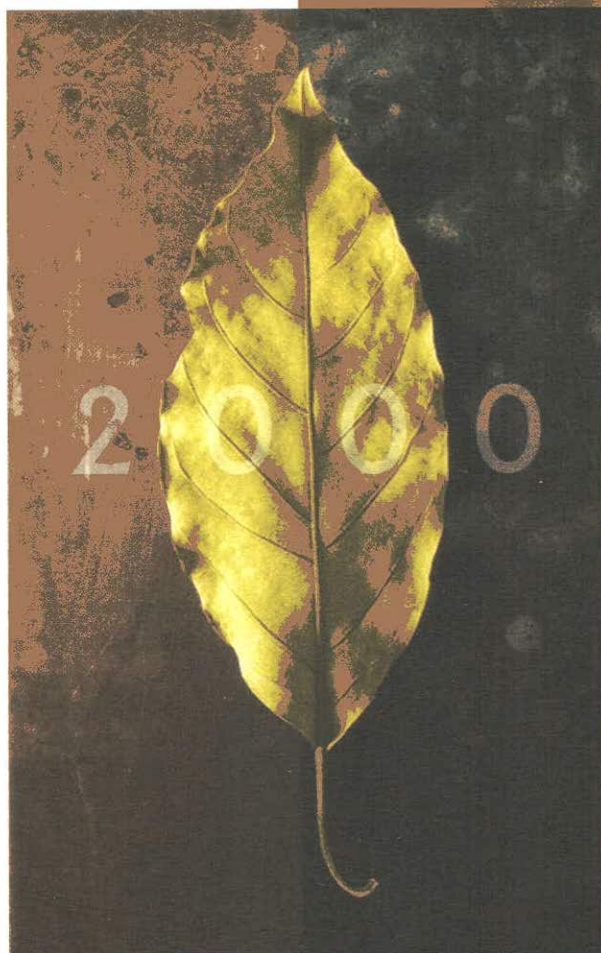




L a p o r a n T a h u n a n



A n n u a l R e p o r t



Jabatan Alam Sekitar
Department Of Environment
Kementerian Sains, Teknologi dan Alam Sekitar
Ministry of Science, Technology and The Environment



LAPORAN TAHUNAN *ANNUAL REPORT*

2000



Jabatan Alam Sekitar
Department Of Environment
Kementerian Sains, Teknologi dan Alam Sekitar
Ministry of Science, Technology and the Environment

Jabatan Alam Sekitar, Malaysia
Department of Environment, Malaysia

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INGKATAN

DB	Bank Pembangunan Asia
EY	Tahun Alam Sekitar ASEAN
KAS	Akta Kualiti Alam Sekeliling
MME	Mesyuarat Menteri-Menteri ASEAN mengenai Alam Sekitar
PEC-VC	Pusat Maya-Kerjasama Alam Sekitar Asia-Pasifik
PO	Pertubuhan Produktiviti Asia
SEAN	Pertubuhan Negara-Negara Asia Tenggara
SOEN	Kumpulan Pegawai Kanan Alam Sekitar ASEAN
WASI	Area Watch and Sanction Inspection
APEDAL	Badan Perlindungan Dampak Lingkungan
IMP	Brunei-Indonesia-Malaysia-Filipina
OD	Keperluan Oksigen Biokimia
PO	Bahan Pemusnah Ozon
ETDEM	Pusat bagi Alam Sekitar, Teknologi dan Pembangunan Malaysia
FC	Klorofluorokarbon
ICM	Majlis Industri Kimia Malaysia
MC	Pusat Pengurusan Pantai
OBSEA	Badan Penyelaras mengenai Laut di Asia Timur
OD	Keperluan Oksigen Kimia
SIRO	Organisasi Kajian Sains Dan Industri Negara-Negara Commonwealth
UC-UEM	Konsortium Pengurusan Alam Sekitar Bandar Universiti Canada
B	desibel
OE	Jabatan Alam sekitar
OKUMAS	Sistem Pengurusan Dokumen
ANCED	Pusat Pembangunan Alam Sekitar Denmark
AGA	Kawasan Pertumbuhan ASEAN Timur
.coli	Escherichia coli
DSS	Sistem Sokongan Keputusan Alam Sekitar
EZ	Zon Ekonomi Eksklusif
IA	Penilaian Kesan kepada Alam Sekeliling
IMA	Agensi Pengurusan Kesan Alam Sekitar
PSM	Persatuan Perlindungan Alam Sekitar Malaysia
PU	Unit Perancang Ekonomi
QA	Akta Kualiti Alam Sekeliling
QC	Majlis Kualiti Alam Sekitar
QR	Laporan Kualiti Alam Sekeliling
SCAP	Komisyen Ekonomi & Sosial bagi Asia-Pasifik
XCO	Ahli Mesyuarat Kerajaan Negeri
LIR	Forward Looking Infrared Radar
MM	Persekutuan Pekilang-Pekilang Malaysia
OMCA	Persekutuan Pertubuhan Pengguna-Pengguna Malaysia
RIM	Institut Penyelidikan Hutan Malaysia
RTAM	Gabungan Persatuan-Persatuan Perdagangan Getah Malaysia
IEF	Kemudahan Alam Sekitar Global
IS	Sistem Maklumat Geografik
GFC	Hidro Klorofluorokarbon
ZM	Pengurusan Zon Pantai Antarabangsa

ABBREVIATIONS

ADB	Asian Development Bank
AEY	ASEAN Environment Year
AKAS	Environmental Quality Report
AMME	ASEAN Ministerial Meeting on the Environment
APEC-VC	Asia-Pacific Environmental Cooperation-Virtual Centre
APO	Asian Productivity Organisation
ASEAN	Association of South East Asian Nations
ASOEN	ASEAN Senior Officials on the Environment
AWASI	Area Watch and Sanction Inspection
BAPEDAL	Environmental Impact Management Agency of Republic of Indonesia
BIMP	Brunei-Indonesia-Malaysia-Philippines
BOD	Biochemical Oxygen Demand
BPO	Ozone Depleting Substances
CETDEM	Centre for Environment, Technology and Development Malaysia
CFC	Chlorofluorocarbon
CICM	Chemical Industries Council of Malaysia
CMC	Coastal Management Centre
COBSEA	Co-ordinating Body on the SEAS of East Asia
COD	Chemical Oxygen Demand
CPO	Crude Palm Oil
CSIRO	Commonwealth Scientific Dan Industrial Research Organisation
CUC-UEM	Canadian Universities Consortium Urban Environmental Management
dB	decibel(s)
DOE	Department of Environment
DOKUMAS	Document Management System
DANCED	Danish Centre for Environmental Development
EAGA	East ASEAN Growth Area
E.coli	Escherichia coli
EDSS	Environmental Decision Support System
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIMA	Environmental Impact Management Agency
EPSM	Environmental Protection Society of Malaysia
EPU	Economic Planning Unit
EQA	Environmental Quality Act
EQC	Environmental Quality Council
EQR	Environmental Quality Report
ESCAP	Economic & Social Commission for Asia and the Pacific
EXCO	Executive Council
FLIR	Forward Looking Infrared Radar
FMM	Federation of Malaysian Manufacturers
FOMCA	Federation of Malaysian Consumers' Associations
FRIM	Forest Research Institute of Malaysia
FRTAM	Federation of the Rubber Trade Associations of Malaysia
GEF	Global Environment Facility
GIS	Geographic Information System
HCFC	Hydro Chlorofluorocarbon
HSU	Hartridge Smoke Unit(s)

IDHL	Institut Diplomasi & Hal Ehwal Luar	IDHL	<i>Institute of Diplomatic and Foreign Affair</i>
IKAN	Indeks Kualiti Air Negara		
IKLAS	Institut Kemahiran dan Latihan Alam Sekitar	ICZM	<i>International Coastal Zone Management</i>
IMO	Organisasi Maritim Antarabangsa	IKLAS	<i>Institute of Environmental Skill and Training</i>
IMR	Institut Penyelidikan Perubatan	IMO	<i>International Maritime Programme</i>
INFOTERRA	Sistem Rujukan Antarabangsa untuk Sumber-Sumber Maklumat mengenai Alam Sekitar	IMR	<i>Institute of Medical Research</i>
INTAN	Institut Tadbiran Awam Negara	INFOTERRA	<i>International Referral System for Sources of Environmental Information</i>
IPCS	Program Antarabangsa Mengenai Keselamatan Bahan Kimia	INTAN	<i>National Institute of Public Administration</i>
IRPTC	Pendaftaran Antarabangsa bagi Bahan Kimia yang Berpotensi Berbahaya	IPCS	<i>International Programme on Chemical Safety</i>
ISIS	Institut Kajian Strategik dan Antarabangsa	IRPTC	<i>International Register of Potentially Toxic Chemicals</i>
JAWI	Jabatan Agama Islam Wilayah Persekutuan	ISIS	<i>Institute of Strategic and International Studies</i>
JICA	Agensi Kerjasama Antarabangsa Jepun	JAWI	<i>Department of Islamic Religion Federal Territory</i>
JPA	Jabatan Perkhidmatan Awam	JICA	<i>Japan International Co-operation Agency</i>
KKSM	Kilang Kelapa Sawit Mentah	JPA	<i>Public Service Department</i>
KSTAS	Kementerian Sains, Teknologi dan Alam Sekitar	KSTAS	<i>Ministry of Science, Technology and the Environment</i>
MAC	Penyaman Udara Kenderaan	MAC	<i>Mobile Air Conditioning</i>
MACRES	Pusat "Remote Sensing" Malaysia	MACRES	<i>Malaysian Centre for Remote Sensing</i>
MASAAM	Persatuan Pemasang-Pemasang dan Pengedar-Pengedar Motosikal dan Skuter Malaysia	MASAAM	<i>Motorcycles and Scooter Assemblers Association of Malaysia</i>
MASM	Minggu Alam Sekitar Malaysia	MEW	<i>Malaysia Environment Week</i>
MEXCOE	Majlis Mesyuarat Kerajaan Negeri yang Bertanggungjawab ke atas Alam Sekitar	MEXCOE	<i>Ministers and State Executive Councillors Responsible for Environmental Matters</i>
MF	Tabung Pelbagai Hala	MF	<i>Multilateral Fund</i>
		MICCI	<i>Malaysian International Chamber of Commerce and Industry</i>
MIER	Institut Sumber Alam Sekitar Malaysia	MIER	<i>Malaysian Institute of Environmental Resource</i>
MINT	Institut Teknologi Nuklear Malaysia	MINT	<i>Malaysian Institute of Nuclear Technology</i>
MISIF	Persekutuan Industri Besi dan Keluli Malaysia	MISIF	<i>Malaysian Iron and Steel Industry Federation</i>
MFIC	Majlis Industri Perabot Malaysia	MFIC	<i>Malaysian Furniture Industries Council</i>
MMVAA	Persatuan Pemasang Kenderaan Bermotor Malaysia	MMVAA	<i>Malaysian Motor Vehicles Assemblers Association</i>
MNS	Persatuan Pencinta Alam Malaysia	MNS	<i>Malaysian Nature Society</i>
MITI	Kementerian Perdagangan Antarabangsa Dan Industri	MITI	<i>Ministry of International Trade and Industry</i>
MPOA	Pertubuhan Kelapa Sawit Malaysia	MPOA	<i>Malaysia Palm Oil Association</i>
MOA	Kementerian Pertanian	MOA	<i>Ministry of Agriculture</i>
MOH	Kementerian Kesihatan	MOH	<i>Ministry of Health</i>
MOHR	Kementerian Pembangunan Sumber Manusia	MOHR	<i>Ministry of Human Resources</i>
MOMG	Kumpulan Pekilang Oleokimia Malaysia	MOMG	<i>Malaysian Oleochemical Manufacturers Group</i>
MOSTE	Kementerian Sains, Teknologi Dan Alam Sekitar	MOSTE	<i>Ministry of Science, Technology and the Environment</i>
MOT	Kementerian Pengangkutan	MOT	<i>Ministry of Transport</i>
MOU	Memorandum Persefahaman	MOU	<i>Memorandum of Understanding</i>
MRPC	Majlis Pengeluar-Pengeluar Getah Malaysia	MRPC	<i>Malaysian Rubber Products Manufacturers' Council</i>
MSJCE	Jawatankuasa Bersama Malaysia-Singapura mengenai Alam Sekitar	MSJCE	<i>Malaysia-Singapore Joint Committee on the Environment</i>
NGO	Pertubuhan Bukan Kerajaan	NGO	<i>Non-Governmental Organisation</i>
NH3N	Amoniakal Nitrogen	NH3N	<i>Ammoniacal Nitrogen</i>
OECD	Pertubuhan Kerjasama Ekonomi dan Pembangunan	OECD	<i>Organisation for Economic Co-operation and Development</i>
PEMSEA	Kerjasama Pengurusan Alam Sekitar bagi Laut Asia Timur	PEMSEA	<i>Partnerships in Environmental Management for the Seas of East Asia</i>

C	Kebenaran Awal Sebelum Mengeksport	PIC	Prior Informed Consent
OMA	Persatuan Pekilang-Pekilang Minyak Kelapa Sawit Malaysia	POMA	Palm Oil Millers' Association
ORIM	Institut Penyelidikan Minyak Kelapa Sawit	PORIM	Palm Oil Research Institute of Malaysia
PTD	Persatuan Pegawai Tadbir & Diplomatik	PPTD	Association of Administrative and Diplomatic Officers
RM	Ringgit Malaysia	RM	Ringgit Malaysia
RRIM	Institut Penyelidik Getah Malaysia	RRIM	Rubber Research Institute of Malaysia
3C	Urusetia Konvensyen Basel	SBC	Secretariat of Basel Convention
DA	Agensi Kerjasama Pembangunan Sweeden	SIDA	Swedish Development Cooperation Agency
IRIM	Institut Standard dan Penyelidikan Industri Malaysia	SIRIM	Standard Industrial and Research Institute of Malaysi
UIA	Universiti Islam Antarabangsa	UIA	International Islamic University Malaysia
UM	Universiti Kebangsaan Malaysia	UKM	Universiti Kebangsaan Malaysia
UM	Universiti Malaya	UM	Universiti Malaya
UNCED	Persidangan Bangsa-Bangsa Bersatu mengenai Alam Sekitar dan Pembangunan	UNCED	United Nations Conference on Environment and Development
UNDP	Program Pembangunan Bangsa-Bangsa Bersatu	UNDP	United Nations Development Programme
UNEP	Program Alam Sekitar Bangsa-Bangsa Bersatu	UNEP	United Nations Environment Programme
UNITEN	Universiti Teknologi Malaysia	UNITEN	Universiti Teknologi Malaysia
UPE	Unit Perancang Ekonomi	UPE	Economic Planning Unit
UPM	Universiti Putra Malaysia	UPM	Universiti Putra Malaysia
US-AEP	Program Kerjasama Alam Sekitar United States-Asia	US-AEP	United States-Asia Environmental Partnership Programme
USM	Universiti Sains Malaysia	USM	Universiti Sains Malaysia
UTM	Universiti Teknologi Malaysia	UTM	Universiti Teknologi Malaysia
UUM	Universiti Utara Malaysia	UUM	Universiti Utara Malaysia
WHO	Pertubuhan Kesihatan Sedunia	WHO	World Health Organisation
WQI	Indeks Kualiti Air	WQI	Water Quality Index
WWF	Dana Pertubuhan Pemeliharaan Alam Sekitar	WWF	World Wide Fund for Nature
RAC		RAC	Refrigerant Air Conditioning
RNR	Getah Asli Mentah	RNR	Raw Natural Rubber
SMI	Industri Kecil Dan Sederhana	SMI	Small and Medium Industry
SOM	Mesyuarat Pegawai-Pegawai Kanan	SOM	Senior Officials' Meeting
SS	Pepejal Terampai	SS	Suspended Solids
TSP	Jumlah Partikulat Terampai	TSP	Total Suspended Particulate
ULG	Gasolin Tanpa Plumbum	ULG	Unleaded Gasoline
NPOE	Polisi Alam Sekitar Kebangsaan	NPOE	National Policy on the Environment
NREB	Badan Sumber Asli Dan Alam Sekitar	NREB	Natural Resources and Environment Board
ODS	Badan Pemusnah Ozon	ODS	Ozone-Depleting Substance(s)
NAQMP	Program Pemantauan Kualiti Air Kebangsaan	NAQMP	National Air Quality Monitoring Programme
NFP	Pusat Rujukan Kebangsaan	NFP	National Focal-Point
OEWG		OEWG	Open-Ended Working Group
PM	Habuk	PM	Particulate Matter
NIDO	Pertubuhan Bangsa-Bangsa Bersatu bagi Pembangunan Industri		
A.B	Yang Amat Berhormat		
B	Yang Berhormat		
EE	Zon Ekonomi Eksklusif		
DRM	Polis DiRaja Malaysia		
AMM	Skim Akreditasi Makmal Malaysia		



Jabatan Alam Sekitar
Kementerian Sains, Teknologi dan Alam Sekitar

PRAKATA



Mandat utama Jabatan Alam Sekitar ialah pencegahan, penempatan dan pengawalan pencemaran dalam meningkatkan kualiti alam sekitar dan hal-hal yang berkaitan dengannya. Semenjak 25 tahun yang lepas, JAS telah memegang teguh misi; merancang dan melaksanakan program-program dan aktiviti-aktiviti bagi mencegah kemerosotan kualiti alam sekitar, di samping negara terus membangunkan sosio-ekonomi di dalam memenuhi keperluan asas manusia di samping memenuhi aspirasi meningkatkan kualiti hidup.

Sementara JAS kekal sebagai sebuah agensi penguatkuasa yang menyebarkan peraturan-peraturan dan standard alam sekitar, masa dan sumber juga telah diperuntukan untuk sokong menyokong aktiviti-aktiviti yang merangkumi promosi kesedaran dan pendidikan alam sekitar, pemangkian kawalan "self-regulatory", peningkatan latihan alam sekitar, menyokong inisiatif-inisiatif kemasyarakatan berorientasikan alam sekitar dan penglibatan aktif di dalam pertukaran maklumat alam sekitar di peringkat serantau dan antarabangsa. Di peringkat institusi pula, usaha telah diperluaskan bagi merapatkan jurang di antara agensi-agensi sektoral dan seterusnya mengukuhkan tanggungjawab bersama ke atas alam sekitar.

