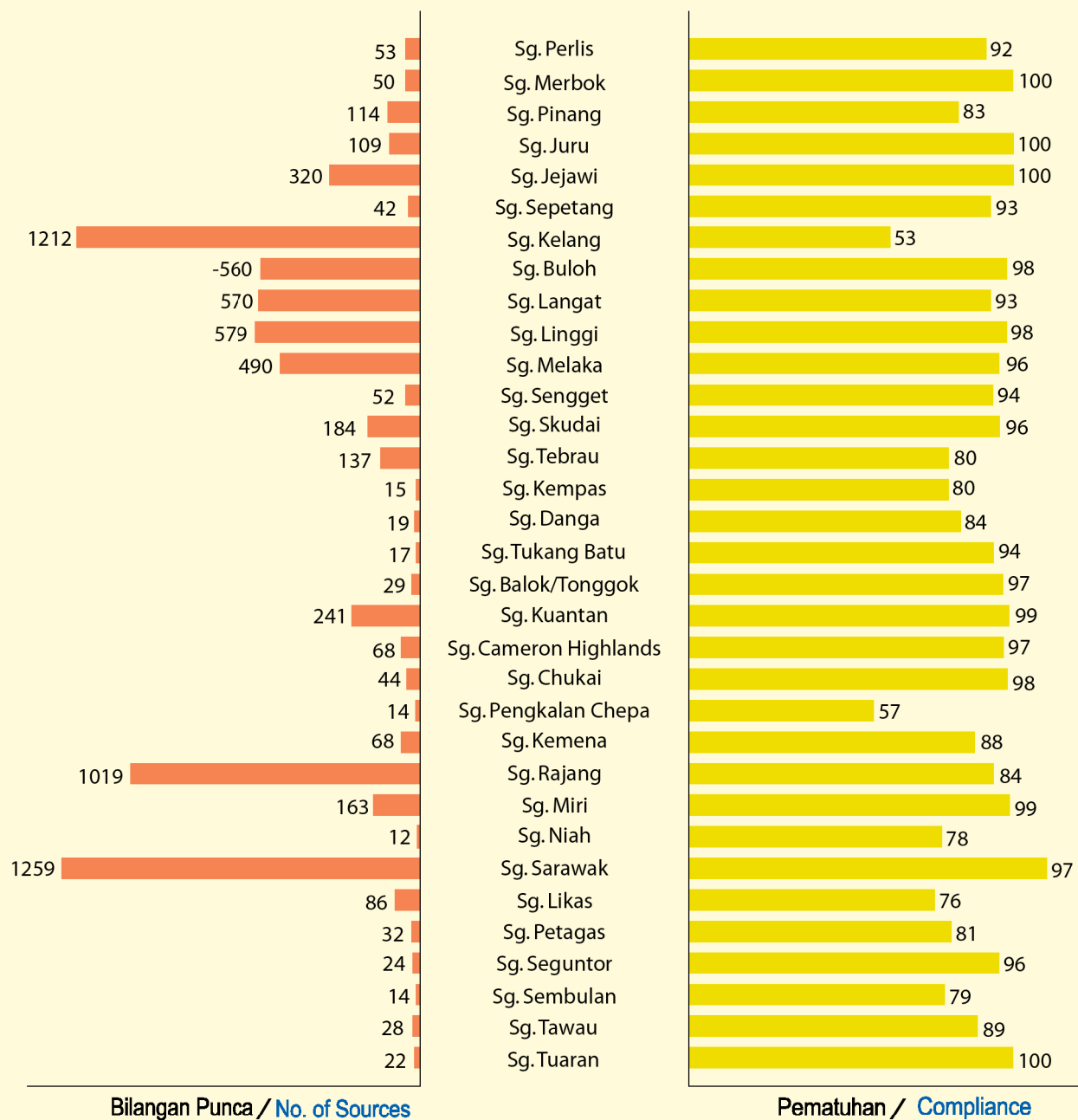


Pencemaran Sungai  
River Pollution

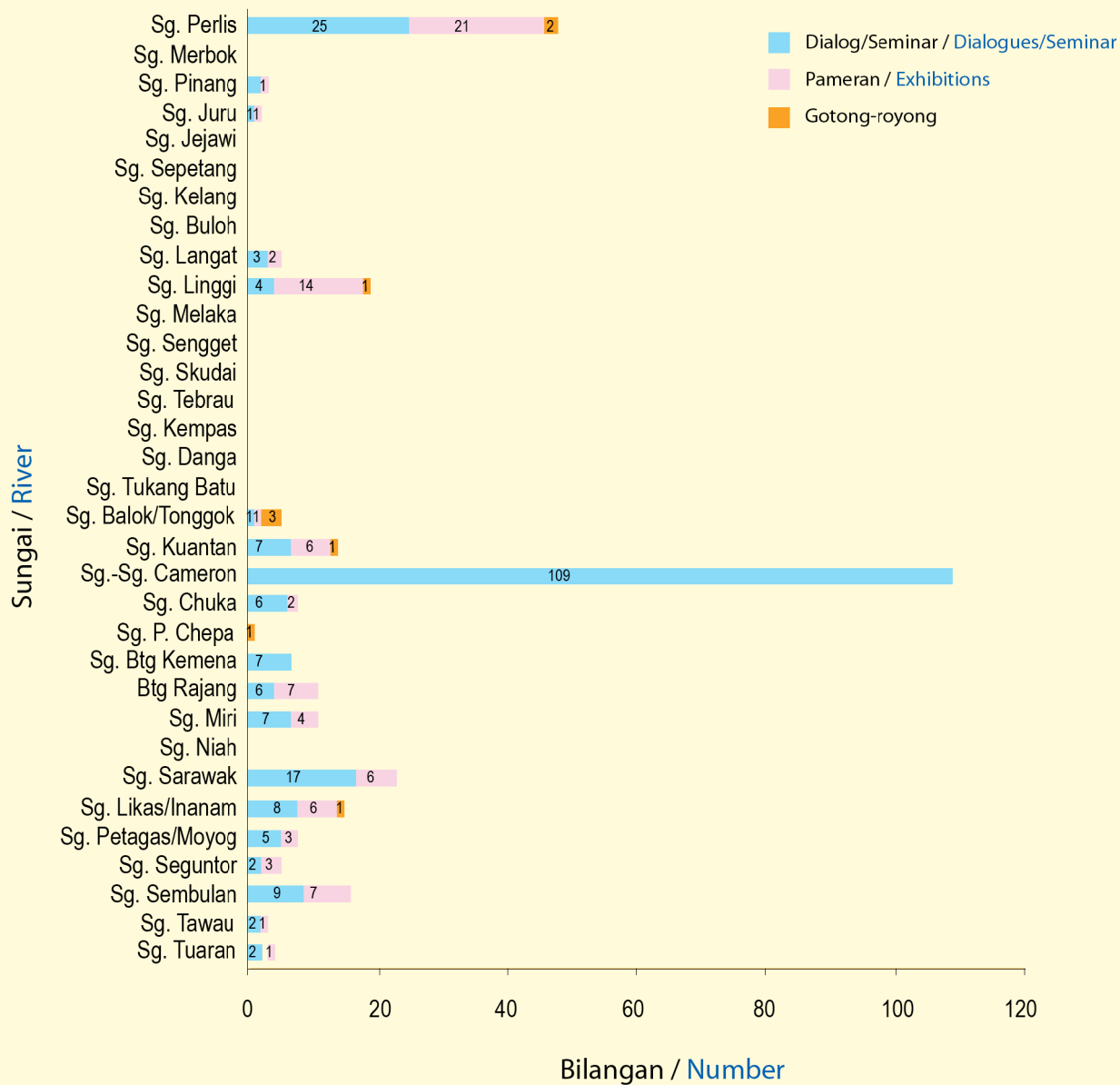


Rajah 4.2 JAS: Tindakan Susulan Ke atas Punca-punca Pencemaran di Bawah Program Pencegahan Pencemaran dan Peningkatan Kualiti Air Sungai, 2008

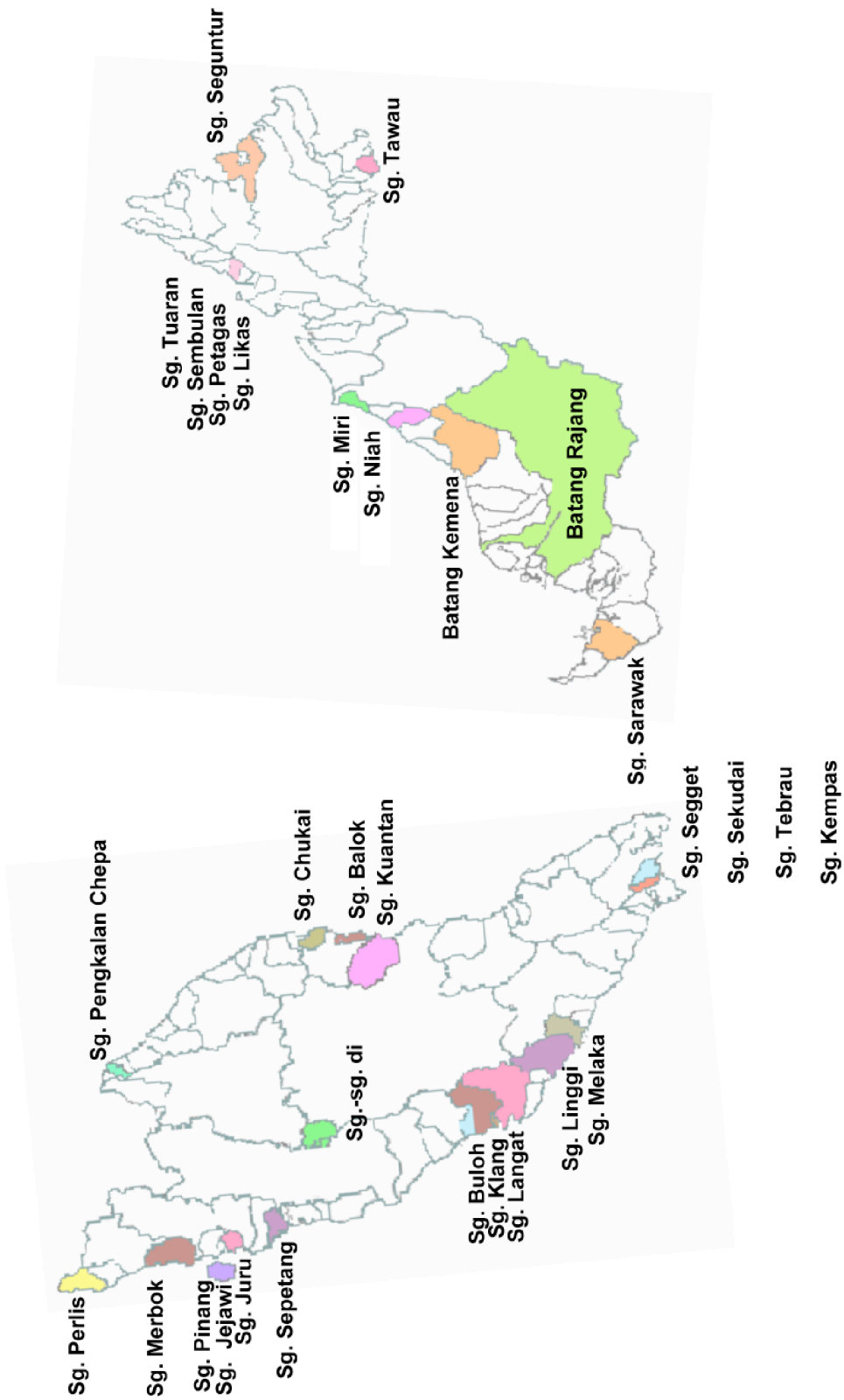
Figure 4.2 DOE: Follow-up Actions on Sources under River Pollution Prevention and Water Quality Improvement Programme, 2008



Rajah 4.3 JAS: Bilangan Punca Pencemaran/Status Pemuatan Punca-punca Terhadap AKAS 1974 di bawah Program Pencegahan Pencemaran dan Peningkatan Kualiti Air Sungai, 2008  
 Figure 4.3 DOE: Number of Pollution Sources/Status of Compliance toward EQA 1974 under River Pollution Prevention and Water Quality Improvement Programme, 2008



Rajah 4.4 JAS: Aktiviti-aktiviti Kesedaran di Bawah Program Pencegahan Pencemaran dan Peningkatan Kualiti Air Sungai, 2008  
 Figure 4.4 DOE: Awareness Activities under River Pollution Prevention and Water Quality Improvement Programme, 2008



Peta 4.3 Malaysia: Lembangan Sungai yang dipilih di bawah Program Pencegahan Pencemaran dan Peningkatan Kualiti Sungai  
 Map 4.3 Malaysia: Selected River Basins under River Pollution Prevention and Water Improvement Programme

## KAWALAN TERHADAP PREMIS YANG DITETAPKAN CONTROL OF PRESCRIBED PREMISES

Kilang Getah Asli Mentah dan Kilang Kelapa Sawit Mentah dikategorikan sebagai premis yang ditetapkan di bawah Perintah Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Getah Asli Mentah) 1978 dan Perintah Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Kelapa Sawit Mentah) 1977. Operasi premis-premis ini adalah tertakluk kepada keperluan Seksyen 18, Akta Kualiti Alam Sekeliling, 1974 di mana tuan punya premis-premis ini perlu mempunyai lesen daripada Jabatan Alam Sekitar bagi menduduki dan/atau menggunakan premis.

### Kilang Getah Asli Mentah

Pada tahun 2008, sejumlah 83 buah kilang getah asli mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Getah Asli Mentah), 1978. Dari jumlah ini 72 buah kilang telah dilesenkan untuk melepaskan effluen yang telah diolah ke alur air, sebuah kilang telah dilesenkan untuk melepaskan effluen ke atas tanah manakala 10 buah kilang dibenarkan untuk mengitar semula effluen. Tempoh lesen yang diberikan bagi setiap premis adalah berbeza dari satu hingga tiga tahun bergantung kepada paras pematuhan kilang-kilang tersebut terhadap syarat-syarat lesen. **Rajah 4.5** menunjukkan bilangan kilang getah asli mentah di Malaysia.

Dalam tahun 2008, pegawai-pegawai penguatkuasa JAS negeri telah menjalankan sebanyak 236 pemeriksaan ke atas kesemua 83 buah kilang getah asli mentah yang telah dilesenkan. Kilang-kilang yang mempunyai rekod pematuhan yang rendah telah diberi keutamaan pemeriksaan. Sebanyak 48 arahan dan 16 notis arahan telah dikeluarkan kepada premis-premis tersebut untuk mengambil tindakan pembaikan bagi mematuhi keperluan perundangan. Sebanyak 10 kompaun telah dikeluarkan bagi kesalahan-kesalahan yang telah dilakukan. 10 tindakan mahkamah telah diambil bagi kesalahan melanggar syarat-syarat lesen dan denda sebanyak RM79,000 telah dikenakan (**Rajah 4.5**).

Raw natural rubber factories and crude palm oil processing mills are classified as prescribed premises under the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Order, 1978 and the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Order, 1977. The operation of these premises is subjected to the requirement of Section 18 of the Environmental Quality Act, 1974 whereby the owners of the premises are required to obtain a license from the Department of Environment for occupation and/or use of the said premises.

### Raw Natural Rubber

In 2008, there were 83 raw natural rubber factories licensed under the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations, 1978. Out of these, 72 factories were licensed to discharge treated effluent into inland watercourse, 1 was permitted to practise land disposal while the remaining 10 were allowed to recycle their effluent. The licensing periods of each premises varied from one to three years depending on the level of compliance to the conditions of the licences. **Figure 4.5** shows the distribution of raw natural rubber factories in Malaysia.

Throughout 2008, DOE state enforcement officers conducted 236 inspections on 83 licensed raw natural rubber factories. Factories with low compliance record were given priority. A total of 48 directives and 16 notices were issued to the concerned premises to take corrective actions. Ten compounds were issued for offences committed and 10 court actions were taken and a total fine of RM79,000 for failure to comply with conditions of the licence (**Figure 4.5**).

Pencapaian pematuhan keseluruhan oleh kilang getah asli mentah pada 2008 adalah 89% berbanding 76% pada tahun 2007.

### Kilang Kelapa Sawit Mentah

Sejumlah 411 buah kilang kelapa sawit mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Kelapa Sawit Mentah), 1977 pada tahun 2008 berbanding 404 pada tahun 2007. Dari 411 buah kilang yang dilesenkan, sebanyak 272 buah kilang telah dilesenkan untuk melepaskan effluen yang diolah ke dalam alur air, 96 buah kilang untuk melupuskan effluen ke atas tanah, 25 buah kilang melupuskan effluen dengan menggunakan kedua-dua kaedah, 5 buah kilang menggunakan kaedah kompos, 8 buah kilang menggunakan gabungan kaedah alur air dan kompos, 4 kilang menggunakan gabungan kaedah atas tanah dan kompos dan 1 buah kilang menggunakan gabungan kaedah alurair, atas tanah dan kompos. **Rajah 4.6** menunjukkan taburan bilangan kilang kelapa sawit mentah di Malaysia.

Sepanjang tahun 2008, 1,396 pemeriksaan ke atas kesemua 411 kilang kelapa sawit yang telah dilesenkan di seluruh negara telah dilaksanakan oleh pegawai-pegawai penguatkuasa JAS negeri. Sebanyak 487 surat arahan dan 369 notis telah dikeluarkan kepada premis-premis tersebut untuk mengambil tindakan bagi mematuhi keperluan perundangan. Sebanyak 117 kompaun dikeluarkan bagi kesalahan yang dilakukan dan 108 tindakan mahkamah telah diambil bagi kegagalan mematuhi syarat-syarat lesen dan denda sebanyak RM1,300,000 telah dikenakan (**Rajah 4.6**).

Pencapaian pematuhan keseluruhan syarat-syarat lesen oleh kilang kelapa sawit pada 2008 adalah 85% berbanding 72% pada tahun 2007.

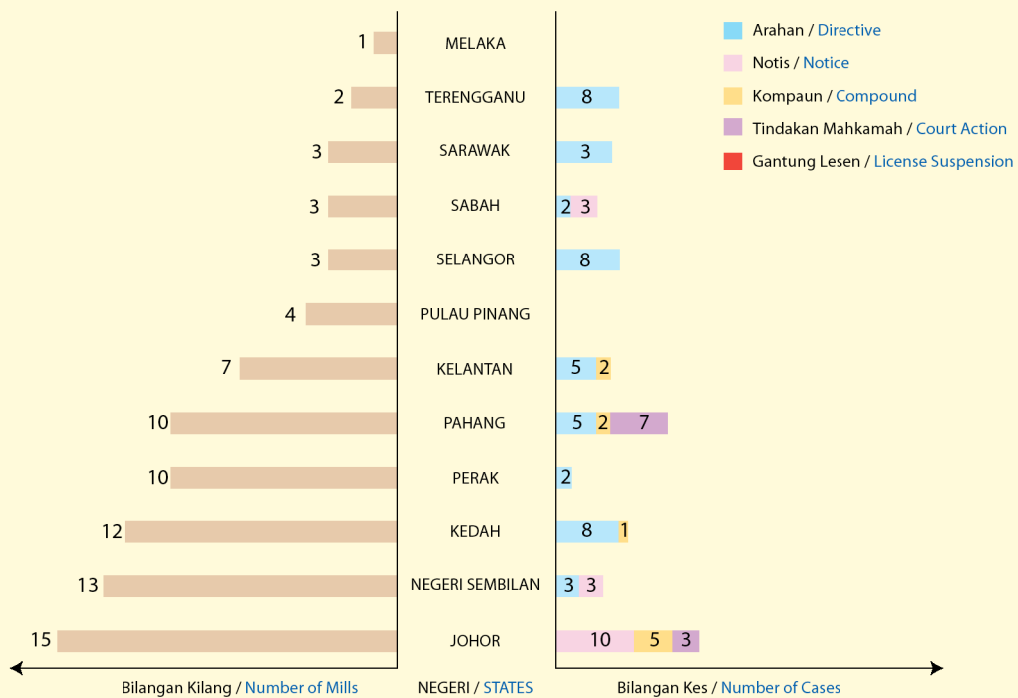
Overall compliance by the raw natural rubber factories increased to 89% compared to 76% in 2007.

### Crude Palm Oil

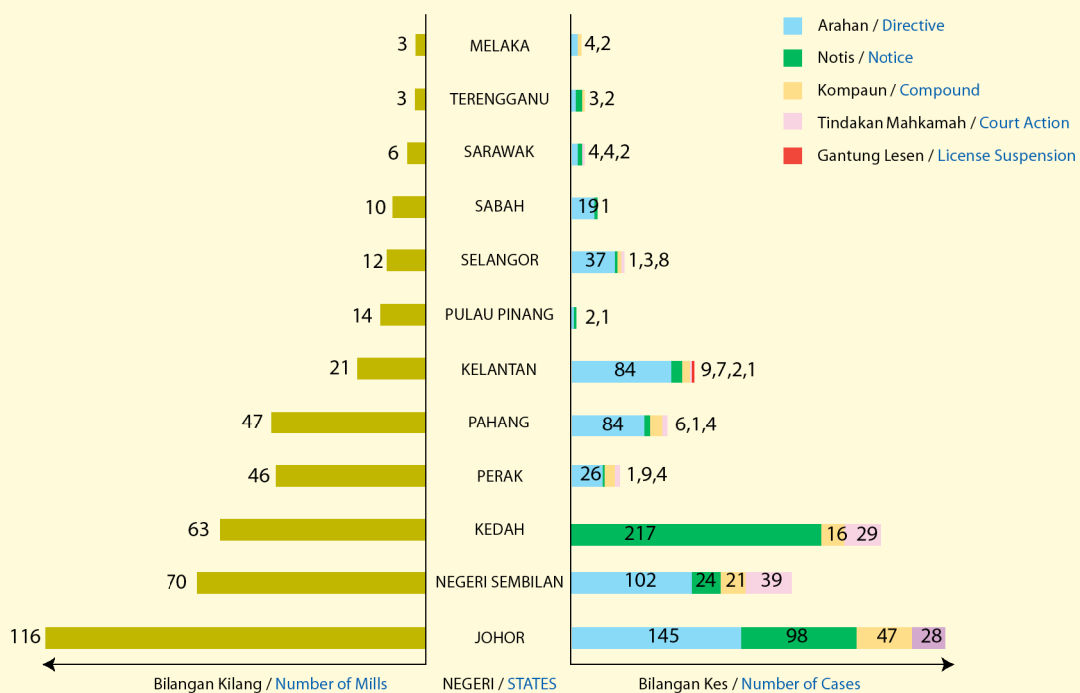
There were 411 palm oil processing mills licensed under the Environmental Quality (Prescribed Premises) (Crude Palm Oil Mill) Regulations, 1977 in 2008 compared to 404 in 2007. Of these 411 licensed prescribed premises, 272 were granted permission to discharge treated effluent into inland watercourses, 96 land disposal, 25 to implement both methods of effluent disposal, 5 composting, 8 to discharge treated effluent into inland watercourse and composting, 4 to practise land disposal and composting and 1 prescribed premises to discharge treated effluent to inland water course, land disposal and composting. **Figure 4.6** shows the distribution of palm oil processing mills in Malaysia.

Throughout the year, 1,396 inspections on 411 licensed palm oil mills were conducted by DOE state enforcement officers. A total of 487 directive letters and 369 notices were issued to the mills to take actions to comply with the legal requirements. One hundred and seventeen (117) compounds were issued for offences committed and 108 court actions were taken and a total fine of RM1,300,000 for failure to comply with conditions of the licences (**Figure 4.6**).

Overall licensing compliance by the palm oil mills in 2008 was 85% compared to 72% in 2007.



Rajah 4.5 JAS: Bilangan Kes Tindakan Undang-Undang Terhadap Kilang Getah Asli Mentah, 2008  
 Figure 4.5 DOE: Legal Action Againsts Raw Natural Rubber Factories, 2008



Rajah 4.6 JAS: Bilangan Kes Tindakan Undang-Undang Terhadap Kilang Sawit Mentah, 2008  
 Figure 4.6 DOE: Legal Action Againsts Crude Oil Mills, 2008

## KAWALAN TERHADAP PREMIS YANG BUKAN DITETAPKAN CONTROL OF NON-PRESCRIBED PREMISES

### Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan Dan Effluen-Effluen Perindustrian) 1979

Premis-premis yang bukan ditetapkan yang melepaskan effluen adalah tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan Dan Effluen-Effluen Perindustrian) 1979. Pada tahun 2008, Jabatan Alam Sekitar telah menjalankan 10,832 pemeriksaan penguatkuasaan terhadap sejumlah 9,496 industri pembuatan dan premis-premis yang bukan ditetapkan lain yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan Dan Effluen-Effluen Perindustrian) 1979. Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 94%. Sebanyak 6% premis lain yang diperiksa didapati menghadapi berbagai kesukaran pematuhan seperti tidak mematuhi standard pelepasan effluen (Peraturan 8) dan tidak mempunyai Kebenaran Bertulis bagi pembinaan loji pengolahan effluen (Peraturan 4).

Pada tahun 2008, status pematuhan industri dan premis-premis yang bukan ditetapkan Sekeliling, 1974 di bawah Peraturan-Peraturan Kualiti menunjukkan kuari, penapisan petroleum, jentera dan bengkel mencapai pematuhan 100%, sementara industri-industri galian bukan logam dan kulit yang masih menunjukkan pematuhan kurang dari 75% (**Rajah 4.8**). Beberapa industri ini didapati beroperasi tanpa mempunyai loji pengolahan effluen ataupun loji pengolahan effluen yang ada tidak efisien untuk mengolah effluen bagi mematuhi standard pelepasan yang ditetapkan.

Pada umumnya, parameter-parameter yang sukar dipatuhi ialah keperluan oksigen biokimia (BOD), keperluan oksigen kimia (COD), pepejal terampai (SS), logam berat dan minyak dan gris (O&G).

### Status Of Compliance With The Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979

Non-prescribed premises that discharged effluents are subjected to the control under the Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979. In 2008, the Department of Environment conducted 10,832 inspections on 9,496 industrial premises and other non-prescribed premises that were subjected to the Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979. The overall compliance performance by the non-prescribed premises was 94%. The remaining 6% of the inspected premises committed offences relating to non-compliance of effluent discharge standards (Regulation 8) and did not have written approval for installing effluent treatment plants (Regulation 4).

In 2008, compliance status of industries and other non-prescribed premises indicated that quarries, petroleum refineries, machinery and workshops achieved 100% compliance, while non-metal mineral and leather industries showed less than 75% compliance (**Figure 4.8**). Some of these industries were found to be operating without effluent treatment plants or some had effluent treatment plants that are not capable of treating the effluent to the stipulated standards.

Generally, the problematic parameters were biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids (SS), heavy metals and oil and grease (O&G).

### **Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978**

Pada tahun 2008, Jabatan Alam Sekitar telah menjalankan 10,832 pemeriksaan penguatkuasaan terhadap sejumlah 9,496 industri pembuatan dan premis-premis yang bukan ditetapkan lain yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978. Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 92%. Sebanyak 8% premis lain yang diperiksa didapati menghadapi berbagai kesukaran pematuhan seperti penyelenggaraan alat kawalan pencemaran udara yang kurang cekap (Peraturan 40) dan tidak mempunyai Kelulusan Bertulis bagi pembinaan alat pembakaan bahanapi dan cerobong (Peraturan 36 & 38).

Pada tahun 2008, status pematuhan industri dan premis-premis yang bukan ditetapkan menunjukkan penapisan petroleum, jentera, loji pengolahan IWK, loji pengolahan persendirian dan ubatan mencapai pematuhan 100%, sementara industri-industri makanan ternakan masih menunjukkan pematuhan kurang dari 75% ((**Rajah 4.7**)). Beberapa industri ini didapati beroperasi tanpa mempunyai alat kawalan pencemaran udara ataupun penyelenggaraan alat kawalan pencemaran udara yang kurang cekap.

### **Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005**

Pada tahun 2008, Jabatan Alam Sekitar telah menjalankan 10,832 pemeriksaan penguatkuasaan terhadap sejumlah 9,496 industri pembuatan dan premis-premis yang bukan ditetapkan lain yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005. Pencapaian pematuhan keseluruhan adalah 86%. Sebanyak 14% premis lain yang diperiksa didapati melakukan kesalahan seperti tiada mengemukakan pemberitahuan mengenai pengeluaran buangan terjadual kepada JAS, buangan terjadual tidak distor dengan baik, buangan terjadual tidak dilabel dengan sempurna dan tiada menyimpan inventori buangan terjadual (Peraturan 3, 8, 9, 10, 11).

### **Status Of Compliance With The Environmental Quality (Clean Air) Regulations, 1978**

In 2008, the Department of Environment conducted 10,832 inspections on 9,496 industrial premises and other non-prescribed premises that were subjected to the Environmental Quality (Clean Air) Regulations, 1978. The overall compliance was 92%. The remaining 8% of the inspected premises committed offences relating to inefficient maintenance of pollution control equipment (Regulation 40) and did not have written approval for installing fuel burning equipment and chimney (Regulation 36 & 38).

In 2008, compliance status of industries and other non-prescribed premises indicated that petroleum refineries, machinery, IWK sewerage treatment plants, private and medical treatment plants achieved 100% compliance, while animal feed mills showed less than 75% compliance (**Figure 4.7**). Some of these industries were found to be operating without air pollution control equipment or due to inefficient maintenance of pollution control equipment.

### **Status Of Compliance With The Environmental Quality (Scheduled Waste) Regulations, 2005**

In 2008, the Department of Environment conducted 10,832 inspections on 9,496 industrial premises and other non-prescribed premises that were subjected to the Environmental Quality (Scheduled Waste) Regulations, 2005. The overall compliance was 86%. The remaining 14% of the inspected premises committed offences relating to not submitting notification of scheduled waste generation to DOE, improper storage and labeling of scheduled waste and not keeping accurate and up-to-date inventory of scheduled waste (Regulation 3, 8, 9, 10, 11).

Pada tahun 2008, status pematuhan industri dan premis-premis yang bukan ditetapkan menunjukkan penapisan petroleum mencapai pematuhan 100%, sementara industri-industri yang masih menunjukkan pematuhan kurang dari 75% ialah percetakan, kenderaan, kuari, galian bukan logam, jentera dan kulit (**Rajah 4.9**).

Sebanyak 3,263 surat arahan dan 1,389 notis arahan telah dikeluarkan atas kesemua kesalahan, sementara 186 tindakan mahkamah telah diambil dengan sejumlah RM3,395,000 denda telah dikenakan bagi kegagalan mematuhi peraturan yang ditetapkan.

Bagi meningkatkan pematuhan, Jabatan Alam Sekitar telah mengeluarkan arahan-arahan kepada pihak industri supaya memasang alat kawalan pencemaran yang sesuai dan efisien, meningkatkan keupayaan kemudahan kawalan pencemaran yang sedia ada dan juga supaya menyediakan jadual perancangan dan pelaksanaan sistem pengurusan alam sekitar yang baik. Di samping itu, berbagai aktiviti kesedaran dilaksanakan sepanjang tahun untuk kumpulan sasaran yang spesifik. Aktiviti-aktiviti tersebut termasuklah dialog, seminar dan bengkel untuk industri dengan tujuan untuk meningkatkan paras pematuhan undang-undang. Jabatan Alam Sekitar juga dalam usaha memastikan pematuhan sepenuhnya mempromosi penggunaan teknologi kawalan yang efisien, amalan pengeluaran bersih serta 'self-regulation'. Pihak industri juga dinasihatkan untuk mewujudkan sistem pengurusan alam sekitar yang baik untuk mendapatkan pensijilan ISO 14000.

### **Lesen Pelanggaran**

Di dalam Akta Kualiti Alam Sekeliling, 1974 Lesen Pelanggaran boleh dikeluarkan untuk tempoh masa yang spesifik bagi membenarkan industri yang menghadapi kesukaran untuk mematuhi standard pelepasan melanggar syarat-syarat yang dibenarkan untuk pelepasan effluen ke dalam pengairan daratan atau pelepasan bendasing udara ke atmosfera

In 2008, the compliance status of industries and other non-prescribed premises indicated that petroleum refineries achieved 100% compliance, while industries that showed less than 75% compliance were printing, transportation, quarries, non-metallic mineral and leather (**Figure 4.9**).

A total of 3,263 written directives and 1,389 written notices were issued for offences committed and 186 court actions were taken and a total fine of RM 3,395,000 for failure to comply with legal requirements.

In order to improve compliance, the Department of Environment issued directives to the relevant industries to install more appropriate and efficient control equipment, upgrade existing pollution control facilities and have good planning and implementation schedule of environmental management systems. In addition, various awareness activities were implemented throughout the year for specific target groups. Such activities included dialogues, seminars and workshops for industries with the aim of improving the level of compliance. The Department of Environment also promoted the adoption of more efficient control technologies, cleaner production practices as well as self-regulatory measures. Industries were also advised to set up good environmental management systems and ISO 14000 certified.

### **Contravention Licenses**

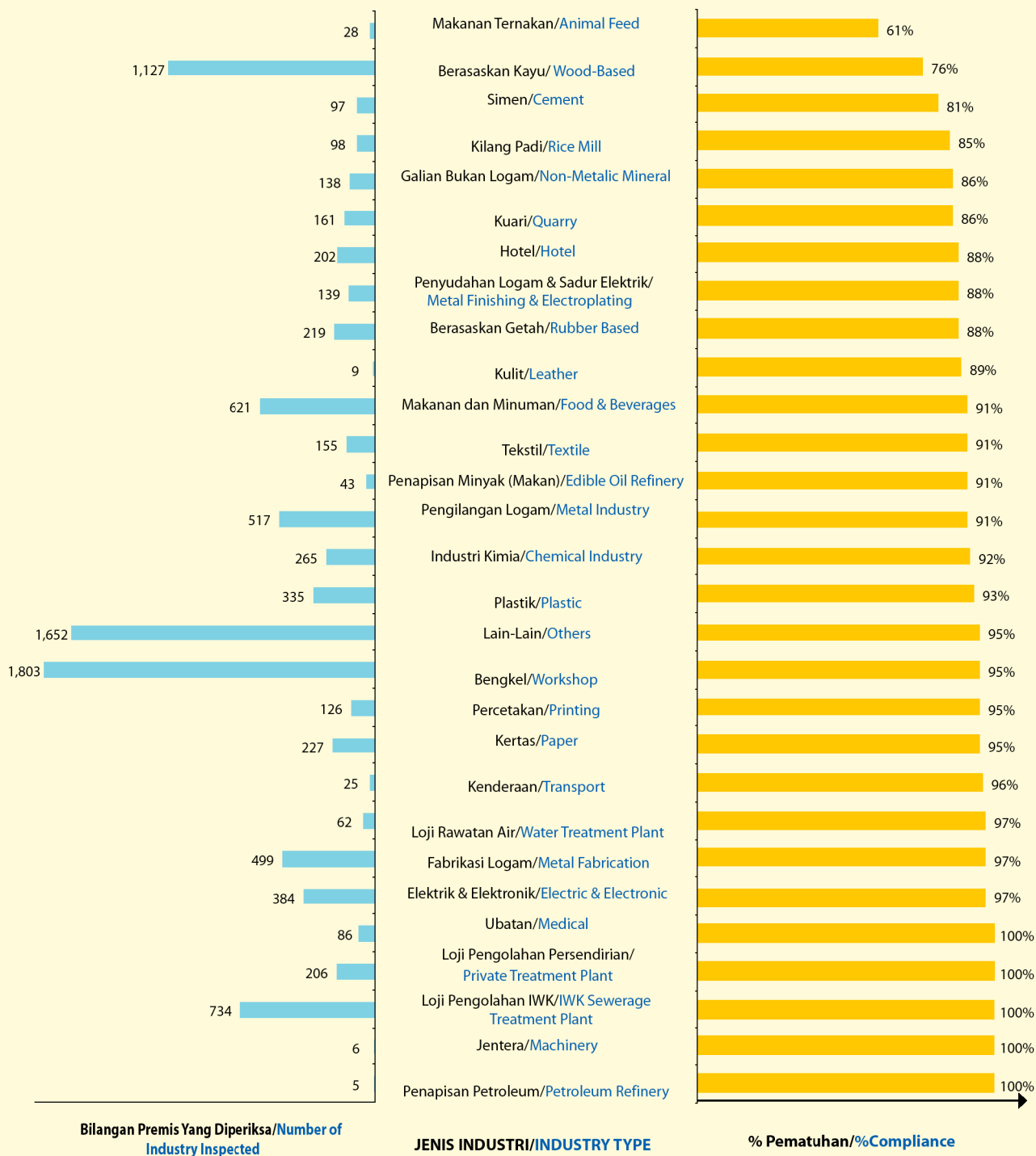
Under the Environmental Quality Act, 1974 contravention licenses may be granted for a specific time frame to allow industries with genuine difficulties complying with stipulated discharge or emission standards to contravene the acceptable conditions of effluent discharges into watercourses or air emissions into atmosphere as stipulated for under Section

sebagaimana yang diperuntukkan di bawah Seksyen 25(1) dan Seksyen 22(1), Akta. Lesen Pelanggaran ini merupakan satu langkah atau mekanisma untuk membantu, memudah dan membolehkan industri yang bermasalah memasang atau meningkatkan peralatan kawalan pencemaran dalam tempoh masa yang mencukupi. Kelulusan bagi lesen pelanggaran adalah bergantung kepada penilaian mengenai situasi sosio-ekonomi, pemuliharaan kualiti alam sekitar dan juga komitmen pihak industri yang bermasalah untuk mematuhi Akta dan Peraturan-Peraturan di bawahnya.

Pada tahun 2008, jumlah permohonan lesen pelanggaran di bawah Seksyen 25, Akta adalah berkurangan kepada 105 berbanding 119 permohonan dalam tahun 2007 (**Rajah 4.10**). Dari 105 permohonan, 69 telah diluluskan dan 36 ditolak. Dari 69 lesen pelanggaran yang diluluskan, 31 (45%) lesen adalah untuk industri makanan dan minuman, 10 (14%) untuk lain-lain industri, 8 (12%) untuk industri kimia, 4 (6%) untuk industri elektrik & elektronik, kertas dan penyudahan logam & sadur elektrik masing-masing, 2 (3%) untuk industri penapisan petroleum, berasaskan getah, tekstil dan ubatan (**Rajah 4.11**). Antara parameter di bawah pelanggaran adalah keperluan oksigen biokimia, keperluan oksigen kimia, pepejal terampai, amoniakal nitrogen, jumlah nitrogen, minyak dan gris, pH, Boron, plumbum, sulfid, fenol, kadmium, zink, perak dan besi. Penguatkuasaan telah dijalankan terhadap premis-premis yang dilesenkan bagi menentukan paras pematuhan. Pematuhan keseluruhan terhadap syarat-syarat lesen pelanggaran yang dikenakan pada tahun 2008 adalah 99.6%.