Laporan Tahunan Jabatan Alam Sekitar 2000 memberi penerangan mengenai usaha-usaha pelaksanaan tanggungjawab JAS di tahun 2000 walaupun mempunyai sumber-sumber kakitangan dan kewangan yang terhad. Banyak lagi yang boleh dibuat untuk meningkatkan kualiti alam sekitar seiring dengan perubahan ekonomi dan sosial. Walaupun pelbagai halangan yang harus ditempuh, saya yakin bahawa kita akan terus berjaya menghadapi cabaran dalam membentuk kemajuan kehidupan manusia yang lestari berdasarkan kepada premis bahawa setiap manusia mempunyai hak untuk hidup di alam yang bersih dan sihat.

Salam Sejahtera

HAJAH ROSNANI IBARAHIM
Ketua Pengarah Kualiti Alam Sekeliling
Malaysia



Department Of Environment
Ministry of Science, Technology and The Environment

FOREWORD

The Department of Environment has a specific mandate ie. the prevention, abatement and control of pollution, the enhancement of the environment and purposes connected therewith. For the past 25 years we have held steadfast to this mission; planning and implementing programmes and activities to prevent environmental degradation, while the nation pursued the goals of socio-economic development to satisfy essential human needs as well as to meet legitimate aspirations for an improved quality of life.

While DOE remains principally a regulatory agency, promulgating environmental regulations and standards, time and resources have also been set aside for mutually supportive activities encompassing the promotion of environmental awareness and education, catalysis of self-regulatory measures, intensification of environmental training, supporting community-based environmental initiatives and active involvement in regional and international environmental exchanges. At the institutional level, efforts have been expended to bridge the gap between sectoral agencies and thus bring about collaborative environmental responsibilities.

The 2000 Annual report of the Department of Environment provides a graphic account of its accomplishments for the year within the limitations imposed by manpower and financial resources. Much more can still be done to improve the quality of the environment in tandem with the economic and social changes taking place. Notwithstanding the obstacles to be encountered, I confidently believe that we can rise to the challenge of securing sustainable human progress based on the premise that every one has a right to a clean and healthy environment.

With best wishes

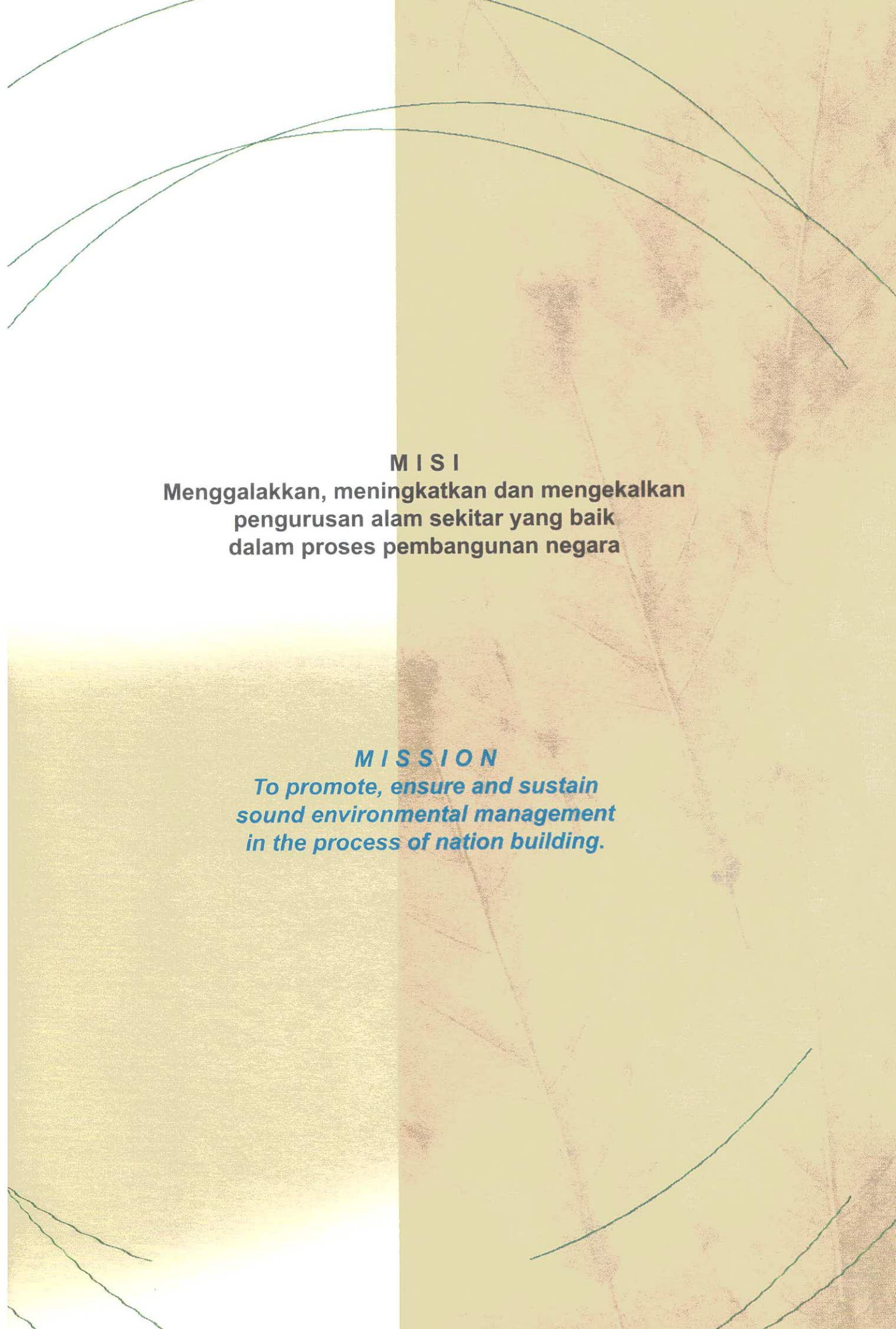
HAJAH ROSNANI IBARAHIM
Director-General of Environmental Quality
Malaysia

VISI

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

VISION

***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.***

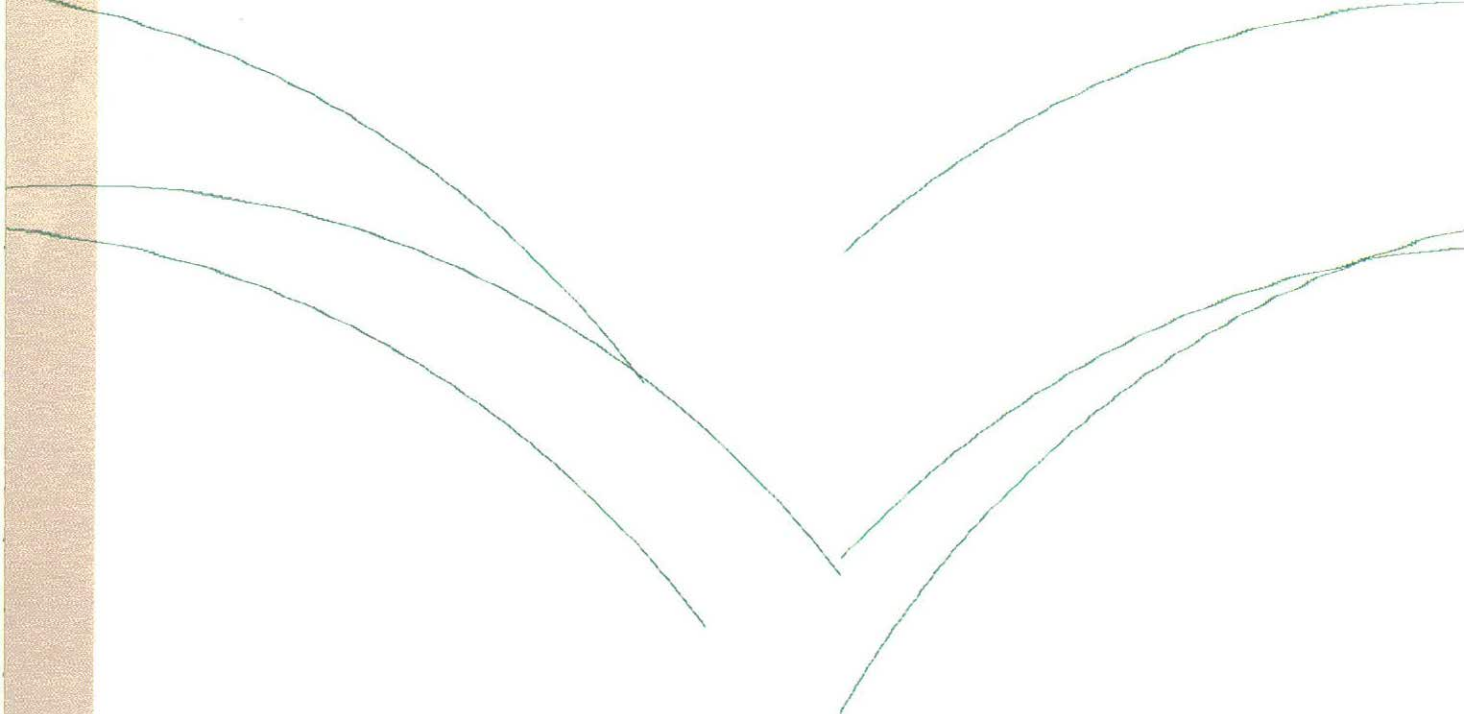


MISI

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

MISSION

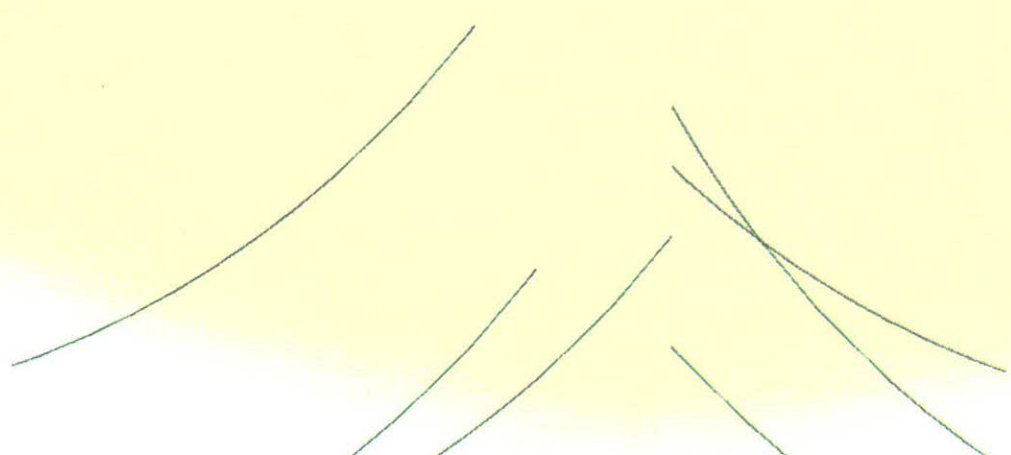
***To promote, ensure and sustain
sound environmental management
in the process of nation building.***



STRATEGI

- Pembangunan Lestari melalui Pemuliharaan Sumber Semulajadi
- Integrasi Faktor Alam Sekitar dalam Perancangan Pembangunan
- Kawalan dan Pencegahan Pencemaran
- Promosi Pendidikan dan Kesedaran Alam Sekitar
- Kerjasama antara agensi dan Persekutuan Negeri
- Penyertaan awam dalam pengurusan alam sekitar
- Kerjasama dan hubungan Dua Hala, Serantau dan Antarabangsa

STRATEGIES

- *Sustainable Development through Conservation of Resources*
 - *Integration of Environmental Factors in Development Planning*
 - *Pollution Prevention and Control*
 - *Promotion of Environmental Education and Awareness*
 - *Inter-agency and Federal-State Cooperation*
 - *Public participation*
 - *Bilateral, Regional and International Cooperation*
- 

Bab 1



Chapter 1

MESYUARAT ANTARA MENTERI SAINS, TEKNOLOGI DAN ALAM SEKITAR DENGAN MENTERI-MENTERI DAN AHLI-AHLI MESYUARAT KERAJAAN NEGERI YANG BERTANGGUNGJAWAB KEATAS HAL EHWAL ALAM SEKITAR (MEXCOE)

Tahun 2000 telah memberi ruang untuk Menteri Sains, Teknologi dan Alam Sekitar dengan Menteri-Menteri dan ahli-ahli Mesyuarat Kerajaan yang bertanggungjawab ke atas Hal Ehwat Alam Sekitar (MEXCOE) bersidang sebanyak 2 kali iaitu pada 28 Mac 2000 dan 21 Oktober 2000. Mesyuarat ini telah dipengerusikan oleh Y.B. Datuk Law Hieng Ding.

Pada mesyuarat ke 18 yang berlangsung di Putrajaya telah membincangkan mengenai Program Pencegahan dan Peningkatan Kualiti Air Sungai Di Malaysia. Mesyuarat memutuskan kriteria bagi memilih sungai perlulah diperjelaskan dan mendapat persetujuan Kerajaan Negeri. Dalam hal yang sama mesyuarat memutuskan agar setiap negeri mencadangkan program pembersihan sungai beserta kos untuk dipertimbangkan dalam Rancangan Malaysia ke-Lapan.

MEXCOE juga mengambil maklum yang kerajaan negeri boleh mensyaratkan secara pentadbiran kehendak menjalankan kajian kesan kepada alam sekitar bagi aktiviti-aktiviti pembangunan di atas tanah bukit, padang golf dan pembangunan kawasan sensitif. Mesyuarat juga mencadangkan agar ketiga-tiga aktiviti tersebut dirujuk semula kepada Peguam Negara untuk dimasukkan sebagai aktiviti yang ditetapkan di bawah Perintah Kualiti Alam Sekeliling (Aktiviti-aktiviti Yang Ditetapkan) [Penilaian Kesan Kepada Alam Sekeliling] 1987.

MEETING BETWEEN THE MINISTER OF SCIENCE, TECHNOLOGY AND THE ENVIRONMENT WITH STATE MINISTERS AND STATE EXECUTIVE COUNCILLORS RESPONSIBLE FOR ENVIRONMENTAL MATTERS (MEXCOE)

For the year 2000, two Meetings between the Minister of Science, Technology and the Environment with State Ministers and State Executive Councils responsible for environmental matters were held on 28 Mac 2000 and 21 October 2000. Both meetings were chaired by YB Datuk Law Hieng Ding, the Minister of Science, Technology and the Environment.

At the 18th MEXCOE Meeting, the main agenda item was the "Programme for the Improvement of River Water Quality for Malaysia". The Meeting decided that the selection criteria be clearly defined and consented to by the State Governments. It was also decided that each State should propose its own river clean-up programme with cost estimates for the Eighth Malaysia Plan.

MEXCOE also took note that State Governments should administratively require the conduct of environmental impact assessment for development activities for golf courses, highland and sensitive areas. It was decided that the three activities be referred to the Attorney-General for incorporation into the existing Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 1987.

Manakala Mesyuarat ke 19 yang dilansungkan di Shah Alam sempena Minggu Alam Sekitar Malaysia telah memberi tumpuan kepada cadangan pindaan Akta Kualiti Alam Sekeliling 1974 (Pindaan) 2000 yang antara lain melibatkan penurunan kuasa kepada pihak berkuasa tempatan untuk menjalankan tugas-tugas penguatkuasaan, memperkemaskan takrifan pembakaran terbuka dan perkara-perkara yang berkaitan dengannya.

MEXCOE juga dimaklumkan bahawa Ketua Pengarah Kualiti Alam Sekeliling telah mewakili kuasa penyiasatan kesalahan melakukan pembakaran terbuka kepada Jabatan Bomba dan Penyelamat, Polis Diraja Malaysia , Kementerian Kesihatan, Pihak Berkuasa Tempatan, Dewan Bandaraya Kuala Lumpur dan Majlis Perbandaran Labuan. Walaubagaimanapun kuasa ini tidak melibatkan kuasa-kuasa pendakwaan.

MEXCOE ke-19 ini mengambil maklum dan menyokong tentang usaha Jabatan Alam Sekitar dalam menyusun semula struktur organisasi dengan penambahan kakitangan.

Ahli-ahli MEXCOE bagi tahun 2000 :

1. Y.B Datuk Law Hieng Ding
Menteri Sains Teknologi dan Alam Sekitar (Pengerusi)
2. Y.B. Dato' Zainal bin Dahalan
Tim. Menteri Sains Teknologi dan Alam Sekitar
3. Y.B. Datuk Amar James Wong Kim Min
Menteri Alam Sekitar dan Kesihatan Awam Negeri Sarawak
4. Y.B. Datuk Chong Kah Kiat
Menteri Pembangunan Pelancongan, Alam Sekitar, Sains dan Teknologi Negeri Sabah.

The 19th MEXCOE Meeting at Shah Alam, which was held on conjunction with Malaysia Environmental Week, focussed on the proposed amendments to the Environmental Quality Act 1974 (Amendment) 2000 pertaining to the delegation of powers to local authorities to conduct enforcement, the definition of open burning and related matters.

MEXCOE was informed that the Director-General of Environmental Quality had delegated powers of investigation for open burning offences to the Fire and Safety Department, the Royal Malaysian Police, the Ministry of Health, the Local Authorities, Kuala Lumpur City Hall and the Labuan Municipal Council. However such delegated powers did not include powers of prosecution.

The 19th MEXCOE also took note and supported the ongoing exercise to restructure the organisation of DOE and request for additional staff.

MEXCOE members for 2000:

1. Y.B. Datuk Law Hieng Ding
Minister of Science, Technology and the Environment (Chairman)
2. Y.B. Dato' Zainal bin Dahlan
Deputy Minister of Science, Technology and the Environment
3. Y.B. Dato' Amar James Wong Kim Min
Minister of Environment and Public Health, Sarawak
4. Y.B. Datuk Chong Kah Kiat
Minister of Tourism Development, Environment, Science and Technology, Sabah

1. Y.B. Dato' Ch'ng Toh Eng
(sehingga 29 Ogos 2000)
Pengerusi Jawatankuasa Tetap,
Kebudayaan dan Pelancongan , Sains,
Teknologi dan Alam Sekitar Negeri Selangor
2. Y.B. Dato' Haji Mohd Mokhtar bin Haji
Ahmad Dahlan
(bermula dari 30 Ogos 2000)
Pengerusi Jawatankuasa Tetap,
Kebudayaan dan Pelancongan , Sains,
Teknologi dan Alam Sekitar Negeri Selangor
3. Y.B. Dato' Kan Tong Leong
Pengerusi J/Kuasa Kerajaan Tempatan,
Alam Sekitar dan Pembangunan
Perbandaran Negeri Pahang
4. Y.B. Encik Ho Cheng Wang
Pengerusi J/Kuasa Kesihatan, Sains,
Teknologi dan Alam Sekitar Negeri Perak
5. Y.B. Datuk Haji Mo'min bin Hj. Abdul Aziz
Pengerusi J/Kuasa Perumahan, Kerajaan
Tempatan dan Alam Sekitar Negeri Melaka
6. Y.B Dato' Dr. Chua Soi Lek
Pengerusi J/Kuasa Pelancongan dan Alam
Sekitar Negeri Johor
7. Y.B. Dato' Beh Heng Seong
Pengerusi J/Kuasa Pengangkutan, Tenaga
dan Komunikasi, Sains, Teknologi dan Alam
Sekitar Negeri Kedah
8. Y.B. Tuan Haji Md. Isa bin Sabu
Pengerusi J/Kuasa Pelancongan,
Kebudayaan, Kesenian dan Alam Sekitar
Perlis
9. Y.B. Dr. Teng Hock Nan
Pengerusi Jawatankuasa Kerajaan
Tempatan, Alam Sekitar dan Pengurusan
Lalulintas Negeri Pulau Pinang
5. *Y.B. Dato' Ch'ng Toh Eng
(until 29 August 2000)
Chairman of Culture and Tourism, Science,
Technology and Environment, Selangor*
6. *Y.B. Dato' Haji Mokhtar bin Haji Ahmad
Dahlan
(from 30 August 2000)
Chairman of Culture and Tourism, Science,
Technology and Environment, Selangor*
7. *Y.B. Dato' Kan Tong Leong
Chairman of Local Authority, Environment
and City Development, Pahang*
8. *Y.B. En. Ho Cheng Wang
Chairman of Health, Science, Technology
and Environment, Perak*
9. *Y.B. Datuk Haji Mo'min bin Haji Abdul Aziz
Chairman of Housing, Local Authority and
Environment, Melaka*
10. *Y.B. Dato' Dr. Chua Soi Lek
Chairman of Tourism and Environment,
Johor*
11. *Y.B. Dato' Beh Heng Seong
Chairman of Transport, Energy and
Communication, Science, Technology and
Environment, Kedah*
12. *Y.B. Tuan Haji Md. Isa bin Sabu
Chairman of Tourism, Culture, Art,
Environment, Perlis*
13. *Y.B. Dr. Teng Hock Nan
Chairman of Local Authority, Environment
and Road Traffic Management, Pulau
Pinang*

14. Y.B. Encik Peter Lai Yit Fee
Pengerusi Jawatankuasa Bertindak Sains,
Alam Sekitar dan Sumber Manusia Negeri
Sembilan

14. Y.B. En. Peter Lai Yit Pit
*Chairman of Science, Environment and
Human Resource, Negri Sembilan*

15. Y.Bhg. Tan Sri Dato' Kamaruzzaman bin
Shariff
Datuk Bandar Dewan Bandaraya Kuala
Lumpur

15. Y.Bhg. Tan Sri Dato' Kamaruzzaman bin
Shariff
Mayor, Dewan Bandaraya Kuala Lumpur

16. Y. Bhg. Dato' Azman b. Abdul Rashid
(sehingga 31 Mei 2000)
Pengarah
Jabatan Pembangunan Persekutuan Negeri
Kelantan

16. Y.Bhg. Dato' Azman bin Abdul Rashid
(until 31 May 2000)
*Director
Department of Federal Development,
Kelantan*

17. Encik Ramli Abdul Rahman
(bermula dari 1 Jun 2000)
Pengarah
Jabatan Pembangunan Persekutuan Negeri
Kelantan

17. En. Ramli bin Abdul Rahman
(from 1 June 2000)
*Director
Department of Federal Development,
Kelantan*



Ahli-ahli MEXCOE Bagi Tahun 2000,
MEXCOE members For 2000.

Bab 2



Chapter 2

Majlis Kualiti Alam Sekeliling

Majlis Kualiti Alam Sekeliling (EQC) bertanggungjawab menasihatkan Menteri mengenai perkara-perkara berhubung dengan Akta Kualiti Alam Sekeliling, 1974 dan apa-apa perkara yang dirujuk kepada oleh Menteri. Majlis ini juga memberi nasihat mengenai polisi kepada Jabatan Alam Sekitar (JAS) dalam merangka polisi dan strategi terhadap pengurusan alam Sekitar secara holistic.

Mesyuarat EQC yang ke 75 dan 76 telah dipengerusikan oleh Dato' Kok Wee Kiat, di mana beliau telah dilantik sebagai pengerusi Majlis Kualiti Alam Sekeliling pada April, 2000. Mesyuarat-mesyuarat EQC ini telah diadakan pada 22 Ogos 2000 dan 6 November 2000 masing-masing. Antara perkara yang telah dibincangkan dan diperakukan adalah:

- Pindaan Akta Kualiti Alam Sekeliling 1974(Akta 127)(Pindaan) 2000
- Perlonggaran standard pelepasan effluen bagi Zn daripada 1 mg/l kepada 2 mg/l
- Mengadakan 'Prime Minister Hibiscus Award' pada peringkat negeri.
- Penyediaan 'Handbook on Environment for Legislation'
- Kajian mengenai Pindaan Akta Kualiti Alam Sekeliling Dan Peraturan-Peraturan di Bawahnya
- Deraf Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Motosikal)
- Perwakilan Kuasa dan Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Pembakaran Terbuka) 2000

Kertas Kerja lain yang dibentangkan kepada Majlis adalah:

- 1 "Access-Empowerment-Governance of the Environment: Global and Local Perspective" (Prof. Dr Muhamad Awang; Dato' Dr. Salleh Mohd. Nor dan Dato' Dr. Abu Bakar Jaafar)

Environmental Quality Council (EQC)

The Environmental Quality Council (EQC) serves as an advisory body to the Minister of Science, Technology and the Environment on matters pertaining to the Environmental Quality Act 1974 and also on any environmental matter referred to it by the Minister. The Council also provides policy guidance to the Department of Environment (DOE) in the formulation of policies and strategies towards a more holistic approach in environmental management.

The 75th and 76th EQC meetings were chaired by Dato' Kok Wee Kiat, who was appointed as EQC Chairman in April 2000. These meetings were held on 22 August 2000 and 6 November 2000 respectively. Among other matters, the Meetings deliberated extensively on:

- *Amendment to the Environmental Quality Act, 1974 (Act 127)(Amendment, 2000)*
- *Review of effluent discharge limit for Zn from 1mg/l to 2 mg/l.*
- *Prime Minister Hibiscus Award at State level.*
- *Preparation of 'Handbook on Environmental Legislations'*
- *Further amendments to Environmental Quality Act and Subsidiary Legislations*
- *Draft of Environmental Quality (Control of Emission from Motorcycles) Regulations*
- *Delegation of Powers for Open Burning Investigations pursuant to Environmental Quality (Prescribed Activities)(Open Burning) Order 2000*

A working paper entitled: "Access – Empowerment-Governance of the Environment: Global and Local Perspective" (jointly authored by Prof. Dr Muhamad Awang; Dato' Dr. Salleh Mohd. Nor and Dato' Dr. Abu Bakar Jaafar) was also presented at the Council meeting.

Ahli-ahli Majlis Kualiti Alam Sekeliling 2000:**Pengerusi :**

Dato' Kok Wee Kiat

Ahli :

Dato' Ng Kam Chiu

Ketua Setiausaha

Kementerian Sains, Teknologi dan Alam

Ketua Setiausaha

Kementerian Perdagangan Antarabangsa dan Industri

atau wakil yang dilantik (Cik Harriet Supramaniam)

Ketua Setiausaha

Kementerian Perdagangan Dalam Negeri dan Hal Ehwal Pengguna

atau wakil yang dilantik (Pn. Normah Sheikh Abdullah)

Ketua Setiausaha

Kementerian Pertanian

atau wakil yang dilantik (Encik Lim Eng Siang)

Ketua Setiausaha

Kementerian Sumber Manusia,

atau wakil yang dilantik (Omar bin Mat Piah)

Ketua Setiausaha

Kementerian Pengangkutan

atau wakil yang dilantik (Encik Sim Say Kiong)

Ketua Setiausaha

Kementerian Kesihatan Malaysia

atau wakil yang dilantik (Ir. Tan Hoo)

Puan Monica Chia Mui Foong

Setiausaha Tetap

Kementerian Pelancongan dan Pembangunan Alam Sekitar Sabah

Datu Haji Hamzah b. Haji Drahman

Setiausaha Tetap

Kem. Perancangan Sumber Sarawak,

EQC Members for 2000***Chairman :***

Dato' Kok Wee Kiat

Members :

Dato' Ng Kam Chiu

Secretary-General

Ministry of Science, Technology and the Environment

Secretary-General

Ministry of International Trade & Industry

or his authorized representative (Cik Harriet Supramaniam)

Secretary-General

Ministry of Domestic Trade & Consumers Affairs

or his authorized representative (Pn. Normah Sheikh Abdullah)

Secretary-General

Ministry of Agriculture

or his authorized representative (Encik Lim Eng Siang)

Secretary-General

Ministry of Human Resources,

or his authorized representative (Encik Omar bin Mat Piah)

Secretary-General

Ministry of Transport

or his authorized representative (Encik Sim Say Kiong)

Secretary-General

Ministry of Health

or his authorized representative (Ir. Tan Hoo)

Puan Monica Chia Mui Foong

Permanent Secretary

Ministry of Tourism & Environment Development, Sabah

Datu Haji Hamzah b. Haji Drahman

Permanent Secretary

Ministry of Resource Planning, Sarawak

Tuan Syed Abdullah Al-Junied
Pengurus Besar
Unit Kesihatan, Keselamatan dan Alam Sekitar,
PETRONAS

Encik Teo Leng
Malaysian Palm Oil Association (MPOA)

Dato' Mohd Yusof bin Hitam
Persekutuan Pekilang-Pekilang Malaysia
(FMM)

Tuan Haji Aliasak Haji Ambia
Majlis Pengeluar-Pengeluar Getah Malaysia
(MRPC)

Prof. Dr. Muhamad bin Awang
Timbalan Naib Canselor (Akademik)
Universiti Putra Malaysia

Y. Bhg. Dato' Dr. Salleh bin Mohd. Nor
Presiden
Persatuan Pencinta Alam Malaysia (MNS)

Ir. Gurmit Singh K.S
Pengarah Eksekutif
Pusat Teknologi Alam Sekitar
Dan Pembangunan, Malaysia (CETDEM)

*Tuan Syed Abdullah Al-Junied
General Manager
Health, Safety and Environment Unit,
PETRONAS*

*Encik Teo Leng
Malaysian Palm Oil Association (MPOA)*

*Y. Bhg. Dato' Mohd Yusof bin Hitam
Federation of Malaysian Manufacturers (FMM)*

*Tuan Haji Aliasak Haji Ambia
Malaysian Rubber Products Manufacturers
Council (MRPC)*

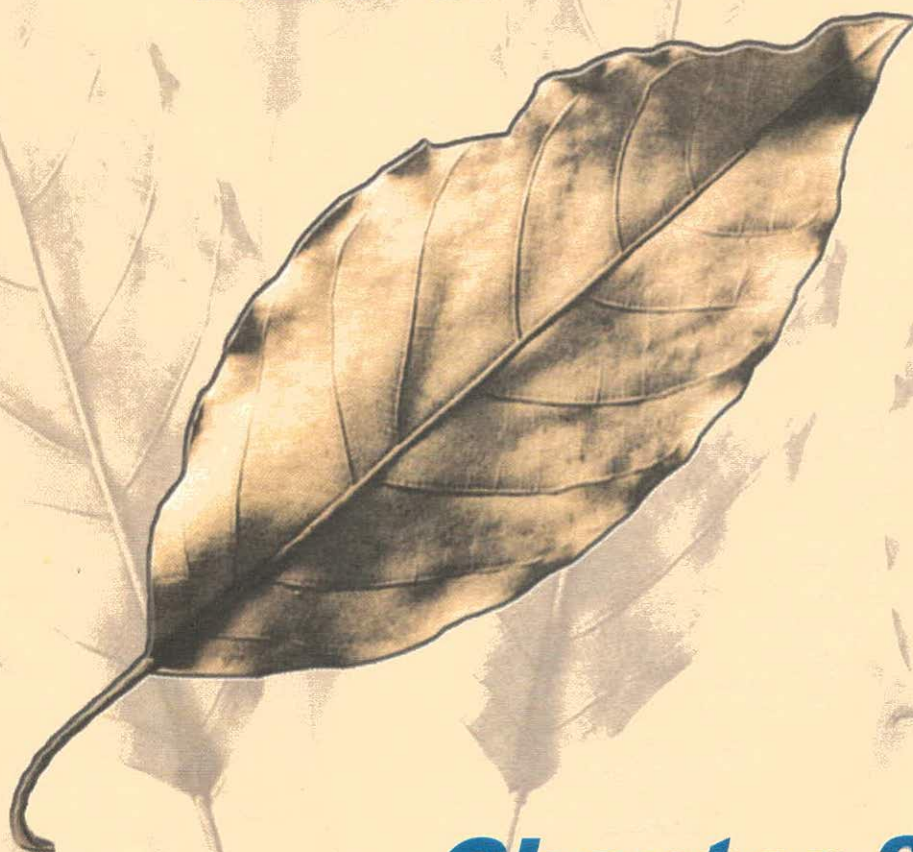
*Prof. Dr. Muhamad bin Awang
Deputy Vice-Chancellor (Academic)
Universiti Putra Malaysia*

*Dato' Dr. Salleh bin Mohd. Nor
President
Malaysian Nature Society (MNS)*

*Ir. Gurmit Singh K.S
Executive Director
Centre for Environment Technology
& Development Malaysia (CETDEM)*



Bab 3



Chapter 3

STRUKTUR ORGANISASI

Jabatan Alam Sekitar diterajui oleh Ketua Pengarah yang dilantik di bawah Seksyen 3(1) Akta Kualiti Alam Sekeliling 1974. Jabatan ini terdiri daripada 3 Bahagian Teknikal di Ibu Pejabat iaitu Kawalan, Penilaian dan Pembangunan dan dua (2) Bahagian Sokongan iaitu Pentadbiran, dan Teknologi Maklumat. Terdapat 14 buah Pejabat Negeri yang terletak di Johor Bahru (Johor), Alor Setar (Kedah), Kangar (Perlis), Kota Bharu (Kelantan), Wilayah Persekutuan Kuala Lumpur, Wilayah Persekutuan Labuan, Bandar Melaka Bersejarah (Melaka), Seremban (Negeri Sembilan), Kuantan (Pahang), Butterworth (Pulau Pinang), Ipoh (Perak), Kota Kinabalu (Sabah), Kuching (Sarawak), Kuala Terengganu (Terengganu), 4 buah Pejabat Cawangan di Pulau Langkawi (Kedah), Temerloh (Pahang), Miri dan Bintulu (Sarawak) dan Pusat Khidmat Nasihat Alam Sekitar yang berpusat di Pejabat Lembaga Kemajuan Perindustrian Malaysia (MIDA) (**Rajah 3.0**). Satu Institut Kemahiran dan Latihan Alam Sekitar (IKLAS) sedang dalam peringkat pembinaan.

SUMBER MANUSIA

Jumlah kakitangan JAS sehingga 31 Disember 2000 ialah 605 orang yang terdiri daripada 129 pegawai dalam kumpulan pengurusan dan profesional dan 476 orang kakitangan dalam kumpulan sokongan. (**Rajah 3.1**).

LAPORAN TAHUNAN BAHAGIAN KEWANGAN

1.0 Peruntukan dan Perbelanjaan

Pada tahun 2000, Jabatan Alam Sekitar telah diperuntukkan sebanyak **RM81,949,920.00** iaitu pertambahan sebanyak RM24,750,820.00 atau 43.7% berbanding dengan tahun sebelumnya. Daripada jumlah ini, sejumlah **RM50,519,020.00** adalah bagi peruntukan mengurus dan **RM31,430,900.00** lagi adalah bagi peruntukan pembangunan (**Rajah 3.2 dan 3.3**).