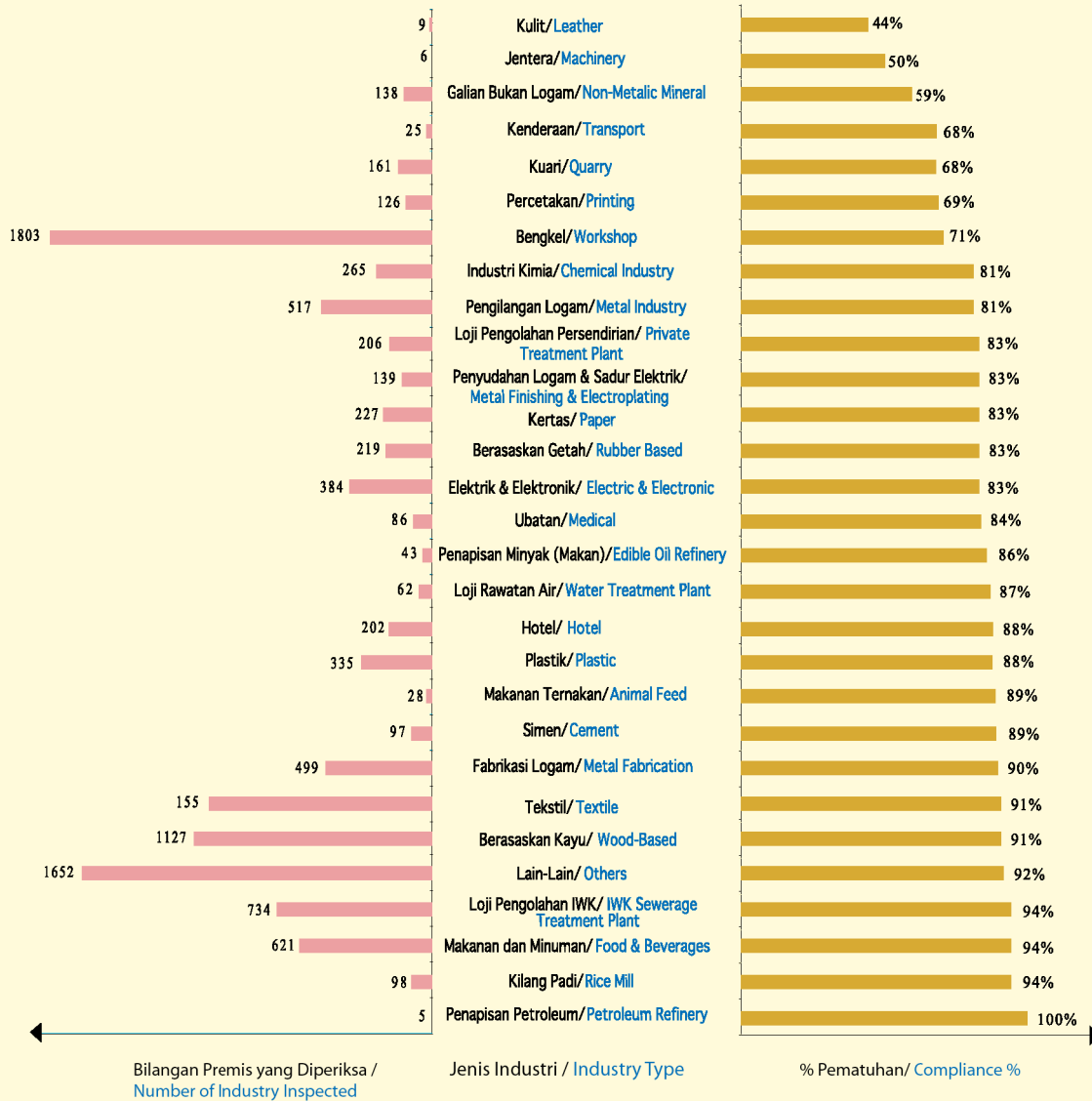
25(1) and Section 22(1) of the Act respectively. These contravention licences serve as a measure to assist, facilitate and enable the problematic industries to have adequate time to install or upgrade their pollution control equipment. Approvals for such contravention licences would depend on the assessment of the socio-economic situation, the existing environmental quality and also the commitment of the problematic industries to comply with the Act and Regulations made thereunder.

In 2008, the total number of application for contravention licenses under Section 25 of the Act decreased to 105 as compared to 119 applications in 2007 (**Figure 4.10**). Out of the 105 applications, 69 were approved and 36 were rejected. Of the 69 approved contravention licences, 31 (45%) licences were for food and beverages industries, 10 (14%) for other industries, 8 (12%) for chemical industries, 4 (6%) each for electric & electronics, paper and metal finishing and electroplating industries, 2 (3%) each for petroleum refinery, rubber-based, textile and medical industries (**Figure 4.11**). Among parameters under contravention were biochemical oxygen demand, chemical oxygen demand, suspended solids, oil and grease, ammoniacal nitrogen, total nitrogen, pH, lead, iron, zinc, boron, cadmium, silver and phenol. Enforcement inspections were conducted on the licensed premises to determine the level of compliance. The overall compliance with the conditions of contravention licences in 2008 was 99.6%.



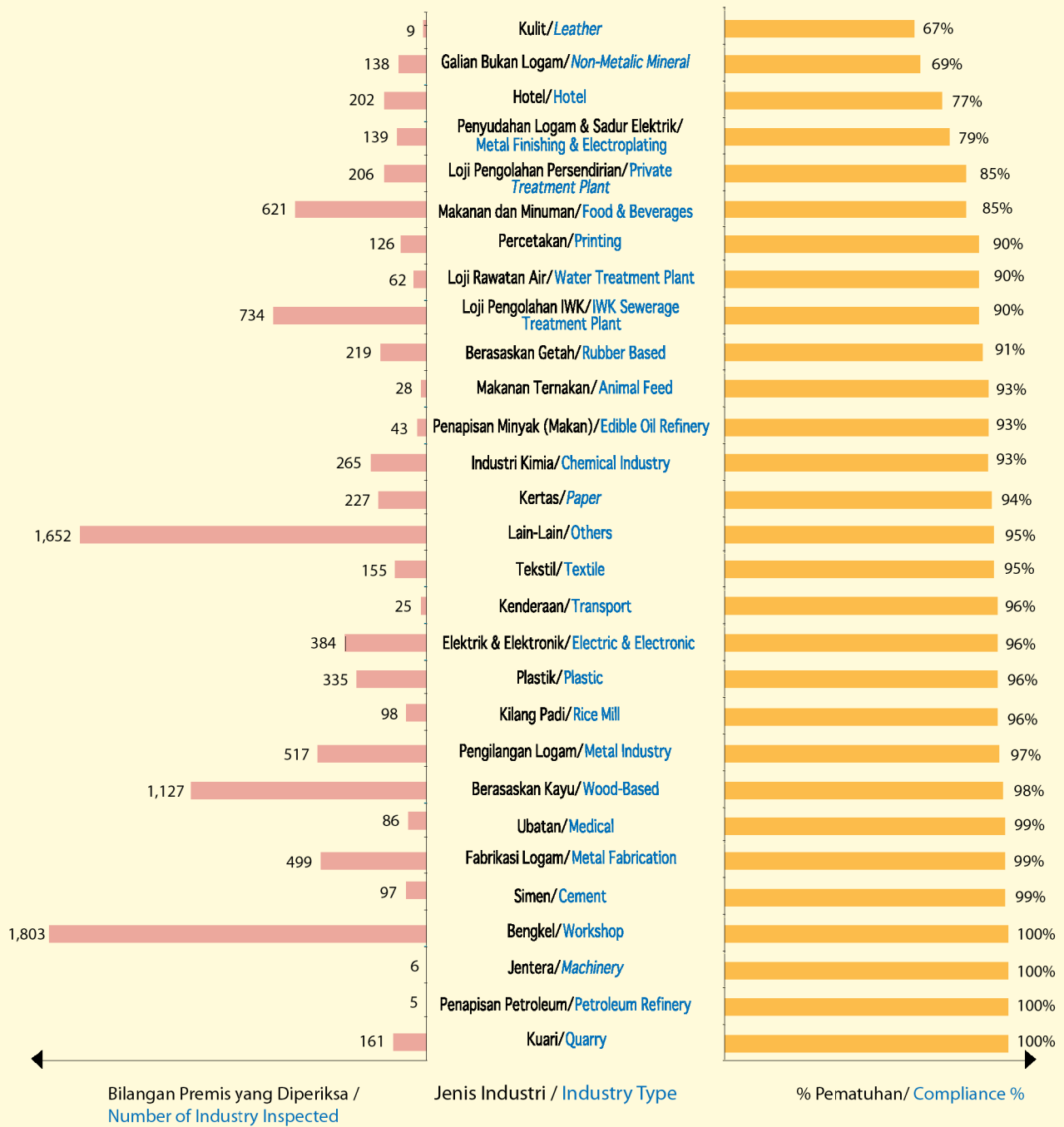
Rajah 4.7 JAS: Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978, Status Pematuhan Industri, 2008

Figure 4.7 DOE: Environmental Quality (Clean Air) Regulations 1978, Compliance Status, 2008



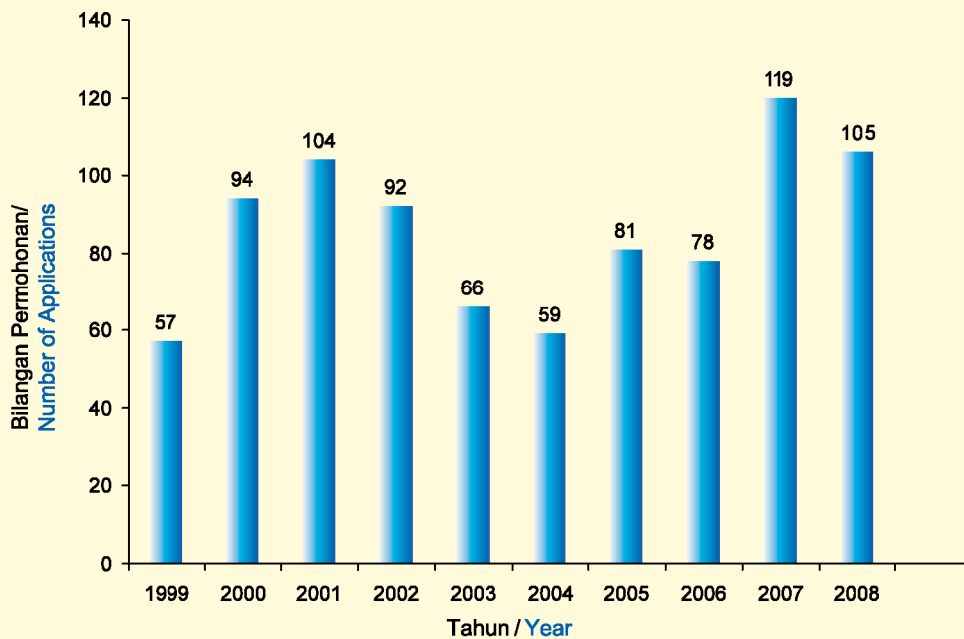
Rajah 4.8 JAS: Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005, Status Pematuhan Industri, 2008

Figure 4.8 DOE: Environmental Quality (Scheduled Waste) Regulations 2005, Compliance Status, 2008

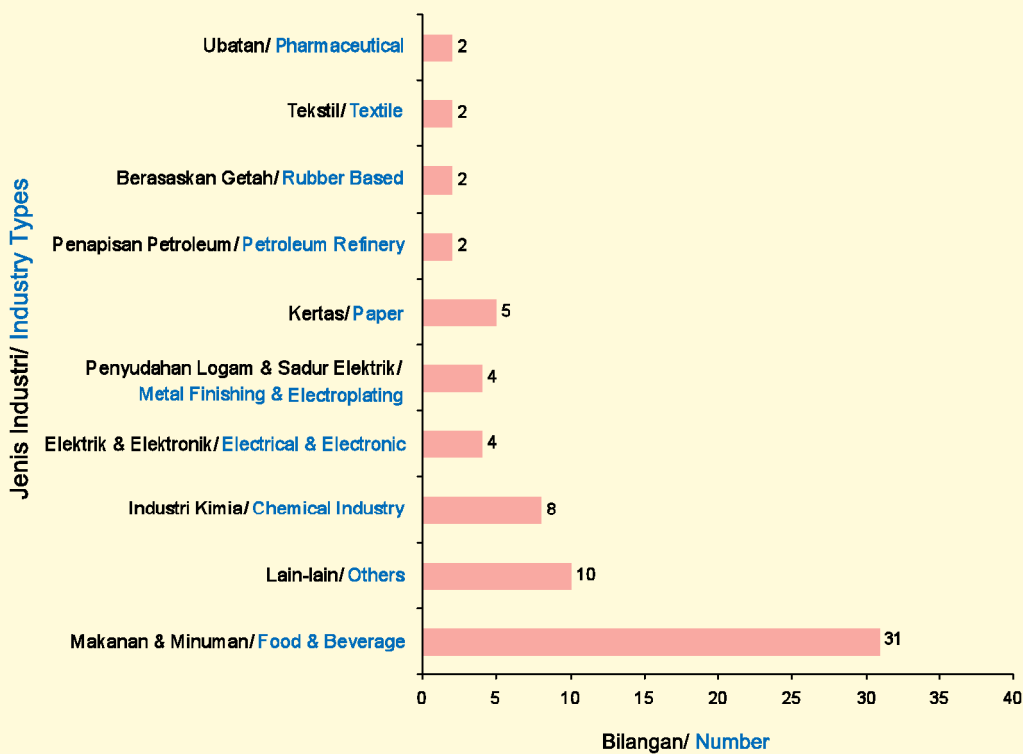


Rajah 4.9 JAS: Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan dan Effluen-Effluen Perindustrian) 1979, Status Pematuhan Industri, 2008

Figure 4.9 DOE: Environmental Quality (Sewage and Industrial Effluent) Regulations 1979, Compliance Status, 2008



Rajah 4.10 JAS: Lesen Pelanggaran di bawah Seksyen 25(1) AKAS 1974, (1999-2008)  
 Figure 4.10 DOE: Number of Contravention Licenses Under Section 25(1)EQA 1974, (1999-2008)



Rajah 4.11 JAS: Lesen Pelanggaran di Bawah Seksyen 25(1) AKAS 1974, Mengikut Jenis Industri, 2008  
 Figure 4.11 DOE: Contravention Licenses Under Section 25(1) by Industri Type 2008

## PENGAWASAN KUALITI AIR MARIN KEBANGSAAN MARINE WATER QUALITY MONITORING

Program Pengawasan Kualiti Air Marin Kebangsaan telah dimulakan pada tahun 1978 di Semenanjung Malaysia dan diperkembangkan ke Sabah dan Sarawak pada tahun 1985. Stesen-stesen pemantauan air marin diwujudkan di kuala sungai dan pantai-pantai bagi memantau perubahan dalam kualiti air marin berdasarkan kepada kegunaannya seperti kawasan rekreasi, perikanan dan taman-taman laut.

Dalam tahun 2008, terdapat 231 stesen pengawasan di seluruh Malaysia; Perlis (2 stesen), Kedah (3 stesen), Pulau Langkawi (7 stesen), Pulau Pinang (24 stesen), Perak (13 stesen), Selangor (14 stesen), Negeri Sembilan (13 stesen), Melaka (8 stesen), Johor (51 stesen), Pahang (11 stesen), Terengganu (19 stesen), Kelantan (10 stesen), Sabah (26 stesen), W.P Labuan (5 stesen) dan Sarawak (25 stesen) (**Jadual 4.4**). Dua (2) stesen telah ditutup pada tahun 2008 kerana terdapat pertindihan dengan stesen program pengawasan pulau-pulau (**Jadual 4.5**).

Di bawah Program Pengawasan Selat Johor di bawah 'Malaysia-Singapore Joint Committee on the Environment' (MSJCE), 20 stesen telah dipantau pada tahun 2008 (**Jadual 4.6**).

Marine water quality monitoring started in 1978 for Peninsular Malaysia and was extended in 1985 to cover Sabah and Sarawak. Monitoring stations had been established at estuarine and coastal areas to monitor marine water quality in relation to their beneficial uses such as recreation, fishing and marine parks.

In 2008, a total of 231 monitoring stations were set up throughout Malaysia; Perlis (2 stations), Kedah (3 stations), Pulau Langkawi (7 stations), Pulau Pinang (24 stations), Perak (13 stations), Selangor (14 stations), Negeri Sembilan (13 stations), Melaka (8 stations), Johor (51 stations), Pahang (11 stations), Terengganu (19 stations), Kelantan (10 stations), Sabah (26 stations), W.P Labuan (5 stations) dan Sarawak (25 stations) (**Table 4.4**). Two (2) monitoring stations were closed in 2008 due to existing stations in the islands monitoring programme (**Table 4.5**).

Under the Malaysia-Singapore Joint Committee on the Environment (MSJCE) Monitoring Programme, 20 stations were monitored in 2008 (**Table 4.6**).



Kes Tumpahan Minyak di Laut  
Oil Spill Case at Sea

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2008

Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2008

Bil. No.	Negeri State	Kawasan Area	Nama Stesen Station Name	No. Stesen Station No.	Latitud Latitude	Longitud Longitude	
1	PERLIS	KUALA/ ESTUARINE	KUALA SG. BARU	6302903	N 06° 19' 54.5"	E 100° 09' 20.0"	
2			KUALA SG. PERLIS	6401901	N 06° 23' 59.0"	E 100° 07' 34.8"	
1	KEDAH	KUALA/ ESTUARINE	KUALA SG. KEDAH	6102908	N 06° 06' 13.0"	E 100° 16' 32.0"	
2		KUALA/ ESTUARINE	KUALA JERLUN	6302925	N 06° 12' 36.0"	E 100° 14' 20.9"	
3		PANTAI/ COASTAL	PANTAI MERDEKA	5603905	N 05° 40' 10.0"	E 100° 22' 40.0"	
1	P. LANGKAWI	PANTAI/ COASTAL	LANGKAWI ISLAND RESORT	6399914	N 06° 17' 51.1"	E 099° 51' 38.3"	
2			PANTAI KOK	6397922	N 06° 22' 12.0"	E 099° 40' 43.7"	
3			PANTAI KUAH	6398913	N 06° 19' 04.1"	E 099° 51' 04.5"	
4			PANTAI PASIR TENGGORAK	6497901	N 06° 25' 46.3"	E 099° 43' 37.1"	
5			PANTAI TELUK BURAU	6396923	N 06° 21' 52.4"	E 099° 40' 13.7"	
6			PANTAI TELUK NIBUNG	6497915	N 06° 21' 38.9"	E 099° 42' 08.1"	
7			PANTAI TENGAH	6297903	N 06° 18' 52.4"	E 099° 43' 46.8"	
1	PULAU PINANG	KUALA/ ESTUARINE	KUALA SG. JAWI	5204901	N 05° 16' 50.0"	E 100° 25' 00.0"	
2			KUALA SG. JURU	5304904	N 05° 20' 20.0"	E 100° 24' 20.0"	
3			KUALA SG. KERIAN	5104901	N 05° 10' 00.0"	E 100° 25' 00.0"	
4			KUALA SG. PINANG	5403934	N 05° 24' 00.0"	E 100° 20' 05.0"	
5			KUALA SG. PERAI	5303908	N 05° 23' 00.0"	E 100° 22' 00.0"	
6		PANTAI/ COASTAL	BATU FERINGGI (CASUARINA)	5402904	N 05° 28' 10.0"	E 100° 14' 30.0"	
7			BATU MAUNG	5202901	N 05° 17' 10.0"	E 100° 17' 25.0"	
8			GERTAK SANGGUL	5201919	N 05° 16' 50.0"	E 100° 12' 40.0"	
9			KAW.PER.BAYAN LEPAS I	5303932	N 05° 20' 00.0"	E 100° 18' 45.0"	
10			KAW.PER.BAYAN LEPAS II	5303933	N 05° 19' 00.0"	E 100° 18' 30.0"	
11			KAW.PER.BAYAN LEPAS III	5302939	N 05° 18' 20.0"	E 100° 17' 45.0"	
12			LUAR PANTAI TELUK BAHANG	5402930	N 05° 27' 45.0"	E 100° 12' 45.0"	
13			PANTAI BERSIH	5403906	N 05° 26' 30.0"	E 100° 22' 40.0"	
14			PANTAI MIAMI	5502901	N 05° 28' 30.0"	E 100° 16' 00.0"	
15			PANTAI PASIR PANJANG	5201938	N 05° 17' 50.0"	E 100° 11' 00.0"	
16			PERSIARAN GURNEY	5403902	N 05° 25' 30.0"	E 100° 19' 30.0"	
17			PULAU AMAN	5203910	N 05° 15' 50.0"	E 100° 23' 35.0"	
18			RUMAH PAM BARU PERAI	5304927	N 05° 21' 15.0"	E 100° 23' 15.0"	
19			RUMAH PAM LAMA PERAI	5303926	N 05° 20' 00.0"	E 100° 18' 45.0"	
20			SELAT PP SELATAN (JELUTONG)	5303911	N 05° 23' 30.0"	E 100° 19' 50.0"	
21			TANJUNG BUNGAH	5402937	N 05° 28' 00.0"	E 100° 16' 50.0"	
22			TELUK TEMPOYAK	5202923	N 05° 28' 30.0"	E 100° 17' 30.0"	
23			KUALA/ ESTUARINE	KUALA SUNGAI TENGAH	5104901	N 05° 12' 41.0"	E 100° 25' 29.0"
24				KUALA SUNGAI PINANG	403934	N 05° 24' 13.0"	E 100° 19' 54.0"
1	PERAK	KUALA/ ESTUARINE	KUALA SG. MANJUNG	4205930	N 04° 14' 09.0"	E 100° 39' 57.0"	
2			KUALA SG. TG. PIANDANG	5003921	N 05° 04' 27.0"	E 100° 22' 34.0"	
3			KUALA SG. GULA	4906926	N 04° 55' 07.0"	E 100° 28' 57.0"	
4			KUALA SG. KURAU	4994919	N 04° 59' 13.0"	E 100° 25' 46.0"	
5			KUALA SG. PERAK	4007901	N 03° 59' 03.0"	E 100° 48' 58.0"	
6		PANTAI/ COASTAL	KUALA SG. SEPETANG	4806925	N 04° 50' 07.0"	E 100° 37' 57.0"	
7			PANTAI PASIR BOGAK	4205908	N 04° 12' 58.0"	E 100° 37' 55.0"	
8			PANTAI PASIR PANJANG	4305924	N 04° 25' 07.0"	E 100° 35' 35.0"	
9			PANTAI PUTERI DEWI	4205907	N 04° 15' 17.0"	E 100° 32' 47.0"	
10			PANTAI TANJUNG BATU	4406927	N 04° 25' 07"	E 100° 35' 35"	
11			PANTAI TELUK BATIK	4205923	N 04° 11' 14.0"	E 100° 36' 33.0"	
12			PANTAI TELUK DALAM	4205928	N 04° 14' 53.0"	E 100° 33' 25.0"	
13			PANTAI TELUK GEDUNG	4205929	N 04° 15' 39.0"	E 100° 34' 49.0"	
1	SELANGOR	PANTAI/ COASTAL	PANTAI BAGAN LALANG	2616927	N 02° 36' 20.0"	E 101° 41' 30.0"	
2			PANTAI MORIB	2712902	N 02° 45' 00.0"	E 101° 26' 20.0"	
3			SELAT PULAU BABI	3012929	N 03° 01' 10.0"	E 101° 15' 55.0"	

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2008

Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2008

Bil. No.	Negeri State	Kawasan Area	Nama Stesen Station Name	No. Stesen Station No.	Latitud Latitude	Longitud Longitude		
4	SELANGOR	KUALA/ ESTUARINE	SELAT KLANG UTARA	3013908	N 03° 04' 00.0"	E 101° 21' 00.0"		
5			KUALA SG. SEPANG	2517922	N 02° 35' 35.0"	E 101° 42' 56.0"		
6			KUALA SG. SEPANG (KECIL)	2612928	N 02° 36' 40.0"	E 101° 42' 15.0"		
7			KUALA SG. SEPANG (KAWALAN)	2616926	N 02° 36' 20.0"	E 101° 41' 30.0"		
8			KUALA SUNGAI KLANG	3013909	N 03° 00' 06.0"	E 101° 23' 24.0"		
9			KUALA SUNGAI LANGAT (JUGRA)	2814925	N 02° 48' 25.0"	E 101° 24' 15.0"		
10			KUALA SUNGAI LANGAT (LUMUT)	2913903	N 02° 55' 50.0"	E 101° 21' 15.0"		
11			KUALA SUNGAI BULOH	3212930	N 03° 15' 10.0"	E 101° 15' 50.0"		
12			KUALA SUNGAI SELANGOR	3312915	N 03° 20' 00.0"	E 101° 13' 30.0"		
13			KUALA SUNGAI TENGI	3311931	N 03° 23' 00.0"	E 101° 10' 20.0"		
14			KUALA SUNGAI BERNAM	3808924	N 03° 51' 00.0"	E 100° 49' 00.0"		
1			N. SEMBILAN	PANTAI/ COASTAL	KUALA SUNGAI LINGGI	2319901	N 02° 23' 20.0"	E 101° 58' 19.0"
2					KUALA SUNGAI LUKUT	2517910	N 02° 34' 45.0"	E 101° 47' 16.0"
3					PANTAI BAGAN PINANG	2418915	N 02° 30' 31.0"	E 101° 49' 44.0"
4	PANTAI TELUK SINTING PASIR PANJANG	2419908			N 02° 24' 57.0"	E 101° 56' 31.0"		
5	PORT DICKSON BANDAR	2517907			N 02° 31' 16.0"	E 101° 47' 51.0"		
6	PANTAI PORT DICKSON BATU 10	2418914			N 02° 24' 58.0"	E 101° 51' 23.0"		
7	PANTAI PORT DICKSON BATU 5	2418906			N 02° 29' 46.0"	E 101° 50' 15.0"		
8	PANTAI PORT DICKSON BATU 6	2418916			N 02° 29' 05.0"	E 101° 50' 46.0"		
9	PANTAI PORT DICKSON BATU 7	2418905			N 02° 27' 43.0"	E 101° 51' 04.0"		
10	PANTAI PORT DICKSON BATU 8	2418912			N 02° 27' 16.0"	E 101° 51' 20.0"		
11	PANTAI PD. BATU 8 (STESEN KAWALAN )	2418913			N 02° 27' 16.0"	E 101° 51' 10.0"		
12	KUALA/ ESTUARINE	PORT DICKSON TNB		2517909	N 02° 32' 09.0"	E 101° 47' 42.0"		
13	PANTAI TG. PELANDOK	2419917		N 02° 25' 03.0"	E 101° 53' 34.0"			
1	MELAKA	KUALA/ ESTUARINE	KUALA SG. KESANG	2186905	N 02° 05' 43.0"	E 102° 29' 12.0"		
2			KUALA SG. MELAKA	2122903	N 02° 11' 06.0"	E 102° 14' 52.0"		
3			KUALA SG. MERLIMAU	2124912	N 02° 09' 25.0"	E 102° 25' 28.0"		
4			KUALA SG. SEBATU	2186904	N 02° 06' 06.0"	E 102° 27' 35"		
5		PANTAI/ COASTAL	PANTAI KUNDOR TG. KELING	2221908	N 02° 14' 37.0"	E 102° 08' 29.0"		
6			PANTAI ROMBANG TG. KELING	2221906	N 02° 13' 35.0"	E 102° 08' 57.0"		
7			PANTAI TG. BIDARA	2320909	N 02° 17' 30.0"	E 102° 05' 18"		
8			PANTAI TELUK GONG	2320902	N 02° 20' 23.0"	E 102° 03' 30.0"		
1	JOHOR	PANTAI/ COASTAL	KG.TANJUNG KOPOK	SJ1	N 01° 25' 31.0"	E 104° 00' 03"		
2			KG. PASIR PUTIH	SJ2	N 01° 25' 48.0"	E 103° 55' 40.0"		
3			J/K SULTAN ISKANDAR	SJ3	N 01° 26' 49.0"	E 103° 46' 09.0"		
4			KG.SENIBUNG	SJ4	N 01° 29' 01.0"	E 103° 48' 47.0"		
5		KUALA/ ESTUARINE	KUALA SG.TEBRAU	SJ4A	N 01° 28' 56.0"	E 103° 47' 48.0"		
6			PANTAI/ COASTAL	TANJUNG PUTRI	SJ5	N 01° 27' 20.0"	E 103° 46' 09.0"	
7				HADAPAN MPJB	SJ6	N 01° 27' 08.0"	E 103° 45' 43.0"	
8		KUALA/ ESTUARINE	TANJUNG DANGA	SJ7	N 01° 27' 24.0"	E 103° 42' 52.0"		
9			KUALA SG.SKUDAI	SJ7A	N 01° 27' 46.0"	E 103° 43' 22.0"		
10			PANTAI/ COASTAL	HADAPAN PUSAT ISLAM	SJ7B	N 01° 27' 19.0"	E 103° 44' 51.0"	
11				TEBING RUNTUH	SJ8	N 01° 25' 10.0"	E 103° 40' 06.0"	
12			KUALA/ ESTUARINE	KUALA SG.MELAYU	SJ8A	N 01° 26' 53.0"	E 103° 41' 53.0"	
13			PANTAI/ COASTAL	TANJUNG BUNGA	SJ9	N 01° 23' 07.0"	E 103° 39' 02.0"	
14				TANJUNG KUPANG	SJ10	N 01° 23' 36.0"	E 103° 39' 11.0"	
15		PULAU BELUNGKOR		EM4	N 01° 26' 25.8"	E 104° 03' 11.04"		
16		PULAU TEKONG		EM5	N 01° 25' 42.3"	E 104° 04' 36.72"		
17		PULAU TEKONG	EM6	N 01° 23' 19.2"	E 104° 05' 20.40"			

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2008

Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2008

Bil. No.	Negeri State	Kawasan Area	Nama Stesen Station Name	No. Stesen Station No.	Latitud Latitude	Longitud Longitude	
18	JOHOR	KUALA/ ESTUARINE PANTAI/ COASTAL	JETI PULAREK	EM7	N 01° 21' 26.8"	E 104° 04' 40.65"	
19			TANJUNG PENGELIH	WQ10	N 01° 19' 52.62"	E 104° 05' 39.57"	
20			PULAU MERAMBONG	WM1	N 01° 20' 17.02"	E 103° 37' 36.29"	
21			KUALA SUNGAI SKUDAI	1437922	N 01° 28' 28.0"	E 103° 43' 12.0"	
22			KUALA SUNGAI TEBRAU	1438943	N 01° 28' 56.0"	E 103° 47' 48.0"	
23			HADAPAN HSAJB	1437920	N 01° 27' 19.0"	E 103° 44' 44.0"	
24			JETI TANJONG BELUNGKOR	1440963	N 01° 27' 14.0"	E 104° 04' 03.0"	
25			KG. TELUK JAWA	1438918	N 01° 28' 17.0"	E 103° 50' 30.0"	
26			PANTAI AIR PAPAN	2538959	N 02° 31' 05.0"	E 103° 50' 00.0"	
27			PANTAI DESARU	1542914	N 01° 32' 48.0"	E 104° 15' 41.0"	
28			LUAR KUKUP	1334925	N 01° 19' 30.0"	E 103° 26' 29.0"	
29			PANTAI LIDO	1437921	N 01° 27' 56.0"	E 103° 43' 29.0"	
30			PANTAI SRI PANTAI	2339960	N 02° 22' 45.0"	E 103° 53' 19.0"	
31			PANTAI STULANG LAUT	1437951	N 01° 28' 02.0"	E 103° 46' 46.0"	
32			PANTAI SUNGAI LURUS	1730962	N 01° 43' 42.0"	E 103° 01' 43.0"	
33			PANTAI TANJONG SETAPA	1341961	N 01° 20' 33.0"	E 104° 08' 09.0"	
34			PANTAI TELUK GOREK	2538958	N 02° 34' 57.0"	E 103° 48' 18.0"	
35			PANTAI TELUK MAHKOTA	1841911	N 01° 53' 52.0"	E 104° 06' 15.0"	
36			PANTAI TG.LEMAN	2140694	N 02° 08' 43.0"	E 104° 00' 24.0"	
37			PASIR GOGOK	1441966	N 01° 25' 02.8"	E 104° 05' 59.7"	
38			PEL. PASIR GUDANG	1428939	N 01° 25' 44.0"	E 103° 54' 03.0"	
39			TANJUNG BUAI	1340973	N 01° 29' 48.1"	E 104° 02' 43.4"	
40			TANJUNG MERAK	1441968	N 01° 21' 45.9"	E 104° 06' 35.5"	
41			TANJUNG PENGELIH	1441967	N 01° 22' 14.7"	E 104° 05' 19.5"	
42			TANJUNG PENYUSUP	1444920	N 01° 22' 12.9"	E 104° 16' 48.3"	
43			TANJUNG SEPANG	1443969	N 01° 23' 01.2"	E 104° 06' 44.8"	
44			PANTAI PUNGGUR	1531974	N 01° 41' 05.0"	E 103° 05' 54.0"	
45			KUALA/ ESTUARINE	SUNGAI KIM-KIM	1439965	N 01° 25' 24.0"	E 103° 54' 03.0"
46			KUALA SUNGAI BATU PAHAT	1729930	N 01° 47' 44.0"	E 102° 53' 22.0"	
47			KUALA SUNGAI JOHOR	1440916	N 01° 29' 04.0"	E 104° 01' 22.0"	
48			KUALA SUNGAI MELAYU	1437946	N 01° 27' 15.0"	E 103° 41' 56.0"	
49	KUALA SUNGAI MERSING	2438905	N 02° 26' 10.0"	E 103° 50' 35.0"			
50	KUALA SUNGAI MUAR	2024932	N 02° 02' 54.0"	E 102° 33' 11.0"			
51	KUALA SUNGAI SEGGET	1437919	N 01° 27' 21.0"	E 103° 45' 58.0"			
1	PAHANG	PANTAI/ COASTAL	PANTAI SEPAT	3633940A	N 03° 42' 02.0"	E 103° 20' 16.0"	
			3633940B	N 03° 41' 54.0"	E 103° 20' 19.0"		
2			PANTAI BATU HITAM	3833915A	N 03° 53' 06"	E 103° 21' 58"	
			3833915B	N 03° 53' 09"	E 103° 21' 59"		
3			PANTAI CHERATING (Club Med )	4133903A	N 04° 08' 41.0"	E 103° 24' 31.0"	
			4133903B	N 04° 07' 51.0"	E 103° 24' 23"		
4			PANTAI CHERATING ( Legend )	4133942A	N 04° 06' 16.0"	E 103° 23' 06"	
			4133942B	N 04° 06' 12.0"	E 103° 23' 07"		
5			PANTAI KUALA API-API	3235917	N 03° 31' 20.0"	E 103° 23' 45.0"	
6			PANTAI MUHIBBAH BALOK	3933901A	N 03° 55' 28.0"	E 103° 22' 21.1"	
			3933901B	N 03° 55' 30.0"	E 103° 22' 23.0"		
7			PANTAI BESERAH	3933941A	N 03° 54' 41.0"	E 103° 22' 02.0"	
7			PANTAI BESERAH	3933941B	N 03° 54' 39.0"	E 103° 22' 01.0"	
8			PANTAI TANJUNG BATU	3334915	N 03° 31' 10.0"	E 103° 23' 45.0"	
9			PANTAI TELUK CEMPEDAK	3833910A	N 03° 48' 51"	E 103° 22' 19.0"	
			3833910B	N 03° 48' 49.0"	E 103° 22' 21.0"		
10			PANTAI TELUK GELORA	3833909A	N 03° 48' 16.0"	E 103° 20' 43.0"	
			3833909B	N 03° 48' 20.0"	E 103° 20' 43.0"		

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2008

Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2008

Bil. No.	Negeri State	Kawasan Area	Nama Stesen Station Name	No. Stesen Station No.	Latitud Latitude	Longitud Longitude	
11	PAHANG		PANTAI LEGENDA	3534943A 3534943B	N 03° 12' 16.7" N 03° 12' 16.7"	E 103° 26' 53.7" E 103° 26' 53.7"	
1	TERENGGANU	KUALA/ ESTUARINE	KUALA SG. BESUT	5825902	N 05° 50' 02.8"	E 102° 33' 28.8"	
2			KUALA SG. DUNGUN	4734918	N 04° 46' 48.9"	E 103° 25' 21.6"	
3			KUALA SG. IBAI	5231949	N 05° 17' 06.1"	E 103° 10' 06.5"	
4			KUALA SG. KERTEH	4534922	N 04° 30' 59.1"	E 103° 26' 52.6"	
5			UTARA TIOXIDE	4234950	N 04° 17' 06.3"	E 103° 28' 20.9"	
6			TENGAH TIOXIDE (DISCHARGE)	4234951	N 04° 16' 22.8"	E 103° 28' 12.7"	
7			SELATAN TIOXIDE	4234952	N 04° 15' 04.1"	E 103° 27' 59.2"	
8			KUALA SG. MARANG	5232911	N 05° 12' 24.7"	E 103° 12' 28.9"	
9			KUALA SG. PAKA	4634920	N 04° 39' 29.7"	E 103° 25' 57.7"	
10			KUALA SG. SETIU	5627953	N 05° 40' 05.9"	E 102° 42' 26.9"	
11			KUALA SG. TERENGGANU	5331907	N 05° 20' 22.1"	E 103° 08' 12.6"	
12			KUALA SUNGAI KEMAMAN	4234929	N 04° 14' 25.2"	E 102° 26' 48.8"	
13			PANTAI/ COASTAL	PANTAI BATU BURUK	5331935	N 05° 19' 29.1"	E 103° 09' 01.4"
14				PANTAI BUKIT KELUANG	5825903	N 05° 50' 02.8"	E 102° 36' 01.4"
15				PANTAI CHENDERING	5231934	N 05° 16' 11.8"	E 103° 10' 51.9"
16				PANTAI RANTAU ABANG	4833917	N 04° 52' 11.4"	E 103° 23' 17.4"
17				KIPC UTARA	4634953	N 04° 36' 37.9"	E 103° 26' 39.2"
18				KIPC TENGAH	4534954	N 04° 34' 54.9"	E 103° 27' 19.5"
19				KIPC SELATAN	4534955	N 04° 30' 09.5"	E 103° 26' 52.6"
1	KELANTAN	KUALA/ ESTUARINE	KUALA SUNGAI KEMASIN	5824914	N 5° 53' 50.0"	E 102° 29' 05.0"	
2			KUALA SG. GOLOK	6220911	N 6° 14' 05.0"	E 102° 05' 35.0"	
3			KUALA SG. KELANTAN	6222901	N 6° 13' 12.0"	E 102° 13' 50.0"	
4			KUALA SG. PENG. DATU	6123913	N 6° 10' 20.0"	E 102° 20' 40.0"	
5			KUALA SG. PENG. CHEPA	6223912	N 6° 12' 20.0"	E 102° 18' 10.0"	
6			PANTAI/ COASTAL	PANTAI BISIKAN BAYU	5825905	N 5° 52' 00.0"	E 102° 31' 00.0"
7				PANTAI CAHAYA BULAN	6122903	N 6° 10' 45.0"	E 102° 16' 50.0"
8				PANTAI IRAMA BACHOK	6024908	N 6° 03' 00.0"	E 102° 25' 15.0"
9				PANTAI SABAK	6123909	N 6° 10' 25.0"	E 102° 20' 10.0"
10			PANTAI SERI TUJUH	6221910	N 6° 13' 00.0"	E 102° 08' 00.0"	
1	W.P. LABUAN	PANTAI/ COASTAL	LAYANG-LAYANGAN	5251902	N 05° 20' 01.0"	E 115° 11' 37.0"	
2			TANJUNG ARU	5251903	N 05° 21' 02.0"	E 115° 14' 39.0"	
3			PULAU PAPAN	5151905	N 05° 15' 22.0"	E 115° 16' 03.0"	
4			KIAMSAM	5151906	N 05° 15' 22.0"	E 115° 10' 28.0"	
5			SUNGAI PAGAR	5151907	N 05° 16' 20.0"	E 115° 10' 19.0"	
1	SABAH	KUALA/ ESTUARINE	KUALA SG. MENGGATAL/INANAM	5050905	N 05° 01' 05.0"	E 115° 07' 07.0"	
2			KUALA SG. PENYU	5453901	N 05° 34' 13.0"	E 115° 35' 55.0"	
3		PANTAI/ COASTAL	BORNEO GOLF SEAWATER	5355901	N 05° 33' 00.0"	E 115° 47' 01.0"	
4			PANTAI BAK-BAK KUDAT	6665901	N 06° 56' 44.0"	E 116° 50' 23.0"	
5			PANTAI ULU TUNGKU, LAHAD DATU	5085901	N 05° 01' 09.0"	E 118° 53' 09.0"	
6			PANTAI BATU SAPI	5580903	N 05° 47' 42.0"	E 118° 02' 22.0"	
7			PANTAI DALIT, TUARAN	6161901	N 06° 11' 25.0"	E 116° 09' 45.0"	
8			PANTAI LOK KAWI	5560904	N 05° 55' 00.0"	E 116° 02' 00.0"	
9			PANTAI MANGROVE PARADISE, TUARAN	6161902	N 06° 15' 02.0"	E 116° 13' 50.0"	
10			PANTAI MANIS, PAPAR	5555901	N 05° 45' 15.0"	E 115° 52' 04.0"	
11			PANTAI MELINSUNG, PAPAR	5565902	N 05° 50' 18.0"	E 115° 50' 45.0"	
12			PANTAI PASIR PUTIH, SANDAKAN	5580901	N 05° 49' 26.0"	E 118° 04' 58.0"	
13			PANTAI SABANDAR, TUARAN	6161903	N 06° 15' 02.2"	E 116° 13' 50.0"	
14			PANTAI SARINA, KUNAK	4481901	N 04° 39' 41.0"	E 118° 17' 01.0"	