2.0 Kutipan Hasil

Pada tahun 2000 hasil yang dikutip berjumlah **RM4,696,592.00** (**Rajah 3.4**)

ORGANISATION STUCTURE

*The Department of Environment is headed by a Director-General who is appointed by virtue of Section 3(1) of the Environmental Quality Act, 1974. The department has three Technical Divisions at its Head Office i.e. Control, Assessment and Development Planning as well as two Support Divisions i.e. Administration and Finance, and Information Technology. There are 14 State Offices, located at Johor Bahru (Johor), Alor Setar (Kedah), Kangar (Perlis), Kota Bharu (Kelantan), Kuala Lumpur (Federal Territory), Labuan (Federal Territory), Bandar Bersejarah Melaka (Melaka), Seremban (Negeri Sembilan), Kuantan (Pahang), Ipoh (Perak), Butterworth (Pulau Pinang), Kota Kinabalu (Sabah), Kuching (Sarawak), Kuala Terengganu (Terengganu), 4 Branch Offices in Pulau Langkawi (Kedah), Temerloh (Pahang), Bintulu and Miri (Sarawak) and an Environmental Advisory Desk at the Malaysian Industrial Development Authority (MIDA) Office. (**Figure 3.0**). An Environmental Skills and Training Institute (IKLAS) is under construction.*

HUMAN RESOURCES

*As of 31 December 2000 DOE had 605 staff which comprised of 129 Officers in the Managerial and Professional Group and 476 staff in the Supporting Group. (**Figure 3.1**).*

FINANCE

1.0 Financial Allocation and Expenditure

*The total 2000 budget allocation for the Department of Environment was **RM81,949,920.00** an increase of RM24,750,820.00 (43.7%) compared to 1999. From this amount **RM50,519,020.00** (61.6 %) was allocated for operational expenditure and **RM31,430,900.00** (38.4 %) for development projects. (**Figures 3.2 and 3.3**).*

2.0 Revenue

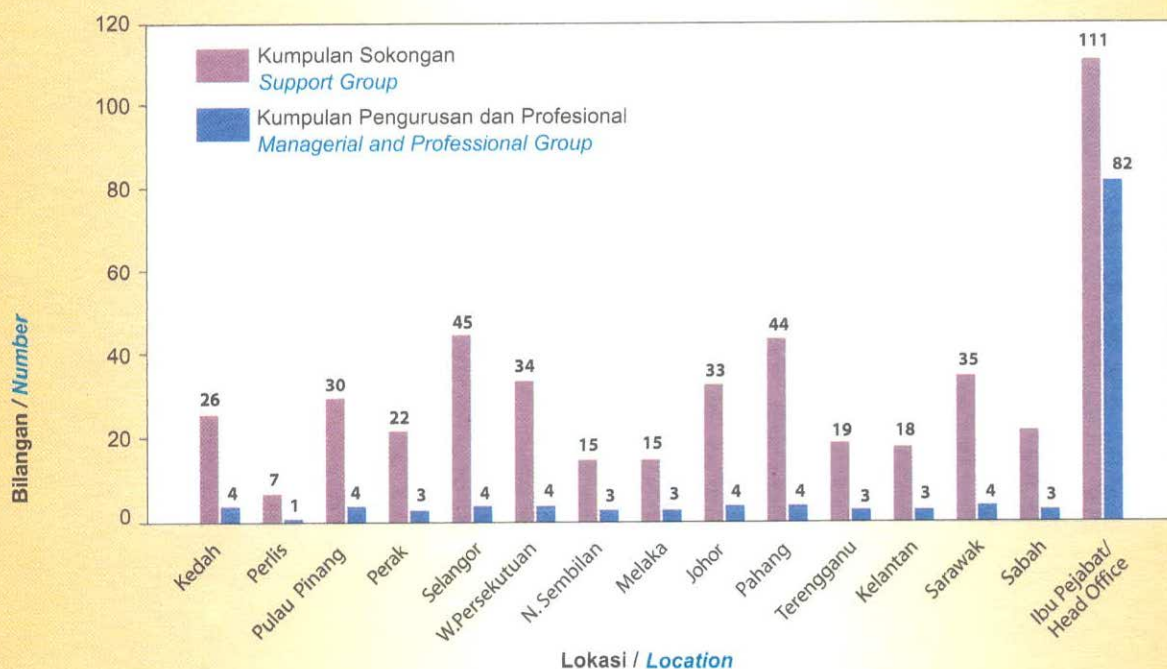
*The total revenue collected in 2000 amounted to **RM4,696,592.00** (**Figure 3.4**)*

RAJAH 3.0 JABATAN ALAM SEKITAR: CARTA ORGANISASI
FIGURE 3.0 DEPARTMENT OF ENVIRONMENT: ORGANISATION STRUCTURE

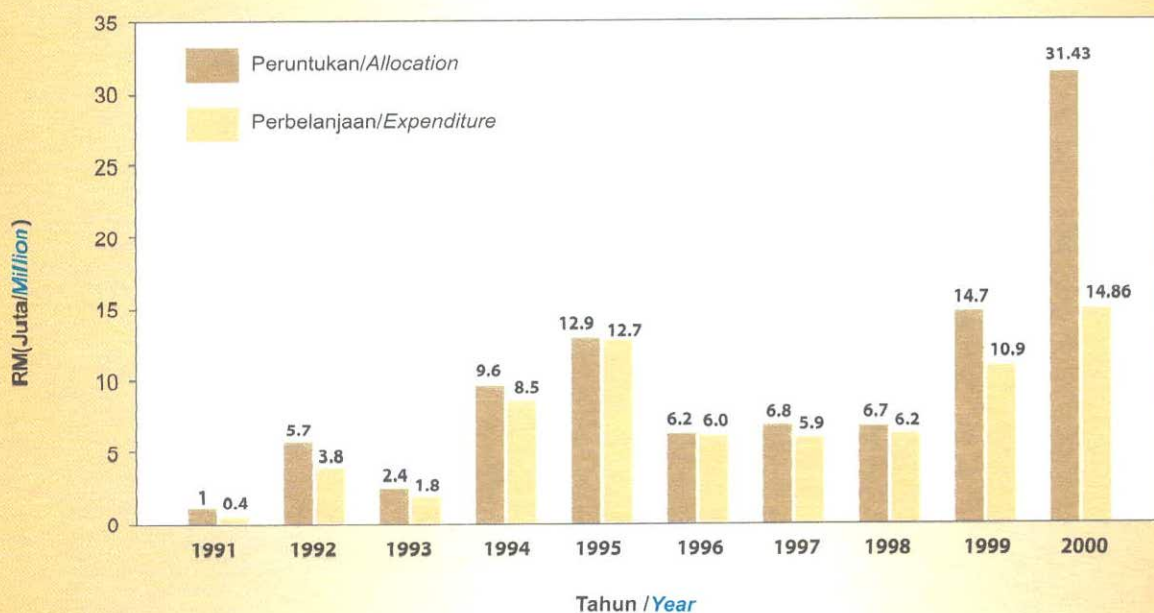


PENGARAH-PENGARAH JAS NEGERI / STATE DIRECTORS

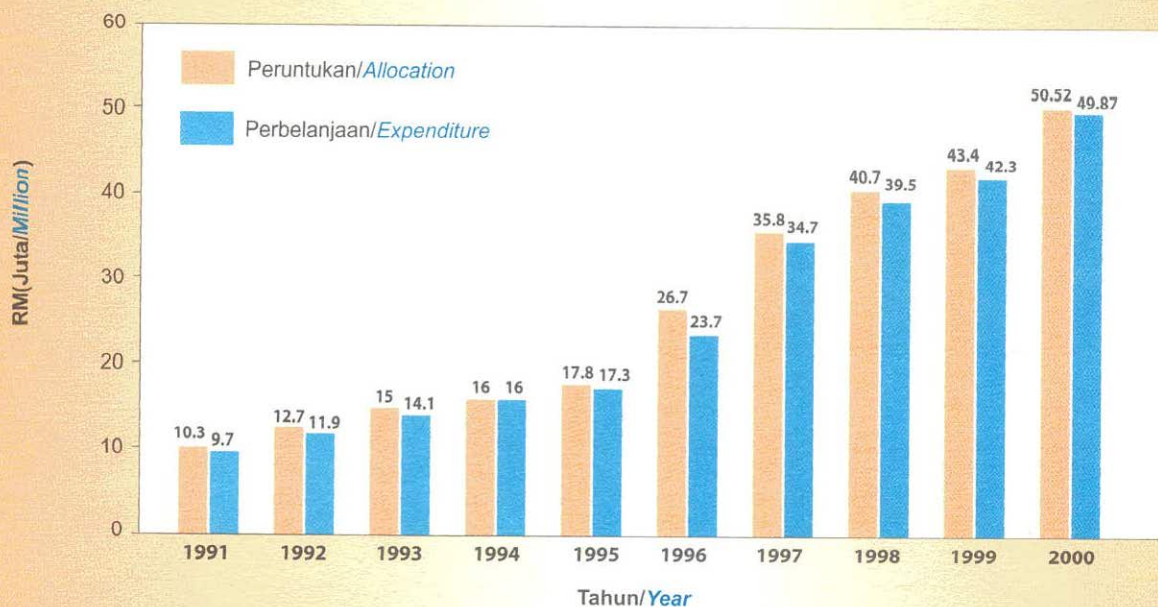




Rajah 3.1 Jabatan Alam Sekitar: Taburan Kedudukan Kakitangan, 2000
Figure 3.1 Department of Environment: Distribution of Personnel, 2000

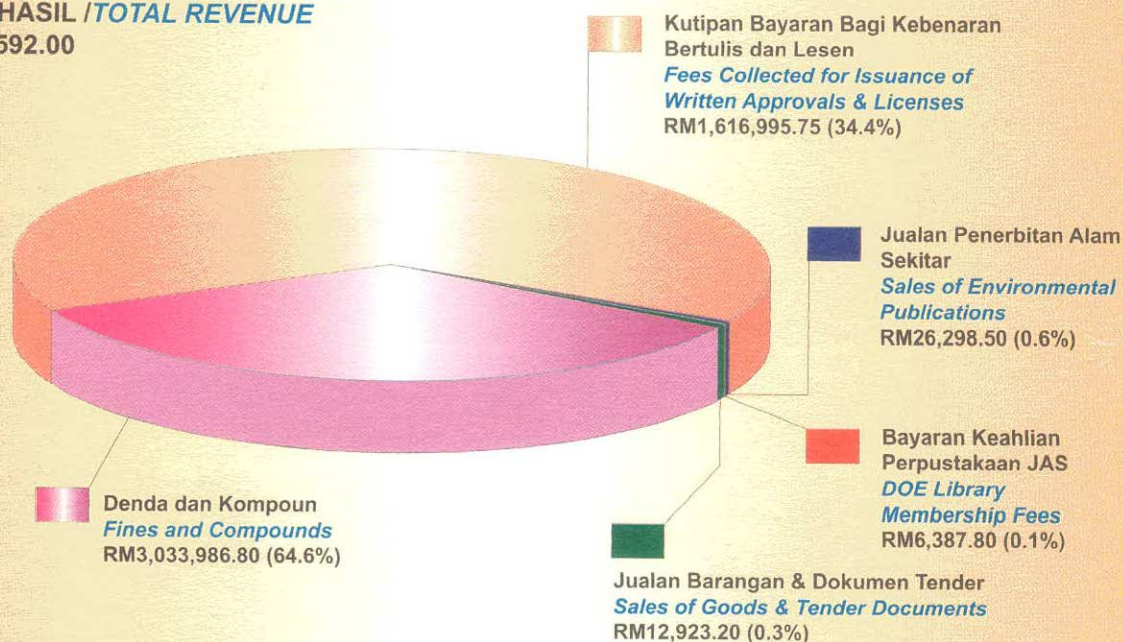


Rajah 3.2 Jabatan Alam Sekitar: Peruntukan dan Perbelanjaan(Pembangunan), 1991-2000
Figure 3.2 Department of Environment: Allocation and Expenditure for Development Projects, 1991-2000



Rajah 3.3 Jabatan Alam Sekitar: Peruntukan dan Perbelanjaan(Mengurus), 1991-2000
 Figure 3.3 Department of Environment: Allocation and Operational Expenditure, 1991-2000

JUMLAH HASIL /TOTAL REVENUE
 RM4,696,592.00



Rajah 3.4 Jabatan Alam Sekitar: Hasil Bagi 2000
 Figure 3.4 Department of Environment: 2000 Revenue

Bab 4



Chapter 4

PENILAIAN KESAN KEPADA ALAM SEKELILING & INPUT ALAM SEKITAR KEPADA PERANCANGAN PEMBANGUNAN

Objektif utama program ini adalah seperti berikut:

- (a) melaksanakan strategi yang mengambil kira faktor-faktor alam Sekitar dalam perancangan dan pembangunan projek seperti yang diperuntukkan dalam Seksyen 34A Akta Kualiti Alam Sekeliling 1974, Pindaan 1985 dan Pindaan 1996 bagi Aktiviti-Aktiviti yang Ditetapkan di bawah Perintah Kualiti Alam Sekeliling (Aktiviti-Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling) 1987.
- (b) memastikan dimensi alam sekitar diambil kira dalam perancangan dan pembangunan projek-projek bagi pelan induk, rancangan struktur/ rancangan tempatan bagi seksyen 34A Akta Kualiti Alam Sekeliling 1974 dan pelan-pelan pembangunan yang lain melalui proses penilaian awal tapak.

Seperti di tahun-tahun yang lalu, aktiviti-aktiviti utama yang telah dilakukan adalah mengulangkaji laporan EIA, menyediakan input alam sekitar bagi perancangan pembangunan, penilaian awal tapak, dan memproses kebenaran bertulis bagi alat kawalan pencemaran dan alat pembakaran bahan api.

PROSEDUR ISO 9002 BAGI PENILAIAN LAPORAN EIA TERPERINCI DAN PENGUATKUASAAN POST-EIA

Tahun 2000 membawa era baru di dalam penilaian laporan EIA bagi Jabatan ini. Pada 23 November 2000, prosedur Penilaian EIA Terperinci dan Penguatkuasaan Post-EIA telah mendapat sijil ISO 9002. Penyampaian sijil MS ISO 9002:94 bagi Jabatan Alam Sekitar telah dianugerahkan oleh Yg. Berhormat Timbalan Perdana Menteri Dato' Seri Abdullah bin Hj. Ahmad Badawi. Penganugerahan ini memberi pengiktirafan dan cabaran kepada Jabatan di dalam menyediakan perkhidmatan yang lebih efisien kepada pelanggan.

ENVIRONMENTAL IMPACT ASSESSMENT AND INPUT TO PLANNING

The main objectives of this programme are:

- (a) To implement the strategy of incorporating environmental factors in project planning and development in line with the requirements of Section 34A of the Environmental Quality Act, 1974 (Amendments 1985 and 1996) for activities prescribed under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987.*
- (b) To ensure the incorporation of the environmental dimension in project planning and development, Master Plans, Structure and Local Plans and other development plans through the pre-siting evaluation process.*

As in previous years, the main activities undertaken were reviewing EIA reports, providing environmental input to development planning, pre-siting evaluation and processing of written permissions for pollution control and fuel burning equipment.

ISO 9002 PROCEDURE FOR REVIEWING DETAILED EIA REPORTS AND POST-EIA ENFORCEMENT

The year 2000 heralded a new era in the review of EIA reports for the Department. On 23 November 2000, the Detailed EIA Review and Post-EIA Enforcement Procedure was ISO 9002 certified. The Department was presented the MS ISO 9002:94 certificate by the Rt Honourable Deputy Prime Minister Dato' Seri Abdullah bin Hj. Ahmad Badawi. This certification provided the recognition and a new challenge to the Department to continue providing better quality service to our clients.

PEMROSESAN LAPORAN EIA

Bilangan laporan yang diterima pada tahun 2000 meningkat jika dibandingkan dengan tahun 1999. Sejumlah 153 laporan EIA dan 1 laporan penilaian risiko telah diterima. Daripada 153 laporan yang diterima ini, 139 laporan telah melalui prosedur penilaian awal EIA dan 14 laporan lagi melalui prosedur terperinci. (Figure 4.0 hingga 4.4).

EIA AWAL

Bilangan laporan yang terbanyak diterima (sejumlah 32 laporan) adalah yang berkaitan dengan pembangunan infrastruktur seperti bagi daerah baru, estet perindustrian dan lebuh raya. Ini diikuti oleh 28 laporan yang berkaitan pulihguna bahan buangan terjadual, 23 laporan bagi perumahan dan 21 laporan lagi bagi pembangunan kuari.

EIA TERPERINCI

Laporan EIA terperinci bagi tahun 2000 merangkumi aktiviti-aktiviti berikut:

- Pembinaan empangan untuk janakuasa hidroelektrik
- Kemudahan Tangki Berpusat.
- Pembangunan bercampur yang melibatkan penambakan pantai
- Pembinaan alat pembakaran sisa buangan terjadual di atas tapak.
- Alat pembakaran sisa pepejal bagi majlis perbandaran.
- Pelan kitar-semula bateri plumbum.
- Pelan janakuasa arang batu.
- Pusat kemudahan pengeluaran silikon
- Penambakan pantai
- Kilang kertas (Brown Paper)

Sehingga akhir tahun 2000, sebanyak 8 laporan terperinci telah diluluskan, 1 telah ditolak, 1 telah ditarik balik, dan 4 laporan masih diproses kerana kekurangan maklumat.

EIA REPORTS PROCESSED

The number of reports received for review in 2000 increased slightly compared with 1999. A total of 153 EIA reports and 1 Risk Assessment report were received. Out of the 153 reports received, 139 reports went through the preliminary procedure and 14 were subject to detailed assessment (Figure 4.0 to Figure 4.4).