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2008

Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2008

Bil. No.	Negeri State	Kawasan Area	Nama Stesen Station Name	No. Stesen Station No.	Latitud Latitude	Longitud Longitude	
15	SABAH		PANTAI SILAM LAHAD DATU	4681902	N 04° 58' 08.0"	E 118° 14' 46.0"	
16			PANTAI TELUK BRUNEI 1	5053901	N 05° 09' 55.0"	E 115° 32' 53.0"	
17			PANTAI TELUK BRUNEI 2	5053902	N 05° 09' 55.0"	E 115° 32' 53.0"	
18			PANTAI TELUK BRUNEI 3	5053903	N 05° 09' 55.0"	E 115° 32' 53.0"	
19			PANTAI TELUK BRUNEI 4	5053904	N 05° 09' 55.0"	E 115° 32' 53.0"	
20			PANTAI TELUK BRUNEI 5	5053905	N 05° 09' 55.0"	E 115° 32' 53.0"	
21			PANTAI TELUK BRUNEI 6	5053906	N 05° 09' 55.0"	E 115° 32' 53.0"	
22			PANTAI TG. ARU ( REST LIDO)	5656901	N 05° 55' 01.0"	E 115° 59' 03.0"	
23			PANTAI TG. ARU ( ROLLER SKATING)	5656902	N 05° 55' 01.0"	E 115° 59' 03.0"	
24			PANTAI TG. ARU ( No. 3)	5656903	N 05° 55' 01.0"	E 115° 59' 03.0"	
25			PANTAI TINAGAT, TAWAU	4473901	N 04° 13' 22.0"	E 117° 59' 04.0"	
26		KASTAM LAMA SANDAKAN (PANTAI TLDM)	5580902	N 05° 50' 00.0"	E 118° 08' 01.0"		
1	SARAWAK	KUALA/ ESTUARINE	KUALA BAKO	1704905	N 01° 40' 00.0"	E 110° 52' 08.0"	
2			KUALA BATANG KEMENA	3130911	N 03° 10' 53.0"	E 113° 01' 40.0"	
3			KUALA BATANG RAJANG	2111909	N 02° 07' 22.0"	E 111° 11' 21"	
4			KUALA SG. MIRI	4349915	N 04° 23' 59.0"	E 113° 58' 25.0"	
5			KUALA SG. SANTUBONG	1702903	N 01° 46' 38.0"	E 111° 16' 46.0"	
6			KUALA SG. SEMATAN	1898901	N 01° 48' 49.0"	E 109° 46' 29.0"	
7			KUALA SG. SARAWAK	1604907	N 01° 36' 44.0"	E 111° 29' 44.0"	
8			KUALA MUKAH	2920920	N 02° 54' 41.0"	E 112° 05' 25.0"	
9			KUALA KRIAN	1710924	N 01° 47' 20.0"	E 111° 05' 58.0"	
10		PANTAI/ COASTAL	PANTAI BAKO	1704906	N 01° 42' 49.0"	E 111° 25' 40.0"	
11			PANTAI BELAWAI	2212913	N 02° 14' 27.0"	E 111° 12' 51.0"	
12			PANTAI BRIGHTON	4449917	N 04° 22' 25.0"	E 113° 57' 51.0"	
13			PANTAI DAMAI	1702904	N 01° 47' 55.0"	E 111° 17' 58.0"	
14			PANTAI LIKAU	3230915	N 03° 20' 49.0"	E 113° 08' 57.0"	
15			PANTAI PANDAN	1824918	N 01° 50' 16.0"	E 109° 40' 11.0"	
16			PANTAI PASIR PUTIH	1604910	N 01° 30' 14.0"	E 111° 30' 00.0"	
17			PANTAI PIASAU	4539918	N 04° 27' 27.0"	E 113° 59' 38.0"	
18			PANTAI SEMATAN	1898902	N 01° 49' 38.0"	E 109° 46' 29.0"	
19			PANTAI TANJUNG BATU	3230913	N 03° 12' 38.0"	E 113° 02' 26.0"	
20			PANTAI HARMONI	2920921	N 02° 54' 35.0"	E 112° 03' 22.0"	
21			PANTAI TANJUNG KEMBANG	1810923	N 01° 49' 28.0"	E 111° 05' 44.0"	
22			KUALA/ ESTUARINE	KUALA BARAM	4539919	N 04° 34' 50.9"	E 113° 58' 48.0"
23			PANTAI/ COASTAL	PANTAI ESPLANED	4339920	N 04° 19' 04.6"	E 113° 57' 31.0"
24				PANTAI BERAYA	4238921	N 04° 12' 45.1"	E 113° 53' 30.6"
25				PANTAI BUNGAI	4137922	N 04° 03' 42.2"	E 113° 46' 50.3"

Kuala/ Estuarine : 75

Pantai/ Coastal : 156

Jumlah/ Total : 231

Jadual 4.5 JAS : Senarai Stesen Yang Telah Ditutup, 2008

Table 4.5 DOE: List of Closed Stations, 2008

Bil. No.	Negeri State	Kawasan Area	Nama Stesen Station Name	No. Stesen Station No.	Latitud Latitude	Longitud Longitude
1	PULAU PINANG	PANTAI COASTAL	TELUK BAHANG (P. MUTIARA)	5402912	N 05° 28' 46.0"	E 100° 15' 41.0"
2	MELAKA	PANTAI COASTAL	PULAU BESAR	2123911	N 02° 06' 55.1"	E 102° 20' 09"

Jadual 4.6 JAS : Stesen Pengawasan 'Malaysia-Singapore Joint Committee on the Environment' – (MSJCE), 2008

Table 4.6 DOE: Monitoring Stations under the Malaysia-Singapore Joint Committee on the Environment (MSJCE), 2008

Bil. No.	Negeri State	Kawasan Area	Nama Stesen Station Name	No. Stesen Station No.	Latitud Latitude	Longitud Longitude
1	JOHOR	PANTAI COASTAL	KG.TANJUNG KOPOK	SJ1	N 01° 25' 31.0"	E 104° 00' 03"
2			KG. PASIR PUTIH	SJ2	N 01° 25' 48.0"	E 103° 55' 40.0"
3			J/K SULTAN ISKANDAR	SJ3	N 01° 26' 49.0"	E 103° 46' 09.0"
4			KG.SENIBUNG	SJ4	N 01° 29' 01.0"	E 103° 48' 47.0"
5			TANJUNG PUTRI	SJ5	N 01° 27' 20.0"	E 103° 46' 09.0"
6			HADAPAN MPJB	SJ6	N 01° 27' 08.0"	E 103° 45' 43.0"
7			TANJUNG DANGA	SJ7	N 01° 27' 24.0"	E 103° 42' 52.0"
8			HADAPAN PUSAT ISLAM	SJ7B	N 01° 27' 19.0"	E 103° 44' 51.0"
9			TEBING RUNTUH	SJ8	N 01° 25' 10.0"	E 103° 40' 06.0"
10			TANJUNG BUNGA	SJ9	N 01° 23' 07.0"	E 103° 39' 02.0"
11			TANJUNG KUPANG	SJ10	N 01° 23' 36.0"	E 103° 39' 11.0"
12			PULAU BELUNGKOR	EM4	N 01° 26' 25.8"	E 104° 03' 11.04"
13			PULAU TEKONG	EM5	N 01° 25' 42.3"	E 104° 04' 36.72"
14			PULAU TEKONG	EM6	N 01° 23' 19.2"	E 104° 05' 20.40"
15			JETI PULAREK	EM7	N 01° 21' 26.8"	E 104° 04' 40.65"
16			TANJUNG PENGELIH	WQ10	N 01° 19' 52.62"	E 104° 05' 39.57"
17			PULAU MERAMBONG	WM1	N 01° 20' 17.02"	E 103° 37' 36.29"
18		KUALA ESTUARINE	KUALA SG.TEBRAU	SJ4A	N 01° 28' 56.0"	E 103° 47' 48.0"
19			KUALA SG.SKUDAI	SJ7A	N 01° 27' 46.0"	E 103° 43' 22.0"
20			KUALA SG.MELAYU	SJ8A	N 01° 26' 53.0"	E 103° 41' 53.0"

## PENGAWASAN KUALITI AIR MARIN PULAU-PULAU ISLAND MARINE WATER QUALITY MONITORING

Malaysia dikurniakan dengan banyak pulau yang kaya dengan sumber akuatik. Kualiti air marin memainkan peranan yang penting dalam pemuliharaan sumber semulajadi ini. Sehubungan dengan itu, Program Pengawasan Kualiti Air Marin Pulau-Pulau telah dimulakan pada Julai 1998. Program ini melibatkan di sekitar 71 buah pulau terpilih dengan 85 buah stesen pengawasan. Pulau-Pulau ini dikelaskan mengikut empat kategori iaitu pulau-pulau pembangunan (3); pulau-pulau peranginan (25); pulau-pulau Taman Laut (38); dan pulau-pulau yang dilindungi (5) (**Jadual 4.7**). Frekuensi persampelan bagi Pulau Pembangunan adalah sebanyak enam (6) kali setahun manakala bagi pulau yang lainnya adalah sebanyak empat (4) kali setahun.

Pengukuran parameter-parameter fizikal kualiti air marin dibuat secara in-situ seperti suhu, pH, konduktiviti, kemasinan, oksigen terlarut dan kekeruhan manakala 12 parameter yang dianalisis di makmal pula adalah seperti jumlah pepejal terampai, *Escherichia.coli*, nitrat, jumlah karbon organik, minyak dan gris termasuk logam berat seperti Merkuri (Hg), Kadmium (Cd), Kromium (Cr), Kuprum (Cu), Plumbum (Pb) dan Arsenik (As) (**Jadual 4.8**). Percontohan bebola tar di pantai juga dilaksanakan.

Malaysia is endowed with many islands rich in marine aquatic resources. The quality of marine water plays an important role in the conservation of these resources. As a step towards this, the Island Marine Water Quality Monitoring Programme was started in July 1998. The monitoring programme covers 71 selected islands with 85 monitoring stations. These islands are classified into four categories; development islands (3); resort islands (25); Marine Park Islands (38); and protected islands (5) (**Table 4.7**). The sampling frequency for development islands was six (6) times per year, and four (4) times per year for the other islands.

Marine water quality monitoring includes measurement of in-situ parameters such as temperature, pH, conductivity, salinity, dissolved oxygen, turbidity; while laboratory analysis involves 12 other parameters such as total suspended solids, *Escherichia.coli*, nitrate, total organic carbon, oil and grease, and heavy metals like Mercury (Hg), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Arsenic (As) (**Table 4.8**). Tarball samplings on beaches were also conducted.



Pulau Peranginan: Cantik dan Bersih  
Island Resort: Beautiful and Clean

Jadual 4.7 JAS: Pengawasan Kualiti Air Marin Pulau, 2008  
Table 4.7 DOE: Island Water Quality Monitoring, 2008

Bil./ No.	Negeri/State	Pulau/Island	Kategori/ Category	Bilangan Stesen/ No. of Station	Latitud/ Latitude	Longitud/ Longitude
1.	KEDAH	Singa Besar	R	1	N 06° 13' 36.3"	E 099° 44' 42.9"
		Dayang Bunting	R	1	N 06° 12' 26.2"	E 099° 46' 48.9"
		Payar	M	1	N 06° 03' 52.0"	E 100° 02' 33.5"
		Kaca	M	1	N 06° 04' 18.2"	E 100° 03' 06.5"
		Lembu	M	1	N 06° 04' 28.2"	E 100° 03' 29.6"
		Segantang	M	1	N 06° 02' 36.7"	E 099° 55' 34.0"
		Langkawi	D	1	N 06° 18' 34.8"	E 099° 51' 00.3"
		Langkawi	D	1	N 06° 25' 51.1"	E 099° 45' 49.0"
		Langkawi	D	1	N 06° 18' 51.9"	E 099° 42' 30.1"
		Langkawi	D	1	N 06° 27' 24.6"	E 099° 49' 27.6"
2.	PERAK	Pangkor	R	1	N 04° 11' 33.8"	E 100° 34' 51.8"
		Pangkor	R	1	N 04° 15' 10.7"	E 100° 32' 39.3"
		Pangkor Laut	R	1	N 04° 12' 14.1"	E 100° 32' 53.0"
		Sembilan	R	1	N 04° 00' 30.7"	E 100° 32' 38.4"
3.	P. PINANG	Aman	R	1	N 05° 17' 09.7"	E 100° 17' 28.5"
		Jerejak	R	1	N 05° 16' 51.2"	E 100° 11' 24.6"
		Kendi	R	1	N 05° 27' 41.4"	E 100° 12' 51.9"
		Rimau	R	1	N 05° 25' 12.7"	E 100° 20' 47.9"
		Gedong	R	1	N 05° 16' 02.6"	E 100° 23' 35.9"
		Pulau Pinang	D	1	N 05° 20' 02.3"	E 100° 19' 03.6"
		Pulau Pinang	D	1	N 05° 13' 56.6"	E 100° 11' 04.8"
		Pulau Pinang	D	1	N 05° 15' 01.9"	E 100° 16' 19.3"
		Pulau Pinang	D	1	N 05° 16' 26.4"	E 100° 23' 30.6"
4.	SELANGOR	Ketam	R	1	N 03° 01' 17.5"	E 101° 15' 46.4"
		Angsa	R	1	N 03° 11' 08.0"	E 101° 13' 07.1"
		Lumut	R	1	N 02° 59' 54.6"	E 101° 21' 42.6"
5.	MELAKA	Besar	R	1	N 02° 06' 55.8"	E 102° 20' 10.6"
		Upeh	R	1	N 02° 11' 39.5"	E 102° 12' 17.2"
6.	PAHANG	Tioman	M	1	N 02° 44' 22.0"	E 104° 07' 53.4"
		Tioman	M	1	N 02° 44' 22.0"	E 104° 07' 53.4"
		Seri Buat	M	1	N 02° 41' 07.4"	E 103° 55' 24.6"
		Cebeh	M	1	N 02° 55' 53.6"	E 104° 05' 51.4"
		Tulai	M	1	N 02° 54' 42.1"	E 104° 06' 51.9"
		Sepui	M	1	N 02° 53' 53.8"	E 104° 03' 09.7"
		Labas	M	1	N 02° 53' 23.7"	E 104° 03' 56.6"
		Sembilang	M	1	N 02° 40' 53.8"	E 103° 53' 28.4"
		Tokong Bahara	M	1	N 02° 39' 48.2"	E 104° 03' 43.9"
		But	M	1	N 02° 39' 59.5"	E 104° 03' 36.4"
7.	JOHOR	Setindan	R	1	N 02° 28' 35.9"	E 103° 51' 28.7"
		Babi Tengah	M	1	N 02° 28' 20.4"	E 103° 51' 41.9"
		Dayang	R	1	N 02° 28' 12.8"	E 104° 30' 12.9"
		Harimau	M	1	N 02° 33' 26.5"	E 103° 56' 46.3"
		Mensirip	M	1	N 02° 33' 04.8"	E 103° 57' 28.9"
		Gual	M	1	N 02° 32' 03.0"	E 103° 58' 03.0"
		Babi Hujung	M	1	N 02° 29' 24.8"	E 103° 56' 21.9"
		Nanga Besar	M	1	N 02° 16' 18.0"	E 104° 37' 37.5"
		Sibu Besar	M	1	N 02° 12' 21.0"	E 104° 04' 22.0"
		Sibu Hujung	M	1	N 02° 10' 20.0"	E 104° 06' 39.7"
		Sibu Tengah	R	1	N 02° 10' 54.9"	E 104° 05' 45.4"
		Rawa	M	1	N 02° 31' 03.0"	E 103° 58' 09.6"

Jadual 4.7 JAS: Pengawasan Kualiti Air Marin Pulau, 2008

Table 4.7 DOE: Island Water Quality Monitoring, 2008

Bil./ No.	Negeri/State	Pulau/Island	Kategori/ Category	Bilangan Stesen/ No. of Station	Latitud/ Latitude	Longitud/ Longitude
		Tinggi	M	1	N 02° 17' 33.7"	E 104° 06' 03.7"
		Besar	M	1	N 02° 25' 51.8"	E 103° 58' 37.1"
		Pemanggil	M	1	N 02° 04' 52.1"	E 104° 18' 54.8"
		Aur	M	1	N 02° 27' 24.3"	E 104° 30' 08.5"
8.	TERENGGANU	Gumia	R	1	N 05° 13' 51.8"	E 103° 15' 39.3"
		Bidong Laut	R	1	N 05° 36' 43.6"	E 103° 03' 23.7"
		Duyong	R	1	N 05° 20' 05.6"	E 103° 07' 44.7"
		Perhentian Besar	M	1	N 05° 53' 21.5"	E 102° 45' 01.8"
		Perhentian Besar	M	1	N 05° 53' 21.5"	E 102° 45' 01.8"
		Perhentian Kecil	M	1	N 05° 55' 04.5"	E 102° 43' 30.4"
		Redang	M	1	N 05° 46' 32.2"	E 103° 02' 13.4"
		Redang	M	1	N 05° 46' 32.2"	E 103° 02' 13.4"
		Kapas	M	1	N 05° 13' 01.1"	E 103° 15' 35.4"
		Susu Dara	M	1	N 05° 57' 34.8"	E 102° 40' 30.8"
		Lang Tengah	M	1	N 05° 47' 32.9"	E 102° 53' 27.1"
		Pinang	M	1	N 05° 44' 52.7"	E 103° 00' 09.4"
		Ekor Tebu	M	1	N 05° 44' 25.6"	E 103° 01' 45.4"
		Lima	M	1	N 05° 46' 11.5"	E 103° 03' 32.6"
		Tenggol	P	1	N 04° 48' 33.8"	E 103° 40' 32.1"
		Nyireh	P	1	N 04° 50' 39.9"	E 103° 39' 47.5"
9.	SABAH	Gaya	R	1	N 06° 00' 58.7"	E 116° 03' 12.1"
		Layang-Layang	R	1	N 07° 22' 12.6"	E 113° 50' 16.4"
		Mabul	R	1	N 04° 15' 04.0"	E 118° 38' 02.4"
		Sipadan	R	1	N 04° 07' 05.2"	E 118° 37' 37.3"
		Sipadan	R	1	N 04° 06' 51.0"	E 118° 37' 32.9"
10.	SARAWAK	Satang Besar	P	1	N 01° 46' 39.0"	E 110° 09' 53.7"
		Talang-Talang Kecil	P	1	N 01° 53' 42.9"	E 109° 45' 58.2"
		Talang-Talang Besar	P	1	N 01° 54' 39.7"	E 109° 46' 36.0"
11.	W. P LABUAN	Labuan	D	1	N 05° 22' 49.9"	E 115° 13' 43.8"
		Labuan	D	1	N 05° 16' 21.9"	E 115° 14' 55.5"
		Labuan	D	1	N 05° 22' 18.6"	E 115° 14' 48.0"
		Labuan	D	1	N 05° 14' 30.9"	E 115° 14' 23.3"
		Kuraman	M	1	N 05° 13' 07.5"	E 115° 08' 25.5"
		Rusukan Kecil	M	1	N 05° 12' 06.4"	E 115° 08' 53.9"
		Rusukan besar	M	1	N 05° 11' 24.0"	E 115° 08' 31.2"
				<b>Bilangan Pulau/ No. of Island</b>	<b>Bilangan Stesen/ No. of Station</b>	
		Pulau Peranginan - Resort Island (R)		25	27	
		Pulau Taman Laut - Marine Park Island (M)		38	41	
		Pulau Dilindungi - Protected Island (P)		5	5	
		Pulau Pembangunan - Development Island (D)		3	12	
		<b>Jumlah / Total</b>		<b>71</b>	<b>85</b>	

Jadual 4.8 JAS: Parameter Kualiti Air Marin, 2008  
 Table 4.8 DOE: Marine Water Quality Parameters, 2008

Bil. / No.	Parameter / Parameters	Kod / Code	Unit / Unit
<b>PENGUKURAN IN-SITU/ IN-SITU MEASUREMENTS</b>			
1.	Oksigen Terlarut / Dissolved Oxygen	DO	mg/l
2.	Kemasinan / Salinity	Sal	%
3.	Suhu / Temperature	Temp	°C
4.	Konduktiviti / Conductivity	Cond	µmhos/cm
5.	Kekeruhan / Turbidity	Turb	ntu/ftu
6.	pH	pH	-
<b>PENGUKURAN MAKMAL/ LABORATORY MEASUREMENT</b>			
1.	Jumlah pepejal terampai / Total Suspended Solid	TSS	mg/l
2.	<i>Escherichia. coli</i>	<i>E.coli</i>	cfu/100 ml
3.	Minyak dan Gris / Oil and Grease	O&G	mg/l
4.	Kuprum / Copper	Cu	mg/l
5.	Kadmium / Cadmium	Cd	mg/l
6.	Plumbum / Lead	Pb	mg/l
7.	Arsenik / Arsenic	As	mg/l
8.	Merkuri / Mercury	Hg	mg/l
9.	Kromium / Chromium	Cr	mg/l
10.	Bebola tar / Tarball	Tar	g/100m
11.	Jumlah Karbon Organik / Total Organic Carbon	TOC	mg/l
12.	Nitrat / Nitrate	NO <sup>3-</sup>	mg/l

## PROGRAM PENGAWASAN KUALITI AIR DARATAN (SUNGAI) SURFACE WATER (RIVER) QUALITY MONITORING PROGRAMME

Jabatan Alam Sekitar telah melaksanakan Program Pengawasan Kualiti Air Kebangsaan sejak tahun 2008. Bermula tahun 1995, kerja-kerja ini telah diswastakan kepada Alam Sekitar Malaysia Sdn. Bhd. (ASMA). Pada tahun 2008, sebanyak 1,063 stesen dari 143 lembangan sungai di Malaysia telah dipantau (**Jadual 4.9**). Sampel air yang diambil dari 1,063 stesen dianalisis untuk mengira Indeks Kualiti Air (WQI) berasaskan parameter berikut:-

- Keperluan Oksigen Biokimia (BOD)
- Keperluan Oksigen Kimia (COD)
- Ammoniakal Nitrogen (NH<sub>3</sub>N)
- pH
- Oksigen Terlarut (DO)
- Pepejal Terampai (SS)

Parameter lain seperti logam berat dan bacteria diukur bergantung kepada keperluan tempat. Tambahan pula, sebanyak 10 buah stesen automatik telah dipasang untuk mengesan perubahan secara terus kepada kualiti air sungai di Sg. Perai (Seberang Perai, Pulau Pinang), Sg. Perak (Perak), Sg. Selangor (Selangor), Sg. Kelang (W.P.KL), Sg. Linggi (Negeri Sembilan), Sg. Melaka (Melaka), Sg. Skudai (Johor), Sg. Keratong (Pahang), Sg. Terengganu (Terengganu) dan Sg. Sarawak (Sarawak) (**Jadual 4.9**). Di bawah Program Pencegahan Pencemaran dan Peningkatan Kualiti Air Sungai, lima (5) stesen automatik telah ditubuhkan di Sg. Langat (Selangor), Sg. Labu (N. Sembilan), Sg. Batang Benar (N. Sembilan), Sg. Putat (Melaka) dan Sg. Rajang (Sarawak).

The Department of Environment (DOE) implemented the National River Water Monitoring Programme in 1978. However since 1995 this work was privatized to Alam Sekitar Malaysia Sdn. Bhd. (ASMA). In 2008, a total of 1,063 stations located within 143 river basins in Malaysia were monitored (**Table 4.9**). Water samples taken from the 1,063 stations were analyzed to compute the Water Quality Index (WQI) based on the following parameters :-

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Ammoniacal Nitrogen (NH<sub>3</sub>N)
- pH
- Dissolved Oxygen (DO)
- Suspended Solids (SS)

Other parameters such as heavy metals and bacteria would be measured depending on site requirement. In addition, 10 automatic water quality monitoring stations had been installed to monitor river quality changes on a continuous basis at Sg. Perai (Seberang Perai, Pulau Pinang), Sg. Perak (Perak), Sg. Selangor (Selangor), Sg. Kelang (W.P.KL), Sg. Linggi (Negeri Sembilan), Sg. Melaka (Melaka), Sg. Skudai (Johor), Sg. Keratong (Pahang), Sg. Terengganu (Terengganu) and Sg. Sarawak (Sarawak) (**Table 4.9**). Under the Pollution Prevention and Water Quality Improvement Program, five (5) automatic stations had been installed at Sg. Langat (Selangor), Sg. Batang Benar (Negeri Sembilan), Sg. Labu (Negeri Sembilan), Sg. Putat (Melaka) and Sg. Rajang (Sarawak).

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
 Table 4.9 : DOE: List of the River Catchment And River Monitored, 2008

NEGERI / STATE	KOD WKA/ CODE WQR	LEMBANGAN SUNGAI/ RIVER BASIN	BIL. STESEN/ NO. OF STATIONS	SUNGAI DIAWASI/ RIVERS MONITOTED	BIL. STESEN/ NO. OF STATIONS
PERLIS	01	PERLIS	9	JARUM JERNIH KOK MAK NGULANG PELARIT PERLIS SERAI WANG KELIAN	1 2 1 1 1 1 1 1
KEDAH	01PLA 01PLB 01PLC 03 04 05	KISAP KUAH MELAKA KEDAH MERBOK MUDA	1 1 2 9 10 13	KISAP KUAH PETANG ULU MELAKA JANING KEDAH PDG TERAP PEDU PENDANG TEKAI BAKAR ARANG BATU BONGKOK BUKIT MERAH KOROK MERBOK PETANI TOK PAWANG TUPAH CHEPIR JERUNG KARANGAN KETIL MUDA PEGANG SEDIM TAWAR	1 1 1 1 1 1 4 1 1 1 1 1 1 1 1 1 2 1 1 2 1 1 2 4 1 1 1
P.PINANG	06J	JURU	12	ARA PMTG RAWA JURU KILANG UBI PASIR RAMBAI	1 1 2 5 1 2
P.PINANG/ KEDAH	06P	PERAI	20	AIR MELINTAS JARAK KARANGAN KELADI KEREH KUBANG SEMANG KULIM PERAI PERTAMA SELUANG	1 5 1 1 2 1 3 2 1 1

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
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P.PINANG	06K	PERAI	4	SELUANG BAWAH	2	
		KLUANG		ARA	2	
				KLUANG	1	
				RELAU	1	
	06PP	PINANG		11	AIR ITAM	5
					AIR TERJUN	1
					DONDANG	3
					JELUTONG	1
					PINANG	1
	06PBL	BAYAN LEPAS		3	BAYAN LEPAS	1
					TIRAM	2
	07	JAWI		7	CHEMPEDAK	1
					JAWI	1
JUNJUNG					3	
MACHANG BUBOK					1	
P.PINANG/ PERAK	08	KERIAN	9	TENGAH	1	
				KECHIL	2	
				KERIAN	4	
				SELAMA	2	
				SERDANG	1	
PERAK	09	KURAU	6	ARA	1	
				KURAU	5	
	10	SEPETANG		15	BATU TEGOH	4
					JANA	1
					LARUT	1
					LIDIN	1
					LIMAU	1
					MALAI	1
					SEPETANG	2
					TEMERLOH	2
	TRONG	1				
	11	BRUAS		6	TUPAI	1
					BRUAS	3
					DANDANG	1
	12	RAJA HITAM		8	ROTAN	2
					DERHAKA	2
					MANJONG	2
12W	WANGI		4	NYIOR	1	
				RAJA HITAM	3	
13	PERAK		58	DERALIK	2	
				WANGI	2	
				BATANG PADANG	3	
				BIDOR	3	
				CHENDERIANG	2	
				CHEPOR	1	
				CUAR	1	
				KAMPAR	2	
				KANGSAR	2	
				KEPAYANG	2	
KERDAH	2					
KINJANG	1					

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PERAK		PERAK		KINTA KLAH KLIAN BARU KUANG NYAMOK PARI PELUS PERAK PINJI RAIA SELUANG SEROKAI SINTANG SUNGKAI SUNGKAI MATI TUMBOH	8 2 2 1 1 2 2 8 2 2 1 2 1 2 2
PERAK/ SELANGOR	14	BERNAM	13	BERNAM INKI SLIM TROLAK	7 1 2 3
SELANGOR	15 16	TENGI SELANGOR	3 13	TENGI AIR HITAM BATANG KALI KANCHING KERLING KUNDANG RAWANG SELANGOR SEMBAH SERENDAH	3 1 1 1 1 1 5 1 1
SELANGOR/ W.P.KL	17 18	BULOH KLANG	5 30	BULOH AMPANG BATU BUNOS DAMANSARA GOMBAK JINJANG KERAYONG KEROH KLANG KUYOH PENCHALA	5 1 3 1 3 3 2 2 2 11 1 1
SELANGOR	19	LANGAT	28	ANAK CHUAU BALAK BATANG BENAR BATANG LABU BATANG NILAI BERANANG BUAN CHUAU JIJAN	1 1 2 2 2 1 1 2 1

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
 Table 4.9 : DOE: List of the River Catchment And River Monitored, 2008

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SELANGOR	20	LANGAT	4	LANGAT	8
		SEPANG		LIMAU MANIS	1
N.SEMBILAN	20L	LUKUT	1	LUKUT	1
	21	LINGGI	24	BATANG PENAR	3
				CHEMBONG	1
				KAYU ARA	1
				KEPAYONG	1
				KUNDUR BESAR	1
				LINGGI	6
				PAROI	1
				PEDAS	1
				REMBAU	2
				SENAWANG	1
				SIMIN	1
MELAKA	22	MELAKA	21	BTG.MELAKA	2
				DURIAN TUNGGAL	1
				KEMUNTING	1
				KERU	1
				MELAKA	9
				PUTAT	2
				REMBIA	2
				TAMPIN	3
	23	DUYONG	4	DUYONG	3
				GAPAM	1
	24	KESANG	7	CHIN-CHIN	1
				CHOHONG	2
				KESANG	3
			TANGKAK	1	
24A	MERLIMAU	4	MERLIMAU	4	
24BT	BARU	2	BARU	1	
			TUANG	1	
24SM	SRI MELAKA	2	AIR SALAK	1	
			SRI MELAKA	1	
JOHOR/ N.SEMBILAN	25	MUAR	39	AIR PANAS	1
			GEMAS	1	
			GEMENCHEH	2	
			JUASSEH	2	
			KELAMAH	1	
			LABIS	3	
			MEDA	1	
			MERBUDU	1	
			MERLIMAU	1	

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
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JOHOR/ N.SEMBILAN		MUAR		MUAR P. MENKUANG PALONG SARANG BUAYA SEGAMAT SENARUT SEROM SPG. LOI TENANG	17 1 2 1 1 1 1 1 1
JOHOR	26	BATU PAHAT	20	AMRAN BANTANG BATU PAHAT BEKOK BERLIAN CHAAH LENIK MEREK MERPO SEMBERONG SIMPANG KANAN SIMPANG KIRI AIR BALOI BENUT PARIT HJ. YASSIN PINGGAN ULU BENUT SEGGET AIR HITAM AYER MERAH KELAPA SAWIT PONTIAN BESAR PONTIAN KECIL MELANA SKUDAI ANAK TEBRAU BALA CAW TEBRAU PANDAN PLENTONG SEBULUNG SENGKUANG TAMPOI TEBRAU KEMPAS DANGA RAMBAH JOHOR	1 1 1 5 1 1 1 1 1 2 2 3 3 4 1 1 1 5 1 1 1 4 2 2 9 3 1 1 1 1 1 1 2 2 2 2 2 2 2 2 1 1 2 1 2 1 1
	27A	AIR BALOI	3		
	27B	BENUT	7		
	28	SEGGET	5		
	28A	PONTIAN BESAR	7		
	28B	PONTIAN KECIL	2		
	28C	SKUDAI	11		
	28D	TEBRAU	11		
	28E	KEMPAS	2		
	28F	DANGA	2		
	28G	RAMBAH	2		
	29	JOHOR	39	ANAK SG. SAYONG BELITONG BERANGAN BKT. BESAR CHEMANGAR	2 1 1 2 1

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
 Table 4.9 : DOE: List of the River Catchment And River Monitored, 2008

NEGERI / STATE	KOD WKA/ CODE WQR	LEMBANGAN SUNGAI/ RIVER BASIN	BIL. STESEN/ NO. OF STATIONS	SUNGAI DIAWASI/ RIVERS MONITOTED	BIL. STESEN/ NO. OF STATIONS
JOHOR		JOHOR		JOHOR	5
				LAYANG	1
				LAYAU KIRI	1
				LEBAM	1
				LINGGIU	1
				PANTI	1
				PAPAN	1
				PELEPAH	1
				PENGGELI	1
				REMIS	1
				SANTI	1
				SAYONG	5
				SEBOL	1
				SELUYUT	1
				SEMANGAR	1
				SEMENCHU	1
				SENING	1
				SERAI	1
				TELOR	1
				TEMOH	1
				TIRAM	4
	29B	KAW. PASIR GUDANG	5	BULUH	1
				LATOH	1
				MASAI	1
				PEREMBI	1
				TUKANG BATU	1
	29C	SANGLANG	1	SANGLANG	1
	30	PULAI	3	CHOH	1
				PULAI	2
	30A	SEDILI BESAR	10	AMBAT	1
				DOHOL	1
				MUPUR	1
				PASIR PANJANG	1
				SEDILI BESAR	5
				TEMUBOR KANAN	1
	30B	SEDILI KECIL	6	ANAK SEDILI KECIL	1
				BAHAN	2
				SEDILI KECIL	3
	30C	PALOI	1	PALOI	1
	31A	MERSING	2	MERSING	2
	31B	JEMALUANG	2	JEMALUANG	2
	31C	KIM-KIM	2	KIM-KIM	2
	32	ENDAU	25	ANAK SG. SEMBERONG	1
				DENGAR	1
				ENDAU	2
				JASIN	1
				JEBONG	1
				KAHANG	1
				LENGA	1
				LENGGOR	1
				MAMAI	1

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
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JOHOR		ENDAU		MELATAI	1
				MENKIBOL	3
				PALOH	1
				PAMOL	1
				SELAI	1
				SEMBERONG	6
				SINGOL	1
				TAMOK	1
PAHANG	32AE 33	ANAK ENDAU ROMPIN	2 18	ANAK ENDAU	2
				AUR	1
	BAKAR	1			
	JEKATIH	2			
	JERAM	1			
	KEPASING	1			
	KERATONG	3			
	PONTIAN	1			
	PUKIN	3			
	ROMPIN	4			
	SEPAYANG	1			
	34B	BEBAR	5	BEBAR	1
				MERBA	1
	SERAI	2			
	TEMIANG	1			
	34M	MERCHONG	2	KELAYAT	1
				MERCHONG	1
	35P	PAHANG	91	ANAK SG. LEPAR	1
				BATU	1
				BELAYAR	1
				BENTONG	4
				BENUS	2
				BERA	3
				BERKAPOR	1
				BERTAM	3
				BILUT	1
				BURUNG	1
				CHINI	1
				HABU	1
				JELAI	2
				JEMPOL	2
				JENKA	2
				KELAU	2
				KERTAM	1
				KOYAN	1
				KUNDANG	1
				LEGGOK	1
	LEPAR	3			
	LIPIS	3			
	LUIT	1			
	MARAN	1			
MENTIGA	2				
PAHANG	8				

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
 Table 4.9 : DOE: List of the River Catchment And River Monitored, 2008

NEGERI / STATE	KOD WKA/ CODE WQR	LEMBANGAN SUNGAI/ RIVER BASIN	BIL. STESEN/ NO. OF STATIONS	SUNGAI DIAWASI/ RIVERS MONITOTED	BIL. STESEN/ NO. OF STATIONS				
PAHANG	36	PAHANG	15	PENJURING	1				
				PERTANG	2				
				PERTING	1				
				RINGLET	1				
				SEMANTAN	3				
				SERTING	5				
				T. PAYA BUNGOR	1				
				TAHAN	1				
				TANGLIR	1				
				TASIK BERA	1				
				TASIK CHINI	10				
				TEKAL	1				
				TEKAM	2				
				TELANG	1				
				TELEMONG	1				
				TELOM	2				
				TEMBELING	1				
				TERANUM	1				
				TERAS	1				
				TERLA	1				
				TRIANG	2				
TRINGKAP	1								
PAHANG	37	BALOK	4	BELAT	1				
				CHARU	1				
				GALING BESAR	1				
				GALING KECIL	1				
				KENAU	1				
				KUANTAN	5				
				PANDAN	1				
				PINANG	1				
				REMAN	1				
				RIAU	1				
PAHANG	37A	CHERATING	1	TALAM	1				
				BALOK	2				
PAHANG	37B	TONGGOK	2	YIOR	1				
				PANJANG	1				
TERENGGANU	38	KEMAMAN	9	CHERATING	1				
				TONGGOK	2				
				CHERUL	2				
				KEMAMAN	3				
				NERAM	1				
				PERASING	1				
				RANSAN	2				
				TERENGGANU	39C	CHUKAI	6	BUNGGUS	1
								CHUKAI	1
								IBOK	2
RUANG	2								
TERENGGANU	39K	KERTIH	2	KERTIH	2				
				BESUL	1				
TERENGGANU	40	PAKA	6	PAKA	2				
				RASAU	2				
				RASAU	2				