PRELIMINARY REPORTS

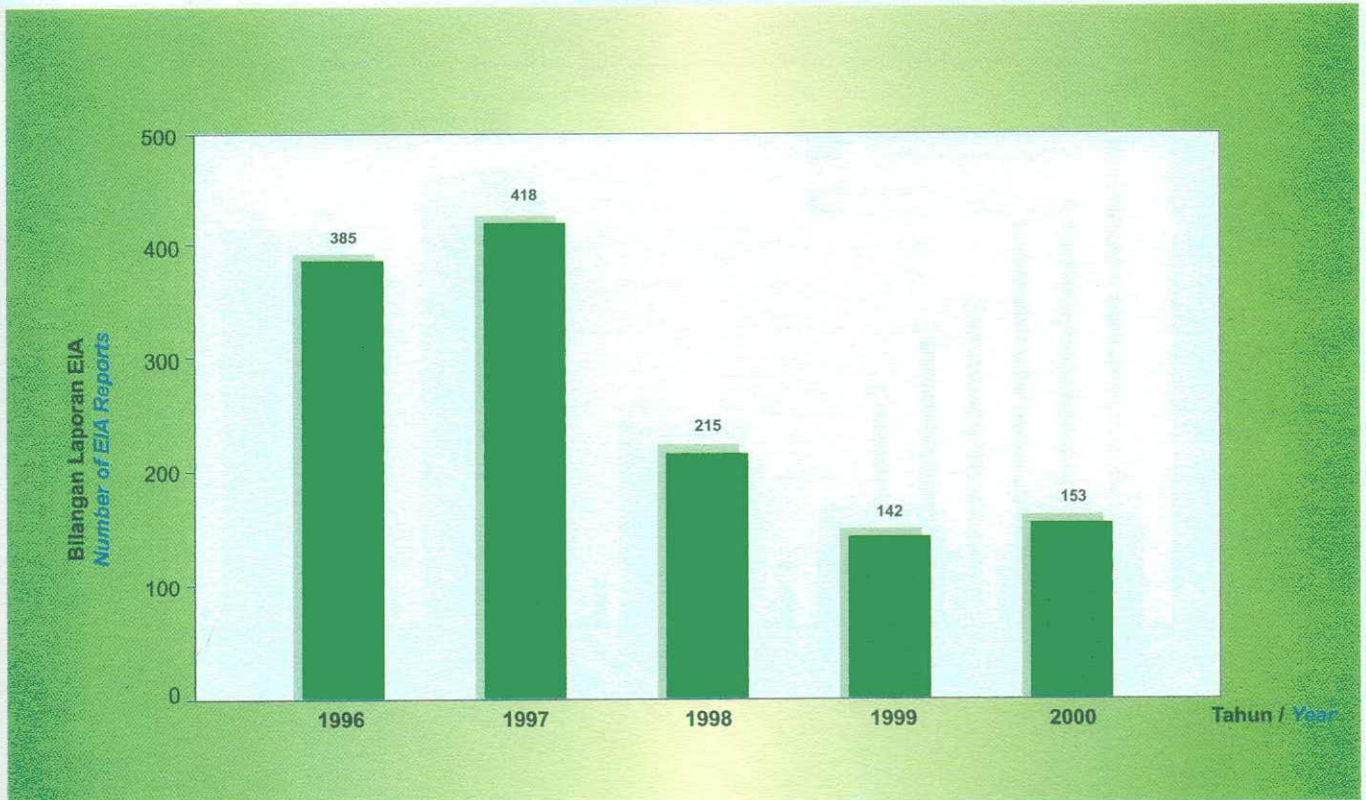
The most number of reports received (32 in total) were for infrastructure development such as new townships, industrial estates and highways. This was followed by 28 reports relating to the recovery of toxic and hazardous wastes, 23 reports for housing and 21 reports for the development of quarries.

DETAILED REPORTS

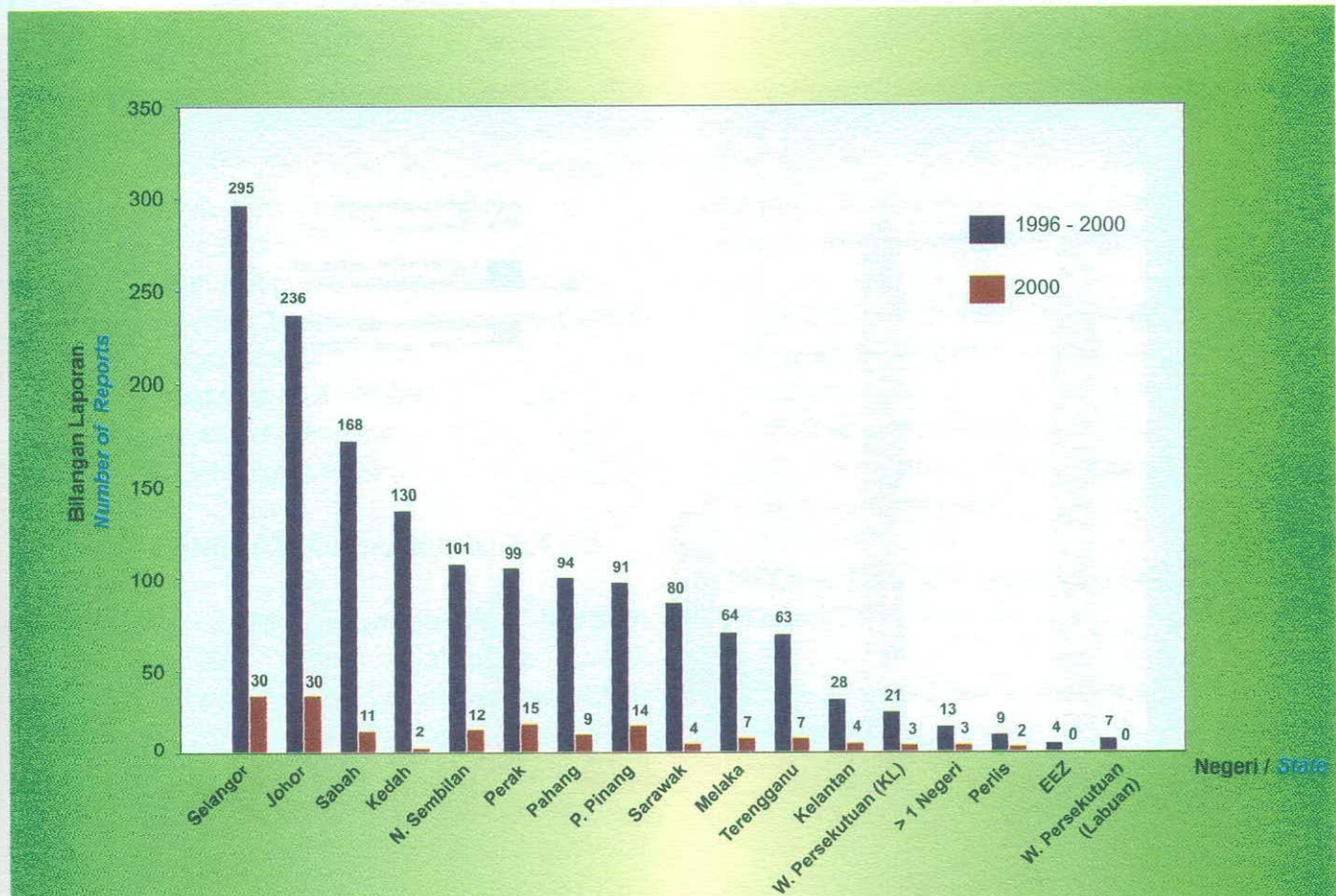
The detailed EIA reports in 2000 were for the following activities:

- Construction of dam for hydroelectricity
- Centralized Tankage Facility
- Mixed development involving coastal land reclamation
- Construction of on-site toxic and hazardous waste incinerator
- Municipal solid waste incinerator
- Lead batteries recycling plant
- Coal-fired power plant
- Construction of dam for water supply
- Silicone manufacturing facility
- Coastal land reclamation
- Brown paper mill

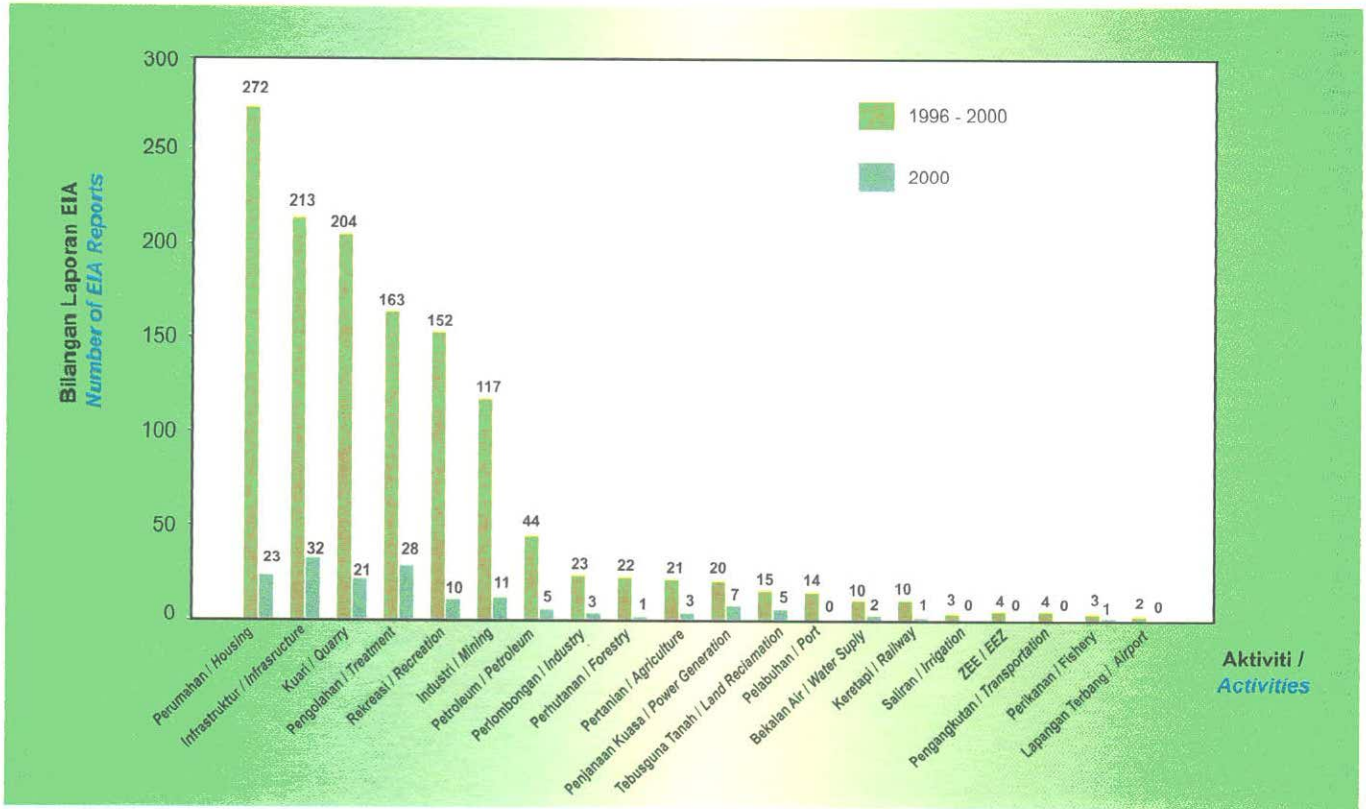
At the end of the year, 8 reports were approved, 1 rejected, 1 withdrawn and 4 still pending mainly due to insufficient information.



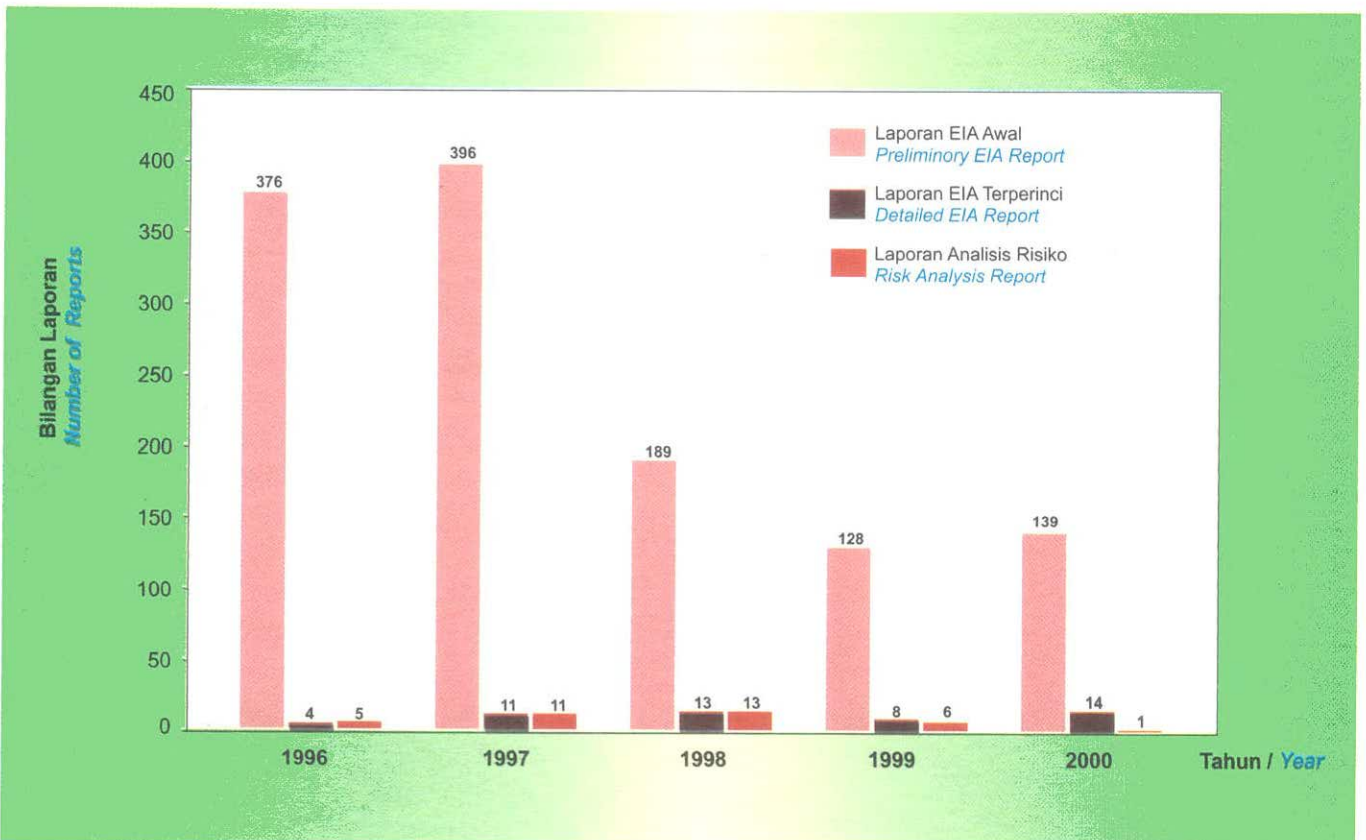
Rajah 4.0 Jabatan Alam Sekitar: Bilangan Laporan EIA Yang Diterima Mengikut Tahun, 1996-2000
 Figure 4.0 Department of Environment: Distribution of EIA Reports Received, 1996-2000



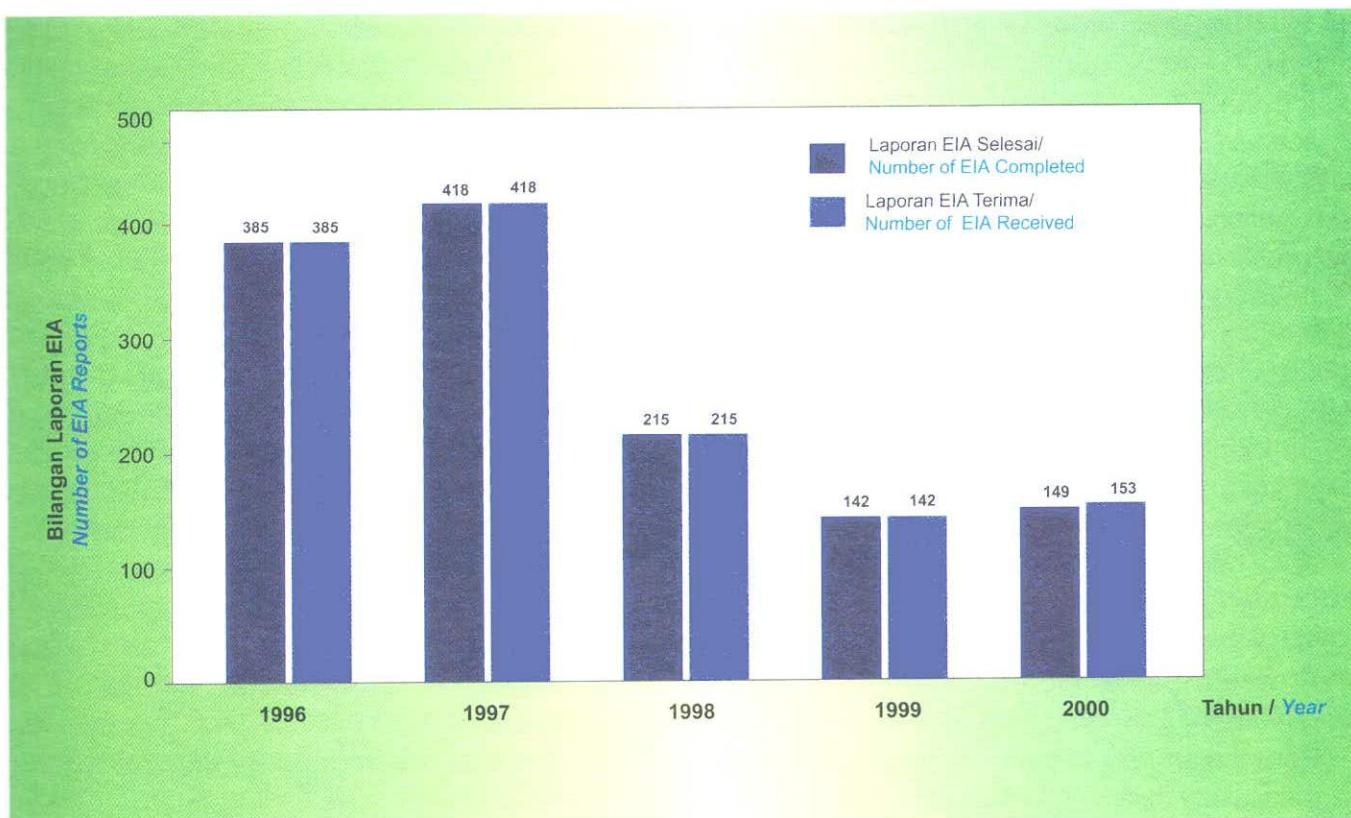
Rajah 4.1 Jabatan Alam Sekitar: Bilangan Laporan EIA Yang Diterima Mengikut Negeri, 1996-2000
 Figure 4.1 Department of Environment: Distribution of EIA Reports By States, 1996-2000



Rajah 4.2 Jabatan Alam Sekitar: Bilangan Laporan EIA Yang Diterima Mengikut Aktiviti, 1996-2000
Figure 4.2 Department of Environment: Number of EIA Reports By Prescribed Activities, 1996-2000



Rajah 4.3 Jabatan Alam Sekitar: Bilangan Laporan EIA Dan Jenis Laporan Diterima, 1996-2000
Figure 4.3 Department of Environment: Types of Reports Submitted, 1996-2000



Rajah 4.4 Jabatan Alam Sekitar: Bilangan Laporan EIA Yang Diterima Dan Diselesaikan, 1996-2000
 Figure 4.4 Department of Environment: Types of Reports Received And Processed, 1996-2000

Selain daripada laporan EIA terperinci, Bahagian EIA turut menerima 7 bidang rujukan untuk aktiviti-aktiviti yang ditetapkan yang memerlukan prosedur terperinci. Aktiviti-aktiviti tersebut adalah:

- Kemudahan alat pembakaran sisa pepejal;
- Pembangunan bercampur yang melibatkan penambakan pantai;
- Alat pembakaran sisa-klinikal
- Pelan janakuasa arang batu
- Kilang kertas(Brown Paper)

LAWATAN PENGUATKUASAAN PROJEK EIA

Pada tahun 2000, sejumlah 586 lawatan penguatkuasaan telah dijalankan untuk mengenalpasti status pembangunan dan pematuhan projek-projek EIA. Daripada lawatan-lawatan ini, sebanyak 236 notis dan 16 kompoun telah dikeluarkan manakala 5 kes telah didakwa di mahkamah kerana tidak mematuhi syarat-syarat kelulusan.

Other than the detailed EIA reports, the EIA Division also received 7 Terms of Reference (TOR) for prescribed activities that were required to follow the detailed procedure. These were for the following activities:

- Solid waste incineration facility;
- Mixed development involving coastal land reclamation;
- Clinical waste incinerator;
- Coal-fired power plant; and
- Brown paper mill.

ENFORCEMENT INSPECTION OF EIA PROJECTS

In 2000, a total of 586 enforcement inspections were carried out to determine the development as well as the compliance status of EIA projects. From these inspections, 236 notices and 16 compounds were issued and 5 cases taken to court for non-compliance of EIA conditions.

PELAN PENGURUSAN ALAM SEKITAR

Aktiviti-aktiviti post-EIA terutama sekali yang melibatkan pembangunan sumber perlu dikawal dan dipantau dengan teliti. Rekod-rekod projek EIA yang lepas menunjukkan bahawa pelanggaran dan aduan kebanyakannya daripada aktiviti-aktiviti pembangunan sumber. Ini adalah disebabkan oleh kesukaran dalam menentukan dan meramalkan keperluan bagi pemuliharaan alam sekitar. Pelan Pengurusan Alam Sekitar (EMP) perlu diwujudkan untuk memastikan semua langkah-langkah kawalan dan keperluan pemantauan di dalam mendapatkan kelulusan EIA adalah dipatuhi. EMP ini termasuklah:

- Corak akhir yang menggabungkan langkah-langkah kawalan
- Program pemantauan alam sekitar yang terperinci
- Peruntukan kewangan dan kakitangan yang mencukupi dalam melaksanakan EMP

Jabatan Alam Sekitar telah menetapkan bahawa EMP perlu diserahkan untuk diluluskan sekurang-kurangnya 3 bulan sebelum pelaksanaan projek tersebut. Dalam membantu pengusaha projek, format EMP boleh didapati di dalam halaman web Jabatan Alam Sekitar.

PENDAFTARAN JURUPERUNDING EIA

Pada tahun 2000, 28 permohonan daripada individu dan 5 permohonan daripada firma diterima untuk pendaftaran. 16 individu dan 2 firma telah diluluskan pendaftarannya. Sehingga akhir tahun 2000, sejumlah 265 juruperunding EIA dan 72 firma juruperunding EIA telah didaftarkan.

AUDIT ALAM SEKITAR

Garis panduan Audit Alam Sekitar (Handbook of Environmental Auditing Guidelines) yang merangkumi garis panduan untuk skema pelaksanaan dan pendaftaran bagi juruaudit alam sekitar telah disempurnakan. Pada peringkat permulaan, Jabatan akan melaksanakan audit alam sekitar di dalam pentadbirannya, dengan menekankan kepada audit pematuhan berdasarkan syarat-syarat kelulusan dan lesen. Ini adalah bagi

ENVIRONMENTAL MANAGEMENT PLAN

Post-EIA activities especially those relating to resource development had to be controlled and closely monitored. Past records of EIA projects revealed that violations and complaints were largely from resource development activities due to the difficulty of specifying and predicting exact requirement for nature conservation. Environmental Management Plans (EMP) had to be prepared to ensure that all mitigation measures and monitoring requirements in EIA approvals were carried out. An EMP would include:

- *the final design incorporating mitigation measures*
- *detailed environmental monitoring programme*
- *budget and personnel to implement the EMP*

The Department had stipulated that EMP must be submitted for approval at least 3 months before the implementation of the project. To assist project proponents, the EMP format could be viewed at the Department's homepage.

REGISTRATION OF EIA CONSULTANTS

Out of the 28 applications from individuals and 5 applications from firms for registration, 16 individuals and 2 firms were approved. At the end of 2000, a total of 265 EIA consultants and 72 EIA consultancy firms had been registered.

ENVIRONMENTAL AUDITING

The 'Handbook of Environmental Auditing Guidelines' including guidelines for implementation and registration scheme for environmental auditors was finalised. At the initial stage, the Department would implement environmental auditing administratively, giving emphasis to compliance audit against approval and licensing conditions for environmental impact assessment (EIA) reports and licenses for prescribed premises such as palm oil and

laporan-laporan EIA dan lesen bagi premis yang ditetapkan seperti kilang kelapa sawit dan getah serta kemudahan bahan buangan terjadual. Industri-industri lain akan disusul kemudian sejajar dengan keperluan semasa.

INPUT ALAM SEKITAR KEPADA PERANCANGAN PEMBANGUNAN

Input alam sekitar disediakan kepada pelan pembangunan, polisi dan kajian, yang dijalankan oleh agensi-agensi lain dan bahagian lain di Jabatan Alam Sekitar. Sejumlah 99 input telah diberikan pada tahun 2000. Ini termasuklah 61 permohonan pendaftaran sistem pembentungan dan peralatan dengan Jabatan Perkhidmatan Pembentungan. Selebihnya adalah untuk pelan dan polisi seperti Kajian Pelan Spatial Kebangsaan; Polisi Zon Persisiran Pantai Kebangsaan, Pelan Tempatan dan kajian lain seperti langkah-langkah kawalan banjir, air bawah tanah, pemantauan pulau-pulau dan aktiviti-aktiviti pembangunan tanah tinggi.

SISTEM MAKLUMAT GEOGRAFIK (GIS)

Peta tematik disediakan untuk projek-projek EIA di Perak. Bagi membantu Jawatankuasa Kabinet bagi Koordinasi Pembangunan di Tanah Tinggi dan Pulau-pulau, peta tematik ini turut disediakan bagi projek-projek pembangunan dan aktiviti-aktiviti pertanian di Cameron Highlands yang dikenalpasti melalui pengawasan udara dan siasatan di daratan. Bagi menyokong aktiviti-aktiviti yang dijalankan oleh Jabatan Alam Sekitar, peta digital telah dihasilkan bagi tujuan berikut:

- Penambakan pantai di Melaka
- Lokasi pembakaran terbuka di tapak pelupusan Sikamat
- Punca pencemaran di Lembangan Sungai Linggi;
- Projek-projek pembangunan di sekitar Hutan Simpanan Air Hitam

PENILAIAN AWAL TAPAK PROJEK

Sejumlah 6,469 permohonan telah diterima bagi penilaian awal tapak projek dalam menentukan

rubber factories and toxic and hazardous wastes facilities. Other industries will be included as the need arises.

ENVIRONMENTAL INPUT TO DEVELOPMENT PLANNING

Environmental inputs were provided for development plans, policies and studies initiated by other agencies as well as by other Divisions of the Department. A total of 99 inputs were given in the year 2000. These included 61 applications to register sewerage systems and equipment with the Sewerage Services Department. Others were for plans and policies such as the National Spatial Plan Study, the National Coastal Zone Policy, Local Plans and other studies for flood mitigation, ground water, island monitoring and highland development activities.

GEOGRAPHICAL INFORMATION SYSTEM (GIS)

As an on-going activity, thematic maps were prepared for EIA projects for Perak. To assist the Cabinet Committee for the Co-ordination of Development on Highlands and Islands, thematic maps were also prepared for development projects and agriculture activities in Cameron Highlands identified through aerial surveillance and ground investigations. To support the activities of other Divisions of the Department, digital maps were produced for the following areas:

- *Coastal land reclamation in Melaka*
- *Location of opening burning spots at the Sikamat landfill site*
- *Pollution sources in the Linggi River Basin*
- *Development projects around the Air Hitam Forest Reserve*

PROJECT PRE-SITING EVALUATION

A total of 6,469 applications were received for pre-siting evaluation to determine site suitability of development projects that were not subjected

kesesuaian tapak projek-projek pembangunan yang tidak termaktub di dalam Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan)(Penilaian Kesan Kepada Alam Sekeliling), 1987. Permohonan-permohonan ini dirujukkan kepada Jabatan Alam Sekitar oleh pihak berkuasa seperti Pihak Berkuasa Tempatan dan Pejabat Tanah. Input teknikal telah diberikan kepada pihak berkuasa ini bagi memastikan alam sekitar diberikan pertimbangan yang sewajarnya di dalam membuat keputusan (**Rajah 4.5 dan 4.6**).

KEBENARAN DAN KELULUSAN BERTULIS

Jabatan Alam Sekitar menerima 7,243 permohonan bagi pembinaan loji rawatan sisa kumbahan dan 810 permohonan bagi pemasangan alat kawalan pencemaran udara bagi memenuhi keperluan Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan dan Effluen-Effluen Perindustrian), 1979 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih), 1978 (**Rajah 4.7 dan 4.8**).

Selain daripada peralatan kawalan pencemaran, Jabatan Alam Sekitar turut menerima 1,640 permohonan bagi kelulusan bertulis untuk pemasangan alat pembakaran bahan api seperti dandang dan alat janakuasa (**Rajah 4.9**).

PEMANTAUAN PEMBANGUNAN DI TANAH-TANAH TINGGI DAN PULAU-PULAU

Jawatankuasa Kabinet yang dipengerusikan oleh

*to the Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 1987. These applications were mainly referred to the Department by other approving authorities such as the Local Authorities and Land Offices. Technical inputs were given to these authorities to ensure that environmental considerations were taken into account in the decision making process. (**Figure 4.5 and Figure 4.6**)*

WRITTEN PERMISSION AND APPROVAL

*The Department received 7,243 applications for the construction of wastewater treatment plants and 810 applications for the installation of air pollution control equipment as required under the Environmental Quality (Sewage and Industrial Effluent) Regulations 1979 and the Environmental Quality (Clean Air) Regulations 1978 (**Figure 4.7 and 4.8**).*

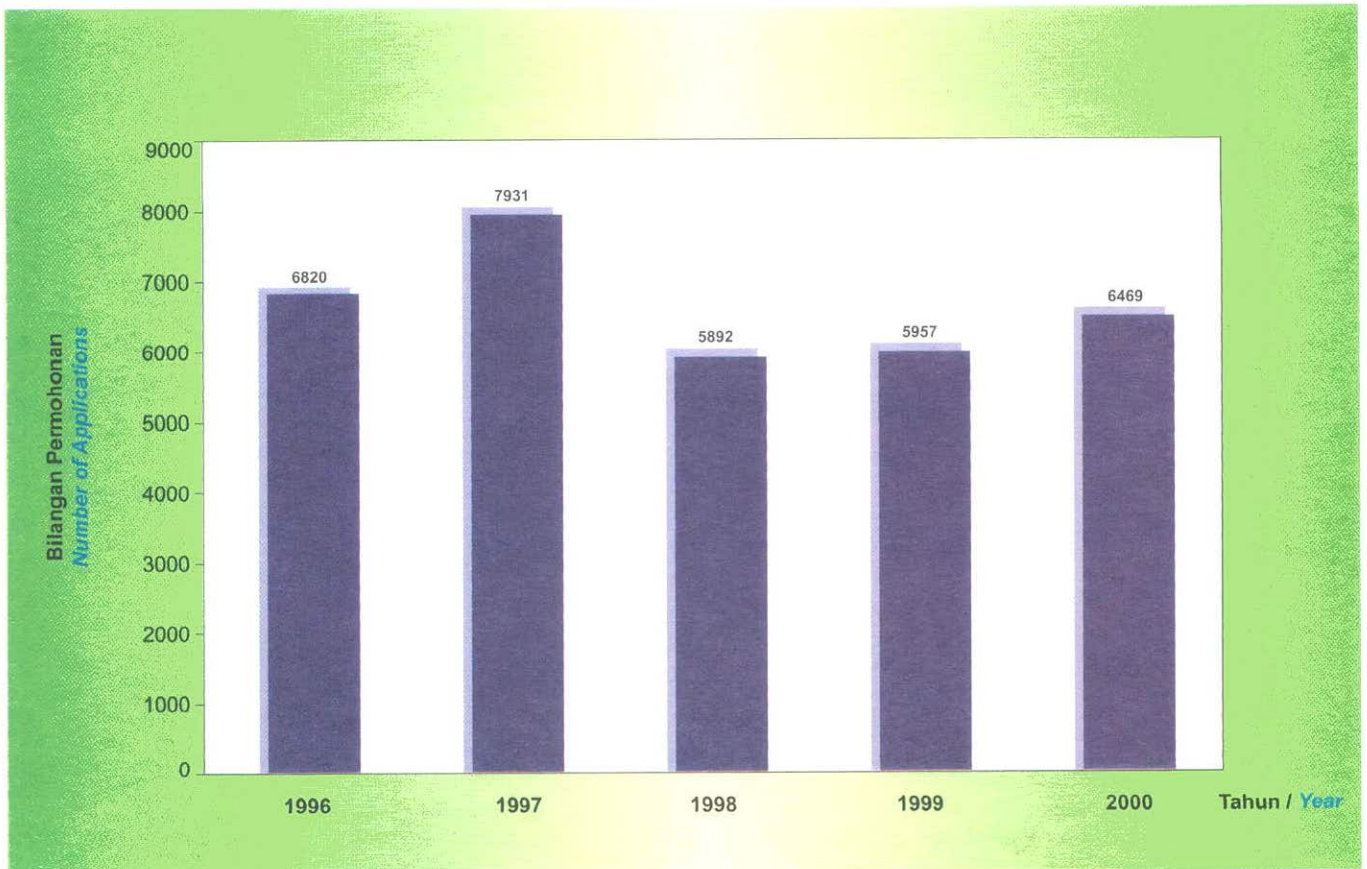
*Other than pollution control equipment, the Department also received 1640 applications for written approvals for the installation of fuel burning equipment, mainly boilers and generator sets (**Figure 4.9**).*

MONITORING OF DEVELOPMENT ON HIGHLANDS AND ISLANDS

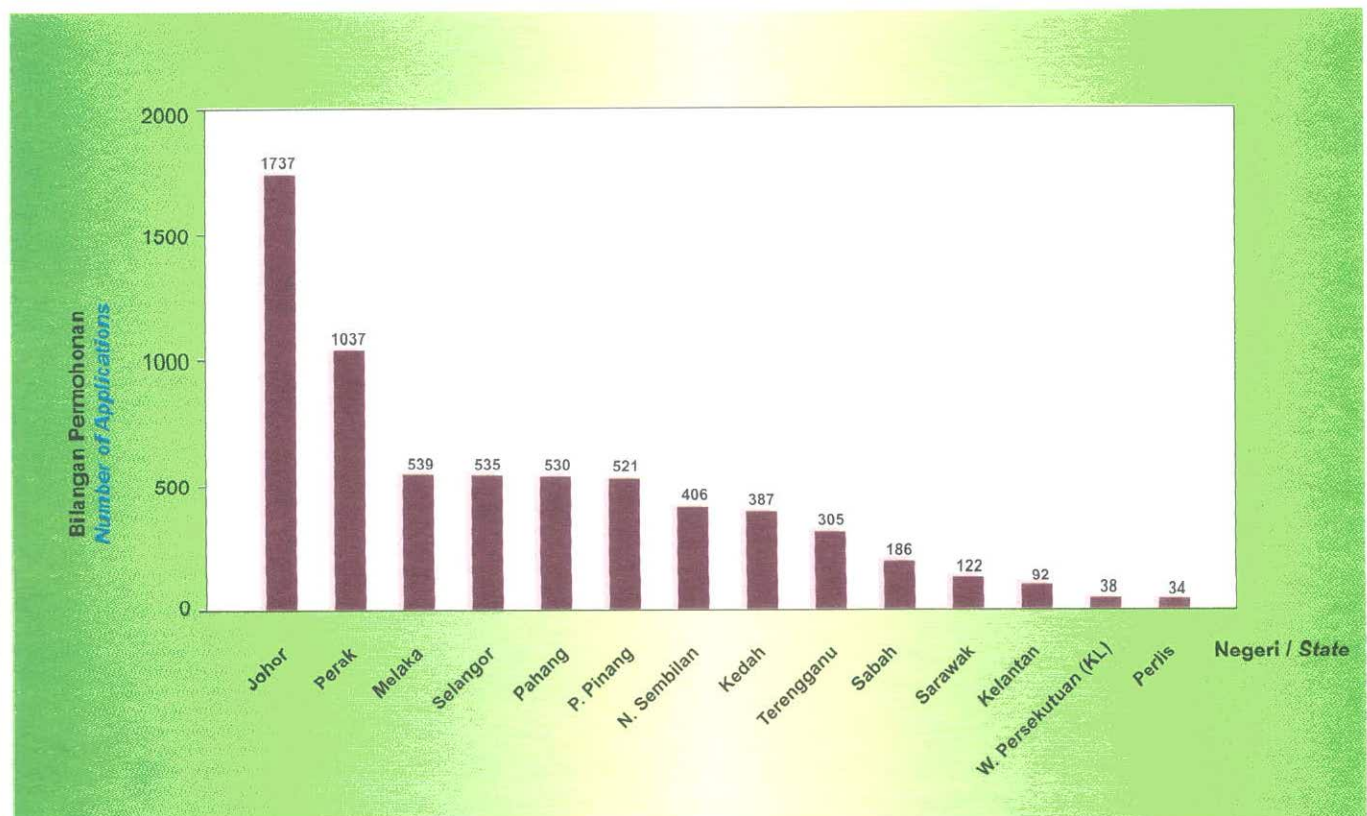
A Cabinet Committee under the chairmanship of the Honourable Minister of Science,