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
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TERENGGANU	41	PAKA	5	RENGAT	1
		DUNGUN		DUNGUN	4
	42I 42L	IBAI	3	TELEMBOH	1
		MERCHANG		IBAI	3
	42M	MARANG	3	LANDAS	1
				MERCHANG	1
	43	TERENGGANU	12	KERAK	1
				MARANG	1
				TEMALA	1
				BERANG	2
				NERUS	4
	44	SETIU	5	PUEH	2
				TELEMONG	1
45 46	MERANG BESUT	1 4	TERENGGANU	3	
			SETIU	4	
47	KLUANG	1	TAROM	1	
			MERANG	1	
47 48	KEMASIN KELANTAN	5 42	BESUT	3	
			JERTIH	1	
KELANTAN	47K 48	KEMASIN KELANTAN	5 42	KLUANG	1
				KEMASIN	2
	48C 48D 49	PENGKALAN CHEPA PENGKALAN DATU GOLOK	6 3 7	SEMERAK	3
				ARING	1
				BELATOP	2
				BER	1
				BEROK	3
				BETIS	1
				CHIKU	1
				GALAS	5
				KELANTAN	3
				KELESA	1
				KERILLA	2
				KETIL	1
				LEBIR	4
				NAL	3
				NENGGIRI	3
PEHI	1				
PERGAU	6				
RELAI	2				
SOKOR	1				
TUANG	1				
48C 48D	PENGKALAN CHEPA PENGKALAN DATU	6 3	ALOR B	1	
			ALOR LINTAH	1	
48D 49	PENGKALAN DATU GOLOK	3 7	KELADI	1	
			PENGKALAN CHEPA	3	
48D 49	PENGKALAN DATU GOLOK	3 7	PENGKALAN DATU	3	
			GOLOK	5	
49	GOLOK	7	LANAS	1	
			TASIK GARU	1	

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
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SARAWAK	50	KAYAN	3	KAYAN	3				
	50S	SEMUNSAM	1	SEMUNSAM	1				
	51	SARAWAK			KELANTAN	1			
					KUAP	2			
					MAONG KIRI	1			
					SARAWAK	5			
					SARAWAK KANAN	2			
					SARAWAK KIRI	1			
					SEMADANG	1			
					SEMENGGOH	1			
					TABUAN	1			
					SAMARAHAN	2			
					KARANGAN	2			
					SADONG	4			
					TARAT	1			
					AI	2			
					LUPAR	3			
					SEKERANG	1			
					SETERAP	1			
	UNDUP	1							
	54	SARIBAS	3	LAYAR	2				
	55	KERIAN	3	SARIBAS	1				
	56	RAJANG			KERIAN	2			
					SEBLAK	1			
					BALOI	1			
					BINATANG	1			
					JULAU	1			
					KANOWIT	1			
					MERADONG	1			
					RAJANG	12			
					SALIM	1			
					SARIKEI	1			
					OYA	3			
					57	OYA	3	OYA	3
					58	MUKAH	4	MUKAH	4
					59	BALINGIAN	2	BALINGIAN	2
					60	TATAU	1	TATAU	1
					61	KEMENA	5	KEMENA	4
								SIBIU	1
	62	SIMILAJAU	2	SIMILAJAU	2				
	63	SUAI	1	SUAI	1				
	64	NIAH	4	NIAH	2				
	65	SIBUTI			SEKALOH	2			
					KABULOH	2			
					KEJAPIL	1			
					SATAP	1			
					SIBUTI	2			
					ADONG	1			
					DALAM	1			
	66	MIRI	7	LUTONG	2				
				MIRI	2				

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
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NEGERI / STATE	KOD WKA/ CODE WQR	LEMBANGAN SUNGAI/ RIVER BASIN	BIL. STESEN/ NO. OF STATIONS	SUNGAI DIAWASI/ RIVERS MONITOTED	BIL. STESEN/ NO. OF STATIONS
SARAWAK	67	BARAM	5	PADANG LIKU	1
				BARAM	4
				TUTOH	1
				LIMBANG	5
	69	TRUSAN	1	TRUSAN	1
	70	LAWAS	3	LAWAS	3
SABAH	71	MENGGALONG	2	MENGGALONG	2
	71A	LAKUTAN	1	LAKUTAN	1
	71B	LINGKUNGAN	2	BUKAU	1
				LINGKUNGAN	1
	72	PADAS	10	ANSIP	1
				BUNSI	1
				LIAWAN	1
				PADAS	3
				PANGATAN	1
				PEGALAN	2
				TANDULU	1
				MEMBAKUT	1
				BONGAWAN	1
				73	MEMBAKUT
	74A	BONGAWAN	1	BONGAWAN	1
	74	KIMANIS	1	KIMANIS	1
	75	PAPAR	3	PAPAR	3
	76	MOYOG	4	MOYOG	4
	76A	SEMBULAN	2	SEMBULAN	2
	76B	LIKAS	8	DARAU	1
				INANAM	3
	76	TELIPOK	2	LIKAS	2
				MENGGATAL	2
	76C	TELIPOK	2	TELIPOK	2
	77	TUARAN	5	DAMIT	2
				SONG SAI	1
	78	KEDAMAIAN	4	TUARAN	2
				KEDAMAIAN	1
				TEMPASUK	2
				WARIU	1
	78T	TENGHILAN	1	TENGHILAN	1
	79	BINGKONGAN	6	BANDAU	1
BINGKONGAN				2	
			MENGGARIS	2	
			TANDEK	1	
80	BENGGOKA	2	BENGGOKA	2	
82	PAITAN	1	PAITAN	1	
83	SUGUT	6	BONGKUD	1	
			LOHAN	1	
			MERALI	1	
			SUGUT	3	
84	LABOK	7	KINIPIR	2	
			LABOK	1	
			LIWAGU	2	
			MALIAU	1	
			TUNGUD	1	

Jadual 4.9 : JAS : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2008  
 Table 4.9 : DOE: List of the River Catchment And River Monitored, 2008

NEGERI / STATE	KOD WKA/ CODE WQR	LEMBANGAN SUNGAI/ RIVER BASIN	BIL. STESEN/ NO. OF STATIONS	SUNGAI DIAWASI/ RIVERS MONITOTED	BIL. STESEN/ NO. OF STATIONS		
SABAH	84A	SAPI	4	SAPI	3		
				SUALONG	1		
	85	MOUNAD	2	MOUNAD	2		
	85A	SEGALIUD	2	SEGALIUD	2		
	86	KINABATANGAN	10	KARAMUAK	1		
				KINABATANGAN	2		
				KOYAH	1		
				LEEPANG	1		
				MENANGGUL	1		
				PIN	1		
				TAKALA	1		
				TENEGANG BESAR	2		
	87			SEGAMA	3	SEGAMA	3
	88			TUNGKU	2	TUNGKU	2
	88A			SILABUKAN	2	SILABUKAN	2
	89			TINGKAYU	2	TINGKAYU	2
	90			KALUMPANG	5	KALUMPANG	3
		PANG BURONG 1	1				
		PANG BURONG 2	1				
	91A	APAS	1	APAS	1		
	91B	BALUNG	1	BALUNG	1		
	91	TAWAU	4	TAWAU	4		
	92	MEROTAI	3	MEROTAI	3		
	93	UMAS-UMAS	1	UMAS-UMAS	1		
	94	BRANTIAN	1	BRANTIAN	1		
	95	KALABAKAN	3	KALABAKAN	3		
	<b>JUMLAH/TOTAL</b>					<b>1,063</b>	



Sungai Sumber Air  
 River Water Sources

## PEMANTAUAN KUALITI AIR TANAH GROUNDWATER MONITORING

Pada tahun 2008, sebanyak 335 sampel daripada 112 buah telaga pemantauan kualiti air tanah di seluruh Malaysia telah dianalisis. Telaga dibina di kawasan-kawasan mengikut kategori guna tanah pertanian, perindustrian, padang golf, tapak pelupusan sampah, tapak penstoran radioaktif, pelupusan tapak J.E, kawasan bekalan air, bekas tapak perlombongan, perbandaran dan luar bandar di seluruh Malaysia (**Jadual 4.10**).

Pengukuran parameter-parameter fizikal kualiti air tanah dibuat secara in-situ manakala parameter kimia dan biologi dianalisis di makmal. Parameter in-situ yang diukur adalah suhu, pH, konduktiviti, turbiditi, saliniti (kemasinan) dan oksigen terlarut. Parameter yang dianalisis di makmal pula ialah bahan kimia organik meruap (VOC), hidrokarbon, racun perosak, logam berat, anion, bakteria, sebatian berfenol, radioaktif, jumlah keliatan dan jumlah pepejal terlarut.

In 2008, 335 groundwater samples were drawn on a quarterly basis from 112 monitoring wells in Malaysia for analysis. The wells had been constructed in areas categorized according to landuse; agriculture, industrial, golf course, solid waste landfill, radioactive storage, animal burial, municipal water supply, ex-mining (gold mine) and urban/suburban areas (**Table 4.10**).

Samples for in-situ measurement and samples for laboratory analysis were collected at each station. In-situ parameters were temperature, pH, conductivity, salinity, dissolved oxygen and turbidity. For laboratory analysis, the parameters were total volatile organic compounds (VOC), pesticides, heavy metals, anions, bacteria, phenolic compounds, radioactivity, total hardness and total dissolved solids.

**Jadual 4.10 JAS: Taburan Telaga-telaga Pemantauan Air Bawah Tanah, 2008**  
**Table 4.10 DOE : Distribution of Groundwater Monitoring Wells, 2008**

Kategori / Category	Bilangan Telaga / Number of Wells
Kawasan Pertanian / Agricultural Areas	12
Bandar / Urban Suburban Areas	11
Tapak Perindustrian / Industrial Sites	18
Tapak Pelupusan Sampah / Landfills	26
Padang Golf/ Golf Courses	7
Tapak Radioaktif / Radioactive Sites	0
Luarbandar / Rural Areas	5
Bekas Lombong / Ex-Mining	3
Bekalan Air Tempatan / Municipal Water Supply	9
Tapak Pelupusan Bangkai Haiwan / Animal Burial	14
Kolam Akuakultur / Aquaculture Farms	6
Peranginan/ Resorts	1
<b>Jumlah/ Total</b>	<b>112</b>

## RANCANGAN KONTIGENSI KEBANGSAAN KAWALAN TUMPAHAN MINYAK (RKKKTM) NATIONAL OIL SPILL CONTINGENCY PLAN (NOSCP)

RKKKTM ditadbir oleh Jawatankuasa Kebangsaan Kawalan Tumpahan Minyak (JKKTM) yang dianggotai oleh 18 Jabatan dan agensi, dipengerusikan oleh Jabatan Alam Sekitar Malaysia (JAS) dan dibantu Jabatan Laut Malaysia (JLM). Disamping itu penubuhan beberapa rangkaian stokpile peralatan kawalan tumpahan minyak (KTM) di lokasi-lokasi strategik sepanjang Pantai Barat dan Pantai Timur Malaysia dapat membantu dan menyegerakan tindakan kawalan tumpahan minyak sekiranya berlaku. JAS juga memberi penekanan terhadap latihan-latihan berstruktur dan berkala bagi semua kakitangan yang terlibat dengan OSR dalam tindakbalas KTM. Latihan-latihan berkenaan adalah bagi memastikan semua kakitangan JAS dan agensi-agensi yang akan terlibat dalam KTM dibekalkan dengan pengetahuan dan kemahiran yang mencukupi dalam pengendalian peralatan dan pengurusan krisis. Resolusi 7 International Convention on Oil Spill Preparedness and Response, telah menggariskan komitmen di peringkat Antarabangsa dalam hal-ehwal berhubung dengan latihan. Keperluan latihan ini telah dimasukkan ke dalam mekanisma tindakbalas RKKKTM.

Pada tahun 2008, JAS telah menganjurkan Latihan Melawan Tumpahan Minyak Peringkat Kebangsaan di dua lokasi iaitu Kerteh, Terengganu (12-14 Ogos 2008) dan Miri, Sarawak (19-21 Ogos 2008). Berbeza daripada tahun-tahun sebelumnya, latihan pada kali ini telah diadakan di dua lokasi bagi membolehkan penglibatan lebih ramai kakitangan peringkat operasi dan organisasi setempat. Latihan bertujuan menguji:-

- kesediaan tindakbalas peringkat pertama;
- tindakan di bawah RKKKTM dari sudut penyelarasan, pelaksanaan pelan dan komunikasi;
- kesediaan Pelan Tindakan Pembersihan Pantai Peringkat Negeri; dan
- Menilai keperluan penyediaan Rancangan Kontingensi Peringkat kedua Negeri.

The NOSCP is administered by the National Oil Spill Control Committee (NOSCC) consisting of 18 member departments and agencies, chaired by the Department of Environment Malaysia (DOE) and assisted by the Marine Department of Malaysia (MARDEP). Apart from the establishment of adequate Oil Spill Response Equipment (OSRE) bases that are strategically positioned throughout the Eastern and Western Coast of the nation, scheduled and periodical training activities for personnel involved in oil spill response (OSR) were also conducted. Such training was aimed to ensure DOE officers involved in OSR were well equipped with the necessary knowledge and skills in equipment handling and crisis management. Resolution 7 of the International Convention on Oil Spill Preparedness and Response (OPRC) 1990 provides for an international commitment for training and preparedness. This preparedness and training requirement has been incorporated into the NOSCP response system.

In 2008, DOE organized the National Oil Spill Preparedness and Response Exercise in two locations namely Kerteh, Terengganu (12-14 August 2008 and Miri, Sarawak (19-21 August 2008). Unlike in the past, this time around the national level exercise was held in two locations to provide participation opportunity for operational level officers and local organizations. The exercise aimed at testing:-

- Tier 1 preparedness and response;
- NOSCP in terms of coordination for plan implementation and communication;
- preparedness and response of State Beach Clean-up Plan; and
- assess the need for a State Tier 2 Contingency Plan.

Kerjasama dan sokongan padu agensi-agensi ahli JKKTM serta organisasi peringkat Negeri yang berkaitan telah menjayakan latihan ini.

The meticulous planning and successful execution of this exercise was attributed significantly to the support and commitment of NOSCC member agencies and relevant State level organizations.



Mobilisasi peralatan di laut.  
Off-Shore Deployment



Peserta diberi latihan hands-on semasa mobilisasi peralatan di laut  
Participants under-going hands-on training during off-shore deployment



Para peserta menjalani latihan table-top pada hari kedua  
Participants undergoing Table-top Exercise on day-2

## JAWATANKUASA TABUNG PUSINGAN BAGI SELAT MELAKA DAN SELAT SINGAPURA (RFC) STRAITS OF MALACCA AND SINGAPORE REVOLVING FUND COMMITTEE (RFC)

Pada 11 Februari 1981, satu Memorandum Persefahaman (MoU) telah ditandatangani diantara kerajaan Malaysia, Indonesia, Singapura dan *Malacca Straits Council* bagi pihak Jepun untuk mewujudkan Tabung Pusingan Selat Melaka dan Selat Singapura sebagai salah satu usaha bersama untuk mengawal kejadian tumpahan minyak yang berpunca dari kapal-kapal yang melayari perairan Selat Melaka dan Selat Singapura.

Pengurusan Tabung Pusingan berkenaan ditadbir oleh *Maritime and Port Authority* (MPA), bagi pihak Singapura untuk tempoh lima (5) tahun mulai 1 April 2006 hingga 31 Mac 2011.

Di antara aktiviti-aktiviti yang dilaksanakan oleh Jawatankuasa Tabung Pusingan pada tahun 2008 adalah seperti berikut:

- Mesyuarat Pengurusan Jawatankuasa Tabung Pusingan ke-29 telah diadakan dari 20-21 Mei 2008 di Singapura.
- Tiga (3) orang peserta masing-masing dari Malaysia, Singapura dan Indonesia telah dibiayai ke IMO Level -2Type and Table – Top Exercise pada 7 Ogos 2008 di Singapura.
- Tiga (3) orang peserta masing-masing dari Malaysia, Singapura dan Indonesia telah dibiayai untuk menghadiri ke *Singapore International Bunkering Conference (SIBCON)* dari 15-17 Oktober 2008.
- Mesyuarat Teknikal Jawatankuasa Tabung Pusingan telah berlangsung di Singapura pada 30 Oktober 2008.

On 11 February 1981, a Memorandum of Understanding (MoU) was signed between the Government of Malaysia, Indonesia, Singapore and the Japanese Malacca Straits Council, for the establishment of a Revolving Fund to combat oil spills from vessels plying the Straits of Malacca and Singapore.

The Fund is currently administered by the Maritime and Port Authority of Singapore on behalf of the Republic of Singapore for duration of five (5) years beginning 1 April 2006 until 31 March 2011.

Among the activities carried out by the RFC in 2008 were:

- 29<sup>th</sup> Revolving Fund Committee (RFC) Management Meeting was held from 20 to 21 May 2008 in Singapore
- Three (3) participants from Malaysia, Singapore and Indonesia were sponsored to the IMO Level -2Type and Table – Top Exercise held on 7 August 2008 in Singapore.
- Three (3) participants from Malaysia, Singapore and Indonesia were sponsored to attend the Singapore International Bunkering Conference (SIBCON) from 15 to 17 October 2008.
- RFC Technical Meeting 2008 was convened in Singapore on 30 October 2008.



**29th REVOLVING FUND COMMITTEE MEETING**  
20 - 21 MAY 2008  
ORCHARD HOTEL, SINGAPORE



Mesyuarat Teknikal Jawatankuasa Tabung Pusingan, 20-21 Mei 2008  
Revolving Fund Committee Meeting, 20-21 May 2008



Pantai Yang Tidak Tercemar  
Unpolluted Beach

## PENCEMARAN MARIN MARINE POLLUTION

Pada tahun 2008, terdapat 12 kes pencemaran marin berpunca daripada tumpahan minyak dilaporkan; tujuh (7) kes dikesan di Laut China Selatan, satu (1) di Selat Melaka, satu (1) di Laut Sulu dan tiga (3) di Selat Johor (**Jadual 4.11**). Kebanyakan kejadian tumpahan minyak adalah kecil dan tidak melibatkan kerja-kerja pembersihan.

Tindakan rondaan yang berterusan oleh Agensi Penguatkuasaan Perundangan Maritim (APPM) dan operasi bersepadu telah dipertingkatkan dalam menangani kejadian pelepasan dan pembuangan haram sisa minyak ke dalam perairan Malaysia.

Operasi bersepadu penguatkuasaan marin yang dijalankan di perairan Malaysia di antara Agensi Penguatkuasaan Perundangan Maritim Kebangsaan dan negara jiran bagi menangani pelbagai isu termasuk pencemaran marin.

In 2008, 12 cases of marine pollution from oil spills were reported; seven (7) cases in the South China Sea, one (1) in the Straits of Malacca, one (1) in Sulu Sea and three (3) in the Johor Straits (**Table 4.11**). Most of the oil spill incidents were minor and did not require clean up.

Continuous surveillance by Maritime Law Enforcement Agencies (MLEA) and Joint Marine Enforcements were increased to overcome illegal discharges and dumping of oily waste into Malaysian Waters.

Continuous joint marine enforcements were conducted in Malaysian Waters with National Maritime Law Enforcement Agencies and neighboring countries to tackle various maritime issues including marine pollution.

**Jadual 4.11 JAS: Kejadian Pencemaran Minyak, 2008**  
**Table 4.11 DOE: Oil Pollution Incidents, 2008**

Lokasi/Location	Kawasan/Area		Bil. Kes/ No. of Cases
Laut China Selatan/ South China Sea	Perairan Malaysia/ Malaysia Territory	Semenanjung/Peninsular	2
		Malaysia Timur/ East Malaysia	5
	Zon Ekonomi Eksklusif (EEZ)/ Exclusive Economic Zone (EEZ)		0
Laut Sulu/Sulu Sea	Perairan Malaysia/ Malaysia Territory	Sabah	1
Selat Melaka/ Straits of Malacca	Perairan Malaysia/Malaysia Territory		1
	Zon Ekonomi Eksklusif (EEZ)/ Exclusive Economic Zone (EEZ)		0
Selat Johor/ Straits of Johor	Perairan Malaysia/ Malaysia Territory	Bahagian Barat/ West Part	0
		Bahagian Timur/ East Part	3
<b>Jumlah/Total</b>			<b>12</b>

## PENGURUSAN BUANGAN TERJADUAL SCHEDULED WASTES MANAGEMENT

### Import dan Eksport Buangan Terjadual

Pada tahun 2008, sebanyak enam (6) Kebenaran Bertulis telah dikeluarkan untuk mengimport 149,535 tan metrik buangan untuk tujuan penggunaan sebagai bahan mentah industri (**Jadual 4.12**). Buangan yang diimport ialah buangan gipsum dari loji janakuasa, sanga kuprum, asid terpakai, buangan kaca daripada tiub sinar katod dan enapcemar kalsium hidroksida. Sejumlah 5,720 tan metrik buangan terjadual telah dieksport untuk tujuan pemerolehan kembali (**Jadual 4.13**). Buangan yang dieksport kebanyakannya terdiri daripada enapcemar hidroksida logam, sanga zink dan mangkin terpakai daripada 45 pengeluar buangan untuk pemerolehan kembali logam di luar negara (**Jadual 4.14**).

### Kebenaran Bertulis dan Lesen Premis Yang Ditetapkan

Sebanyak 63 Kebenaran Bertulis telah diluluskan oleh Ketua Pengarah untuk pembinaan kemudahan pengolahan dan pelupusan buangan terjadual pada tahun 2008. Kebenaran Bertulis berkenaan telah dikeluarkan kepada 21 kemudahan pemerolehan kembali separa (e-waste), 27 kemudahan pemerolehan kembali (bukan e-waste), 5 (lima) kemudahan pemerolehan kembali penuh (e-waste), 7 (tujuh) kemudahan penstoran luar tapak, 2 (dua) kemudahan pengolahan luar tapak dan 1 (satu) insinerator buangan terjadual.

Disamping itu, sejumlah 609 lesen diluluskan kepada kemudahan baru dan kemudahan sediaada untuk pemerolehan kembali luar tapak, penstoran luar tapak-pengangkutan, penunu, buangan terjadual, pengolahan atas tanah, pengolahan luar tapak dan tapak pelupusan selamat. (**Jadual 4.15**).

### Import and Export of Scheduled Wastes

In 2008, six (6) Written Approvals were issued for the import of 149,535 tonnes of wastes for use as raw materials in industrial processes (**Table 4.12**). The imported wastes comprised of copper slag, waste gypsum arising from power plant, copper slag, spent acid, waste glass from cathode ray tube and calcium hydroxide sludges. A total of 5,720 tonnes of scheduled wastes were exported for recovery operations (**Table 4.13**). The exported wastes were derived from 45 waste generators and comprised mainly of metal hydroxide sludges, zinc dross, spent catalyst phenolic resin and used toner for metal recovery in foreign countries (**Table 4.14**).

### Written Permission and Licences for Prescribed Premises

Sixty-three (63) Written Permissions were granted by the Director General in 2008 for the construction of treatment and disposal facility for scheduled wastes; 21 off-site partial recovery plants (e-waste), 27 off-site recovery plants (non e-waste), 5 (five) off-site full recovery plants (e-waste), 7 (seven) off-site storage facilities, 2 (two) off-site treatment facilities and 1 (one) scheduled waste incinerator.

A total of 609 licences were issued for both existing and new facilities for off-site recovery, off-site storage-transportation, scheduled wastes incinerators, land treatment, off-site treatment and secured landfills (**Table 4.15**).

Jadual 4.12 JAS: Kuantiti dan Jenis Buangan Terjadual Yang Dieksport (Tan), 2004–2008  
Table 4.12 DOE: Quantity and Types of Scheduled Wastes Exported (Tonnes), 2004–2008

Jenis Buangan Type of Waste	Tahun / Year				
	2004	2005	2006	2007	2008
Enapcemar Hidroksida Logam/ Metal Hydroxide Sludge	2,494	2,288	1,769	2,592	2816
Mangkin Terpakai / Spent Catalyst	722	215	645	794	364
Bahan Blasting Terpakai/ Used Blasting Material	25	-	105	120	120
Dross zink / Zinc Dross	-	2,347	1,082	1,050	200
Buangan Bateri Nikel-Kadmium/ Waste of Nickel Cadmium Battery	103	272	117	-	-
Toner Terpakai / Used Toner	-	-	139	47	50
Buangan mengandungi formaldehid/ Waste Containing Formaldehyde	-	-	24	132	-
Buangan Elektrikal & Elektronik/ Electrical & Electronic Wastes	-	90	1,925	2,350	2089
Buangan Mengandungi Merkuri/ Solid Waste Containing Mercury Compound	-	-	-	23	-
Bekas-Bekas Terpakai Mengandungi Bahan Kimia Used Drums Containing Chemicals	10	12	-	-	-
Phenolic Resin	-	-	-	-	81
<b>Jumlah (Tan) / Total (Tonnes)</b>	<b>3,354</b>	<b>5,224</b>	<b>5,806</b>	<b>7,108</b>	<b>5,720</b>

Jadual 4.13 JAS: Kuantiti dan Destinasi Buangan Terjadual Yang Dieksport (Tan), 2004-2008  
Table 4.13 DOE: Quantity and Destination of Scheduled Wastes (Tonnes) Exported, 2004-2008

Negara Pengimport/ Importing Country	Tahun/Year				
	2004	2005	2006	2007	2008
Amerika/ America	25	-	1,847	1,721	1,882
Australia/ Australia	-	-	-	-	-
Belgium/ Belgium	51	-	119	807	242
China/ China	-	-	79	-	-
Estonia/ Estonia	-	-	-	33	-
Filipina/ Philippines	1,000	1,000	1,280	-	-
Finland/ Finland	190	-	381	360	333
Holland/ Holland	295	-	-	-	-
Itali/ Italy	-	-	98	92	90
Jepun/ Japan	1,019	1,793	660	2,092	1,462
Jerman/ Germany	476	492	537	1,681	1,396
Korea Selatan/ South Korea	-	-	117	-	-
Kanada/ Canada	80	-	-	-	-
Perancis/ France	189	272	-	-	-
Singapura/ Singapore	23	14	10	11	-
Sweden/ Sweden	6	8	21	35	66
Afrika Selatan/ South Africa	-	1,555	424	140	160
Thailand/ Thailand	-	90	233	136	89
<b>Jumlah (Tan) / Total (Tonnes)</b>	<b>3,354</b>	<b>5,224</b>	<b>5,806</b>	<b>7,108</b>	<b>5,720</b>

Jadual 4.14 JAS: Kuantiti, Jenis dan Negara Buangan Terjadual yang Diimport (Tan), 2004–2008  
 Table 4.14 DOE: Quantity, Types and Origin of Scheduled Wastes Imported (Tonnes) by Type and Origin, 2004–2008

Jenis Buangan Type of Waste	Tahun Year		2004	2005	2006	2007	2008
	Negara Country						
Sangga Kuprum / Copper Slag	Singapura/ Singapore		58,723	58,774	33,674	28,400	44,000
Sangga Peleburan Granulated Blast Furnace Slag	Singapura/ Singapore		70		0	0	0
	Jepun/ Japan		293,614	241,872	0	0	0
	China/ China		0		0	0	0
Buangan Gypsum Dari Janakuasa/ Waste Gypsum From Power Plant	Singapura/ Singapore		0	0	132,833	84,890	56,400
Buangan Kaca CRT/ Waste Glass From CRT	Amerika Syarikat/ United States		0	0	4,628	14,966	40,000
Asid Terpakai Spent Ultra High Acid	Singapura/ Singapore		0	0	1,016	3,276	2,540
Mangkin Terpakai Spent Catalyst	Singapura/ Singapore		1,108	6,000	0	0	0
Kalsium Hydroxide Sludge Sludge Calcium Hydroxida	Singapura/ Singapore		0	0	0	1,542	6,595
<b>Jumlah (Tan)/ Total (Tonnes)</b>			<b>353,515</b>	<b>306,646</b>	<b>172,151</b>	<b>133,074</b>	<b>149,535</b>



Pembuangan Haram Bahan Buangan Terjadual  
 Illegal Dumping of Scheduled Waste

Jadual 4.15 JAS: Lesen-Lesen Yang Dikeluarkan Bagi Kemudahan Pengolahan dan Pelupusan Buangan Terjadual, 2008  
Table 4.15 DOE: Licensed Scheduled Waste Treatment and Disposal Facilities, 2008

Kemudahan/Facility	Negeri/State													Jumlah/ Total
	JHR	KDH	MLK	N.S.	PHG	PRK	P.P	SBH	SRK	SLG	TRG	W.P. KL	W.P. Labuan	
Penstoran Luar Tapak-Pengangkutan Off Site Storage-Transport	44	20	17	17	4	24	55	6	20	60	2	10	4	283
Penstoran Luar Tapak Off Site Storage	-	-	-	1	-	-	-	-	9	1	-	-	2	13
Pemerolehan Kembali/Off Site Recovery	27	4	1	8	8	20	12	-	4	25	6	-	-	115
a. Pemerolehan Kembali Penuh bukan e-Waste/Full Off Site Recovery none e-Waste	2	1	3	1	-	1	5	-	-	2	-	-	-	15
b. Pemerolehan Kembali Penuh e-Waste/Full Off Site Recovery e-Waste	15	15	11	8	-	2	36	-	7	28	-	6	-	128
c. Pemerolehan Kembali Separa e-Waste/Half Off Site Recovery e-Waste	7	1	1	3	-	2	3	5	10	4	4	-	1	41
Insinerator Buangan Terjadual/Scheduled Waste Incinerator	-	-	-	1	-	-	-	-	1	-	-	-	1	3
Pengolahan Di atas Tanah/Landfarm	-	-	-	4	-	-	-	-	2	-	-	-	-	6
Pengolahan Luar Tapak/Off Site Treatment	-	1	-	2	-	-	-	-	1	-	1	-	-	5
Tapak Pelupusan Selamat/Secured Landfill	95	42	33	45	12	49	111	11	54	120	13	16	8	609
Bil. Lesen/No. of License	42	24	16	26	6	27	58	5	36	64	7	6	8	325

Nota/Note:

JHR - JOHOR  
KDH - KEDAH  
MLK - MELAKA  
N.S - NEGERI SEMBILAN  
PRK - PERAK  
PP - PULAU PINANG  
PHG - PAHANG  
SBH - SABAH  
SLG - SELANGOR  
SRK - SARAWAK  
TRG - TERENGGANU  
W.P. KL - WILAYAH PERSEKUTUAN KUALA LUMPUR  
W.P. Labuan - WILAYAH PERSEKUTUAN LABUAN

## PROJEK ENVIRONMENTALLY HAZARDOUS SUBSTANCES (EHS) ENVIRONMENTALLY HAZARDOUS SUBSTANCES (EHS) PROJECT

### Latarbelakang

Pendedahan terhadap *Environmentally Hazardous Substances* (EHS) dan *unregulated chemicals* ke atas alam sekitar dan manusia yang didapati telah digunakan secara meluas dalam kebanyakan produk amat membimbangkan. Pengumpulan bahan-bahan kimia ini secara berterusan dalam satu jangkamasa yang panjang dalam ekosistem dan manusia telah mendorong kesedaran peri-pentingnya pemahaman kepada bahan-bahan kimia ini dan langkah-langkah kawalan yang efektif sangat diperlukan. Oleh sebab itu, terdapat beberapa keperluan antaranya:

- (i) Satu strategi yang menyeluruh dan tersusun terutamanya aktiviti-aktiviti yang dapat meningkatkan keupayaan dan kesedaran dalam pengurusan bahan-bahan kimia;
- (ii) Maklumat berkaitan dengan penggunaan bahan-bahan kimia berbahaya di Malaysia dan metodologi pelaksanaan untuk penilaian risiko kepada manusia dan alam sekitar; dan
- (iii) Kemampuan dari segi staf dan latihan dalam mengendalikan bahan-bahan kimia secara menyeluruh, terutamanya penilaian risiko dalam mengendalikan peralatan bahan-bahan kimia.

Bagi mencapai keperluan ini, Skim Pemberitahuan dan Pendaftaran EHS telah dicadangkan untuk dilaksanakan di bawah *EHS Component, Malaysian-Danish Environmental Cooperation Programme*.

Kementerian Sumber Asli dan Alam Sekitar bersama-sama dengan Jabatan Alam Sekitar telah bekerjasama dengan Kerajaan Denmark dalam melaksanakan projek EHS sejak tahun 2006. Objektif projek ini adalah untuk menubuhkan suatu sistem pengurusan yang efektif dan mampan yang mampu meminimumkan dan mengurangkan risiko daripada EHS.

### Background

The increasing concern about human and environmental exposure from Environmentally Hazardous Substances (EHS) and unregulated chemicals used in a wide range of products and the long term persistence and continued accumulation of the many chemicals in the eco-system and humans has prompted the recognition on the importance of understanding the potential hazards and the need for effective chemicals control measures. Hence there is a need for the following:

- (i) An overall strategy and coordination of activities as well as an increased capacity and awareness of chemicals management;
- (ii) Information on the use of hazardous chemicals in Malaysia and for implementation of methodologies for assessment the risks to human and the environment; and
- (iii) Capacity in terms of staff and training for the management of chemicals in general and particularly with respect to the use of risk assessment as a chemical management tool.

To address these needs, an EHS Notification and Registration Scheme (Scheme) has been proposed for implementation under the EHS Component of the Malaysian-Danish Environmental Cooperation Programme.

The Ministry of Natural Resources and Environment together with the Department of Environment and with the cooperation from the Denmark Government started the EHS project in 2006. The objective for this project is to establish an effective and sustainable management system that will minimize and reduce the risks from EHS.

Terdapat tiga (3) sub-komponen di bawah projek ini;

### **Sub-komponen 1: Pelan Strategi dan Tindakan**

Objektif – Kelompangan yang wujud di dalam pengurusan EHS di Malaysia telah dikenalpasti dan pendekatan strategik melalui pengurusan EHS yang lebih mampan telah dicadangkan. Satu draf pelan strategi dan tindakan nasional bagi pengurusan EHS telah dikemukakan, manakala satu perjanjian telah dicapai berhubung dengan struktur penyelarasan antara agensi untuk suatu jangka masa panjang.

### **Sub-komponen 2: Skim Perintis (a) Sistem Pemberitahuan dan Pendaftaran Kimia dan (b) Penilaian Risiko EHS**

Objektif – Perintis bagi Skim Pemberitahuan EHS telah dilaksanakan dan pendaftaran bagi bahan-bahan kimia berbahaya yang mengandungi EHS telah dimulakan. Skim perintis bagi penilaian risiko bahan-bahan kimia kepada manusia dan alam sekitar sedang dibangunkan.

### **Sub-komponen 3: Pembinaan Keupayaan Dalam Pengurusan Bahan Kimia**

Objektif – JAS telah membangunkan kepakaran dalam pengurusan dan penilaian risiko berkaitan dengan EHS, manakala staf daripada lain-lain agensi 'stakeholder', institusi-institusi, industri-industri dan NGO telah diberikan latihan dalam pengurusan bahan kimia yang tertumpu kepada fungsi tugas masing-masing.

## **Aktiviti-Aktiviti EHS pada 2008**

### **Sub-komponen 1**

Satu usaha penghasilan draf pelan strategi dan tindakan EHS telah dilakukan dan ianya dalam proses di peringkat akhir yang telah dibentangkan kepada semua 'stakeholders' semasa 'Final Conclusive Workshop' pada 23-24 April 2009.

There are 3 (three) sub-components under this project;

### **Sub-component 1 : Strategy and Action Plan**

Objective - Gaps within the management of EHS in Malaysia are identified and strategic approaches towards sustainable management of EHS are proposed. A draft national strategy and action plan for the management of EHS is developed, and agreement has been reached on a longer-term interagency coordinating structure.

### **Sub-component 2: Pilot Schemes on (a) A Notification System and Chemical Register and (b) Risk Assessment of EHS**

Objective- A pilot notification scheme for EHS is conducted and a register for hazardous chemical substances including EHS is started. A pilot scheme for assessment of risk of chemicals to humans and the environment is developed

### **Sub-Component 3: Capacity Building in Chemicals Management**

Objective - The DOE has developed expertise on assessment and management of risks due to EHS, and staff from other stakeholder agencies, institutions, industries and NGOs has received training in selected areas of chemical management as relevant for their administrative functions

## **EHS activities in 2008**

### **Sub-component 1**

An effort to develop a draft strategy and action plan for EHS was initiated and in the process of final stage to be presented to all stakeholders during the final conclusive workshop which is scheduled on 23-24 April 2009.

### Sub-komponen 2 (a) & (b)

Satu majlis pelancaran bagi *software on notification and registration scheme of EHS* telah diadakan pada 15 Julai 2008.

Satu skim pilot bagi sistem notifikasi dan pendaftaran EHS telah dibangunkan dan sedia untuk digunakan oleh pihak pengimport dan pengilang yang mengimport atau menghasilkan EHS.

Beberapa siri seminar dan program kesedaran dengan kerjasama dari CICM telah diadakan mengikut zon iaitu zon tengah (Wisma FMM, Damansara), zon utara (Penang) dan zon selatan (Johor Bahru).

Beberapa siri latihan *on-hands* training bagi penggunaan sistem notifikasi dan pendaftaran telah dianjurkan oleh JAS untuk industri bertempat di bilik ICT, JAS Putrajaya.

Kursus berkaitan dengan *risk assessment* telah diadakan dan disertai oleh pegawai-pegawai dari JAS dan agensi-agensi lain seperti SIRIM, NIOSH, JKPP, *Pesticide Board* dan *Pharmaceutical Board*.

Satu latihan penilaian risiko telah dijalankan ke atas tiga (3) *substance* yang terpilih iaitu *nonylphenol, benzene dan chlorpyrifos*. Hasil daripada latihan ini, satu laporan penilaian risiko telah disiapkan dan dibentangkan kepada *stakeholders* semasa bengkel diadakan.

### Sub-komponen 3

Satu program sangkut yang disertai oleh pegawai-pegawai dari JAS, JKPP, *Pesticide Board* dan SIRIM telah diadakan pada 7-27 Jun 2008 bertempat di *Danish Technical University* dan *Danish Food Technology, Copenhagen Denmark*.

Latihan asas mengenai *Gobally Harmonized System* (GHS) dan penilaian risiko kepada pegawai-pegawai JAS telah diadakan pada 23 Mei dan 3-4 Jun 2008.

### Sub-component 2 (a) & (b)

The EHS notification and registration system is scheduled to be launched in 15 July 2008.

A system on notification and registration of EHS was developed for importers and manufacturers that import or produce EHS

A series of seminars and awareness programs with the cooperation from CICM were done according to zones; central zone (Wisma FMM, Damansara), northern zone (Penang) and southern zone (Johor Bahru).

A series of practical training for notification and registration of EHS were organized by DOE for industries in DOE Headquarters, Putrajaya.

Risk Assessment courses were conducted and officers from DOE and other agencies such as NIOSH, DOSH, Pesticide Board and the Pharmaceutical Services Division participated.

A training on risk assessment for three (3) selected substances namely *nonylphenol, benzene and chlorpyrifos* was done and results were presented to the stakeholders during the workshop.