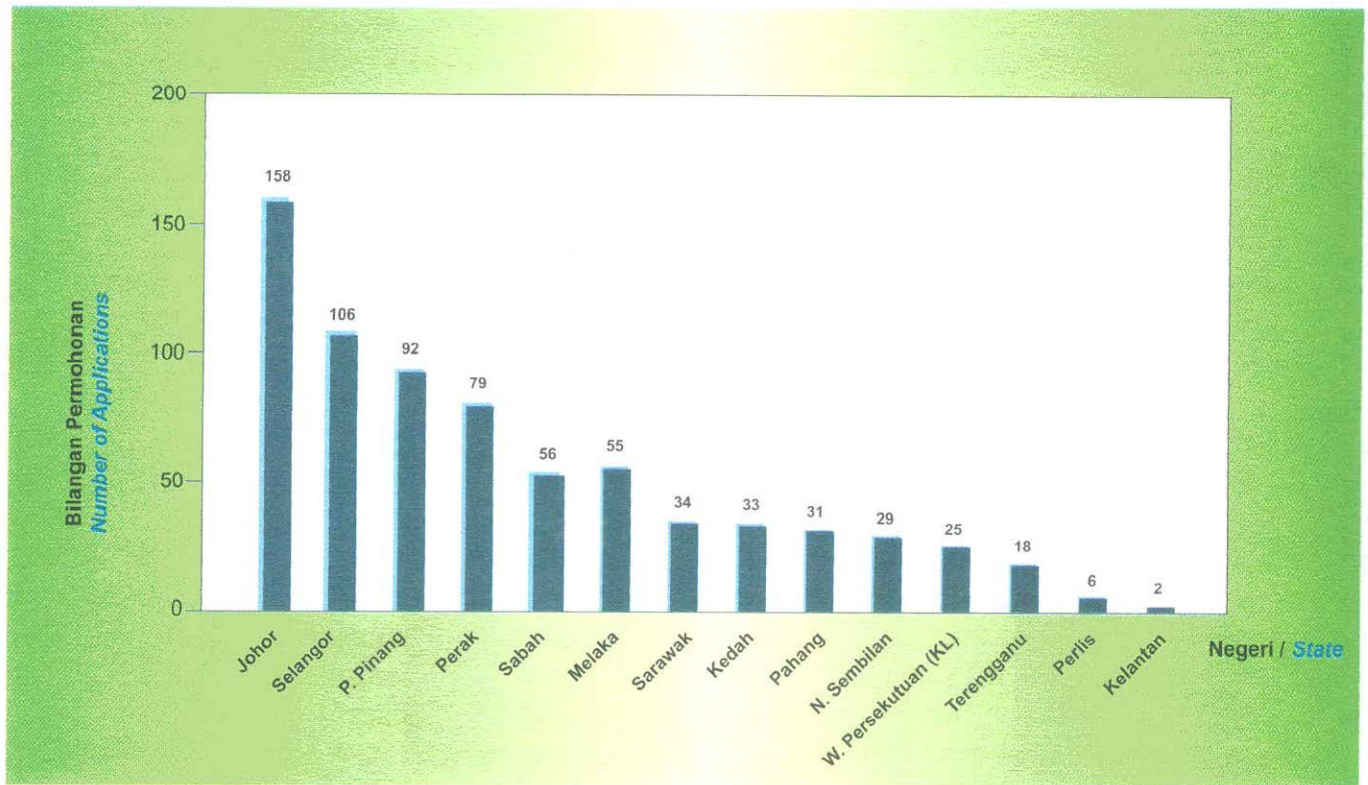
Lawatan Post-EIA ke projek Jalanraya di Cameron Highlands
Post-EIA visit to Highway Project in Cameron Highlands



Rajah 4.5 Jabatan Alam Sekitar: Permohonan Bagi Penilaian Awal Tapak Untuk Pembangunan Projek-Projek, 1996-2000
 Figure 4.5 Department of Environment: Applications for Pre-Siting Evaluation of Development Projects, 1996-2000

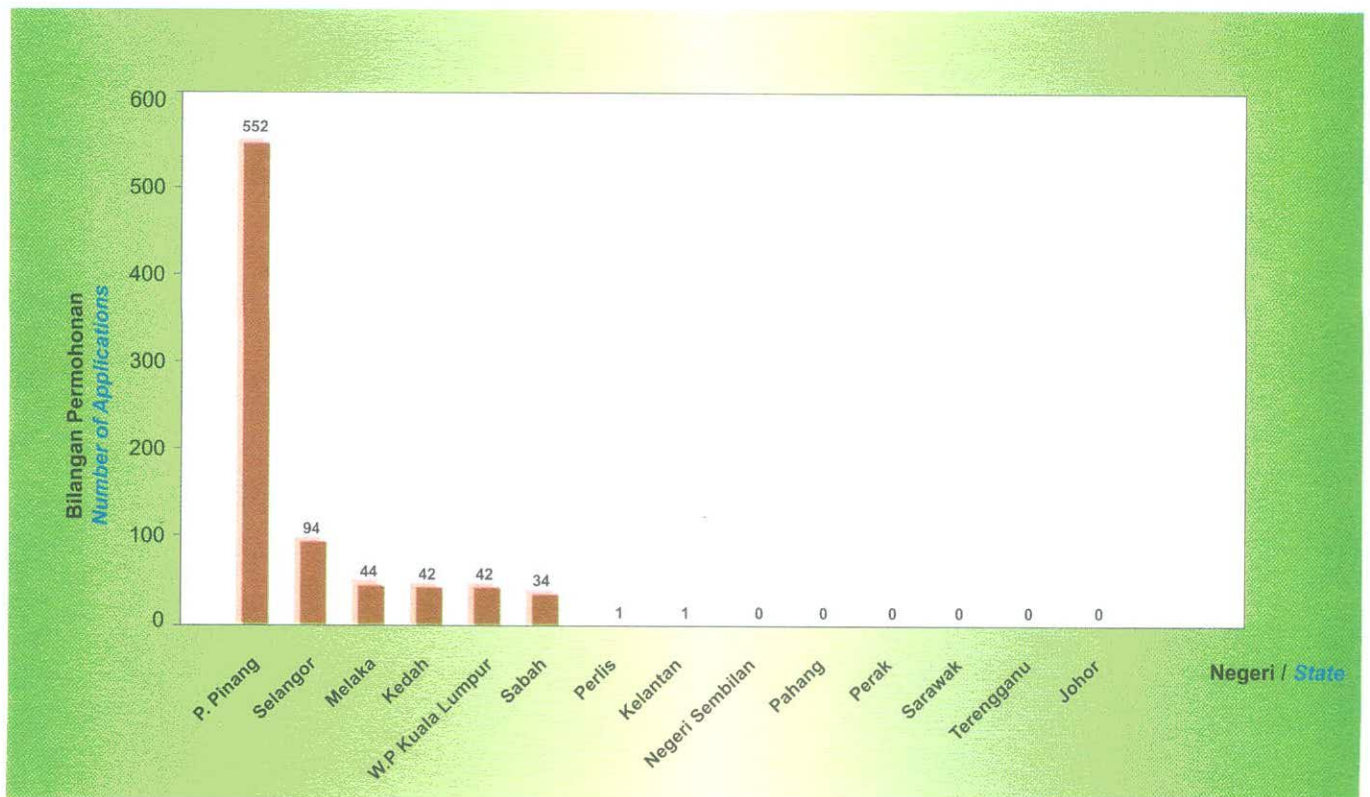


Rajah 4.6 Jabatan Alam Sekitar: Permohonan Bagi Penilaian Awal Tapak Untuk Pembangunan Projek-Projek Mengikut Negeri, 2000
 Figure 4.6 Department of Environment: Applications for Pre-Siting Evaluation of Development Projects by State, 2000



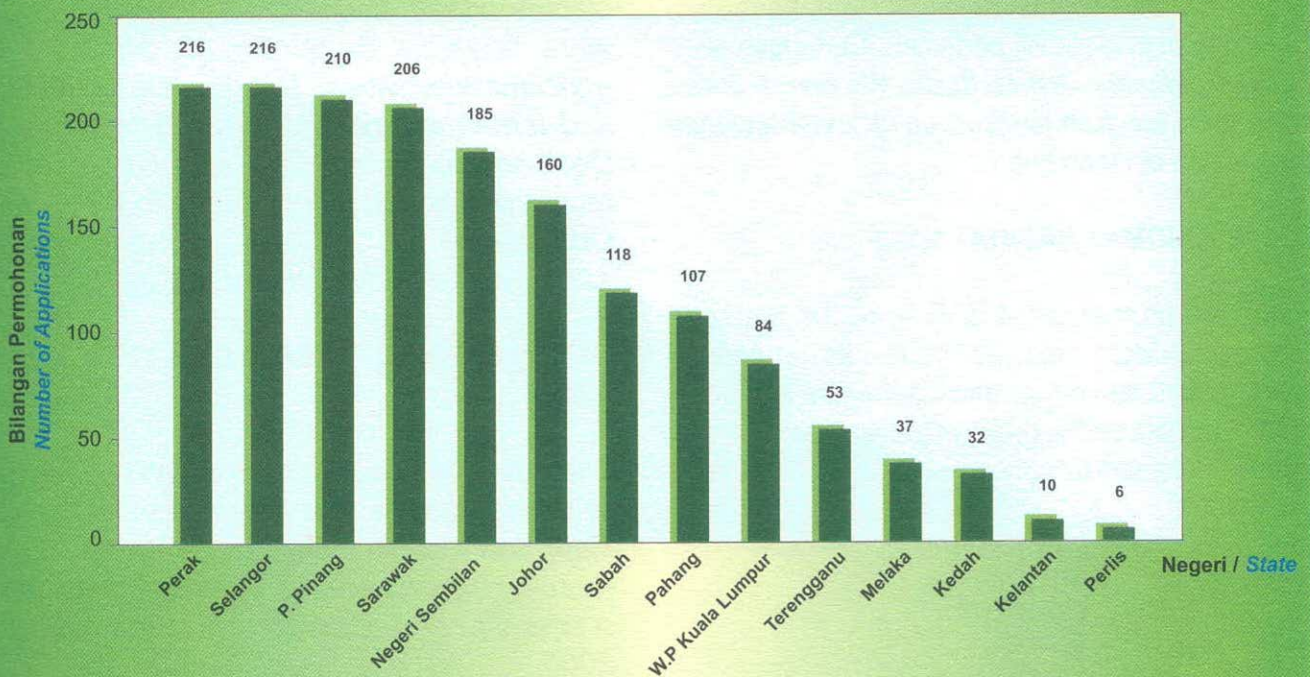
Rajah 4.7 Jabatan Alam Sekitar: Permohonan Bagi Kebenaran Bertulis Untuk Pembinaan Kemudahan Pengolahan Effluen Mengikut Negeri, 2000

Figure 4.7 Department of Environment: Applications for the Construction of Wastewater Treatment Plants By State, 2000



Rajah 4.8 Jabatan Alam Sekitar: Permohonan Bagi Pemasangan Alat Kawalan pencemaran Udara Mengikut Negeri, 2000

Figure 4.8 Department of Environment: Applications for Installation of Air Pollution Control Equipments by State, 2000



Rajah 4.9 Jabatan Alam Sekitar: Permohonan Bagi Pemasangan Peralatan Bahanapi Mengikut Negeri, 2000
 Figure 4.9 Department of Environment: Applications for the Installation of the Fuel Burning Equipment by State, 2000

Yang Berhormat Menteri Sains, Teknologi dan Alam Sekitar, Y.B Datuk Law Hieng Ding telah diwujudkan untuk mentadbir dan mengkoordinasi pembangunan tanah-tanah tinggi dan pulau-pulau. Di dalam membantu Jawatankuasa Kabinet, Kementerian Sains, Teknologi dan Alam Sekitar telah mewujudkan Kumpulan Kerja Pegawai-Pegawai Kanan, di mana Jabatan Alam Sekitar bertindak sebagai sekretariat. Bidang rujukan bagi kumpulan kerja ini adalah:

- Untuk menasihati Jawatankuasa Kabinet di dalam menetapkan strategi dan arah tuju bagi pembangunan tanah tinggi.
- Untuk mewujudkan mekanisma yang sesuai bagi aktiviti-aktiviti di tanah tinggi
- Untuk menilai keberkesanan program pemantauan dan penguatkuasaan
- Untuk menyarankan langkah-langkah kawalan di dalam mengelakkan kemerosotan kualiti alam sekitar di tanah tinggi dan pulau.
- Menyediakan laporan aktiviti-aktiviti pemantauan dan penguatkuasaan.

Technology and Environment, Y. B. Datuk Law Hieng Ding had been established to monitor and coordinate development on highlands and islands. To assist the Cabinet Committee, a Task Force had been established with the Department of Environment as the Secretariat. The Terms of Reference of the Task Force are as follows:

- *To recommend strategies and direction for the development of highlands*
- *To establish a suitable mechanism for monitoring activities on highlands*
- *To assess the effectiveness of monitoring and enforcement programmes*
- *To recommend practical measures to prevent the deterioration of environmental quality*
- *To provide regular reports on monitoring and enforcement activities*

Pengawasan udara dan siasatan di darat telah dijalankan di 31 lokasi berpusat di Cameron Highlands. Ini merupakan projek pembangunan fizikal dan aktiviti-aktiviti pertanian. Cadangan akan diusulkan kepada Jawatankuasa Kabinet di dalam mengambil langkah-langkah untuk pembangunan yang lestari di tanah tinggi.

PUSAT KHIDMAT NASIHAT MIDA

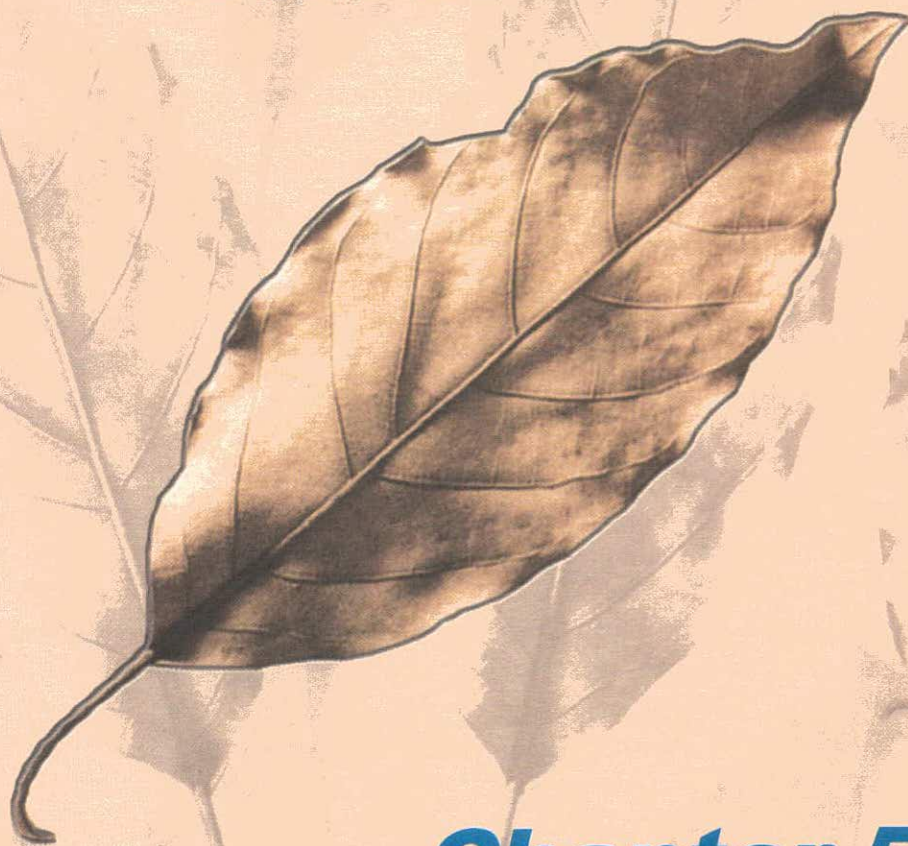
Pusat Khidmat Nasihat JAS di MIDA memberi penerangan dan maklumat serta nasihat kepada bakal pelabur dari dalam dan luar negara mengenai keperluan alam sekitar di dalam pembangunan projek industri. Sejumlah 67 pertanyaan telah diterima pada tahun 2000.

Aerial surveillance and ground investigations were carried out at 31 locations by two DOE officers based at Cameron Highlands. These were physical development projects and agricultural activities. Pending the geo-hazard and terrain mapping to be undertaken by the Department of Minerals and Geo-science, recommendations will be made to the Cabinet Committee on actions to be taken for sustainable development of highlands.

DOE ADVISORY SERVICES CENTRE AT MIDA

The Advisory Services Desk at MIDA continued to provide advice and information to potential local and foreign investors on environmental requirements for setting up industrial projects. A total of 67 enquiries were received in the year 2000.

Bab 5



Chapter 5



PENGAWASAN KUALITI UDARA

Pada tahun 2000, Jabatan Alam Sekitar telah menubuhkan sebanyak 6 buah stesen pengawasan kualiti udara automatik yang baru. Dengan penubuhan 6 buah stesen ini maka sasaran penubuhan 50 buah stesen 'Continuous Air Quality Monitoring' (CAQM) menjelang tahun 2000 telah dapat dicapai. Lokasi keseluruhan rangkaian stesen-stesen pengawasan kualiti udara kebangsaan adalah seperti di **Peta 5.0 dan Peta 5.1**.