### Sub-component 3

An attachment programme attended by officers from DOE, DOSH, Pesticide Board and SIRIM was held from 7–27 June 2008 at the Danish Technical University and Danish Food Technology, Copenhagen, Denmark.

Basic training for Globally Harmonized System (GHS) and risk assessment for DOE officers were conducted on 23 May and 3–4 June 2008.

## PENGUATKUASAAN TERHADAP AKTIVITI PEMBAKARAN TERBUKA ENFORCEMENT AGAINST OPEN BURNING ACTIVITIES

Sepanjang tahun 2008, semua pejabat JAS Negeri telah meneruskan operasi rondaan mencegah pembakaran terbuka di kawasan-kawasan yang dikenalpasti sebagai kawasan yang cenderung berlaku kebakaran. Sejumlah 3,661 kes pembakaran terbuka yang dikesan dan disiasat termasuk *hotspot* yang dikesan melalui satelit (**Jadual 4.16 & Jadual 4.17**)

Kejadian pembakaran terbuka sering berlaku di kawasan pertanian (1,249), ladang (200), belukar (192) dan industri (248) terutamanya semasa cuaca panas dan kering iaitu pada bulan Februari (322), Mei (417), Ogos (581) dan September (551). Daripada 3,661 kes pembakaran terbuka tersebut, 249 kes telah dikompaun sebanyak RM303,050.00 dan 12 kes telah dikenakan tindakan mahkamah.

### Pengawasan Melalui Udara

Program Pengawasan Melalui Udara diteruskan pelaksanaannya pada tahun 2008 untuk mengawasi dan mengesan dari udara kejadian pencemaran alam sekitar seperti aktiviti pembakaran terbuka, pelepasan dari industri, pencemaran pantai dan laut, dan aktiviti pembukaan tanah serta pembangunan di kawasan tanah tinggi dan pembangunan di pulau-pulau. Maklumat mengenai kejadian pencemaran alam sekitar yang dikesan melalui pengawasan dari udara ini disalurkan terus ke bilik operasi JAS untuk diambil tindakan penguatkuasaan oleh pegawai penguatkuasa di lapangan.

Sejumlah RM2,669,942.28 diperuntukkan di bawah Projek Pembangunan pada tahun 2008 untuk pelaksanaan program ini. Sepanjang program ini, sebanyak 230 bilangan penerbangan yang melibatkan 980.09 jumlah jam penerbangan telah dilaksanakan.

Throughout 2008, DOE State Offices continued to conduct daily ground surveillance of fire prone areas. A total of 3,661 open burning cases were investigated, including hotspots detected via satellites (**Table 4.16 & Table 4.17**).

Frequent incidents of open burning were found to occur in agricultural areas (1,249), plantations (200), bushes (192) and industries (248) especially during the hot and dry period in the months of February (322), May (417), August (581) and September (551). Out of 3,661 open burning cases detected, 249 cases were issued compounds amounting to RM330,050.00 and 12 cases were prosecuted in court.

### Airborne Surveillance

The National Airborne Surveillance Programme continued in 2008 to monitor and detect environmental pollution due to open burning activities, emission from industries, coastal and marine pollution, land clearing activities on highland and island development. Information on environmental pollution activities detected from the air surveillance would be transmitted directly to the DOE operation room for follow up on enforcement actions by ground surveillance staff.

A development budget of RM2,669,942.28 was allocated in 2008 for aerial surveillance. In this programme, 230 flights with a total of 980.09 flight hours were undertaken.

Jadual 4.16 JAS: Bilangan Kes Pembakaran Terbuka Mengikut Negeri, 2008

Table 4.16 DOE: Number of Open Burning Cases by State, 2008

Negeri State	Ladang Plantation	Pertanian Agriculture	Belukar Bushes	Hutan Forest	Tapak Pembinaan Construction Sites	Tapak Pelupusan Disposal Sites	Industri Industry	Lain- lain Others
PERLIS	0	0	0	0	1	0	0	1
KEDAH	5	39	5	1	36	23	20	37
P.PINANG	6	3	15	2	11	27	18	140
PERAK	7	0	14	2	10	18	3	21
SELANGOR	11	76	43	7	50	53	62	376
WP KL	0	0	0	0	22	11	14	52
N.SEMBILAN	6	0	8	5	12	8	7	99
MELAKA	6	8	3	1	10	0	4	37
JOHOR	4	11	5	0	22	13	19	27
PAHANG	39	59	36	44	21	12	17	80
TERENGGANU	2	8	15	21	6	4	19	42
KELANTAN	19	11	1	10	14	11	11	61
SARAWAK	81	1034	12	2	0	1	3	9
SABAH	14	0	28	48	15	8	51	214
WP LABUAN	0	0	7	0	1	1	0	12
<b>Jumlah / Total</b>	<b>200</b>	<b>1,249</b>	<b>192</b>	<b>143</b>	<b>231</b>	<b>190</b>	<b>248</b>	<b>1,208</b>
<b>Jumlah Keseluruhan / Total Amount: 3,661</b>								

Jadual 4.17 JAS: Bilangan Kes Pembakaran Terbuka Bulanan, 2008

Table 4.17 DOE: Number of Open Burning Cases by Month, 2008

Negeri / State	Ladang Plantation	Pertanian Agriculture	Belukar Bushes	Hutan Forest	Tapak Pembinaan Construction Sites	Tapak Pelupusan Disposal Sites	Industri Industry	Lain-lain /Others
Januari / January	48	43	14	9	28	16	25	102
Februari / February	12	45	26	24	25	32	40	118
Mac / March	9	7	7	12	23	15	18	72
April / April	14	36	22	5	19	22	12	92
Mei / May	34	189	18	7	16	17	14	122
Jun / June	20	69	12	12	17	11	21	113
Julai / July	15	57	19	11	20	29	19	170
Ogos / August	23	315	29	13	16	17	23	145
September/ September	10	406	10	15	14	4	23	69
Oktober/ October	10	48	8	6	11	8	13	55
November / November	5	24	21	29	13	8	23	78
Disember / December	0	10	6	0	29	11	17	72
<b>Jumlah / Total</b>	<b>200</b>	<b>1,249</b>	<b>192</b>	<b>143</b>	<b>231</b>	<b>190</b>	<b>248</b>	<b>1,208</b>
<b>Jumlah Keseluruhan / Total Amount: 3,661</b>								

## PUNCA-PUNCA BERGERAK (KENDERAAN BERMOTOR) MOBILE SOURCES (MOTOR VEHICLES)

Sehingga akhir tahun 2008, sebanyak 17,971,901 buah kenderaan bermotor telah berdaftar di Malaysia, iaitu pertambahan sebanyak 1,156,603 buah kenderaan (6.88%) berbanding tahun 2007. Pecahan keseluruhan kenderaan bermotor yang berdaftar mengikut jenis kenderaan seperti **Rajah 4.12**.

Dari sejumlah 1,156,603 buah kenderaan baru yang didaftarkan dalam tahun 2008, kategori motosikal merupakan yang tertinggi iaitu 543,122 unit (46.96%) diikuti motokar dengan 537,092 unit (46.44%), manakala sebanyak 76,389 unit (6.6%) adalah dari lain-lain jenis kenderaan termasuk lori, bas, van dan sebagainya.

Taburan bilangan kenderaan bermotor di Malaysia mengikut negeri adalah seperti di **Rajah 4.13**. Wilayah Persekutuan Kuala Lumpur masih mendahului negeri-negeri lain dengan mempunyai bilangan kenderaan yang tertinggi iaitu sebanyak 4.04 juta (22.49%) daripada keseluruhan bilangan kenderaan yang berdaftar di negara ini, diikuti oleh negeri Johor, Selangor, Pulau Pinang dan Perak.

### Kawalan Pelepasan Asap dan Gas dari Kenderaan Bermotor

Pelepasan asap serta gas-gas pencemar seperti karbon monoksida (CO), hidrokarbon (HC), oksida-oksida nitrogen (NOx) serta partikulat (PM) yang dilepaskan melalui ekzos kenderaan bermotor adalah dikawal di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Diesel) 1996 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Petrol) 1996.

### Kawalan Pelepasan Asap Hitam Dari Kenderaan Diesel

Kawalan pelepasan asap hitam berlebihan dari ekzos kenderaan diesel dilaksanakan (Area Watch And

By the end of 2008, there were about 17,971,901 registered motor vehicles in Malaysia, an increase of 1,156,603 (6.88%) compared to 2007. The breakdown of the total registered vehicles according to vehicle types is in **Figure 4.12**.

Out of 1,156,603 new vehicles registered in 2008, motorcycles made up the highest number 543,122 units (46.96%) followed by motorcars 537,092 units (46.44%), while the remaining 76,389 (6.6%) were from the other vehicle types such as lorries, buses, vans and others.

The distribution of registered vehicles throughout the states is given in **Figure 4.13**. The Federal Territory of Kuala Lumpur recorded the highest number of vehicle registered i.e. 4.04 million (22.49%) followed by Johor, Selangor, Pulau Pinang and Perak.

### Control of Smoke and Gaseous Emissions From Motor Vehicles

Emission of smoke and gaseous pollutants such as carbon monoxide, hydrocarbons, oxides of nitrogen and particulate matter emitted from motor vehicle exhausts are controlled under the Environmental Quality (Control of Emission from Diesel Engines) Regulations 1996 and the Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996.

### Control of Black Smoke Emission From Diesel Vehicles

Excessive black smoke emission emitted from diesel vehicle exhausts is controlled through the AWASI (AREA

Sanction Inspection). Melalui Program AWASI ini, skuad peronda JAS akan menjalankan rondaan, pemerhatian pelepasan asap hitam dari ekzos kenderaan, memberhentikan kenderaan untuk menjalankan ujian asap ke atas kenderaan-kenderaan diesel yang diperhatikan mengeluarkan asap hitam berlebihan. Tindakan kompaun akan diambil serta- merta kepada pemandu dan tuannya kenderaan yang didapati gagal mematuhi had pelepasan asap 50 Unit Asap Hartridge (HSU).

Pada tahun 2008, sebanyak 1,626 operasi penguatkuasaan telah dilaksanakan di bandar-bandar di seluruh negara. Sebanyak 230,441 buah kenderaan diesel telah diperiksa, dan dari jumlah tersebut, sebanyak 4,342 buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan asap hitam sebanyak 50 HSU, manakala 622 daripadanya telah dikenakan perintah larangan beroperasi sehingga dibaikpulih dan lulus ujian asap semula oleh JAS. Pada keseluruhannya, peratus pematuhan oleh kenderaan diesel adalah 98.12%.

Bilangan kenderaan diesel yang dikompaun dan peratus pematuhan mengikut jenis kenderaan adalah seperti di **Rajah 4.14**, **Rajah 4.15** dan **Rajah 4.16** pula menunjukkan bilangan kenderaan dikompaun, pengeluaran perintah larangan serta peratus pematuhan mengikut jenis kenderaan. Tindakan mahkamah telah juga diambil ke atas 354 pemandu serta pemilik kenderaan kerana gagal menjelaskan kompaun yang telah dikenakan.

#### **Kawalan Pelepasan Gas CO dan HC Dari Kenderaan Petrol**

Sepanjang tahun 2008, sejumlah 3,200 buah kenderaan petrol telah diuji pelepasan CO dan HC dengan menggunakan meter gas CO-HC Analyzer melalui kaedah 'ujian idling'. Sebanyak 131 buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan yang dibenarkan. Peratus pematuhan secara keseluruhannya adalah 96.22 %. Surat amaran telah dikeluarkan kepada pemandu-pemandu kenderaan supaya segera membaiki kenderaan masing-masing untuk memastikan kenderaan sentiasa mematuhi had pelepasan yang telah ditetapkan.

Watch And Sanction Inspection) Programme. Through this programme the DOE's mobile squad would go on patrol, observing and testing diesel vehicles emitting excessive smoke. Compounds were issued on-the-spot to the drivers and owners if the vehicle fails to comply with the stipulated smoke limit of 50 HSU, and a Prohibition Order (prohibiting vehicle use) will only be issued if the smoke limit exceeds 70 HSU.

In 2008, a total of 1,626 enforcement programmes were conducted in the cities throughout the country. 230,441 diesel vehicles were visually inspected, out of which 4,342 vehicles were compounded for failing to comply the 50 HSU smoke limit including 622 vehicles were issued with the prohibition order. Vehicles issued with prohibition order were required to undergo smoke retest by the DOE before allowed on the road. Overall compliance of diesel vehicles was 98.12%.

The number of vehicles summoned and their percentage of compliance according to vehicle types is given in **Figure 4.14**, **Figure 4.15** and **Figure 4.16** shows the number of vehicles compounded, number of prohibition orders issued and the percentage of compliance according to states. Court actions were also taken against 354 drivers and vehicle owners for failing to settle the compounds issued.

#### **Control of CO and HC Gas Emissions from Petrol Vehicles**

Throughout 2008, a total of 3,200 petrol powered vehicles were tested for CO and HC emission using the CO-HC gas analyzer by the idling test method. 131 vehicles were compounded for failing to comply with the stipulated CO and HC limits. The overall percentage of compliance is 96.22 %. Warning letters were issued to drivers to take immediate repairs on the vehicles to ensure compliance.

### Ujian Kelulusan Jenis (Kenderaan Petrol)

Malaysia telah memperkenalkan standard pelepasan pencemar untuk model baru kenderaan motor dengan tujuan memperbaiki pelepasan pencemar menggunakan rekabentuk enjin baru dan teknologi kawalan pelepasan. Mana-mana model baru kenderaan motor pada atau selepas 1 Januari 2000 dikehendaki mematuhi standard pelepasan pencemar yang ditetapkan dalam Jadual Ketiga, Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Petrol), 1996. Jisim Karbon Monoksida hendaklah tidak melebihi 2.2 g/km, manakala Kombinasi Hidrokarbon dan Nitrogen Oksida hendaklah tidak melebihi 0.5 g/km. Pada tahun 2008, Jabatan Alam Sekitar telah mengeluarkan sebanyak 45 Sijil Ujian Kelulusan Jenis bagi model baru kenderaan yang akan dipasarkan di Malaysia.

### Pengwujudan Kemudahan Yang DiLuluskan

Bagi membolehkan orang ramai menghantar kenderaan mereka untuk menjalani ujian pelepasan asap dan gas, Jabatan Alam Sekitar melalui program "Kemudahan Yang DiLuluskan (KYDL)" telah memberi pengiktirafan kepada bengkel-bengkel kenderaan yang memenuhi kriteria-kriteria yang telah ditetapkan. Tindakan segera untuk membaiki kenderaan boleh dilakukan di pusat-pusat yang diluluskan oleh JAS.

Sehingga akhir tahun 2008, sebanyak 59 bengkel serta pusat-pusat pemeriksaan kenderaan di seluruh negara telah diberikan sijil pengiktirafan sebagai "Kemudahan Yang Diluluskan" oleh JAS.

### Kawalan Pelepasan Asap Daripada Motosikal

Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Motosikal), 2003 telah diwartakan dan mula dikuatkuasa mulai 1 Januari 2004. Peraturan ini telah menggariskan piawai pelepasan seperti berikut:-

Standard Kelulusan Jenis bagi motosikal baru  
: 97/24/EC

Standard pelepasan(idling) bagi motosikal terpakai  
: 4.5 % CO(Karbon Monoksida)

### Type Approval Test (Petrol Vehicles)

Malaysia had established exhaust emission standard for new vehicles in order to improve exhaust emission by utilizing new engine design and emission control technology. Any new model of motor vehicle that is commissioned on and after 1 January 2000 is required to comply with emission standards prescribed in the Third Schedule of the Environmental Quality (Control of Emission from Petrol Engines) Regulations, 1996. The mass of Carbon Monoxide shall not exceed 2.2 g/km while the combination of Hydrocarbon and Nitrogen Oxides shall not exceed 0.5 g/km. In 2008, the Department of Environment had issued 45 Type Approval Test Certificates for new models to be marketed in Malaysia.

### Establishment of Approved Testing Facilities

To facilitate public access to workshops for smoke and gaseous emission testing, DOE accredited a number of workshops that had fulfilled the prescribed criteria as "Approved Testing Facilities". Such centres could also serve as immediate repair centres for the non-complying vehicles.

By end 2008, a total of 59 workshops and vehicle testing centers throughout the country were registered as "Approved Testing Facilities".

### Control of Emission from Motorcycles

The Environmental Quality (Control of Emission from Motorcycles) Regulations, 2003 was gazetted and came into force on 1 January 2004. The emission standards adopted are as follows :-

Type Approval Emission Standard for new motorcycles  
: 97/24/EC

Idling Emission Standard for in-use motorcycles  
: 4.5 % CO(Carbon Monoxide)

Pengimport motosikal adalah dikehendaki mematuhi standard baru pelepasan berkuatkuasa 1 Januari 2005 bagi model baru dan 1 Julai 2005 bagi model sedia ada, manakala pembuat tempatan hendaklah mematuhi standard pelepasan baru berkuatkuasa 1 Julai 2005 bagi model baru dan 1 Julai 2006 bagi model sedia ada. Sepanjang tahun 2008, sebanyak 4 Sijil Kelulusan Jenis telah dikeluarkan kepada pembuat, pemasang dan pengimport motorsikal untuk pasaran dalam negara.

### Bunyi Bising Kenderaan Bermotor

Pelepasan bunyi bising daripada kenderaan bermotor dikawal di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Bunyi Bising Kenderaan Bermotor) 1987.

Operasi penguatkuasaan bagi mengawal pelepasan bunyi bising dari motorsikal telah dilaksanakan secara bersama oleh pejabat-pejabat JAS negeri dengan kerjasama Polis DiRaja Malaysia (Cawangan Trafik). Pada tahun 2008, sejumlah 2,033 buah motosikal telah ditahan untuk menjalani ujian pelepasan bunyi bising. Dari jumlah ini, 117 penunggang motosikal telah dikompaun kerana melanggar had bunyi bising yang dibenarkan. Peratus pematuhan secara keseluruhannya ialah 94.24 % (**Rajah 4.17**).

Motorcycle importers were required to comply with the new emission standards effective from 1 January 2005 for new models and 1 July 2005 for current models, Local manufactures would have to comply with the new emission standards effective from 1 July 2005 for new models and 1 July 2006 for current models. Throughout 2008, a total of 4 Type Approval Test Certificates were issued to manufacturers, assemblers and importers of motorcycles for the domestic market.

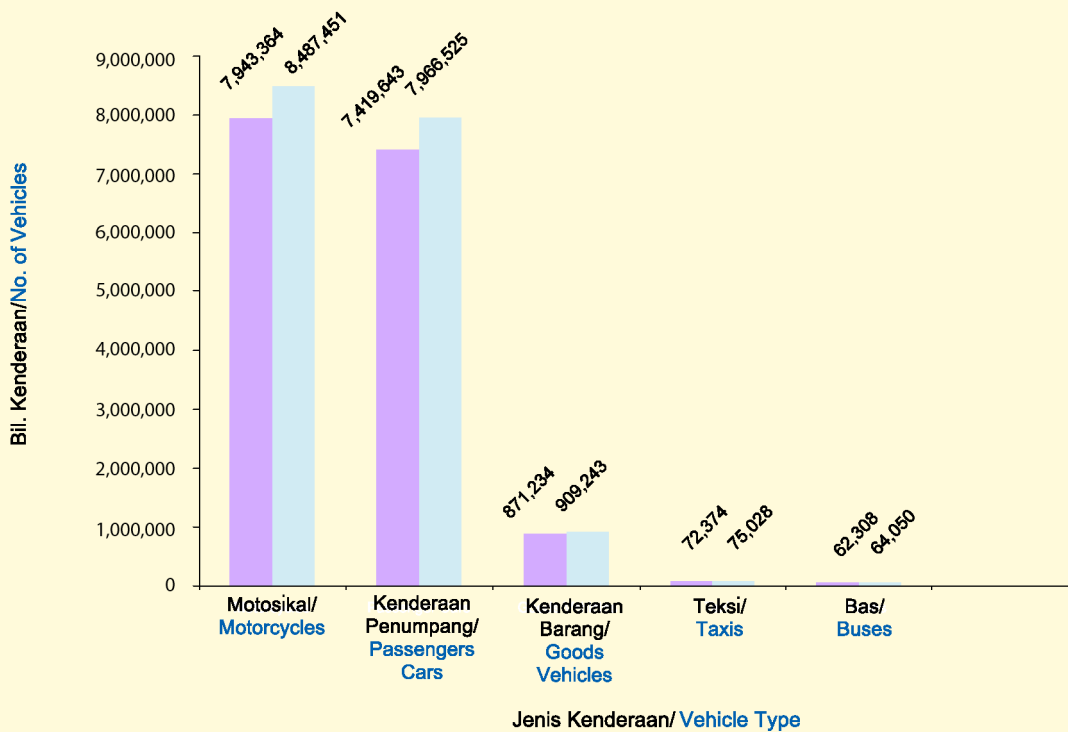
### Noise from Motor Vehicles

Noise from motor vehicles is enforced under the Environmental Quality (Motor Vehicle Noise) Regulations 1987.

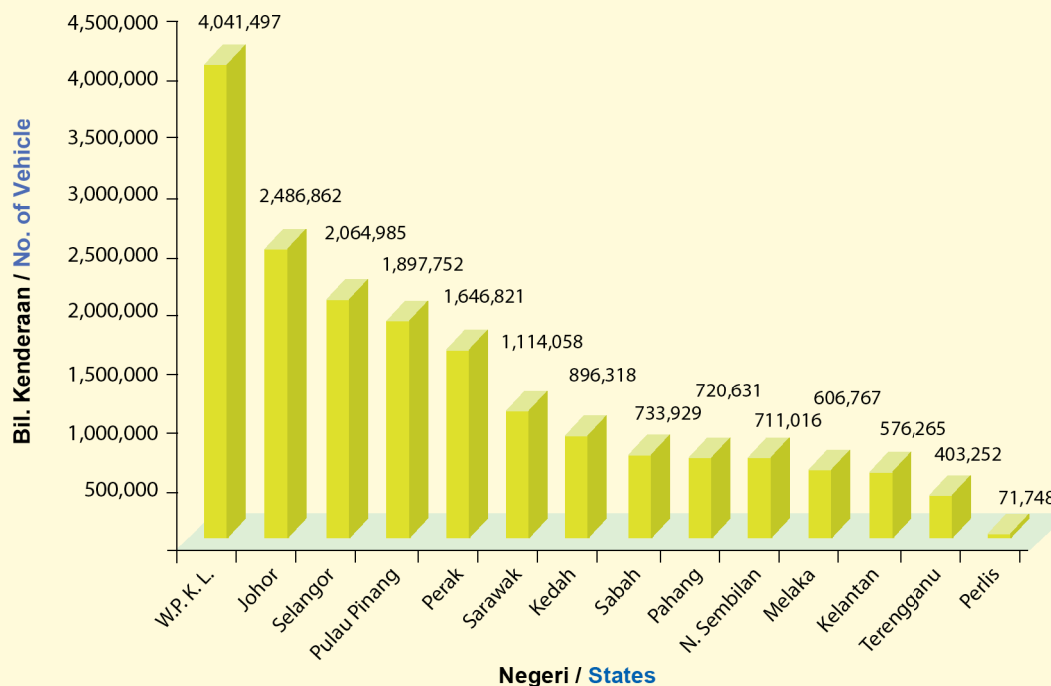
Enforcement campaigns to control excessive noise from motorcycles were jointly conducted by the DOE and the Traffic Police. In 2008, a total of 2,033 motorcycles were stopped for noise inspection. From the total above, 117 motorcyclists were summoned for violating the stipulated noise limits. The overall percentage of compliance is 94.24 % (**Figure 4.17**).



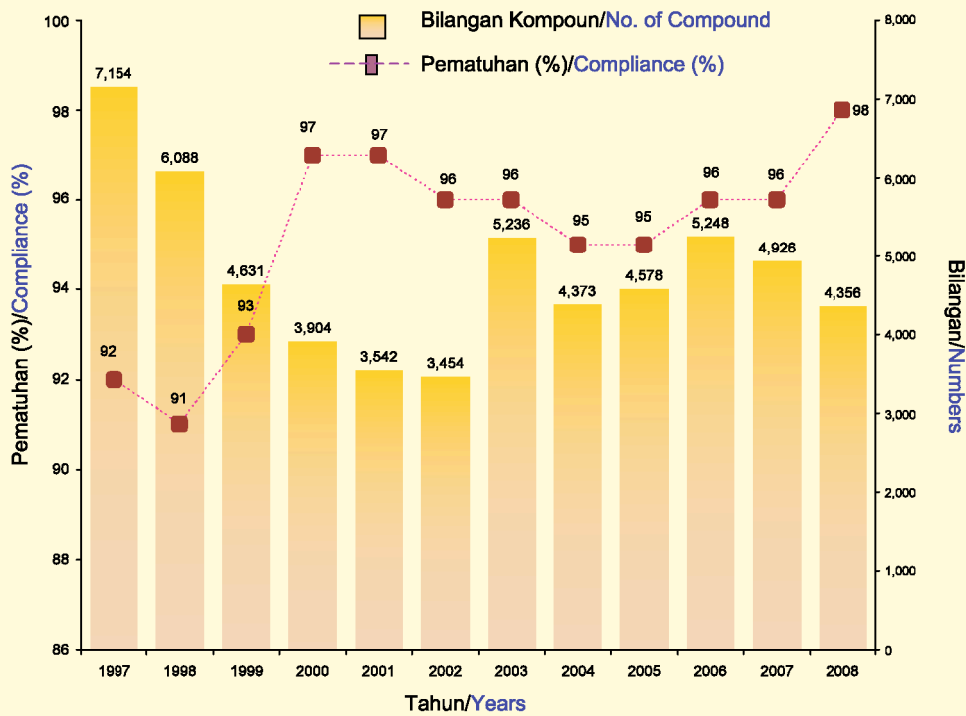
Ujian Pelepasan Asap dan Gas  
Smoke and Gaseous Emissions Testing



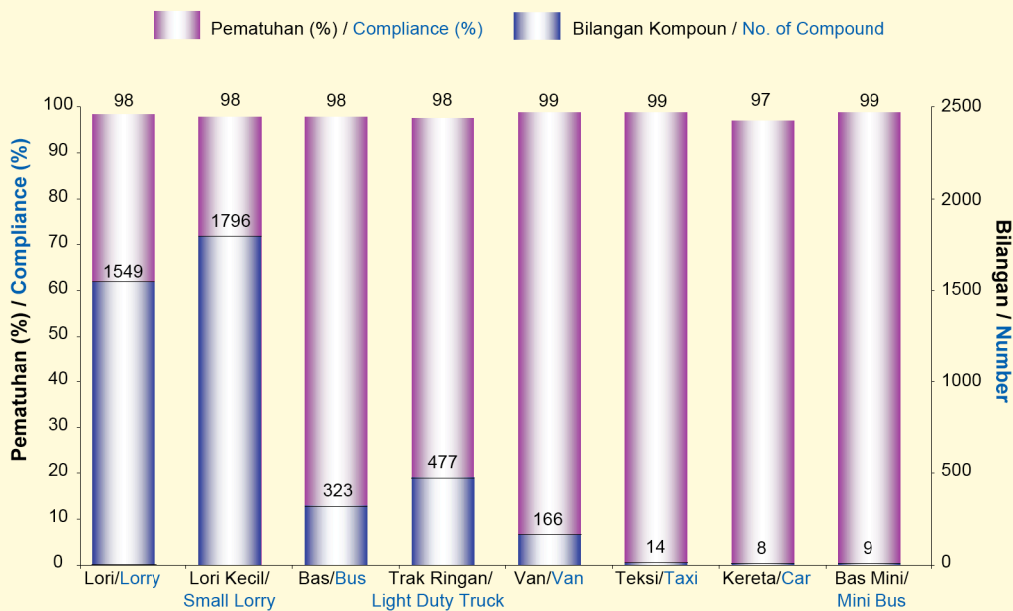
Rajah 4.12 JAS: Bilangan Kenderaan Bermotor Mengikut Jenis, 2008  
 Figure 4.12 DOE: Number of Motor Vehicles by Type, 2008



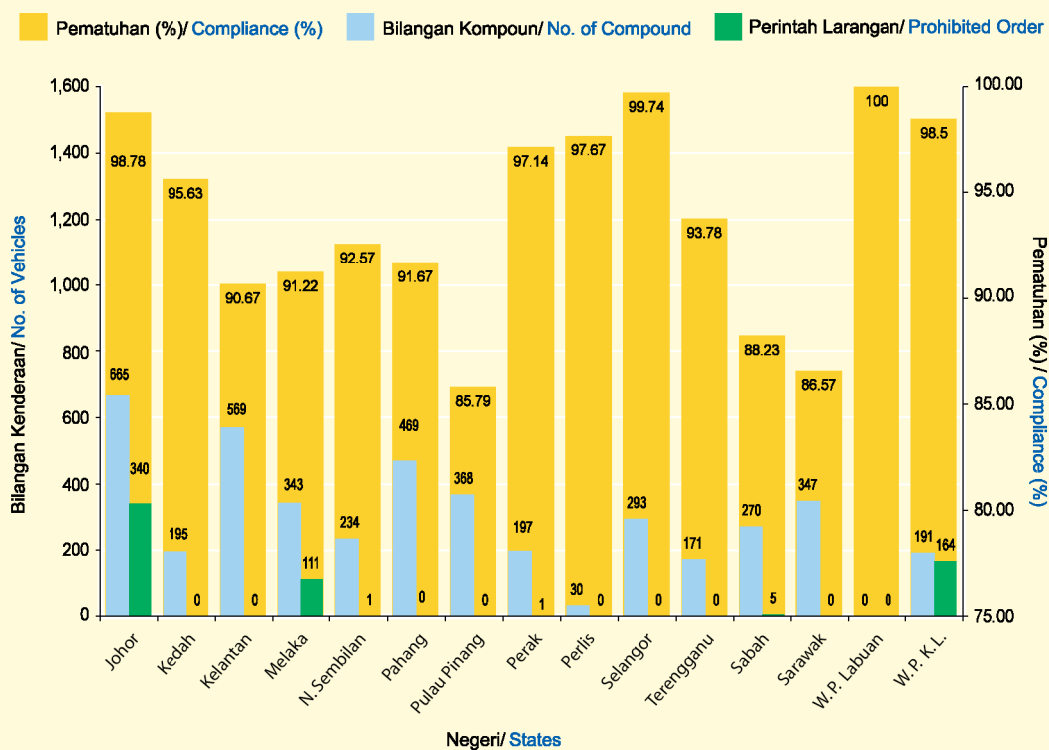
Rajah 4.13 JAS: Bilangan Kenderaan Bermotor Mengikut Negeri, 2008  
 Figure 4.13 DOE: Number of Motor Vehicles by States, 2008



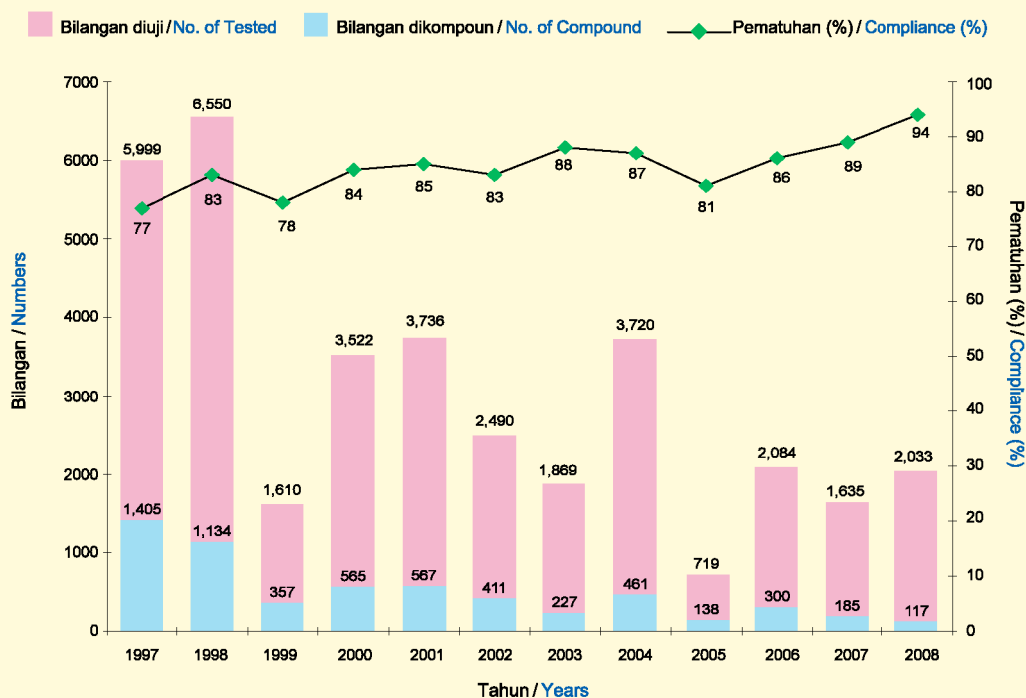
Rajah 4.14 JAS: Penguatkuasaan Pelepasan Asap Hitam Kenderaan Mengikut Tahun, 2008  
 Figure 4.14 DOE: Enforcement of Vehicular Black Smoke Emission by Year, 2008



Rajah 4.15 JAS: Penguatkuasaan Pelepasan Asap Hitam Kenderaan Diesel Mengikut Jenis Kenderaan, 2008  
 Figure 4.15 DOE: Enforcement of Vehicular Black Smoke Emission by Types, 2008



Rajah 4.16 JAS: Penguatkuasaan Pelepasan Asap Hitam Kenderaan Mengikut Negeri, 2008  
 Figure 4.16 DOE: Enforcement of Vehicular Black Smoke Emission by State, 2008



Rajah 4.17 JAS: Penguatkuasaan Pelepasan Bunyi Bising Motosikal, 1997-2008  
 Figure 4.17 DOE: Enforcement of Motorcycle Noise Emission, 1997-2008

## TINDAKAN UNDANG-UNDANG LEGAL ACTION

### Pendakwaan

Pada tahun 2008, sejumlah 688 kesalahan telah disabitkan dengan denda berjumlah RM4,777,230.00. (**Rajah 4.18**). Daripada jumlah keseluruhan kes tersebut, sebanyak 365 (53.05%) kesalahan melibatkan kenderaan bermotor melalui pelepasan ke udara melebihi had yang ditetapkan di bawah Seksyen 22(1) dengan jumlah denda sebanyak RM479,130.00. Terdapat 126 (18.31%) kes mahkamah adalah melibatkan kesalahan pelanggaran syarat lesen di bawah seksyen 16 dengan jumlah denda sebanyak 1,253,000.00. Selain itu, sebanyak 120 (17.45%) kes mencemar perairan daratan melalui pelepasan effluen melebihi had yang ditetapkan di bawah Seksyen 25(1) AKAS 1974 dengan jumlah denda sebanyak RM2,216,000.00. Bagi 77 (11.19%) kes yang selebihnya adalah kesalahan-kesalahan lain di bawah AKAS 1974 (**Rajah 4.19**).

### Kompaun

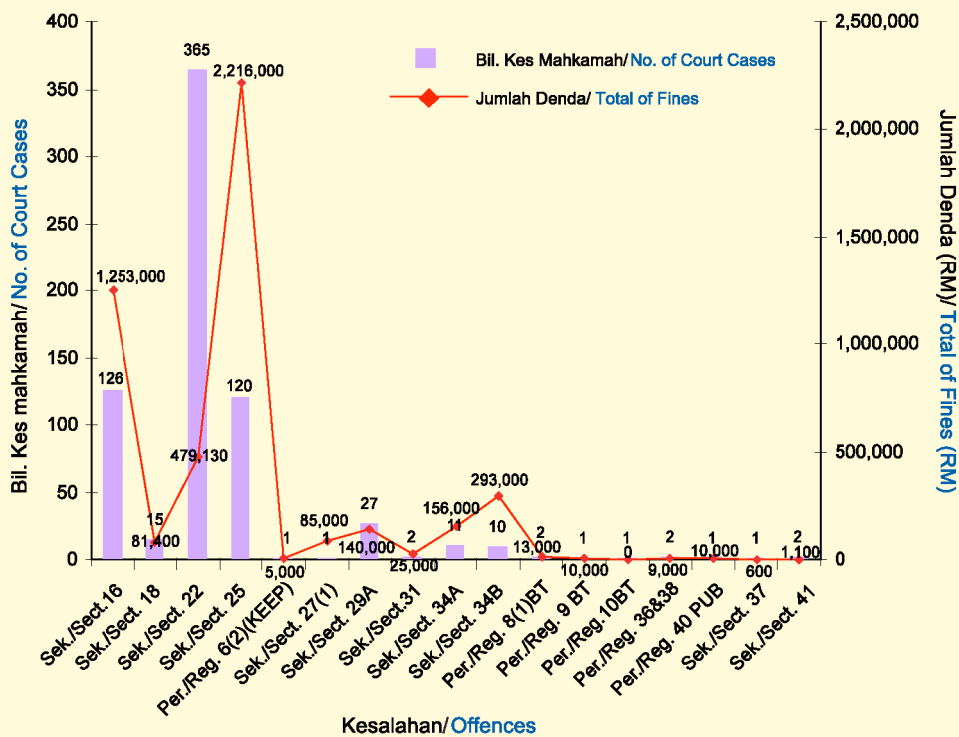
Sejumlah 6,121 kompaun telah dikeluarkan sepanjang tahun 2008 kepada premis dan syarikat untuk pelbagai kesalahan di bawah AKAS 1974. Daripada jumlah keseluruhan tersebut, sebanyak 4,285 (70%) kompaun adalah kesalahan di bawah Peraturan Kualiti Alam sekeliling (Kawalan Pelepasan Dari Enjin Diesel) 1996, sebanyak 910 (14.87%) kompaun adalah kesalahan di bawah Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005, sebanyak 512 (8.37%) kompaun adalah kesalahan di bawah Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978, sebanyak 300 (4.90%) kompaun adalah kesalahan di bawah Seksyen 29A, AKAS 1974 dan sebanyak 114 (1.86 %) kompaun adalah kesalahan di bawah Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan dari Enjin Petrol) 1996 (**Rajah 4.20**).

### Prosecution

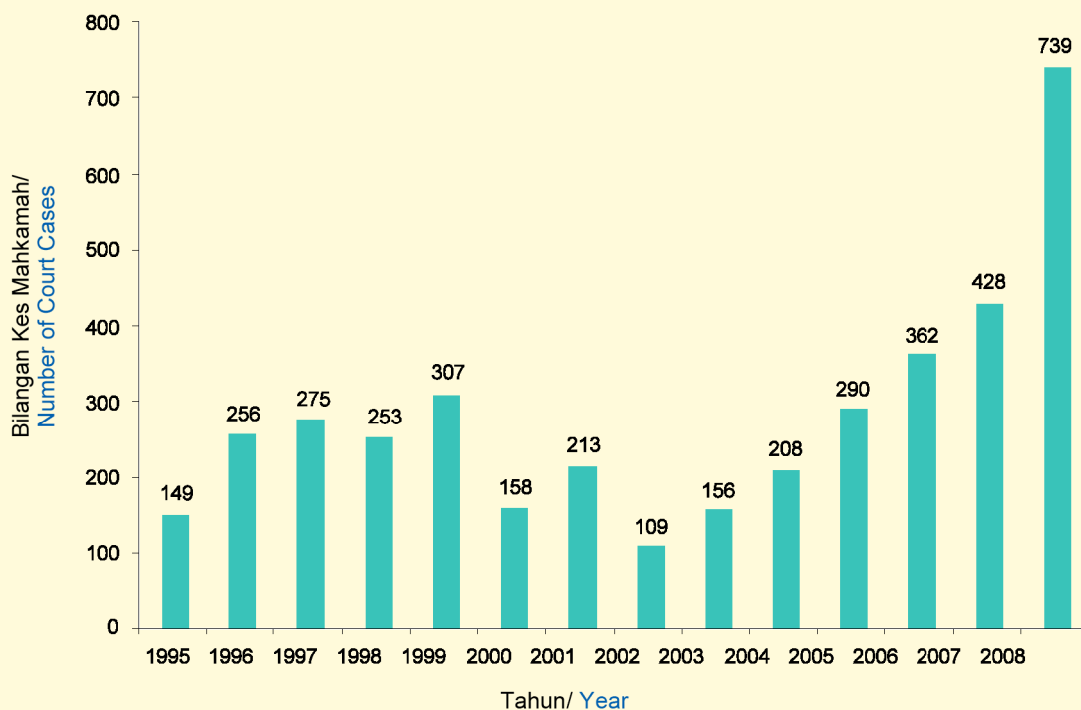
In 2008, a total of 688 offences were prosecuted and fined a total of RM4,777,230.00 (**Figure 4.18**). Out of this total cases, 365 (53.05%) cases involved offences from motor vehicles emissions above the stipulated standards under Section 22(1) of the EQA 1974 and fined a total of RM479,130.00. There were 126 (18.31%) cases involved in violating conditions of licences under section 16 and fined RM1,253,000.00. For polluting inland waters by effluent discharges above the stipulated standards under Section 25(1) of the EQA 1974, 120 (17.45%) cases were prosecuted and fined a total of RM2,216,000.00 while the remaining 77 (11.19%) cases were prosecuted for other offences under the EQA 1974 (**Figure 4.19**).

### Compounds

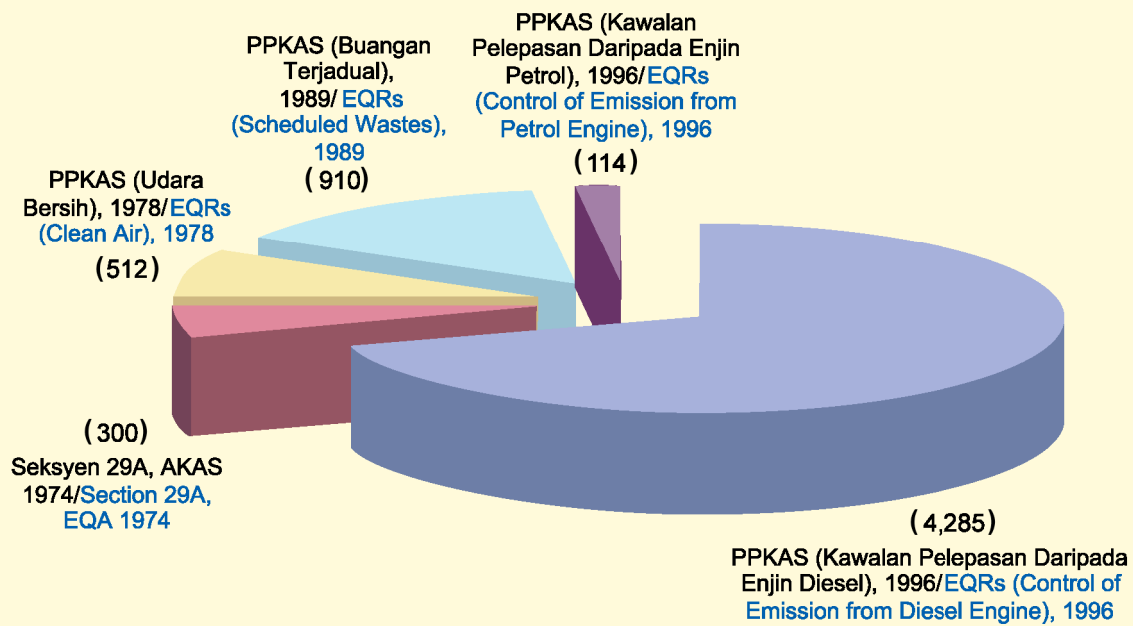
A total of 6,121 compounds were issued in 2008 against premises and companies for various offences under EQA 1974. Out of this total, 4,285 (70%) were offences under the Environmental Quality (Control of Emission from Diesel Engines) Regulations 1996, 910 (14.87%) were offences under the Environmental Quality (Scheduled Wastes) Regulations 2005, 512 (8.37%) were offences under the Environmental Quality (Clean Air) Regulations 1978, 300 (4.90%) were offences under Section 29A of EQA 1974 and 114 (1.86 %) were offences under the Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996 (**Figure 4.20**).



Rajah 4.18 JAS: Kesalahan Disabitkan oleh Mahkamah, 2008  
 Figure 4.18 DOE: Offences Prosecuted by Court, 2008



Rajah 4.19 JAS: Bilangan Kes Mahkamah, 1995-2008  
 Figure 4.19 DOE: Number of Court Cases, 1995-2008



Rajah 4.20 JAS: Bilangan Kompoun Yang Diterima oleh JAS, 2008  
 Figure 4.20 DOE: Number of Compounds Received by DOE, 2008



Kawasan Pantai Tercemar  
 Polluted Beach Area

## MAKLUMBALAS TERHADAP PENGADUAN AWAM RESPONSE TO PUBLIC COMPLAINTS

Jabatan Alam Sekitar telah menerima sejumlah 4,931 aduan pencemaran alam sekitar sepanjang tahun 2008. Daripada jumlah keseluruhan aduan tersebut, sebanyak 4,909 kes aduan telah disiasat oleh Pejabat JAS Negeri dengan 3,407 kes aduan telah diambil tindakan oleh JAS. Manakala 1,502 kes aduan pula adalah di luar bidangkuasa JAS dan telah dirujuk kepada agensi lain yang berkaitan.

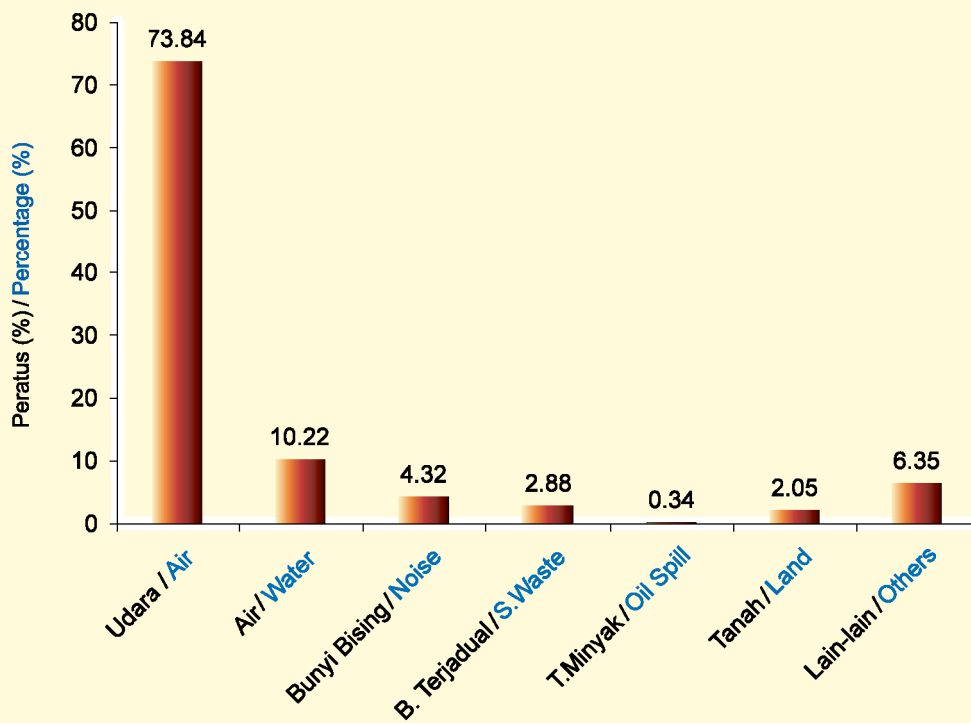
Pada tahun 2008, Selangor menerima aduan yang tertinggi iaitu sebanyak 1,376 kes (27.91%), diikuti oleh Johor sebanyak 652 kes (13.22%) dan Pulau Pinang sebanyak 519 kes (10.53%). Wilayah Persekutuan Labuan menerima aduan yang paling sedikit iaitu sebanyak 25 kes (0.51%), diikuti dengan Perlis iaitu sebanyak 50 kes (1.01%).

Seperti tahun-tahun yang sebelumnya, kebanyakan aduan yang diterima adalah berkaitan dengan pencemaran udara iaitu sebanyak 3,641 kes (73.84%), sebanyak 504 kes (10.22%) berkaitan pencemaran air, sebanyak 213 kes (4.32%) berkaitan pencemaran bunyi, sebanyak 142 kes (2.88%) berkaitan pelupusan haram buangan terjadual, sebanyak 17 kes (0.34%) berkaitan pencemaran tanah, sebanyak 101 kes (2.05%) berkaitan tumpahan minyak dan sebanyak 313 kes (6.35%) lain-lain aduan (**Rajah 4.21**).

The Department of Environment received 4,931 environmental pollution complaints in 2008. Out of this total number, 4,909 cases were investigated by the State DOE Offices and 3,407 cases were under the jurisdiction of DOE. The remaining 1,502 cases outside the jurisdiction of DOE were referred to other relevant agencies.

In 2008, the highest number of complaints received was Selangor 1,376 (27.91%), followed by Johor 652 (13.22%) and Penang recorded 519 (10.53%). Federal Territory of Labuan recorded the least number of complaints received of 25 (0.51%), followed by Perlis 50 (1.01%).

As in the previous years, most of the complaints received are related to air pollution 3,641 (73.84%), followed by 504 (10.22%) water pollution, 213 (4.32%) noise pollution, 142 (2.88%) illegal dumping of scheduled or toxic wastes, 17 (0.34%) land pollution, 101 (2.05%) oil spillage and 313 (6.35%) others (**Figure 4.21**).



Rajah 4.21 JAS: Bilangan Kes Aduan Mengikut Jenis, 2008  
 Figure 4.21 DOE: Type of Complaints, 2008



Pelepasan ke Udara daripada Loji Penapisan Minyak  
 Air Emissions from Oil Refinery Plant

**BAB 5 / Chapter 5**



## PROMOSI KESEDARAN DAN PENDIDIKAN ALAM SEKITAR PROMOTION OF ENVIRONMENTAL EDUCATION AND AWARENESS

### **Bandar Lestari-Anugerah Alam Sekitar 2006/2007**

Jabatan Alam Sekitar, Kementerian Sumber Asli dan Alam Sekitar dengan kerjasama Jabatan Kerajaan Tempatan, Kementerian Perumahan dan Kerajaan Tempatan dan Institut Alam Sekitar dan Pembangunan (LESTARI), UKM yang menyediakan sokongan teknikal telah memulakan anugerah ini untuk memberi pengiktirafan kepada pihak berkuasa tempatan yang telah berusaha menggabungkan dimensi alam sekitar di dalam perancangan, pentadbiran dan pelaksanaan dasar, program-program dan aktiviti-aktivitinya.

Penilaian ini berasaskan kepada lima (5) kriteria: i) Persekitaran Fizikal, ii) Inisiatif Ekologi, iii) Perkhidmatan Alam Sekitar, iv) Pentadbiran Alam Sekitar dan v) Aktiviti Pendidikan dan Kesedaran. Untuk tahun 2006/2007, sebanyak 47 buah Pihak Berkuasa Tempatan telah menyertainya di bawah kategori-kategori berikut:

1. Kategori 1-PBT Ibu Negeri (15)
2. Kategori 2-PBT Majlis Perbandaran/Bandaraya (17)
3. Kategori 3-Majlis Daerah (15)

Majlis Penganugerahan Bandar Lestari-Anugerah Alam Sekitar 2006/2007 telah disempurnakan oleh Y.Bhg. Datin Seri Jeanne Abdullah, isteri kepada Perdana Menteri Malaysia bertempat di Putra International Convention Centre, Putrajaya pada 5 Jun 2008 bersempena dengan Hari Alam Sekitar Sedunia.

Majlis Penganugerahan telah dihadiri wakil daripada pelbagai agensi kerajaan, pihak berkuasa tempatan, badan bukan kerajaan, organisasi berteraskan komuniti dan juga sektor swasta. Penerima-penerima Anugerah telah membawa pulang sebuah Sijil Pengiktirafan yang ditandatangani oleh Y.A.B. Perdana Menteri Malaysia dan sebuah trofi khas Anugerah Bandar Lestari.

### **Bandar Lestari-Environment Award 2006/2007**

The Department of Environment, Ministry of Natural Resources and Environment in collaboration with the Local Government Department, Ministry of Housing and Local Government and Institute for Environment and Development (LESTARI), UKM providing technical support initiated this award to give recognition to Local Authorities for incorporating environment dimension in planning, administration and implementation of policies, programs and activities.

Assessment was based on five (5) criteria: i) Physical Environment, ii) Ecological Initiatives, iii) Environmental Services, iv) Environmental Governance and v) Education and Awareness activities. For 2006/2007, 47 local authorities participated under the following categories:

1. Category 1-Capital Cities (15)
2. Category 2-Town Councils/ Municipalities (17)
3. Category 3-District Councils (15)

The "Majlis Penganugerahan Bandar Lestari-Anugerah Alam Sekitar 2006/2007" was officiated by Y.Bhg. Datin Seri Jeanne Abdullah, the wife of the then Honourable Prime Minister of Malaysia in Putrajaya International Convention Centre, Putrajaya on 5 June 2008 in conjunction with World Environment Day.

The Award Presentation Ceremony was attended by various government agencies, local authorities, non-governmental organisations, community-based organizations and the private sector. The winners received a certificate signed by the Honourable Prime Minister of Malaysia and a trophy.

**PENERIMA-PENERIMA ANUGERAH BANDAR LESTARI 2006/2007  
& ANUGERAH KHAS  
BANDAR LESTARI - ENVIRONMENT AWARD 2006/2007  
& SPECIAL AWARDS RECIPIENTS**

**KATEGORI 1 (PBT IBU NEGERI)/CATEGORY 1 (Capital Cities)**

**Penerima Anugerah Bandar Lestari – Anugerah Alam Sekitar 2006/2007/  
Bandar Lestari - Environment Award 2006/2007 Recipients  
DEWAN BANDARAYA KUCHING UTARA**

**Penerima-Penerima Anugerah Khas/Special Award Recipients  
MAJLIS BANDARAYA SHAH ALAM**

*Inisiatif : Pentadbiran Alam Sekitar (Unit Pembangunan Mampan)/  
Initiative: Environment Administration (Sustainable Development Unit)*

**DEWAN BANDARAYA KOTA KINABALU**

*Inisiatif : Pendidikan Dan Kesedaran (Pusat Aktiviti Alam Sekitar)/  
Initiative: Education And Awareness (Environment Activity Centre)*

**MAJLIS BANDARAYA KUCHING SELATAN**

*Inisiatif : Ekologi (Taman Rimba Sama Jaya)/ Initiative: Ecological (Taman Rimba Sama Jaya)*

**KATEGORI 2 (PBT Majlis Bandaraya/Perbandaran)/  
CATEGORY 2 (Town Councils/Municipalities)**

**Penerima Anugerah Bandar Lestari – Anugerah Alam Sekitar 2006/2007/  
Bandar Lestari - Environment Award 2006/2007 Recipient  
MAJLIS PERBANDARAN SUBANG JAYA**

**Penerima-Penerima Anugerah Khas/Special Award Recipients  
MAJLIS PERBANDARAN KEMAMAN**

*Inisiatif : Ekologi (Hutan Bakau Rekreasi)/Initiative: Ecological (Hutan Bakau Rekreasi)*

**MAJLIS BANDARAYA MIRI**

*Inisiatif : Pendidikan Dan Kesedaran (Penyertaan Masyarakat)/  
Initiative: Education And Awareness (Community Participant)*

**KATEGORI 3 (PBT Majlis Daerah)/CATEGORY 3 (Districts Councils)**

**Penerima Anugerah Bandar Lestari – Anugerah Alam Sekitar 2006/2007/  
Bandar Lestari - Environment Award 2006/2007 Recipient  
MAJLIS DAERAH PEKAN**

**Penerima Anugerah Khas/Special Award Recipient**

**MAJLIS DAERAH LIPIS**

*Inisiatif : Ekologi (Lanskap Semulajadi)/Initiative: Ecological (Natural Landscape)*

### **Kem Kesedaran Alam Sekitar (KeKAS)**

Pada tahun 2008, seramai 46 peserta dari Sekolah Menengah Presint 9(1) Putrajaya dan pegawai-pegawai JAS negeri telah terlibat dalam sebuah kem kesedaran alam sekitar yang telah dilaksanakan di Institut Penyelidikan Perhutanan Malaysia (FRIM), Kepong, Selangor pada 19-21 Ogos 2008. Kem ini telah dijalankan dengan kerjasama Kementerian Pelajaran Malaysia, Jabatan Pelajaran Negeri dan Jabatan Perhutanan Malaysia. Modul Bersepadu Pendidikan Alam Sekitar digunapakai bagi menyebarkan maklumat alam sekitar kepada peserta kem.

### **Pertandingan Debat Alam Sekitar Antara Institusi Pengajian Tinggi (IPT)**

Sejak tahun 1991, Debat Alam Sekitar Antara Institusi Pengajian Tinggi merupakan program tahunan yang dianjurkan oleh JAS dengan kerjasama Majlis Debat Universiti-Universiti Malaysia (MADUM), Dewan Bahasa Dan Pustaka dan Kementerian Pelajaran Malaysia/ Kementerian Pengajian Tinggi Malaysia. Debat Alam Sekitar Antara IPT kali ke-18 ini telah diadakan pada 26-29 Julai 2007 menyaksikan penyertaan sebanyak 24 pasukan debat dari 24 Institusi Pengajian Tinggi di Malaysia. Tuan rumah pada kali ini ialah Universiti Malaysia Sabah, Kota Kinabalu, Sabah.

Sistem 'power match berkumpulan' (bracket power match) untuk pusingan awal bagi menentukan pasukan yang akan berlawanan dan juga peranan mereka (kerajaan/ pembangkang). Setiap pasukan akan ditentukan kedudukan (ranking) mereka berdasarkan menang/kalah, juri, margin (julat kemenangan) dan markah keseluruhan.

Pertandingan Peringkat Awal melibatkan enam (6) pusingan. Lapan (8) pasukan terbaik berdasarkan kedudukan akan dipilih untuk ke peringkat suku akhir dan pasukan yang menang akan ke separuh akhir secara kalah mati. Dua (2) pasukan akan ke peringkat akhir.

### **Environmental Awareness Camp (KeKAS)**

In 2008, 46 participants from Sekolah Menengah Precinct 9(1) Putrajaya and DOE State officers participated in an environmental awareness camp at the Institut Penyelidikan Perhutanan Malaysia (FRIM), Kepong, Selangor on 19-21 August 2008. This camp was conducted in collaboration with the Ministry of Education, State Education Department and Forestry Department of Malaysia. The Environmental Education Integrated Module was used in this camp.

### **Inter-Varsity Environmental Debate**

Since 1991, the Inter-Varsity Environmental Debate had been organised annually by DOE in collaboration with the Malaysian Universities Debate Council (MADUM), Dewan Bahasa dan Pustaka and the Ministry of Education/ Ministry of Higher Education. The 18<sup>th</sup> Inter-Varsity Environmental Debate held from 26–29 July 2008 saw the participation from 24 teams from 24 Institutions of Higher Learning in Malaysia. The host institution was Universiti Malaysia Sabah, Kota Kinabalu, Sabah.

The bracket power match system was adopted in the preliminary rounds to determine whether a team is in the preposition or opposition side. The ranking of each team was based on several criteria such as "winner/ loser", jury, margin and overall score.

All teams took part in the preliminary six (6) rounds. The eight (8) highest ranking teams were then selected to compete in the Quarter-Finals, out of which four (4) qualified for the Semi-finals and eventually two (2) teams entered the Finals.

Pertandingan Akhir Debat Alam Sekitar Antara Institusi Pengajian Tinggi 2008 diadakan di Dewan Resital, Universiti Malaysia Sabah menyaksikan perlawanan di antara Universiti Institut Teknologi Malaysia (UiTM) dan Universiti Islam Antarabangsa Malaysia (UIAM). UiTM diwakili oleh Mohd. Nizamuddin bin Abdul Hamid, Shahrulnizam Ahmad, Farah Sabirin dan pendebat simpanan, Zarul Azhar Nasir. UIAM pula diwakili Syazwan Suhaimi, Muhammad Izzat Md Jonid, Farhan Nor Diyana Samsudin dan pendebat simpanan, Mohd Firdaus Zainal Abidin

UIAM muncul sebagai johan pertandingan Debat Alam Sekitar 2008, menerima Piala Pusingan Menteri Sumber Asli dan Alam Sekitar serta wang tunai RM8,000 dan sijil penyertaan. Manakala UiTM, sebagai naib johan menerima wang tunai RM5,000 dan sijil penyertaan. Dua pasukan yang layak ke separuh akhir iaitu Universiti Teknologi Petronas (UTP) dan Universiti Malaya (UM), masing-masing menerima wang tunai RM1,000 dan juga sijil penyertaan. Pendebat UIAM, Farhan Nor Diyana Samsudin muncul Pendebat Terbaik dan menerima Piala Ketua Pengarah Alam Sekitar, beserta wang tunai RM1,500. Hadiah telah disampaikan oleh Y.B. Dato' Maznah binti Mazlan, Timbalan Menteri Sumber Asli dan Alam Sekitar.

The Finals of the 2008 Inter-Varsity Environmental Debate held at the Dewan Resital, Universiti Malaysia Sabah was between Universiti Institut Teknologi Malaysia (UiTM) and Universiti Islam Antarabangsa (UIAM). UiTM was represented by Mohd. Nizamuddin bin Abdul Hamid, Shahrulnizam Ahmad, Farah Sabirin and Zarul Azhar Nasir as a reserve. UIAM was represented by Syazwan Suhaimi, Muhammad Izzat Md Jonid, Farhan Nor Diyana Samsudin and Mohd Firdaus Zainal Abidin as reserve.

The UIAM team emerged as the overall winner of the 2008 Inter-Varsity Environmental Debate, receiving the Minister of Natural Resources and Environment Challenge Trophy, a cash prize of RM8,000.00, and certificates of participation. UiTM, as runners-up received a cash prize of RM5,000.00, and certificates of participation. The two teams which qualified for the semi-finals, namely UTP and UM each received a cash prize of RM1,000.00, and certificates of participation. Farhan Nor Diyana Samsudin from UIAM was named the Best Debater and received the Director-General of Environment Trophy, together with a cash prize of RM1,500.00. The prizes were given out by Y.B. Dato' Maznah binti Mazlan, the Deputy Minister of the Ministry of Natural Resources and Environment.



Pertandingan Debat Alam Sekitar kali ke-18 di UMS, Sabah  
The 18<sup>th</sup> Inter-Varsity Environmental Debate at UMS, Sabah

Jadual 5.2 JAS: Pusingan Pertandingan Debat Alam Sekitar Antara Institusi Pengajian Tinggi (IPT)  
 Table 5.2 DOE: The Rounds of the Inter-Varsity Environmental Debate among Institutions of Higher Learning



\*Nota: Pasukan yang digelapkan menang dalam perdebatan

\*Note: Bold Team win in debating

### Minggu Alam Sekitar Malaysia (2008)


Minggu Alam Sekitar yang ke-17 dengan tema "Pemuliharaan Alam Sekitar, Tanggungjawab Kita Bersama" telah dilancarkan pada 20 Oktober 2008 di Paya Indah Wetlands, Dengkil, Selangor. Program ini diadakan serentak dengan pembukaan semula Paya Indah Wetlands dan pelancaran Kempen Kesedaran Alam Sekitar.

Y.B. Datuk Douglas Uggah Embas, Menteri Sumber Asli dan Alam Sekitar telah merasmikan pembukaan semula Paya Indah Wetlands dengan melepaskan 53 burung-burung air. Di samping itu, acara kemuncak

### 2008 Malaysia Environment Week (MASM 2008)

The 17<sup>th</sup> Malaysia Environment Week, with the theme 'Environmental Conservation, Our Shared Responsibility' was launched on 20 October 2008 at Paya Indah Wetlands (PIW), Dengkil, Selangor. This event coincided with the re-opening of Paya Indah Wetlands and the launch of the Environment Awareness Campaign.

Y.B. Datuk Douglas Uggah Embas, Minister of Natural Resources and Environment officiated the reopening of Paya Indah Wetlands by releasing 53 water birds. The highlight of the event was the tree-planting ceremony



pada hari tersebut adalah penanaman pokok secara beramai-ramai yang melibatkan 500 para tetamu dan 920 pelajar-pelajar sekolah menengah daripada 21 sekolah-sekolah dari kawasan Bangi, Banting, Cyberjaya, Dengkil, Kajang, Putrajaya and Sepang. Beg-beg guna semula juga diedarkan kepada para tetamu untuk menggalakkan masyarakat supaya tidak menggunakan beg plastik.

Iklan, jingles dan akhbar-akhbar tempatan dalam pencemaran udara, air dan marin juga disiarkan serentak melalui televisyen, radio dan suratkhbar pada hari yang sama dengan pelancaran Kempen Kesedaran Alam Sekitar. Kempen ini bukan sahaja menggalakkan penglibatan masyarakat dalam alam sekitar malah juga memupuk komitmen dalam usaha memulihara dan menjaga alam sekitar.

### **Sekolah Lestari-Anugerah Alam Sekitar 2007/2008**

Program Sekolah Lestari-Anugerah Alam Sekitar adalah program kesedaran alam sekitar yang telah dianjurkan bersama di antara Jabatan Alam Sekitar dan Kementerian Pelajaran Malaysia dengan bantuan teknikal dari Institut Alam Sekitar dan Pembangunan (LESTARI), Universiti Kebangsaan Malaysia yang telah direkabentuk untuk membantu dan memperkukuhkan lagi program-program pendidikan alam sekitar yang sediaada di sekolah-sekolah. Melalui inisiatif ini, elemen-elemen pendidikan alam sekitar dapat diterapkan secara langsung kepada guru-guru dan para pelajar dan secara tidak langsung juga kepada komuniti setempat melalui intergrasi pengetahuan, kemahiran dan nilai murni alam sekitar di bawah empat komponen utama iaitu Pengurusan, Kurikulum, Kokurikulum dan Penghijauan.

Program ini telah dilancarkan dengan rasminya oleh Menteri Sumber Asli dan Alam Sekitar, Y.B. Dato' Sri Adenan Hj. Satem dan Menteri Pelajaran Malaysia, Y.B. Dato' Sri Hishammuddin Tun Hussein di Sekolah Menengah Jalan Tiga, Bandar Baru Bangi, Selangor pada 27 Januari 2005.

whereby 500 guests from different sectors and 920 schoolchildren from 21 schools in Bangi, Banting, Cyberjaya, Dengkil, Kajang, Putrajaya and Sepang participated. During the event, recyclable shopping bags were distributed to guests to encourage the public not to use plastic bags.

Commercials, jingles and print advertisements on air, water and marine pollution appeared in television, radio and newspaper on the same day to launch the Environment Awareness Campaign. This campaign was aimed at encouraging public involvement and also their commitment in protecting and conserving the environment.

### **Sustainable School-Environment Award 2007/2008**

The Sekolah Lestari-Anugerah Alam Sekitar Programme, a collaborative environmental awareness programme between the Department of Environment and the Ministry of Education Malaysia with technical support from the Institute of Environment and Development (LESTARI) of Universiti Kebangsaan Malaysia was designed to facilitate and strengthen existing environmental education programmes in schools. Through this initiative, the fundamental elements of environmental education can be incorporated directly by teachers and students, and indirectly by local communities through the integration of knowledge, skills and environmental values under the four key components of Management, Curriculum, Co-Curriculum and Greening.

This programme was launched by the then Honourable Minister of Natural Resources and Environment, Dato' Sri Adenan Hj. Satem and the Honourable Minister of Education, Dato' Sri Hishammuddin Tun Hussein at Sekolah Menengah Jalan Tiga, Bandar Baru Bangi, Selangor on 27 January 2005.

Bagi sesi 2007/2008, sebanyak 72 penyertaan dari 13 buah negeri telah diterima terdiri daripada 25 buah sekolah rendah dan 47 buah sekolah menengah.

Sebagai persiapan bagi proses penilaian, satu (1) kursus untuk para penilai telah diadakan pada 7-9 April 2008 di Hotel Legacy, Melaka. Seramai 45 peserta telah menghadiri kursus tersebut yang terdiri daripada pegawai-pegawai Jabatan Alam Sekitar, Jabatan Pelajaran Negeri, Badan Bukan Kerajaan (NGO), Badan Berkanun dan agensi swasta. Mereka-mereka ini kemudiannya dilantik sebagai penilai untuk Anugerah Sekolah Lestari-Anugerah Alam Sekitar 2007/2008.

For the 2007/2008 session, 72 entries from 13 states comprising of 25 primary schools and 47 secondary schools participated respectively.

In preparation for the assessment process, a training course for assessors was held on 7-9 April 2008 at the Legacy Hotel, Melaka. The training course was attended by 45 participants from Department of Environment, Ministry of Education Malaysia, non-governmental organisations, local authorities and private agencies. Upon completion of the course, the participants were appointed as assessors for the 2007/2008 Sustainable School-Environmental Award.



Kem Kesedaran Alam Sekitar (KeKAS)  
Environmental Awareness Camp (KeKAS)

## SEBARAN MAKLUMAT ALAM SEKITAR ENVIRONMENTAL INFORMATION DISSEMINATION

### Sebaran Maklumat / Perhubungan Awam

Beberapa aktiviti yang bertujuan untuk mempromosi dan meningkatkan kesedaran alam sekitar telah dilaksanakan dalam tahun 2008 seperti pameran alam sekitar, tayangan iklan menerusi televisyen/radio dan penerbitan bahan terbitan alam sekitar.

### Maklumat Alam Sekitar

Pada tahun 2008, JAS telah menerbitkan sejumlah 524,000 naskhah bahan-bahan bacaan alam sekitar yang terdiri daripada Laporan Kualiti Alam Sekeliling 2007, Laporan Tahunan Jabatan Alam Sekitar 2007, majalah IMPAK dan ERA HIJAU, cetakan semula buku Kartun Alam Sekitar Edisi ke-2, risalah-risalah, buku-buku dan kalendar bermesejkan alam sekitar.

Bahan-bahan bercetak tersebut diedarkan kepada pelbagai agensi kerajaan, perpustakaan-perpustakaan, pusat rujukan, institusi pendidikan, persatuan bukan kerajaan dan orang individu.

### Pameran Awam

Pada tahun 2008, JAS telah menyertai sebanyak 14 pameran bertemakan alam sekitar yang telah dianjurkan oleh sekolah-sekolah, institusi-institusi pengajian tinggi, sektor perindustrian, agensi kerajaan dan awam.

- Pameran semasa Hari Bertemu Pelanggan NRE 1/2008  
Putrajaya, 1 April 2008
- Pameran semasa Majlis Penganugerahan Bandar Lestari-Anugerah Alam Sekitar 2006/2007 & Anugerah Langkawi 2007  
Putra International Convention Centre, Putrajaya, 5 Jun 2008
- Pameran semasa Sambutan Hari Alam Sekitar Sedunia 2008  
Zoo Negara, Kuala Lumpur, 22 Jun 2008

### Information Dissemination / Public Relations

Several activities aimed at promoting and enhancing environmental awareness conducted in 2008 were environmental exhibitions, advertisements through television/radio and newspaper and publications on the environment.

### Environmental Information

In 2008, DOE published more than 524,000 copies of environmental reading materials including the Environmental Quality Report 2007, the 2007 Annual Report, IMPAK and ERA HIJAU bulletin, a reprint of the "Buku Kartun Alam Sekitar", brochures, books and calendars with environmental messages.

These printed materials were distributed to various government agencies, libraries, resource centres, educational institutions, non-governmental organizations and individuals.

### Environmental Exhibitions

In 2008, DOE participated in 14 environmental exhibitions organized by schools, institutions of higher learning, the industrial sector, government agencies and the public.

- Exhibition at "Hari Bertemu Pelanggan NRE 1/2008"  
Putrajaya, 1 April 2008
- Exhibition at "Majlis Penganugerahan Bandar Lestari - Anugerah Alam Sekitar 2006/2007 & Anugerah Langkawi 2007"  
Putra International Convention Centre, Putrajaya, 5 June 2008
- Exhibition at "Sambutan Hari Alam Sekitar Sedunia 2008"  
Zoo Negara, Kuala Lumpur, 22 June 2008

- Pameran semasa Pengurusan Aduan Hari Bertemu Pelanggan  
Taman Laut Pulau Tioman, Pahang, 30 Jun -3 Julai 2008
- Pameran semasa Inovasi dan Kecemerlangan Festival Konvensyen 08/09 Universiti Malaya Kuala Lumpur, 4-10 Ogos 2008
- Pameran semasa Lawatan Star Rating MAMPU ke Kementerian Sumber Asli Dan Alam Sekitar Putrajaya, 19 Ogos 2008
- Pameran semasa Hari Kesihatan, Keselamatan dan Alam Sekitar-Carigali PTTEPI Operating Company Sdn. Bhd.  
Hotel Equatorial Bangi Selangor, 22 Ogos 2008
- Pameran semasa Sambutan Hari Kemerdekaan ke-51 dan Hari Bertemu Pelanggan Kementerian Sumber Asli dan Alam Sekitar Putrajaya, 27 Ogos 2008
- Pameran semasa Minggu Kesedaran Alam Sekitar SMK. Putrajaya Presint 9(1), Putrajaya, 29 Ogos 2008
- Pameran semasa Sambutan Minggu Alam Sekitar Malaysia  
Paya Indah Wetlands, Dengkil Selangor, 20 Oktober 2008
- Pameran semasa Eco Film Festival Akademik Seni Budaya dan Warisan Kebangsaan Malaysia, Kuala Lumpur, 31 Oktober-2 November 2008
- Pameran semasa Hari Kualiti NRE dan Hari Bertemu Pelanggan NRE 2008  
Putrajaya, 6-7 November 2008
- Pameran semasa "Waste Management Conference and Exhibition 2008"  
Sime Darby Convention Centre, Kuala Lumpur, 11-12 November 2008
- Pameran semasa Program Semarak Hadhari Peringkat Wilayah Persekutuan 2008  
Dataran Putra, Putrajaya, 17-21 Disember 2008
- Exhibition at "Pengurusan Aduan Hari Bertemu Pelanggan"  
Taman Laut Pulau Tioman, Pahang, 30 June -3 July 2008
- Exhibition at "Inovasi dan Kecemerlangan Festival Konvensyen 08/09" Universiti Malaya Kuala Lumpur, 4-10 August 2008
- Exhibition at "Lawatan Star Rating MAMPU ke Kementerian Sumber Asli Dan Alam Sekitar"  
Putrajaya, 19 August 2008
- Exhibition at "Hari Kesihatan, Keselamatan dan Alam Sekitar-Carigali PTTEPI Operating Company Sdn. Bhd."  
Hotel Equatorial Bangi Selangor, 22 August 2008
- Exhibition at "Sambutan Hari Kemerdekaan ke-51 dan Hari Bertemu Pelanggan Kementerian Sumber Asli dan Alam Sekitar"  
Putrajaya, 27 August 2008
- Exhibition at "Minggu Kesedaran Alam Sekitar" SMK. Putrajaya Presint 9(1), Putrajaya, 29 August 2008
- Exhibition at "Sambutan Minggu Alam Sekitar Malaysia"  
Paya Indah Wetlands, Dengkil Selangor, 20 October 2008
- Exhibition at "Eco Film Festival"  
Akademik Seni Budaya dan Warisan Kebangsaan Malaysia, Kuala Lumpur, 31 October-2 November 2008
- Exhibition at "Hari Kualiti NRE dan Hari Bertemu Pelanggan NRE 2008" Putrajaya, 6-7 November 2008
- Exhibition at "Waste Management Conference and Exhibition 2008"  
Sime Darby Convention Centre, Kuala Lumpur, 11-12 November 2008
- Exhibition at "Program Semarak Hadhari Peringkat Wilayah Persekutuan 2008"  
Dataran Putra, Putrajaya, 17-21 December 2008

## Perkhidmatan Perpustakaan-Enviro

Perpustakaan-Enviro yang terletak di Ibu Pejabat JAS berfungsi sebagai pusat rujukan kepada kakitangan JAS dan orang awam yang berdaftar. Sehingga 31 Disember 2008, koleksi bahan rujukan adalah sebanyak 35,424 buah. Bilangan pengunjung ke perpustakaan (HQ) ialah seramai 2,153.

## Enviro-Library Services

The Enviro-Library located at the DOE Head Office served as an important reference centre for both DOE staff and registered public users. As of 31 December 2008, the entire collection of reference materials totaled 35,072. The number of library users were 2,153.



Pameran Alam Sekitar  
Environmental Exhibition



Majlis Penganugerahan Bandar Lestari-Anugerah Alam Sekitar 2006/2007  
The "Majlis Penganugerahan Bandar Lestari –Anugerah Alam Sekitar 2006/2007"



Minggu Alam Sekitar Malaysia 2008  
2008 Malaysia Environment Week

**BAB 6 / Chapter 6**



## HAL-EHWAL ALAM SEKITAR ANTARABANGSA – KERJASAMA DUA HALA INTERNATIONAL ENVIRONMENTAL AFFAIRS – BILATERAL COOPERATION

### Malaysia – Arab Saudi

Satu delegasi seramai enam (6) orang dari Arab Saudi telah mengadakan lawatan sambil belajar ke Jabatan Alam Sekitar, Malaysia pada 23 Julai 2008. Objektif lawatan ke JAS adalah untuk mengetahui secara lebih lanjut mengenai kaedah-kaedah yang digunakan untuk pengumpulan dan penganalisaan sampel air sungai dan marin di Malaysia dan pengurusan kualiti udara di Malaysia.

### Malaysia – Bangladesh

Satu delegasi yang terdiri daripada dua (2) orang pegawai kanan dari Bangladesh telah mengadakan lawatan sambil belajar ke Jabatan Alam Sekitar, Malaysia pada 16 September 2008. Tujuan lawatan tersebut adalah untuk memahami secara mendalam tentang undang-undang dan pengurusan alam sekitar di Malaysia.

### Malaysia – Indonesia Mengenai Jerebu

Satu Memorandum Persefahaman (MoU) di antara Malaysia dan Indonesia ke arah usaha-usaha pencegahan kebakaran tanah dan hutan serta jerebu di Wilayah Riau, Sumatera, Indonesia telah ditandatangani pada 3 Jun 2008 di Jakarta, Indonesia.

Beberapa program telah dilaksanakan di bawah MoU ini. Ianya termasuk Bengkel Latihan Bina Upaya Bagi Amalan Pembakaran Sifar Kepada Ketua-ketua Masyarakat Dan Para Petani Dari Wilayah Riau, Sumatera, Indonesia telah diadakan pada 14 hingga 17 Julai 2008 di Sepang, Selangor dan Latihan Pemadaman Api Bagi Masyarakat Peduli Api (sukarelawan pemadam api) dari Wilayah Riau, Sumatera, Indonesia telah diadakan pada 4 hingga 8 Ogos bertempat di Akademi Bomba dan Penyelamat, Kuala Kubu Bharu, Selangor.

Aktiviti-aktiviti yang akan dilaksanakan pada tahun hadapan adalah pemasangan stesen pemantauan kualiti udara dan projek perintis pengurusan tanah gambut di Wilayah Riau, Sumatera, Indonesia.

### Malaysia – Kingdom Of Saudi Arabia

A delegation consisting of six (6) people from the Kingdom of Saudi Arabia visited the Department of Environment, Malaysia on 23 July 2008. The purpose of the visit was to learn about the sampling and analysis procedures on river, marine and air quality monitoring in Malaysia.

### Malaysia – Bangladesh

A delegation consisting of two (2) senior officers from Bangladesh visited the Department of Environment, Malaysia on 16 September 2008. The visit was to gather information on environmental regulations and environmental management in Malaysia.

### Malaysia – Indonesia on Haze

A Memorandum of Understanding (Mou) between Malaysia and Indonesia on Collaboration in Preventive Measures to Deal with Land and Forest Fires and Haze in Riau Province, Sumatera, Indonesia was signed on 3 June 2008 in Jakarta, Indonesia.

Under the MoU, several programmes have been implemented which include a Training Workshop on Zero Burning Practices for Community Leaders and Farmers from Riau Province, Sumatera, Indonesia which was held from 14 to 17 July 2008 in Sepang, Selangor and a fire-fighting training for Masyarakat Peduli Api (fire brigade volunteers) from Riau Province, Sumatera, Indonesia which was held on 4 to 8 August 2008 at the Fire and Rescue Department's Academy, Kuala Kubu Bharu, Selangor.

Activities to be implemented in the following year are installation of air quality monitoring station and pilot project on peatland management in Riau Province, Sumatera, Indonesia.

## HAL-EHWAL ALAM SEKITAR ANTARABANGSA – KERJASAMA SERANTAU INTERNATIONAL ENVIRONMENTAL AFFAIRS – REGIONAL COOPERATION

### Malaysia – Singapura

Mesyuarat Ke-tujuh Kumpulan Kerja Jawatankuasa Bersama Malaysia - Singapura mengenai Alam Sekitar (WG of MSJCE) telah diadakan pada 28-29 April 2008. Mesyuarat ini telah dipengerusikan bersama oleh Y. Bhg. Dato' Hajah Rosnani Ibarahim, Ketua Pengarah Alam Sekitar, Malaysia dan Encik Lee Yuen Hee, Ketua Pegawai Eksekutif, National Environment Agency, Singapore.

Delegasi Malaysia ke mesyuarat tersebut terdiri daripada pegawai-pegawai kanan dari Jabatan Alam Sekitar serta wakil dari Kementerian Luar Negeri, Jabatan Laut Semenanjung Malaysia, Agensi Penguatkuasaan Maritim Malaysia (APMM) dan Universiti Kebangsaan Malaysia.

Isu-isu alam sekitar yang telah dibincangkan dalam mesyuarat tersebut adalah seperti kawalan pencemaran kenderaan, pemantauan kualiti air di Selat Johor, tumpahan minyak dan kimia di Selat Johor dan program latihan.

### Malaysia – Singapore

The 7<sup>th</sup> Malaysia-Singapore Joint Committee on the Environment (MSJCE) Working Group Meeting (WG of MSJCE) was held in Singapore on 28-29 April 2008. The Meeting was co-chaired by Dato' Hajah Rosnani Ibarahim, Director General of Environment, Malaysia and Mr. Lee Yuen Hee, Chief Executive Officer, National Environment Agency, Singapore.

The Malaysian delegates to this meeting were senior officers of the Department of Environment and representatives from the Ministry of Foreign Affairs, Marine Department, Malaysian Maritime Enforcement Agency (MMEA) and National University of Malaysia.

The environmental issues discussed at the meeting were vehicular emissions control, water quality in the Straits of Johor, chemical and oil spill along the Straits of Johor and training programmes.



Mesyuarat Ke-tujuh Kumpulan Kerja Jawatankuasa Bersama Malaysia - Singapura mengenai Alam Sekitar (WG of MSJCE)

The 7<sup>th</sup> Malaysia - Singapore Joint Committee on the Environment (MSJCE) Working Group Meeting



Majlis Menandatangani Memorandum Persefahaman (MoU) di antara Malaysia dan Indonesia ke arah Usaha-usaha Pencegahan Kebakaran Tanah Dan Hutan Serta Jerebu di Wilayah Riau, Sumatera, Indonesia  
 Memorandum of Understanding (MoU) between Malaysia and Indonesia on Collaboration in Preventive Measures to Deal with Land and Forest Fires and Haze in Riau Province, Sumatera, Indonesia



Bengkel Latihan Bina upaya Bagi Amalan Pembakaran Sifar Kepada Ketua-ketua masyarakat Dan Para Petani Dari Wilayah Riau, Sumatera, Indonesia  
 Training Workshop on Zero Burning Practices for Community Leaders and Farmers from Riau Province, Sumatera, Indonesia

**BAB 7 / Chapter 7**



## **BAHAGIAN TEKNOLOGI MAKLUMAT INFORMATION TECHNOLOGY DIVISION**

Bahagian Teknologi Maklumat telah diberi tanggungjawab untuk menyediakan infrastruktur dan perkhidmatan ICT kepada Jabatan Alam Sekitar. Ini termasuklah melaksanakan perolehan perkakasan, perisian dan perkhidmatan ICT; merancang, membangun, melaksana dan menyelenggara sistem-sistem aplikasi jabatan serta menyokong pelaksanaan aplikasi-aplikasi Elektronik Kerajaan (MyEG) di Jabatan; menyediakan, memantau dan menyelenggara perkhidmatan rangkaian komunikasi jabatan; memantau dan mengawal selia keselamatan ICT di seluruh jabatan selaras dengan Dasar Keselamatan ICT JAS; menyediakan latihan-latihan ICT; serta menyediakan khidmat nasihat dan sokongan teknikal ICT kepada para pengguna di Jabatan.

### **Sistem Elektronik Kawalan Alam Sekitar (E-KAS)**

Sistem Elektronik Kawalan Alam Sekitar (E-KAS) merupakan satu sistem aplikasi bersepadu yang menjadi pusat pengumpulan data-data berkaitan alam sekitar, termasuk buangan terjadual, punca-punca dan beban pencemaran, pemantauan, pelesenan serta penguatkuasaan alam sekitar.

Dalam usaha untuk meningkatkan kadar penggunaan Sistem E-KAS, Modul Penguatkuasaan dalam Sistem E-KAS telah diperbaiki dan ditingkatkan. Submodul-submodul yang terlibat adalah submodul Aduan, Kompaun, Status Pematuhan Premis Yang Ditetapkan (PYDT) untuk kilang-kilang getah dan kilang-kilang kelapa sawit, dan juga Status Pematuhan Premis Yang Bukan Ditetapkan (PYBDT).

### **Sistem Penguatkuasaan & Pemantauan Jarak Jauh**

Pada tahun 2008, Sistem Penguatkuasaan Dan Pemantauan Jarak Jauh telah dilaksanakan dalam memupuk kesedaran di kalangan pelbagai sektor industri untuk mengawal dan memantau pelepasan

The Information Technology Division is responsible to provide ICT infrastructure and services for the Department Of Environment. This includes the procurement of hardware, software and ICT services; planning, developing, implementing and maintaining application systems within the department as well as supporting the implementation of the Electronic Government (MyEG) application systems at the department; providing, monitoring and maintaining the department's network and communication services; monitoring and regulating the ICT security within the entire department in accordance to the DOE ICT Security Policy; providing ICT trainings; as well as providing ICT technical advices and support to the users of the department.

### **Environmental Control Electronic System (E-KAS)**

The Environmental Control Electronic System (E-KAS) is an integrated application system that serves as the central hub for the collection of environmental data, including scheduled wastes, pollution sources and pollution loads, environmental monitoring, licensing and enforcement.

In an effort to increase the usage of the E-KAS system the Enforcement Module in the E-KAS System was further improved and enhanced. Submodules on Complaints, Compounds, Compliance Status for Prescribed Premises for rubber factories and palm oil mills, as well as Compliance Status for Non-Prescribed Premises were included.

### **Remote Monitoring And Enforcement System**

In 2008, the Remote Monitoring And Enforcement System was implemented to create awareness among the various industries to effectively control and monitor their emission through the deployment of Continuous

pencemar udara dengan lebih berkesan melalui penggunaan Sistem Pemantauan Pelepasan Berterusan (CEMS). Bagi tujuan ini, sebanyak enam (6) siri seminar telah diadakan di seluruh negara.

Sehingga 2008, sistem ini telah dilaksanakan kepada empat (4) jenis industri; industri simen, kilang kelapa sawit, stesen janakuasa, loji rawatan insinerator serta industri minyak dan gas.

#### **Laman Web Rasmi Jabatan Alam Sekitar**

Pada tahun 2008, laman web Jabatan Alam Sekitar melalui alamat URL <http://www.doe.gov.my> telah diperbaharui dan ditingkatkan dengan ciri-ciri mesra pengguna yang lebih baik.

Pada bulan Mei 2008, maklumat-maklumat berkaitan Penilaian Kesan Kepada Alam Sekeliling (EIA) yang komprehensif dan terperinci telah mula dipaparkan di laman web jabatan. Ini termasuklah senarai jururunding EIA yang berdaftar dengan JAS serta laporan-laporan EIA termasuk Laporan Terperinci EIA (DEIA) dan Laporan Awal EIA (PEIA).

Pada bulan Ogos 2008, Sistem Pengurusan Indeks Pencemar Udara (Air Pollutant Index Management System—APIMS) telah diintegrasikan ke dalam laman web JAS. Sistem ini bertujuan untuk memudahkan pengurusan data-data Indeks Pencemar Udara (IPU) dengan lebih efisien. Melalui sistem ini juga, data-data IPU boleh dipaparkan secara interaktif berserta carta statistik yang lebih difahami berkaitan dengan status IPU.

Emission Monitoring System (CEMS). For this purpose, six (6) series of seminars all over the country were conducted.

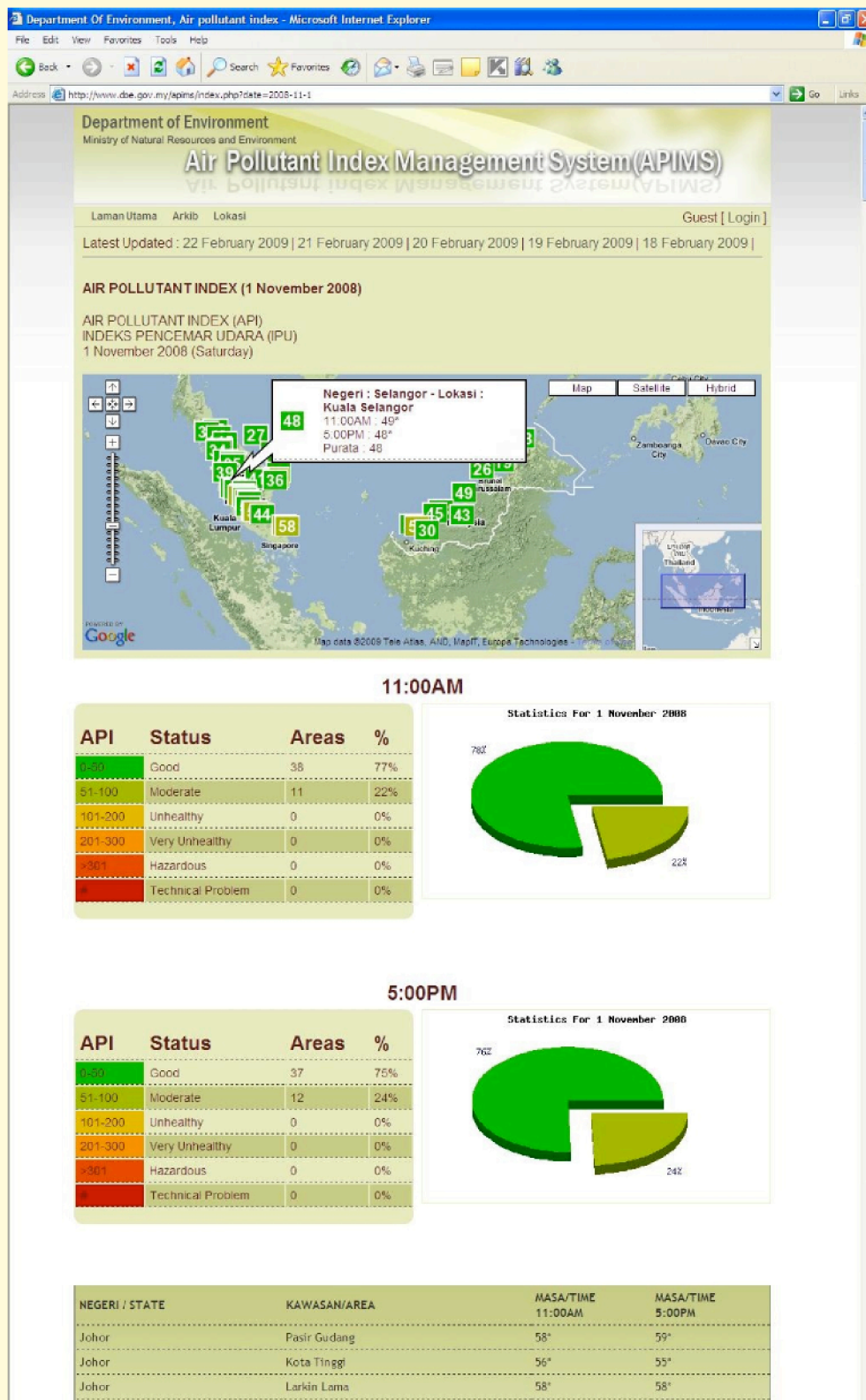
As of 2008, this system was implemented in four (4) types of industries; cement industry, palm oil mills, heat and power generation industry, waste incineration plants and the oil and gas industry.

#### **The Website Of The Department Of Environment**

In 2008, the website of the Department of Environment at URL <http://www.doe.gov.my>, was further improved and enhanced with user friendly features.

In May 2008, a comprehensive and detailed Environmental Impact Assessment (EIA) information was made available via the department's website which included the listing of EIA consultants registered with DOE as well as Detailed EIA Reports (DEIA) and Preliminary EIA Reports (PEIA).

In August 2008, the Air Pollutant Index Management System (APIMS) was integrated into DOE's website. The objective of this system was to allow more efficient management of the Air Pollutant Index (API) data. With this system, the API data can be viewed via the website interactively, together with the statistical charts showing the API status.



Sistem Pengurusan Indeks Pencemar Udara (APIMS)  
Air Pollutant Index Management System (APIMS)



### **Sistem NRE\*Asset**

Pada tahun 2008, Sistem NRE\*Asset telah dilaksanakan ke seluruh Jabatan Alam Sekitar.

Sistem NRE\*Asset merupakan satu sistem aplikasi web yang memberi kemudahan merekod dan mengemaskini data dan maklumat mengenai aset jabatan, sekaligus dapat menjana laporan secara online.

Beberapa siri latihan penggunaan sistem telah dijalankan di Ibu Pejabat JAS dan Pejabat JAS Negeri.

Sistem ini diharapkan dapat membantu Jabatan dalam mengurus aset-aset dengan lebih sistematik dan berkesan mengikut kaedah kawalan pengurusan aset.

### **Sistem Notifikasi Dan Pendaftaran Bahan-Bahan Berbahaya Kepada Alam Sekeliling (EHS)**

Sistem Notifikasi Dan Pendaftaran Bahan-Bahan Berbahaya Kepada Alam Sekeliling (EHS) adalah satu sistem aplikasi web untuk membolehkan para pengeluar dan pengimport bahan-bahan berbahaya kepada alam sekeliling membuat notifikasi kepada Jabatan Alam Sekitar secara online.

Sistem ini turut membolehkan JAS membuat pendaftaran dan merekod EHS yang dinotifikasikan oleh pihak pengeluar dan pengimport bahan-bahan berbahaya tersebut.

Sistem yang diterajui oleh Bahagian Bahan Berbahaya ini telah dilancarkan kepada umum pada Julai 2008. Beberapa siri kursus telah diadakan kepada pihak pengeluar dan pengimport bahan-bahan berbahaya. Sistem ini boleh dicapai melalui alamat URL <http://www.e-ehs.doe.gov.my>.

### **Program Latihan ICT**

Pada tahun 2008, Bahagian Teknologi Maklumat telah menganjurkan beberapa program latihan

### **NRE\*Asset System**

In 2008, the NRE\*Asset System was implemented throughout the Department of Environment.

The NRE\*Asset System is a web based application system that provides the facility to record and update data and information on the department's assets, as well as to produce online generation.

Several series of training on the usage of the system were conducted at the DOE Head Office and the DOE State Offices.

This system would help the department to manage its assets in a systematic and effective manner according to the asset management control procedure.

### **Environmentally Hazardous Substances (EHS) Notification And Registration System**

The Environmentally Hazardous Substances (EHS) Notification And Registration System is a web based application system to allow manufacturers and importers of environmentally hazardous substances (EHS) to notify the Department Of Environment via the online system.

This system also allows DOE to register and record the EHS which have been notified by the EHS manufacturers or importers.

This system which is led by the Hazardous Substance Division was launched to the public in July 2008. Several series of training courses for EHS manufacturers and importers have been conducted. This system can be reached at URL <http://www.e-ehs.doe.gov.my>.

### **ICT Training Programmes**

In 2008, the Information Technology Division had organized a number of ICT training programmes,

ICT, termasuklah kursus, seminar, bengkel dan taklimat ICT sebagai sebahagian daripada usaha untuk meningkatkan kefahaman, pengetahuan dan kemahiran ICT di kalangan kakitangan JAS (**Jadual 7.1**).

including courses, seminars, workshops and talks in its efforts to enhance the understanding, knowledge and skills in ICT among DOE staff (**Table 7.1**).

Jadual 7.1 JAS: Program Latihan ICT 2008  
Table 7.1 DOE: 2008 ICT Training Programmes

Bil. No.	Nama Kursus Course Name	Tarikh Kursus Course Date	Bilangan Peserta Number Of Participants
1.	Seminar & Sesi Kemas Kini Teknologi Microsoft Office 2007 Seminar & Technology Update On Microsoft Office 2007	27 Februari February 2008	21



Penganjuran Latihan ICT Bertempat Di Bilik Latihan ICT, Bahagian Teknologi Maklumat  
Organizing ICT Training at ICT Training Room, Information Technology Division



Melaksanakan Penyelenggaraan Komputer  
Performing Computer Maintenance

**BAB 8 / Chapter 8**



## INSTITUT ALAM SEKITAR MALAYSIA (EiMAS) ENVIRONMENT INSTITUTE OF MALAYSIA (EiMAS)

### Program Latihan EiMAS

Pada tahun 2008, EiMAS telah berjaya menyediakan latihan sebanyak 72 kursus kepada sejumlah 4,170 peserta (**Jadual 8.1**).

Daripada 4,170 peserta, seramai 1,438 peserta adalah kakitangan JAS, manakala selebihnya adalah peserta dari luar Jabatan. Program latihan ini bertujuan untuk meningkatkan kecekapan dan kompetensi di kalangan peserta.

### Program Latihan untuk Industri

Pada tahun 2008, EiMAS meneruskan usaha menganjurkan program-program dan latihan untuk industri, bagi meningkatkan kefahaman dan pengetahuan mereka bagi mencapai pematuhan terhadap kehendak alam sekitar.

### Kursus Persijilan

Pada tahun 2008, tiga (3) Kursus Persijilan untuk pihak industri telah berjaya dilaksanakan iaitu Kursus Persijilan Untuk Pengurusan Buangan Terjadual, Kursus Pensijilan Alat Bagi Operator Kawalan Pencemaran Udara dan Kursus Pensijilan Bagi Operator Sistem Pengolahan Elluent Industri. Enam (6) peperiksaan kursus persijilan tersebut juga telah dilaksanakan pada tahun 2008.

### Seminar

Sebanyak 17 seminar telah dianjurkan kepada pihak industri untuk memberi pemahaman dan pengetahuan mengenai keperluan dan kehendak Jabatan Alam Sekitar, serta teknologi dan amalan-amalan alam sekitar. Seminar yang dianjurkan adalah *Seminar on Scheduled Waste Management, Seminar on Understanding of Environmental Requirements on Industrial Effluent Treatment System and Air Pollution*

### EiMAS Training Programme

In 2008, EiMAS successfully executed 72 training courses for a total of 4,170 participants (**Table 8.1**).

Out of the 4,170 participants, 1,438 were from DOE while the rest were external participants. These training programmes were aimed to enhance the efficiency and competency of the participants.

### Training Programmes for Industries

In 2008, EiMAS continued its training programmes for industries in order to upgrade their understanding and knowledge towards compliance to environmental requirements.

### Certification Courses

In 2008, three (3) Certification Courses were conducted for the industries namely, Certification Course for Scheduled Waste Managers, Certification Course for Operators of Air Pollution Control Equipment (Bag Filter Dust Collector) and Certification Course for Operators of Industrial Effluent Treatment Systems (IETS). Examinations for these certification courses were conducted six (6) times during 2008.

### Seminars

A total of 17 seminars were conducted for industries to provide understanding and knowledge of environmental requirements and available environmental technologies or practices. The topics covered were Understanding of Environmental Requirements on Industrial Effluent Treatment System and Air Pollution Control System, Continuous Emission Monitoring Systems (CEMs), Success Stories

*Control System, Seminar On Continuous Emission Monitoring Systems (CEMs), Seminar On Success Stories Of Performance Monitoring of IETS and APCS dan Seminar Latihan Pengurusan Alam Sekitar.*

### **Program Sangkutan**

Program sangkutan bagi kakitangan JAS di beberapa organisasi swasta di dalam negeri telah dianjurkan. Seramai 20 pegawai telah mengikuti program sangkutan di lima (5) premis kilang pada tahun 2008. Objektif Program ini adalah untuk menyediakan latihan 'hands-on' kepada kakitangan JAS bagi membolehkan mereka menjadi jurulatih yang kompeten dalam bidang masing-masing (**Jadual 8.2**).

### **Latihan Luar Negara**

Selain daripada mengendalikan latihan dalam negara, EiMAS juga bertanggungjawab menguruskan penghantaran pegawai dan kakitangan JAS untuk mengikuti kursus di luar negara yang kurang daripada tiga (3) bulan.

Sepanjang tahun 2008, EiMAS telah mengaturkan 16 pencalonan bagi menghadiri 10 program latihan di luar negara (**Jadual 8.3**).

### **Program Kerjasama**

Dalam memenuhi keperluan menyediakan latihan yang terbaik untuk kakitangan JAS, dan juga memantapkan keupayaan tenaga pengajar EiMAS, EiMAS juga telah menjalinkan kerjasama dengan agensi kerajaan, badan-badan berkanun dan sektor swasta. Ini termasuklah beberapa premis industri/pemaju projek yang menerima peserta kursus daripada EiMAS termasuk peserta luar negara di bawah kursus Program Kerjasama Teknikal Malaysia (PKTM).

of Performance Monitoring of IETS and APCS and Environment Management.

### **Attachment Programmes**

Attachment programmes for DOE officers were held at various private organisations. A total of 20 officers attended the placement programmes at five (5) factory premises in 2008. The objectives of this programme were to provide 'hands-on' training for DOE staff to enable them to become competent trainers in their respective fields (**Table 8.2**).

### **Overseas Training Courses**

Besides conducting internal training programmes, EiMAS was also responsible in making arrangements for DOE officers and staff for overseas training of less than three (3) months.

Throughout 2008, 16 nominations to participate in 10 overseas programmes were made (**Table 8.3**).

### **Collaboration Programmes**

In fulfilling the need to provide the best training for DOE personnel as well as to strengthen the capacity of EiMAS trainers, EiMAS had established collaborative programmes with a number of government agencies, statutory bodies and the private sector. These included a number of industries/project developers who had accepted EiMAS participants for their study visits, including foreign participants under the Malaysian Technical Cooperation Programme (MTCP).

**Program Kerjasama Teknikal Malaysia (PKTM):  
Kursus Mengenai Pengurusan Alam Sekitar  
dan Kawalan Pencemaran**

Sebagai penyelaras kepada program PKTM, Unit Perancang Ekonomi telah meluluskan EiMAS sebagai agensi ke-35 bagi mengendalikan latihan untuk peserta antarabangsa di bawah Program Kerjasama Teknikal Malaysia (PKTM). Kursus Pengurusan Alam Sekitar dan Kawalan Pencemaran (EMPC) ini dibuka kepada negara-negara Organization of the Islamic Conference (OIC) dan Asia-Pasifik. Pemilihan akhir peserta adalah berdasarkan kepada relevansi, kelayakan akademik dan peruntukkan kewangan.

Kursus EMPC yang berlangsung pada 28 Julai sehingga 15 Ogos 2008 telah dihadiri oleh 19 orang peserta daripada Gambia, Cambodia, Indonesia, LAO PDR, Nepal, Philippines, Qatar, Singapore, Sri Lanka dan Solomon Island serta seorang (1) peserta daripada Malaysia.

Objektif kursus PKTM ini diadakan adalah bagi menyediakan latihan dalam pelbagai aspek dan kaedah bagi pengurusan kualiti udara; berkongsi amalan-amalan yang baik dalam pelaksanaan program-program kebangsaan dan antara agensi yang melibatkan pengurusan pencemaran pantai dan marin; berkongsi

**Malaysian Technical Cooperation Programme (MTCP): Course on Environmental Management and Pollution Control**

The Economic Planning Unit, as the coordinator for MTCP, gave its approval to EiMAS as the 35<sup>th</sup> agency to provide training for international participants under the auspices of the Malaysian Technical Cooperation Programme. The course on Environmental Management and Pollution Control (EMPC) is open to Organization of the Islamic Conference (OIC) and Asia-Pacific Countries. Final selection was made based on job relevancy, academic qualifications and budget availability.

The EMPC course, held on 28 July–5 August 2008 was attended by 19 participants from Gambia, Cambodia, Indonesia, LAO PDR, Nepal, Philippines, Qatar, Singapore, Sri Lanka and Solomon Island as well as one (1) participant from Malaysia.

The objectives of this MTCP Course were to provide training in the various aspects and methods of air quality management; to share good practices on the implementation of national and inter-agencies programmes involving coastal and marine pollution management; to share experiences on the legal and



Kursus Pengolahan Sisa Air Buangan Dalam Industri Makanan  
Course on Waste Water Treatment in Food Industry

pengalaman dalam keperluan perundangan dan prosedur mengenai penilaian kesan kepada alam sekeliling (EIA) di Malaysia; dan memberi pendedahan serta pengetahuan yang bersesuaian dan kemahiran mengenai punca-punca pencemaran buangan berbahaya dan pengurusan kawalannya.

Kursus ini telah berjaya menonjolkan aspek pengurusan alam sekitar yang berbeza-beza di Malaysia, dan hubungan rapat di antara agensi kerajaan dan swasta membuktikan kejayaan konsep Persyarikatan Malaysia.

**Program Latihan Negara Ketiga/ Program Kerjasama Teknikal Malaysia (PKTM): Kursus Mengenai Rawatan Sisa Air Buangan Dalam Industri Makanan Untuk Negara CLMV**

Pada tahun 2008, EIMAS juga telah diberi kepercayaan untuk menjadi agensi penyelaras bagi kursus TCTP/ MTCP tajaan Unit Perancang Ekonomi dan Japan International Cooperation Agency (JICA). Kursus ini dibuka kepada negara-negara Cambodia, Lao PDR, Myanmar dan Vietnam (CLMV). Pemilihan akhir peserta adalah berdasarkan kepada relevansi, kelayakan akademik dan peruntukan kewangan.

Kursus yang berlangsung pada 17–27 November 2008 telah dihadiri oleh sembilan (9) orang peserta daripada negara CLMV serta empat (4) orang peserta daripada Malaysia.

Objektif kursus ini diadakan adalah bagi memberi pemahaman tentang prinsip kawalan pencemaran dalam proses industri makanan; memperkenalkan pengawasan sistem pengolahan air sisa; menyediakan panduan dalam kawalan proses; dan memberikan pengetahuan dan kemahiran dalam teknik pemeriksaan yang berkaitan dengan sistem operasi pengolahan air sisa.

procedural requirements on environmental impact assessment (EIA) in Malaysia; to give exposure and provide appropriate knowledge and skill on hazardous waste pollution sources and control management.

This course succeeded in demonstrating the different aspects of environmental management in Malaysia, as well as the close partnership between Government agencies and the private sector, underlining the success of our Malaysian Incorporated concept.

**Third Country Training Programme (TCTP)/ Malaysian Technical Cooperation Programme (MTCP): Course on Waste Water Treatment in Food Industry for CLMV Countries**

In 2008, EIMAS was also given the task to be the implementing Agency for the TCTP/MTCP Course sponsored by Economic Planning Unit and Japan International Cooperation Agency (JICA). The course was offered to countries like Cambodia, Lao PDR, Myanmar and Vietnam (CLMV). Final selection was made based on job relevancy, academic qualifications and budget availability.

The course, held on 17-27 November 2008 was attended by nine (9) participants from CLMV countries as well as four (4) participants from Malaysia.

The objectives of the course were to understand the principal of pollution control in food processing industries; to familiarize with performance monitoring of a waste water treatment system; to provide guidance in process control; and to impart knowledge and skills on inspection techniques related to waste water treatment system operation.

### **Kerjasama dengan Institut Latihan Kehakiman dan Perundangan**

EiMAS meneruskan program kerjasama dengan ILKAP melalui dua (2) siri kursus bertajuk 'Kursus Asas Pendakwaan' dan 'Kursus Lanjutan Pendakwaan' dengan kumpulan sasarannya terdiri daripada 45 orang Pegawai Pendakwa JAS.

### **Kerjasama dengan Polis Di Raja Malaysia**

EiMAS telah mengadakan kursus 'Penyediaan dan Metodologi bagi Kertas Siasatan' dengan kerjasama Polis Di Raja Malaysia, untuk kumpulan sasarannya yang terdiri daripada 27 orang Pegawai Penyiasat JAS.

### **Kerjasama dengan Agensi Penguatkuasaan Maritim Malaysia (APMM)**

EiMAS telah mengadakan kursus AKAS 1974 & Pemakaian Terhadap Kawalan Pencemaran Marin dengan kerjasama Agensi Penguatkuasaan Maritim Malaysia (APMM), untuk kumpulan sasarannya terdiri daripada 30 orang Pegawai JAS.

### **Collaboration with the Judicial and Legal Training Institute (ILKAP)**

EiMAS continued its collaboration programmes with ILKAP by organizing two (2) series of courses; 'Basic Course on Prosecution' and 'Advanced Course On Prosecution' intended for 45 DOE's Prosecuting Officers.

### **Collaboration with the Malaysian Royal Police College**

EiMAS organized a course on Preparation and Methodology of Investigation Papers in collaboration with the Malaysian Royal Police for 27 DOE's Investigating Officers.

### **Collaboration with the Malaysian Maritime Enforcement Agency**

EiMAS organised a course on "EQA 1974 & Application For Marine Pollution Control" in collaboration with the Malaysian Maritime Enforcement Agency, for 30 DOE's Officers.



Kursus Asas Pendakwaan dan Kursus Lanjutan Pendakwaan  
Basic Course on Prosecution and Advanced Course on Prosecution



Sesi Latihan Makmal EIMAS, Kursus "Industrial Effluent Treatment System"  
 Laboratory Session EIMAS, Industrial Effluent Treatment System Course



Sesi Ceramah, Kursus "Industrial Effluent Treatment System"  
 Lecture Session, Industrial Effluent Treatment System Course

Jadual 8.1: Program Latihan EIMAS, 2008  
 Table 8.1: EIMAS Training Programmes, 2008

Bil. No.	Kategori Kursus Course Category	Bil. Kursus Yang Disediakan / No. Of Courses Conducted	Peserta JAS DOE Participants	Peserta Luar External Participants	Tempoh (Hari) Duration (Days)
1	Basic Competency Course	5	201	-	273
2	Quality Management	5	107	-	21
3	Water Quality Management	7	139	-	94
4	Air Quality Management	10	199	19	40
5	Environmental Legislation	4	103	-	26
6	Environmental Management and Impact Assessment	6	117	18	25
7	Scheduled Waste Management	6	151	33	35
8	Malaysian Technical Cooperation Programme (MTCP)	1	-	19	19
9	Third Country Training Programme (TCTP)	1	4	9	21
10	Certification Programme for Industry	7	-	198	35
11	Information Communication Technology	3	57	-	12
12	Seminars and Conference	17	360	2,278	19
13	Examination for Certification	6	-	158	-
	<b>Jumlah/ Total</b>	<b>78</b>	<b>1,438</b>	<b>2,732</b>	<b>620</b>

Jadual 8.2 JAS: Program Sangkutan 2008  
Table 8.2 DOE: Attachment Programmes, 2008

Bil. No.	Tempat Place	Tarikh Date	Peserta Participants
1	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Julai / July 2008	Mehrani Saharudin (DOE Negeri Sembilan)
2	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Julai / July 2008	Mohd Azrul Mas Saud (DOE Kedah)
3	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Julai / July 2008	Muhamad Hisham Abdullah (DOE Pahang)
4	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Julai / July 2008	Hazrina Salleh (DOE Selangor)
5	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Ogos / August 2008	Mohd Aznor Lamat (DOE Johor)
6	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Ogos / August 2008	Norli Abdullah (DOE Terengganu)
7	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Ogos / August 2008	Mohd Helmi Ahmad (DOE Kedah)
8	Fatty Chemical (M) Sdn. Bhd. Seberang Prai, Pulau Pinang	7 - 11 Ogos / August 2008	Mohd Nazir Mansor (DOE Melaka)
9	Petronas Gas Berhad, Kerteh, Terengganu	17 - 21 Ogos/ August 2008	Zakaria Ahmad (DOE Pahang)
10	Petronas Gas Berhad, Kerteh, Terengganu	17 - 21 Ogos / August 2008	Roslina Diwa (DOE Selangor)
11	Petronas Gas Berhad, Kerteh, Terengganu	17 - 21 Ogos / August 2008	Hor Su Wei (DOE Penang)
12	Petronas Gas Berhad, Kerteh, Terengganu	17 - 21 Ogos / August 2008	Norhisham Abdul Hamid (DOE W.P.K.L)
13	Nestle (M) Sdn. Bhd., Chembong Negeri Sembilan	24 - 28 November 2008	Muhamad Ridhwan Ramli (DOE Kelantan)
14	Nestle (M) Sdn. Bhd., Chembong Negeri Sembilan	24 - 28 November 2008	Saravanan a/l Kassi (DOE W.P.K.L)
15	Nestle (M) Sdn. Bhd., Chembong Negeri Sembilan	24 - 28 November 2008	Ooi Chean Wei (DOE Sarawak)
16	Nestle (M) Sdn. Bhd., Chembong Negeri Sembilan	24 - 28 November 2008	Zaimastura Ibrahim (EiMAS)
17	PETRONAS Gas Penapis, Melaka	24 - 28 November 2008	Mohd Amin Ghazali (DOE Terengganu)
18	PETRONAS Gas Penapis, Melaka	24 - 28 November 2008	Mohamad Safuan M. Sanuar (DOE Negeri Sembilan)
19	PETRONAS Gas Penapis, Melaka	24 - 28 November 2008	Mohd Shahrin Mansor (DOE, Headquarters)
20	PETRONAS Gas Penapis, Melaka	24 - 28 November 2008	Shamsuri Abdul Manaf (DOE Selangor)

Jadual 8.3 JAS: Latihan Luar Negara, 2008  
Table 8.3 DOE: Overseas Training Courses, 2008

Bil. No.	Kursus Courses	Penganjur Organizer	Tempat Place	Tarikh Date	Peserta Participants
1	Pengurusan Lembangan Sungai Bersepadu (IRBM)	Japan International Cooperation Agency (JICA) and Japan Water Agency (JWA)	Japan	9 Jan - 31 Jan 2008	Tengku Khalkausar Tengku Fathahi (DOE, Headquarters)
2	Peatland Fire Prediction and Monitoring System for The ASEAN Region	Singapore Government	Singapura	26 - 28 Feb 2008	Aida Yasmin Kamaruddin (DOE, Headquarters)
3	Minamata Disease Workshop 2008	Kerajaan Jepun	Japan	9 - 15 Mac/ March 2008	Hazrel Izzat Bin Mohd Noor (DOE Sarawak)
4	Minamata Disease Workshop 2008	Kerajaan Jepun	Japan	9 - 15 Mac/ March 2008	Mohamad Shabir Bin Said (DOE Penang)
5	Assistance And Protection Course	Republik Rakyat China	China	12 - 16 Mei/ May 2008	Abu Bakar Hj Tajuddin (DOE, Headquarters)
6	Policy on Resources Circulation and Solid Waste Management	Korea International Cooperation Agency (KOICA)	Republik Korea	19 Mei/May - 5 Jun/June 2008	Norlaili Bt Othman (DOE, Headquarters)
7	Policy on Resources Circulation and Solid Waste Management	Korea International Cooperation Agency (KOICA)	Republik Korea	19 Mei/May - 5 Jun/June 2008	Ku Marudi Bin Ku Sulaiman (DOE Selangor)
8	2008 Asia Pacific Leadership Programme on Environment for Sustainable Development, 2008 Asia Pacific Leadership	Republik Rakyat China	China	15 - 20 Sept. 2008	Tuan Hj. Abu Hasan Mohd Isa (DOE Kedah)
12	Environmental Education For Sustainable Development– Conservation Ecosystem For Lives of Local Communities	Japan International Cooperation Agency (JICA)	Japan	23 Sept.- 8 Nov. 2008	Mehrani Bte Saharudin (DOE Negeri Sembilan)
9	2008 International Training Course on Renewable Energy, Environment & Hygine From Developing Countries	Ministry of Commerce, Republik Rakyat China	Chengdu, Sichuan Province, P.R.China	15 - 29 Okt./ Oct. 2008	Shaliza Shaharum (DOE Sarawak)
10	Seminar on Integrated Coastal Management	Ministry of Commerce, Republik Rakyat China	Xiamen, Fujian Province, P.R.China	18 Okt./Oct - 16 Nov. 2008	Melissa Joseph James (DOE Sabah)
11	Region Focused Training Program Hazardous Waste Management And Appropriate Disposal For Asia (J-08-04066)	Japan International Cooperation Agency (JICA)	Japan	18 Nov - 20 Dis./Dec. 2008	Mohamad Hafiz Md Isa (DOE Johor)

Jadual 8.4: Premis Industri/ Tapak Projek Yang Dilawati Oleh Peserta Kursus, 2008  
 Table 8.4: Industrial Premises/Project Sites Visited By Course Participants, 2008

Bil. No.	Premis Industri/ Tapak Projek Industrial Premises/Project Sites
1	Alam Sekitar Malaysia Sdn. Bhd (Bukit Jelutong Business & Technology Centre, Shah Alam)
2	Pacific Food Product Sdn Bhd (Ayer Keroh Industrial Estate, Melaka)
3	Jimah Jom-Jt Joint Venture (Port Dickson, Negeri Sembilan)
4	Master Jaya Environmental Sdn. Bhd (Taming Jaya Ind Park Seri Kembangan)
5	Prima Agri-Products Sdn Bhd (Bandar Baru Bangi, Selangor)
6	Negeri Sembilan Cement Industries Sdn. Bhd.(CIMA)
7	Petroleum Industry of Malaysia Mutual Aid Group (PIMMAG)
8	PROTON Tanjung Malim Sdn Bhd
9	Golden Jomalina Food Industries Sdn. Bhd.
10	F&NCC Beverages Sdn Bhd (Shah Alam, Selangor)
11	Kian Joo Canpack Sdn Bhd (Nilai, Negeri Sembilan)
12	Perfect Food Manufacturing Sdn Bhd (Melaka)

**BAB 9 / Chapter 9**



## PENGELUARAN BERSIH DAN TEKNOLOGI MESRA ALAM CLEANER PRODUCTION AND ENVIRONMENTALLY SOUND TECHNOLOGY

Pengeluaran Bersih merupakan salah satu pendekatan baru bagi pengurusan alam sekitar. Konsep Pengeluaran Bersih (CP) kini semakin dikenali dan diterimapakai oleh komuniti industri. Pengeluaran Bersih telah diperakui di peringkat antarabangsa sebagai satu strategi pengurusan alam sekitar terbaik yang membolehkan sumber-sumber asli digunakan dengan lebih cekap dan mampan.

Pengeluaran Bersih juga dikenalpasti sebagai strategi pencegahan alam sekitar bersepadu yang diaplikasikan kepada proses, produk dan perkhidmatan bagi mengurangkan kos pengeluaran dan memperolehi faedah ekonomi secara langsung dan seterusnya dapat mengurangkan risiko kepada manusia dan alam sekitar.

Di Malaysia, kesedaran mengenai pengeluaran bersih di kalangan industri kecil dan sederhana masih lagi di tahap rendah. Usaha untuk mempromosi kesedaran konsep pengeluaran bersih sedang dilaksanakan secara berterusan oleh Unit Teknologi Bersih, Jabatan Alam Sekitar, Putrajaya.

Empat (4) strategi pelaksanaan pelan tindakan yang dilaksanakan oleh Unit Teknologi Bersih di bawah Rancangan Malaysia kesembilan (RMK-9) bagi Projek Pembangunan Pusat Teknologi Mesra Alam dan Pengeluaran Bersih (2006-2010) adalah seperti berikut:-

1. Kempen kesedaran konsep pengeluaran bersih;
2. Membentuk hubungan jaringan kerja dan penghebahan maklumat pengeluaran bersih;
3. Pembangunan kapasiti pengeluaran bersih; dan
4. Latihan, audit dan penyelidikan dan pembangunan (R&D) pengeluaran bersih.

Cleaner Production is a new approach for managing the environment. Cleaner Production concept is now well known and widely accepted by industrial communities. Cleaner Production has been acknowledged at international level as the best environmental management strategy that enables resources to be used efficiently and sustainably.

Cleaner Production is also known as an integrated environmental prevention strategy which can be applied to process, product and services in order to reduce production cost and obtain direct economic benefits as well as reduce risks to human and environment.

In Malaysia, awareness on cleaner production among small and medium scale industries are still low. Efforts to promote cleaner production concept have been carried out continuously by the Cleaner Production Unit, Department of Environment, Putrajaya.

Four (4) strategies of action plan implementation have been carried out by the Cleaner Production Unit under the Ninth Malaysian Plan (RMK-9) for Cleaner Production and Environmentally Friendly Technologies Centre Development Project (2006-2010). The strategies are as follow:-

1. Awareness campaign on cleaner production concept;
2. Establish of networking and dissemination of information on cleaner production;
3. Capacity building on cleaner production; and
4. Training, audit and research and development on cleaner production.

Pada tahun 2008, sebanyak RM1,070,000.00 telah diperuntukan untuk melaksanakan Pelan Tindakan Pengeluaran Bersih (CP) dibawah Rancangan Malaysia Ke-sembilan (RMK-9). Daripada peruntukan tersebut sebanyak RM1,069,220.10 (99.9 %) telah dibelanjakan untuk program pengeluaran bersih. Prestasi perbelanjaan RMK-9 adalah seperti dalam **Jadual 9.1** seperti berikut:-

In 2008, about RM1,070,000.00 has been allocated to implement the Cleaner Production Action Plan under the Ninth Malaysian Plan (RMK-9). From the allocation, about RM1,069,220.10 (99.9 %) has been spent for cleaner production programs. Expenditure performance under Ninth Malaysia Plan (RMK-9) are shown in **Table 9.1** as follows:-

**Jadual 9.1 JAS: Prestasi Perbelanjaan Pelaksanaan Program Pengeluaran Bersih Mengikut Tahun**  
**Table 9.1 DOE: Expenditure Performance on the Cleaner Production Programme based on Years**

Tahun / Year	2006	2007	2008
Peruntukan (RM) / Allocation (RM)	Tiada / Nil	258,000.00	1,070,000.00
Perbelanjaan Sebenar (RM) / Actual Expenditure (RM)	Tiada / Nil	237,436.22	1,069,220.10
Peratus Perbelanjaan Di bawah RMK-9 (%) Percentage of Expenditure Under RMK-9 (%)	Tiada / Nil	99.8	99.9

#### **PROGRAM PROMOSI DAN KESEDARAN PENGELUARAN BERSIH KEPADA JAS DAN INDUSTRI**

##### **Seminar 'Promotion of Environmentally Sound Technologies and Cleaner Production'**

Pada tahun 2008, sebanyak tiga (3) siri seminar roadshow telah diadakan bagi mempromosi pengeluaran bersih seperti dalam **Jadual 9.2** yang mempunyai objektif seperti berikut:-

- i. Meningkatkan kesedaran industri kecil dan sederhana (IKS) dan stakeholders yang relevan mengenai faedah dan pelaksanaan konsep pengeluaran bersih dan teknologi bersih;
- ii. Mempromosikan konsep/ pendekatan pengeluaran bersih sebagai 'alat kawalan' atau strategi dalam pengurusan alam sekitar;
- iii. Mengeratkan perhubungan dan kerjasama di antara Jabatan Alam Sekitar, agensi kerajaan serta

#### **PROGRAM ON PROMOTION AND AWARENESS OF CLEANER PRODUCTION FOR DOE AND INDUSTRIES**

##### **Seminar on Promotion of Environmentally Sound Technologies and Cleaner Production**

In 2008, there were three (3) series of road show seminars carried out to promote Cleaner Production as shown in **Table 9.2**, with the following objectives:-

- i. Improve awareness among small and medium scale industries (SMI) and relevant stakeholders on the benefits and implementation of cleaner production concept and clean technology;
- ii. Promote the concept / approach of Cleaner Production as a control tool or strategy in environmental management;
- iii. Strengthen the communication and cooperation between department of environment, other

stakeholders yang relevan dalam menyediakan rangkaian maklumat pengeluaran bersih atau teknologi bersih dan menyebarkannya kepada industri; dan

- iv. Membincangkan dan menilai opsi dan mekanisme kewangan yang diperlukan bagi membantu industri melaksanakan pengeluaran bersih dan teknologi bersih.

Penganjuran "Seminar on Promotion of Environmentally Sound Technologies and Cleaner Production" telah dilaksanakan dengan kerjasama Jabatan Alam Sekitar Negeri mengikut zon iaitu zon tengah (Kuala Lumpur dan Negeri Selangor), zon selatan (Melaka, Negeri Sembilan dan Johor) dan zon utara (Perak, Pulau Pinang, Kedah dan Perlis).

Penganjuran seminar, roadshow, taklimat dan latihan pengeluaran bersih telah dilaksanakan secara bersepadu dengan kerjasama pihak SMIDEC, SME Bank, pihak universiti iaitu Universiti Malaya (UM), Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), Universiti Teknologi Malaysia (UTM), SIRIM Berhad, Pusat Teknologi Malaysia (PTM), Perbadanan Produktiviti Malaysia (MPC), ENSEARCH, badan bukan kerajaan (NGO's) dan persatuan industri seperti Persatuan Pekilang-Pekilang Malaysia (FMM), Persatuan Industri Kecil dan Sedehana (SMI) dan MICCI.

government agencies and relevant stakeholders in setting up information network for cleaner production or clean technology and disseminate the information to industries; and

- iv. Discuss and assess the required options and financial mechanisms to help industries implement cleaner production and clean technology.

A seminar on "Promotion of Environmentally Sound Technologies and Cleaner Production" was carried out with the cooperation of State Department of Environment offices according to designated zone namely central zone (Kuala Lumpur and Selangor), southern zone (Melaka, Negeri Sembilan dan Johor) and northern zone (Perak, Pulau Pinang, Kedah and Perlis).

Seminars, road shows, briefing and training on cleaner production were carried out with the cooperation of SMIDEC, SME Bank, local universities such as University of Malaya (UM), University of Putra Malaysia (UPM), National University of Malaysia (UKM), University of Technology Malaysia (UTM), SIRIM Berhad, Malaysia Energy Center (PTM), Malaysia Productivity Corporation (MPC), ENSEARCH, Non government agencies (NGO's) and industries association such as Federation of Malaysia Manufacturers (FMM), Association of Small and Medium Industries (SMI) and MICCI .



Aktiviti Seminar Mengenai Pengeluaran Bersih, 2008  
Cleaner Production Seminar Activities, 2008

Kumpulan sasaran peserta seminar adalah terdiri daripada pihak industri khususnya industri kecil dan sederhana dan juga pegawai-pegawai JAS. Bilangan peserta yang telah menghadiri seminar tersebut adalah seramai 100-120 orang. Sebanyak enam (6) kertas kerja telah disampaikan oleh penceramah jemputan yang pakar mengenai pengeluaran bersih.

The participants for the seminar were from the local industries especially small and medium scale industries and DOE officers. The number of participants who attended each seminar was between 100-120. Six (6) papers had been delivered by expert guest speakers in cleaner production.

**Jadual 9.2: Senarai Aktiviti Seminar mengenai Pengeluaran Bersih, 2008**  
**Table 9.2: List of Seminar on Cleaner Production Activities, 2008**

Bil. No.	Tarikh Date	Aktiviti Seminar Seminar Activities	Tempat Venue
1	18 Mac / 18 March 2008	Seminar mempromosi Pengeluaran Bersih dan Teknologi Mesra Alam (Zon Selatan) Seminar on Promotion of Cleaner Production and Environmentally Sound Technologies (Southern Zone)	Allson Klana Resort, Seremban Allson Klana Resort, Seremban
2	17 Jun / 17 June 2008	Seminar mempromosi Pengeluaran Bersih dan Teknologi Mesra Alam (Tengah) Seminar on Promotion of Cleaner Production and Environmentally Sound Technologies (Central Zone)	Hotel Quality, Shah Alam/ Quality Hotel, Shah Alam
3	29 Julai / 29 July 2008	Seminar mengenai Aspek Alam Sekitar dan Pengeluaran Bersih di Industri Makanan Seminar on Environmental Aspects and Cleaner Production in Food Industries (National Zone)	Hotel Palm Garden, IOI Resort, Putrajaya Palm Garden Hotel, IOI Resort, Putrajaya
4	23 Okt. / 23 Oct. 2008	Seminar mempromosi Pengeluaran Bersih dan Teknologi Mesra Alam (Zon Utara) Seminar on Promotion of Cleaner Production and Environmentally Sound Technologies (Northern Zone)	Hotel Sunway, Seberang Jaya Sunway Hotel, Seberang Jaya

### **Seminar Kebangsaan mengenai Aspek Alam Sekitar dan Pengeluaran Bersih di Industri Makanan**

Pada 29 Julai 2008, seminar di atas telah diadakan khusus kepada industri makanan di Hotel Palm Garden Resort, IOI Resort, Putrajaya. Seminar tersebut telah dihadiri oleh seramai 140 orang peserta yang terdiri daripada pihak industri kecil dan sederhana dan juga pegawai-pegawai JAS.

### **Taklimat mengenai 'Carbon Finance and Municipal Solid Waste Management in Malaysia'**

Pada tahun 2008, Unit ini telah menganjurkan program taklimat di atas kepada pegawai Jabatan Alam Sekitar bertempat di EiMAS, Bangi. Taklimat tersebut telah diadakan pada 29 Januari 2008 dengan penganjuran bersama EiMAS dan dihadiri oleh seramai 50 orang peserta yang terdiri daripada Pihak Berkuasa Tempatan (PBT) di Selangor dan Kuala Lumpur. Pegawai JAS Negeri dan Ibu Pejabat turut hadir sebagai peserta. Taklimat tersebut disampaikan oleh pihak Bank Dunia dan wakil dari Kementerian Perumahan dan Kerajaan Tempatan (KPKT).

Taklimat tersebut secara umumnya membincangkan mengenai penukaran sisa kepada tenaga dengan perancangan dan pengurusan yang terperinci mengenainya yang disampaikan oleh pihak Bank Dunia yang menyokong projek rawatan sisa pepejal dengan Carbon Finance. Di antara objektif taklimat tersebut adalah berikut:-

- i. Memperkenalkan hubungan di antara perubahan cuaca dengan pengurusan sisa pepejal;
- ii. Memperkenalkan hubungan di antara pengurusan sisa pepejal dengan Program "Carbon Finance";
- iii. Memperkenalkan 'The Newly Established Carbon Finance Facilities' dan berkongsi pengalaman mengenai pengurusan sisa pepejal dan hubungan kaitnya dengan Carbon Finance.

### **National Seminar on Environmental Aspects and Cleaner Production in Food Industries**

On 29 July 2008, the above seminar was held specifically for food industries at the Hotel Palm Garden Resort, IOI Resort, Putrajaya. The seminar was attended by 140 participants from small and medium industries and also DOE officers.

### **Briefing on 'Carbon Finance and Municipal Solid Waste Management in Malaysia'**

In 2008, this Unit organized a briefing programme to DOE officers in EiMAS, Bangi. The briefing which was held on 29 January 2008, was jointly organized with EiMAS and attended by 50 participants from the Local Authorities in Selangor and Kuala Lumpur. DOE state and headquarters officers were also present. The briefing was given by an officer from the World Bank and a representative from the Ministry of Housing and Local Government.

The topic was on waste conversion to energy with its detail planning and management. This project on solid waste treatment is supported by the World Bank's Carbon Finance Programme. The objectives of the briefing were:-

- i) To introduce a relationship between climate change and solid waste management;
- ii) To introduce a relationship between solid waste management and Carbon Finance Program; and
- iii) To introduce 'The Newly Established Carbon Finance Facilities' and share experience on solid waste management and its relationship with Carbon Finance.



Bengkel Taklimat mengenai 'Carbon Finance and Municipal Solid Waste Management in Malaysia'  
 Workshop on 'Carbon Finance and Municipal Solid Waste Management in Malaysia'

### **Taklimat mengenai 'Clean Development Mechanism' kepada Pegawai JAS**

Pada tahun 2008, Unit ini juga telah menganjurkan program taklimat mengenai 'Clean Development Mechanism' kepada pegawai Jabatan Alam Sekitar bertempat di JAS Ibu Pejabat, Putrajaya. Taklimat tersebut telah diadakan pada 4 Mac 2008 dan dihadiri oleh seramai 50 orang Pegawai JAS dari JAS Negeri dan Ibu Pejabat. Taklimat tersebut diadakan bertujuan seperti berikut:-

- i. Meningkatkan kesedaran, kefahaman dan menambah pengetahuan pegawai Jabatan Alam Sekitar tentang konsep dan aplikasi CDM seperti yang tercatat di bawah Artikel 12, Protokol Kyoto;
- ii. Membantu dan memudahkan pegawai Jabatan Alam Sekitar untuk mempromosikan konsep dan mekanisma CDM kepada pihak industri; dan
- iii. Mengeratkan lagi kerjasama diantara Jabatan Alam Sekitar, Kementerian Sumber Asli dan Alam Sekitar (NRE), agensi kerajaan dan bukan kerajaan/ pihak swasta yang relevan dalam isu-isu yang berhubungkait dengan perubahan iklim serta memberi peluang kepada Jabatan Alam Sekitar untuk memainkan peranan yang lebih aktif khususnya dalam memberi input kepada projek-projek CDM.

### **Briefing on 'Clean Development Mechanism' to DOE Officers**

In 2008, this Unit also organized a briefing programme on 'Clean Development Mechanism' to DOE officers in DOE headquarters, Putrajaya. The briefing was held on 4 Mac 2008 and was attended by 50 DOE officers from state offices and headquarters. The briefing were aimed at the following:-

- i. To improve and increase awareness, understanding and knowledge of DOE officers on the concept and application of CDM as stated in Article 12, Kyoto Protocol;
- ii. To help and facilitate DOE officers to promote the concept and mechanism of CDM to industries; and
- iii. To strengthen cooperation between DOE, Ministry of Natural Resources and Environment (NRE), government agencies and relevant NGO/ private sector in issues related to climate change and to allow DOE to play a more active role especially in providing inputs to CDM projects

### **Bengkel 'Performance Monitoring of Industrial Effluent Treatment System Towards Cleaner Production'**

Bengkel telah diadakan bertempat di Hotel Avillion Legacy, Melaka selama dua hari iaitu dari 29–30 April 2008. Bengkel tersebut telah dihadiri oleh 60 orang pegawai-pegawai JAS yang mempunyai objektif seperti berikut:-

- i) Meningkatkan kefahaman pegawai-pegawai JAS yang terlibat dengan kerja-kerja penguatkuasaan dan pemprosesan permohonan kebenaran bertulis (KB) mengenai sistem rawatan effluen industri (IETS) dan konsep kawalan pencemaran serta kepentingan pengawasan IETS; dan
- ii) Memberi pendedahan mengenai konsep/pendekatan pengeluaran bersih sebagai langkah pengawalan atau strategi dalam pengurusan alam sekitar dan kepentingan pelaksanaan permonitoran bagi IETS.

### **Workshop on 'Performance Monitoring of Industrial Effluent Treatment System Towards Cleaner Production'**

This workshop was held at Avillion Legacy Hotel, Malacca for two days from 29–30 April 2008. The workshop was attended by 60 DOE officers, with the following objectives:-

- i) To improve the understanding of DOE officers involved in enforcement activities and these processing the written approval (KB) applications on industrial effluent treatment system (IETS) which includes pollution control concept and the importance of IETS monitoring;
- ii) To expose the DOE officers on the concept/approach of cleaner production as a control or strategy in environmental management and the importance of monitoring the implementation of IETS.



Bengkel 'Performance Monitoring of Industrial Effluent Treatment System Towards Cleaner Production'  
Workshop on 'Performance Monitoring of Industrial Effluent Treatment System Towards Cleaner Production'

Di antara aktiviti yang dilaksanakan dalam program tersebut adalah lawatan sambil belajar ke kilang pemprosesan makanan sejuk beku berasaskan ayam di Farm's Best Industries Sdn. Bhd. dan kilang pembuatan peralatan semikonduktor di Infineon Technologies AG Sdn. Bhd. bagi melihat pelaksanaan 'performance monitoring' bagi IETS dan pengeluaran bersih. Maklumat pelaksanaan program adalah seperti dalam **Jadual 9.3.**

Among the activities implemented for this programme was a study visit to Farm's Best Industries Sdn. Bhd. which is a chicken based frozen food factory and a semiconductor manufacturing factory (Infineon Technologies AG Sdn. Bhd.). The purpose of the visit was to learn the implementation and performance monitoring of IETS and cleaner production in these premises. The details of the programme is given in **Table 9.3.**

**Jadual 9.3: Senarai Aktiviti Taklimat / Bengkel / Ceramah, 2008**  
**Table 9.3: List of Briefing / Workshop / Technical Presentation Activities, 2008**

Bil. No.	Tarikh Date	Aktiviti Taklimat/Ceramah Briefing/ Technical Presentation Activities	Tempat Venue
1	29 Januari 2008 29 January 2008	Bengkel Taklimat mengenai 'Carbon Finance and Municipal Solid Waste Management in Malaysia' Workshop on 'Carbon Finance and Municipal Solid Waste Management in Malaysia'	EiMAS
2	4 Mac 2008 4 March 2008	Taklimat mengenai 'Clean Development Mechanism' Workshop on 'Clean Development Mechanism'	JAS, Ibu Pejabat DOE's HQ Office
3	29 - 30 April 2008 29 - 30 April 2008	Bengkel 'Performance Monitoring of Industrial Effluent Treatment System Towards Cleaner Production' Workshop on 'Performance Monitoring of Industrial Effluent Treatment System Towards Cleaner Production'	Hotel Avillion Legacy, Melaka Avillion Legacy Hotel, Malacca

## PROGRAM PROMOSI MENERUSI PENYEBARAN MAKLUMAT MENGENAI PENGELUARAN BERSIH

Pada tahun 2008, Unit Teknologi Bersih telah menerbitkan beberapa bahan-bahan pengeluaran bersih bagi tujuan seperti berikut:-

- i) Untuk menyediakan bahan rujukan, garis panduan dan dokumentasi pengeluaran bersih bagi meningkatkan kefahaman dan kesedaran mengenai pengeluaran bersih kepada industri, pegawai-pegawai JAS, institusi kewangan, badan bukan kerajaan (NGO's) dan orang awam;
- ii) Untuk penyebaran maklumat mengenai pengeluaran bersih; dan
- iii) Untuk menggalakkan semua pihak di Malaysia terutama industri untuk melaksanakan pengeluaran bersih.

Antara bahan-bahan penerbitan yang telah diterbitkan oleh Unit ini adalah seperti dalam **Jadual 9.4**.

## PROMOTION PROGRAMME THROUGH DISSEMINATION OF INFORMATION ON CLEANER PRODUCTION

In 2008, the Cleaner Production Unit published several materials on cleaner production with the following objectives:-

- i) To provide reference materials, guidelines, and documentations on cleaner production so as to improve the understanding and awareness to industries, DOE officers, financial institutions, NGOs and the public;
- ii) To disseminate information on cleaner production; and
- iii) To encourage Malaysia communities especially industries to implement CP.

Among the publication materials developed by this Unit are in **Table 9.4**.

**Jadual 9.4: Senarai Aktiviti Penerbitan mengenai Pengeluaran Bersih, 2008**  
**Table 9.4: List of Publications on Cleaner Production Activities, 2008**

Bil. No.	Tarikh Date	Tajuk Penerbitan Publication Title
1	Februari / February 2008	Poster 'Pengeluaran Bersih' Cleaner Production Poster
2	Februari / February 2008	Versi Bahasa Inggeris: Brosur 'Pengenalan Asas Pengeluaran Bersih' English Language Version: Brochure of 'Cleaner Production Brief Info'
3	Mac / March 2008	Persembahan Multimedia VCD: 'Cleaner Production in Malaysia' VCD of Multimedia Presentation: 'Cleaner Production in Malaysia'
4	Mei / May 2008	Versi Bahasa Malaysia: Blueprint Pengeluaran Bersih untuk Malaysia Malaysia Language Version: Cleaner Production Blueprint for Malaysia
5	Ogos / August 2008	Versi Bahasa Malaysia: Audit Pengeluaran Bersih Malaysia Language Version: Cleaner Production Audit
6	Ogos / August 2008	Versi Bahasa Malaysia: Brosur 'Pengenalan Asas Pengeluaran Bersih' Malaysia Language Version: Brochure of 'Cleaner Production Brief Info'



Terbitan mengenai Pengeluaran Bersih, 2008  
Cleaner Production Publication, 2008

## PROGRAM PEMBANGUNAN KAPASITI PENGELUARAN BERSIH

Dalam tahun 2008, Unit ini telah melaksanakan beberapa program pembangunan kapasiti pengeluaran bersih di Jabatan ini.

Pelaksanaan program tersebut adalah bertujuan untuk membangunkan sumber manusia yang berpengetahuan, berkemahiran, berkebolehan dan mempunyai daya kompetensi bagi memastikan kejayaan pelaksanaan program-program pengeluaran bersih oleh Jabatan ini. Oleh yang demikian, pelaksanaan program seperti latihan yang berterusan merupakan pendekatan yang paling berkesan untuk memantapkan pembangunan pengeluaran bersih di Jabatan ini.

## CLEANER PRODUCTION CAPACITY BUILDING PROGRAMME

In 2008, this Unit carried out several programmes on cleaner production capacity building within the department.

The implementation of these programmes were aimed at developing human resources who are knowledgeable, skillful, capable and posses high competency to ensure the success of the cleaner production programs undertaken by the Department. Because of that, the implementation of the programmes such as continuous training are the most effective approach to strengthen the development of cleaner production in the Department.

### Program Latihan Sangkutan Pengeluaran Bersih

Dalam tahun 2008, Unit Teknologi Bersih telah melaksanakan Program Latihan Sangkutan Pengeluaran Bersih menerusi 'International Training and Study Visit Program on Cleaner Production Technologies and Management'. Seramai enam (6) orang pegawai Jabatan Alam Sekitar yang terpilih telah menyertai kursus tersebut yang telah diadakan dari 20 Ogos hingga 12 September 2008 di Asian Institute of Technology (AIT), Thailand.

Objektif utama kursus ini adalah untuk memberi pendedahan dan meningkatkan pengetahuan Pegawai JAS mengenai pelaksanaan CP di luar negara terutamanya di negara Asia yang lain bagi pemantapan program CP yang dilaksanakan oleh Jabatan ini. Pegawai-Pegawai Jabatan ini yang telah mengikuti kursus tersebut adalah seperti dalam **Jadual 9.5**.

### Attachment Training Program on Cleaner Production

In 2008, the Cleaner Production Unit embarked on a regional Cleaner Production Attachment Training Program through the 'International Training and Study Visit Program on Cleaner Production Technologies and Management'. Six (6) officers were selected to participate in the course which commenced from 20 August to 12 September 2008 in the Asian Institute of Technology (AIT), Thailand.

The primary objective of the course was to expose and increase knowledge of DOE officers on the implementation of CP in other countries especially in Asian countries in order to further strengthen CP programmes implemented by the department. DOE officers who participated in the training are as shown in **Table 9.5**.

Jadual 9.5 JAS: Senarai Nama Pegawai-Pegawai JAS yang Menyertai Kursus Latihan di Asian Institute of Technology, Thailand, 20 Ogos-12 September 2008  
Table 9.5 DOE: Name of DOE's Officers Participated in the Training Course at Asian Institute of Technology, Thailand, 20 August-12 September 2008

Bil. No.	Nama Pegawai JAS Name of DOE's Officer	Jawatan Designation	Tempat Bertugas Place of Office
1	En. Mohd Sani Mad Daud	Ketua Penolong Pengarah Head Assistant Director	JAS Kedah DOE Kedah
2	En. Hedzir Bin Zakaria	Pegawai Kawalan Kanan Alam Sekitar Senior Environmental Control Officer	JAS Johor DOE Johor
3	En. Ahmad Saiful Salihin	Pegawai Kawalan Kanan Alam Sekitar Senior Environmental Control Officer	JAS Sabah DOE Sabah
4	En. Anuar Bin Ishak	Pegawai Kawalan Alam Sekitar Environmental Control Officer	JAS Melaka DOE Malacca
5	En. Goh See Ben	Pegawai Kawalan Alam Sekitar Environmental Control Officer	JAS (EiMAS) DOE (EiMAS)
6	En. Azahar Bin Omar	Penolong Pegawai Kawalan Kanan Alam Sekitar Senior Assistant Environmental Control Officer	JAS (Ibu Pejabat, Unit Teknologi Bersih) DOE (Cleaner Production Unit, Headquarters)



Latihan dan Lawatan Sambil Belajar mengenai Teknologi dan Pengurusan Pengeluaran Bersih, AIT, Thailand  
 International Training and Study Visit Program on Cleaner Production Technologies and Management, AIT, Thailand

### **Program Latihan mengenai Pengeluaran Bersih kepada Pegawai Jabatan Alam Sekitar**

Bagi meningkatkan kemahiran dan pengetahuan pegawai Jabatan Alam Sekitar mengenai Pengeluaran Bersih, sebanyak dua (2) siri latihan telah dilaksanakan seperti berikut:

- i) Bengkel mengenai Pengeluaran Bersih kepada Pegawai Jabatan Alam Sekitar: 'Pengenalan kepada Pengeluaran Bersih'

Program latihan ini telah diadakan pada 4 hingga 8 Ogos 2008 di SIRIM Berhad, Shah Alam oleh SIRIM Training Services Sdn. Bhd. Seramai 20 orang Pegawai JAS dari setiap JAS Negeri dan Ibu Pejabat telah menyertai bengkel latihan tersebut.

- ii) Bengkel mengenai Pengeluaran Bersih kepada Pegawai Jabatan Alam Sekitar: 'Pengenalan kepada Pengeluaran Bersih (Peringkat Lanjutan)'

### **Training Programs on Cleaner Production To DOE Officers**

In order to increase knowledge and skills of DOE officers on Cleaner Production, two (2) series of training were carried out:

- i) Workshop on Cleaner Production for DOE Officers: Introduction to Cleaner Production.

This training programme was conducted from 4 to 8 August 2008 in SIRIM Berhad, Shah Alam by SIRIM Training Services Sdn. Bhd. A total of 20 DOE officers from the state offices and headquarters attended the training.

- ii) Workshop on Cleaner Production for DOE Officers: Introduction to Cleaner Production (Advanced Stage)

Program latihan di atas telah diadakan pada 17 hingga 21 November 2008 di SIRIM, Shah Alam oleh SIRIM Training Services Sdn. Bhd. Seramai 20 orang Pegawai JAS dari setiap JAS Negeri dan Ibu Pejabat telah menyertai bengkel latihan tersebut. Antara program yang diadakan dalam bengkel tersebut adalah seperti lawatan dan praktikal audit Pengeluaran Bersih di beberapa industri seperti kilang Winner Food Sdn. Bhd., kilang F&N Coca Cola (M) Sdn. Bhd. dan kilang Okumura Metals Sdn. Bhd.

This training program was conducted from 17 to 21 November 2008 in SIRIM Berhad, Shah Alam by SIRIM Training Services Sdn. Bhd. A total of 20 DOE officers from the state offices and headquarters attended the training. The program included site visits and practical CP audits in several industries namely Winner Food Sdn. Bhd., F&N Coca Cola (M) Sdn. Bhd. and Okumura Metals Sdn. Bhd.

Program latihan yang diadakan oleh Unit ini adalah seperti dalam **Jadual 9.6**.

The training programs conducted by this Unit are in **Table 9.6**.

**Jadual 9.6 JAS: Senarai Aktiviti Program Latihan mengenai Pengeluaran Bersih, 2008**  
**Table 9.6 DOE: List of Training on Cleaner Production Activities, 2008**

Bil. No.	Tarikh Date	Aktiviti Seminar Seminar Activities	Tempat Venue	Bil. Peserta Participants Number
1	27 - 30 Mei 2008 27 - 30 May 2008	Bengkel Latihan Hands-on 'Cleaner Production Virtual Centre (CPVC) dan Cleaner Production Implementation Tools (CPIT)' Hands-on Training Workshop on 'Cleaner Production Virtual Centre (CPVC) dan Cleaner Production Implementation Tools (CPIT)'	Prescott Metro Inn, Kajang Prescott Metro Inn, Kajang	25
2	4-8 Ogos 2008 4-8 August 2008	Latihan 'Pengenalan kepada Pengeluaran Bersih' 'Introduction on Cleaner Production' Training	SIRIM, Shah Alam SIRIM, Shah Alam	20
3	20 Ogos -12 September 2008 20 August -12 September 2008	Latihan dan Lawatan Sambil Belajar mengenai Teknologi dan Pengurusan Pengeluaran Bersih International Training and Study Visit Program on Cleaner Production Technologies and Management	Institut Teknologi Asian, Thailand Asian Institute of Technology, Thailand	6
4	28 Oktober 2008 28 October 2008	Latihan 'Pentadbiran Laman Web Cleaner Production Virtual Centre (CPVC) dan Sistem Aplikasi Cleaner Production Implementation Tool (CPIT)' Training on 'Cleaner Production Virtual Centre (CPVC) and Cleaner Production Implementation Tool (CPIT) Web Administration'	JAS Ibu Pejabat JAS Headquarters	6
5	17 - 21 November 2008 17 - 21 November 2008	Latihan 'Pengenalan kepada Pengeluaran Bersih (Lanjutan)' 'Introduction on Cleaner Production (Advance Level)' Training	SIRIM, Shah Alam SIRIM, Shah Alam	20



Bengkel Latihan Hands-on `Cleaner Production Virtual Centre (CPVC) dan Cleaner Production Implementation Tools (CPIT)`

Hands-on Training Workshop on `Cleaner Production Virtual Centre (CPVC) dan Cleaner Production Implementation Tools (CPIT)`

## PROGRAM PENYELIDIKAN & PEMBANGUNAN PENGELUARAN BERSIH

### Projek Pembangunan `Sistem Aplikasi untuk Penilaian dan Pelaksanaan Pengeluaran Bersih`

Projek ini telah selesai dilaksanakan dengan jayanya pada September 2008. Projek pembangunan yang mengambil masa selama dua (2) fasa ini bermula dari Jun 2007 melibatkan pembangunan perisian sistem penilaian dan pelaksanaan pengeluaran bersih berlandaskan laman web iaitu `Cleaner Production Implementation Tools (CPIT)` (**Jadual 9.7**) Sistem tersebut boleh diakses melalui laman web yang dibangunkan khusus mengenai pengeluaran bersih iaitu Cleaner Production Virtual Centre (CPVC).

Aplikasi ini merupakan self-help tool kepada industri terutamanya industri kecil dan sederhana di Malaysia.

Pendekatan seperti ini perlu memandangkan industri pembuatan dan pengeluaran semakin bertambah dari masa ke semasa. Ia juga secara tidak langsung akan



Penyertaan dalam Pameran `Waste Management Conference & Exhibition 2008`, Anjuran ENSEARCH di Sime Darby Conference Centre, Kuala Lumpur, 11–12 November 2008  
Participated in `Waste Management Conference & Exhibition 2008`, Organized by ENSEARCH at Sime Darby Conference Centre, Kuala Lumpur, 11–12 November 2008

## CLEANER PRODUCTION RESEARCH AND DEVELOPMENT PROGRAM

### Development Project on `Application System For Evaluation and Implementation of Cleaner Production`

This project was successfully implemented in September 2008. The development of the project took place in two (2) phases from June 2007 which involved the development of application system for evaluation and implementation of cleaner production software. The system application is known as `Cleaner Production Implementation Tools (CPIT)` (**Table 9.7**) which is a web based software and can be accessed through specially developed website on cleaner production known as Cleaner Production Virtual Centre (CPVC).

This application is a self – help tool for industries especially for small and medium scale industries in Malaysia.

This approach is important because of the increasing number of manufacturing and production industries. It also indirectly encourages the industries to adopt the

menggalakkan pihak industri mengamalkan budaya self-regulation terhadap pematuhan Akta Kualiti Alam Sekeliling 1974.

Melalui kaedah ini juga adalah diharapkan peranan Jabatan Alam Sekitar dapat diperluaskan bukan sahaja dari segi aspek penguatkuasaan malah berperanan sebagai pemangkin kepada pengurusan alam sekitar yang baik dan efisien.

- i) Bengkel Latihan Hands-on 'Cleaner Production Virtual Centre (CPVC) dan Cleaner Production Implementation Tools (CPIT)' kepada Pegawai JAS

Bengkel latihan di atas telah diadakan selama lima (5) hari bagi dua (2) sesi kumpulan yang terdiri daripada 25 orang pegawai Jabatan ini bertempat di Prescott Metro Inn Kajang. Latihan tersebut diadakan lanjutan daripada Projek Pembangunan Sistem Aplikasi untuk Penilaian dan Pelaksanaan Cleaner Production. Di antara tujuan bagi latihan tersebut adalah seperti berikut:-

- Memperkenalkan sistem aplikasi Cleaner Production Implementation Tools (CPIT) dan Cleaner Production Virtual Centre (CPVC) kepada pegawai-pegawai JAS;
- Untuk melatih dan memberi kefahaman kepada pegawai JAS mengenai penggunaan secara praktikal sistem tersebut di atas; dan
- Untuk membolehkan pihak perunding mendapat maklumbalas mengenai pembangunan sistem tersebut bagi tujuan penambahbaikan sebelum diserahkan sistem tersebut kepada pihak JAS.

- ii) Bengkel Latihan Pentadbiran Laman Web 'Cleaner Production Virtual Centre (CPVC) dan Cleaner Production Implementation Tools (CPIT)' kepada Pegawai JAS

culture of self regulation towards achieving compliance to the Environmental Quality Act 1974

Through this method, the role of DOE can be further expanded not only in enforcement aspects but also to act as a catalyst for efficient and outstanding environmental management.

- i) Hands-on Training of 'Cleaner Production Virtual Centre (CPVC) and Cleaner Production Implementation Tools (CPIT)' to DOE Officers

The training was conducted for five (5) days for two (2) separate groups of 25 DOE officers in Prescott Metro Inn Kajang. The training was held as an extension to the Application System on Cleaner Production Implementation Tools (CPIT) and Cleaner Production Virtual Centre (CPVC) to DOE Officers. Objectives of the training were as follows:-

- To introduce the Application System of Cleaner Production Implementation Tools (CPIT) and Cleaner Production Virtual Centre (CPVC) to DOE officers;
- To train and provide understanding of practical use for the above system to DOE officers; and
- To provide the project consultancy of the development system feedback for the purpose to upgrading the system before hand over to DOE.

- ii) Training Workshop on 'Cleaner Production Virtual Centre (CPVC) and Cleaner Production Implementation Tools (CPIT)' for DOE Officers

Bengkel latihan di atas telah diadakan pada 28 Oktober 2008 bertempat di JAS Ibu Pejabat. Latihan tersebut diadakan lanjutan daripada selesainya Projek Pembangunan Sistem Aplikasi untuk Penilaian dan Pelaksanaan Teknologi Bersih.

Tujuan latihan tersebut diadakan adalah bagi melatih mengenai pentadbiran dan pengurusan laman web CPVC. Seramai lima (5) orang pegawai dari Unit Teknologi Bersih dan Bahagian Teknologi Maklumat, JAS Ibu Pejabat telah mengikuti latihan tersebut yang diadakan dengan kerjasama pihak perunding projek iaitu Unit Perundingan Universiti Malaya (UPUM).

The training workshop was held on 28 October 2008 at DOE headquarters. The training was conducted to enhance further the Application System for Evaluation and Implementation of Cleaner Production Development Project.

The objective of the training was is to train the administration and management of CPVC website. Five (5) officers from the Cleaner Production Unit and Information Technology Division, DOE headquarters attended the training with the cooperation of University Malaya Consultancy Unit (UPUM) as the project consultant.

**Jadual 9.7 JAS: Senarai Projek-projek yang Dilaksanakan Tahun 2008**  
**Table 9.7 DOE: List of Project Implementation in 2008**

Bil. No.	Projek Mula Project Started	Projek Project	Projek Selesai Project Completed
1	Jun 2007	Projek Pembangunan 'Sistem Aplikasi untuk Penilaian Pelaksanaan Cleaner Production'	Sept. 2008
	2007, June	Development Project on 'Application System for Evaluation and Implementation of Cleaner Production'	2008, September