Selain dari itu, pelaksanaan program Audit Jaminan Mutu (Quality Assurance Audit) ke atas semua stesen kualiti udara automatik di seluruh negara masih diteruskan. Program audit ke atas sistem dan alatan stesen pengawasan kualiti udara automatik ini dilaksanakan dengan bantuan pihak USEPA di bawah program USAEP. Hasil dari laporan awal yang telah disediakan mendapati pengawasan kualiti udara yang dijalankan telah mengikut standard yang ditetapkan. Tindakan juga telah diambil berdasarkan hasil laporan tersebut bagi meningkatkan lagi kualiti program pengawasan.

Berikutan dari kejadian jerebu pada tahun 1997, satu Kajian Jerebu di Malaysia telah dijalankan dengan kerjasama Kerajaan Australia melalui Commonwealth Scientific and Industrial Research Organization (CSIRO). Kajian ini telah bermula pada bulan Disember 1998. Jabatan Alam Sekitar dan Jabatan Perkhidmatan Kaji cuaca Malaysia telah terlibat untuk menjalankan percontohan kualiti udara di dua buah stesen iaitu di Gombak dan Petaling Jaya, manakala kerja-kerja analisis makmal dan interpretasi data dijalankan oleh CSIRO. Percontohan terakhir yang diambil adalah pada 16 Disember 2000. Laporan akhir kajian ini dijangka akan dikemukakan pada bulan Jun 2001.

BUNYI BISING

Program pengawasan bunyi bising pada tahun 2000 terus memberi

AIR QUALITY MONITORING

*In the year 2000, the Department of Environment established 6 new automatic air quality stations. With these six additional stations, the national network comprised of 50 Continuous Air Quality Monitoring Stations (CAQM). The locations of these network of air quality stations is shown in **Map 5.0 and Map 5.1***

In addition, Quality Assurance Audit was carried out on all the automatic air monitoring stations throughout the country. The system and equipment audit was implemented with assistance from USEPA under USAEP. Initial reports indicated that generally the air monitoring programme had complied with the set standards. Action had been taken to further improve the quality of the programme based on the recommendations of the reports.

Arising from the haze episode of 1997, a Haze Study for Malaysia was initiated in December 1998 with assistance from the Australian Government through the Commonwealth Scientific and Industrial Research Organization (CSIRO). The Department of Environment and the Malaysian Meteorological Services Department were involved in carrying out monitoring at two stations in Gombak and Petaling Jaya, while CSIRO carried out the analysis and data interpretation. The last sampling was taken in 16 December 2000 and the final report is expected in June 2001.

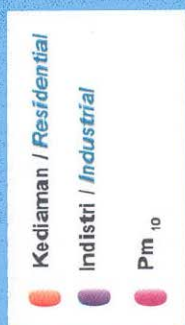


Pelepasan pencemar dari cerobong kilang
Air pollutant through industrial stack emission

Peta 5.0 : Semenanjung : Lokasi Stesen Pemantauan CAQM, 2000
Map 5.0 : Peninsula : Location of CAQM Stations, 2000



Peta 5.1: Sabah dan Sarawak : Lokasi Stesen Pemantauan CAQM, 2000
 Map 5.1 : Sabah dan Sarawak : Location of CAQM Stations, 2000



penumpuan kepada penilaian paras kebisingan yang dialami oleh beberapa kawasan sensitif terpilih meliputi hospital dan sekolah. Data-data pengawasan yang diperolehi telah dibandingkan dengan had-had tahap penerimaan yang disyorkan oleh Pertubuhan Kesihatan Sedunia (WHO). Dari data-data yang diperolehi didapati bahawa paras bunyi bising di kawasan-kawasan sekitar Kuala Lumpur terutamanya melebihi paras yang ditetapkan.

Program Pemantauan Kualiti Air Sungai

Jabatan Alam Sekitar (JAS) telah melaksanakan Program Pemantauan Kualiti Air Sungai di Malaysia sejak dari tahun 1978 hingga sekarang. Pada tahun 2000, sebanyak 901 buah stesen pemantauan kualiti air secara manual telah diwujudkan dari 120 buah lembangan sungai untuk tujuan pemantauan kualiti air sungai (**Jadual 5.0**).

JAS juga telah menubuhkan 10 buah stesen pemantauan automatik untuk mengesan perubahan secara terus menerus kepada kualiti air sungai di Sg. Perai, Sg. Perak, Sg. Selangor, Sg. Kuantan, Sg. Terengganu dan Sg. Sarawak. (**Jadual 5.1**).

Sampel air yang diambil seterusnya dianalisa bagi parameter-parameter berikut:-

- Keperluan Oksigen Biokimia (BOD)
- Keperluan Oksigen Kimia (COD)
- Ammoniakal Nitrogen (NH_3N)
- pH
- Oksigen Terlarut (DO)
- Pepejal Terampai (SS)

Pemantauan Biologi dan Indikator Biologi

Program Pemantauan Biologi dan Indikator Biologi telah dimulakan pada tahun 1999. Pemantauan Biologi dengan menggunakan organisma akuatik seperti bakteria, rumpair, ikan dan mikro-invertebrata termasuk siput sebagai indikator bagi menilai status kualiti air. Selain daripada komponen biotic, parameter-parameter fizik dan kimia juga dianalisa. Enam batang sungai telah dipilih bagi program ini iaitu Sg. Sarawak(Negeri Sarawak), Sg. Linggi

NOISE MONITORING

The thrust of the noise monitoring program for the year 2000 was towards a general assessment of noise exposure at selected sensitive areas such as schools and hospitals. The data obtained were assessed against the acceptable limits proposed by the World Health Organisation. From data obtained, it was found that noise level at schools and hospitals in Kuala Lumpur had exceeded the recommended limit.

River Water Quality Monitoring Programme

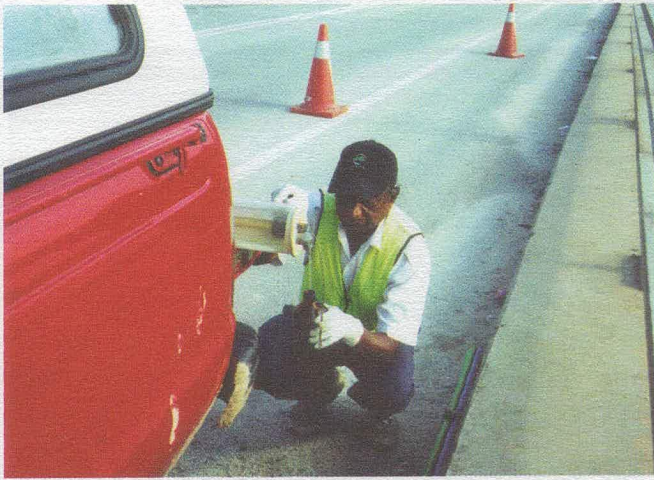
*The Department of Environment had been implementing the River Water Quality Monitoring Programme in Malaysia since 1978. In the year 2000, water samples from 901 stations located within 120 river basins in Malaysia were collected and analysed (**Table 5.0**). In addition, there were 10 automatic continuous monitoring stations at Sg. Perai, Sg. Perak, Sg. Selangor, Sg. Klang, Sg. Linggi, Sg. Melaka, Sg. Skudai, Sg. Kuantan, Sg. Terengganu and Sg. Sarawak (**Table 5.1**).*

The water samples collected stations were analysed for the following parameters to derive the Water Quality Index:-

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Ammoniacal Nitrogen (NH_3N)
- pH
- Dissolved Oxygen (DO)
- Suspended Solids (SS)

Biological and Bioindicator Monitoring

Biological and Bioindicator Monitoring Project at several representative rivers which started in 1999 was completed in 2000. The project involved the use of aquatic organisms such as bacteria, fish, macroinvertebrates as indicators to assess water quality status. Six rivers selected for the project were Sg. Sarawak (Sarawak), Sg. Linggi (Negri Sembilan), Sg.



Persampelan kualiti air sungai
River water quality sampling



Stesen Pemantauan Berterusan Automatik Kualiti Air Sungai
Automatic Continuous Monitoring Station For River Water Quality



(Negeri Sembilan), Sg. Liwagu (Negeri Sabah), Sg. Sedili Besar (Negeri Johor), Sg. Pahang (Negeri Pahang) dan Sg. Kedah (Negeri Kedah). Pemantauan biologi akan dikembangkan ke sungai-sungai yang lain pada masa hadapan.

Pemantauan Kualiti Air Sungai di Kawasan Wabak Japanese Encephalitis (JE)

Program pemantauan ini mula dilaksanakan pada bulan April 1999 bagi tujuan mengesan perubahan kepada kualiti air sungai dari pelupusan bangkai babi di kawasan wabak JE di Negeri Sembilan, Melaka dan Perak. Sebanyak 10 buah stesen telah ditubuhkan bagi tujuan ini iaitu 4 buah di Negeri Sembilan, 4 buah di Melaka dan 2 buah di Perak.

Liwagu (Sabah), Sg. Sedili Besar (Johor), Sg. Pahang (Pahang) and Sg. Kedah (Kedah). The project will be expanded to other rivers in the future.

River Monitoring in Areas Affected by the Japanese Encephalitis (JE) Outbreak

The programme was initiated in April 1999 to detect water quality changes (if any) arising from the disposal of pig carcasses at JE affected areas in Negri Sembilan, Malacca and Perak. A total of 10 stations were established for the purpose: 4 in Negri Sembilan, 4 in Malacca and 2 in Perak.

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000
 Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Perlis	01	PERLIS	10	ARAU	1
				JARUM	1
				JERNIH	2
				KOK MAK	1
				NGULANG	1
				PERALIT	1
				PERLIS	1
				SERAI	1
				TASOH	1
Kedah	01PL	MELAKA	3	KISAP	1
				MELAKA	1
				PETANG	1
	03	KEDAH	6	KEDAH	1
				PADANG TERAP	3
				PEDU	1
				TEKAI	1
	04	MERBOK	10	BAKAR ARANG	1
				BATU	1
				BONGKOK	1
				BUKIT MERAH	1
				KOROK	1
				MERBOK	1
				PETANI	1
				TOK PAWANG	2
				TUPAH	1
Kedah / Pulau Pinang	05	MUDA	9	JERUNG	2
				KETIL	1
Pulau Pinang	06J	JURU	8	ARA	1
				JURU	1
				KILANG UBI	2
				PASIR	1
				RAMBAI	3
Pulau Pinang	06P	PERAI	22	AIR MELINTAS	1
				JARAK	6
				KELADI	1
				KEREH	1
				KUBANG SEMANG	4
				KULIM	3
				PERAI	2

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Pulau Pinang				SELUBANG	1
				SELUANG BAWAH	2
Pulau Pinang	06PP	PINANG/KLUANG	7	AIR ITAM	1
				DONDANG	3
				JELUTONG	1
				KLUANG	1
	07	JEJAWI	5	CEMPEDAK	1
				JAWI	3
				JUNJONG	1
Pulau Pinang / PERAK	08	KERIAN	10	KECHIL	3
				KERIAN	4
				SELAMA	2
				SERDANG	2
Perak	09	KURAU	5	ARA	1
				KURAU	4
Perak	10	SEPETANG	10	BATU TEGUH	2
				JANA	1
				LARUT	1
				LIDIN	1
				MALAI	1
				SEPETANG	3
				TUPAI	1
	10T	TEMERLOH	2	TEMERLOH	2
	11	BERUAS	4	BRUAS	2
				ROTAN	2
	12	RAJA HITAM	4	DERHAKA	2
				RAJA HITAM	2
	12W	WANGI / DERALIK	6	DERALIK	2
				MANJONG	2
				WANGI	2
	13	PERAK	53	BATANG PADANG	3
				BIDOR	3
				CHENDERANG	2
				CUAR	2
				KAMPAR	2
				KANGSAR	2
				KEPAYANG	2
				KERDAH	2
				KINTA	6
				KLAH	2

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000 (sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Perak				KLIAN BARU	2
				KUANG	1
				PARI	2
				PELUS	2
				PERAK	8
				PINJI	2
				RAIA	2
				SELUANG	1
				SEROKAI	2
				SUNGKAI	2
				SUNGKAI MATI	2
				TUMBOH	1
Perak / Selangor	14	BERNAM	10	BERNAM	6
				SLIM	2
				TEROLAK	2
Selangor	15	TENGI	2	TENGI	2
	16	SELANGOR	9	BATANG KALI	1
				KANCING	1
				KERLING	1
				SELANGOR	4
				SEMBAH	1
				SERENDAH	1
	17	BULOH	5	BULOH	5
Selangor W. Perse- kutuan	18	KLANG	24	AMPANG	1
				BATU	2
				DAMANSARA	3
				GOMBAK	3
				JINJANG	1
				KERAYONG	1
				KEROH	1
				KLANG	10
				KUTOH	1
				PENCALA	1
Selangor	19	LANGAT	21	ANAK CHUAU	2
				BATANG BENAR	1
				BATANG LABU	1
				BISA	1
				CHUAU	3
				LANGAT	7
				LIMAU MANIS	1
				LUI	1

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Selangor 20	SEPANG	3		RINCHANG	1
				SEMENYIH	3
				SEPANG	3
Negeri Sembilan	20J	LUKUT	1	LUKUT	1
	21	LINGGI	15	BATANG PENAR	1
				CHEMBONG	1
				KEPAYONG	1
				KUNDUR BESAR	1
				LINGGI	6
				PEDAS	1
				REMBAU	2
				SIMIN	1
				TEMIANG	1
Melaka	22	MELAKA	11	BTG. MELAKA	2
				DURIAN TUNGGAL	1
				MELAKA	6
				PUTAT	1
				TAMPIN	1
	24	DUYONG	3	DUYONG	3
	24	KESANG	8	CHOCONG	2
				KESANG	3
				MERLIMAU	3
Johor	25	MUAR	43	GEMENCHEH	3
				JUASSEH	2
				KELAMAH	2
				LABIS	4
				MERBUDU	1
				MERLIMAU	1
				MUAR	16
				P. MENKUANG	1
				PALONG	4
				SEGAMAT	1
				SENARUT	2
				SEROM	1
				SPG. LOI	2
				TEMARONG	1
				TENANG	2
	26	BATU PAHAT	23	AMRAN	2
				BATU PAHAT	1
				BEKOK	4
				BERLIAN	2

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Johor				TIRAM	4
	29B	TUKANG BATU	5	BULUH	1
				LATOH	1
				MASAI	1
				PEREMBI	1
				TUKANG BATU	1
	30A	SEDILI BESAR	13	AMBAT	2
				DOHOL	1
				MUPUR	1
				SEDILI BESAR	5
				SEMANGGOT KANAN	1
				TEMUBOR KANAN	2
	30B	SEDILI KECIL	5	ANAK SEDILI KECIL	1
				BAHAN	2
				SEDILI KECIL	2
	30C	PALOI	2	PALOI	2
	31A	MERSING	1	MERSING	1
	31B	JEMALUANG	2	JEMALUANG	2
	32	ENDAU	29	ANAK SG. SEMBERONG	2
				DENGAR	2
				ENDAU	1
				JEBONG	1
				LENGA	2
				LENGGOR	2
				MAMAI	2
				MELANTAI	2
				MENGKIBOL	3
				PALOH	2
				PAMOL	1
				SEMBERANG	5
				SINGOL	2
				TAMOK	2
	32/33	PONTIAN	3	PONTIAN	2
				SEPAYANG	1
Pahang	32AE	ANAK ENDAU	2	ANAK ENDAU	2
	33	ROMPIN	18	AUR	1
				BAKAR	1
				JEKATHI	2
				JERAM	1
				KEPASING	1
				KERATONG	4

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Pahang				PUKIN	3
				REKOH	1
				ROMPIN	4
	34	BEBAR/MERCHONG	8	BEBAR	1
				KELAYAT	1
				MERBA	1
				MERCHONG	1
				SERAI	2
				TEMIANG	2
	35	SERTING	7	MOKEK	2
				SERTING	5
	35B	BERA	5	BERA	3
					1
					1
	35CH	BERTAM	10	BERTAM	2
				BURUNG	1
				HABU	1
				LENGGOK	1
				RINGLET	1
				TELOM	2
				TERLA	1
				TRINGKAP	1
	35L	LEPAR	10	ANAK SG. LEPAR	1
				BELAYAR	1
				BERKAPOR	2
				CHINI	1
				LEPAR	3
				T. PAYA BUNGOR	1
				TASIK CHINI	1
	35M	MENTIGA	2	MENTIGA	2
	35P	PAHANG	51	BATU	1
				BENTONG	4
				BENUS	2
				BILUT	1
				JELAI	2
				JEMPOL	2
				JENGKA	2
				KELAU	2
				KERTAM	1
				KOYAN	1
				KUNDANG	1

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Pahang				LIPIS	3
				LUIT	1
				MARAN	2
				PAHANG	9
				PENJURING	1
				PERTANG	2
				PERTING	2
				SEMANTAN	3
				SIAM	1
				TANGLIR	1
				TEKAL	1
				TEKAM	2
				TELANG	1
				TELEMONG	2
				TERANUM	1
				TERAS	1
	36	KUANTAN	11	BELAT	1
				CHARU	1
				GALING BESAR	1
				GALING KECIL	1
				KENAU	1
				KUANTAN	4
				PINANG	1
				RIAU	1
	37	BALOK/TONGGOK	5	BALOK	2
				TONGGOK	3
	37A	CERATING	1	CERATING	1
Terengganu	38	KEMAMAN	10	CHERUL	2
				KEMAMAN	2
				NERAM	2
				PERASING	2
				RANSAN	2
	39C	CHUKAI	5	CHUKAI	1
				IBOK	2
				RUANG	2
	39K	KERTIH	1	KERTIH	1
	40	PAKA	10	BESUL	2
				PAKA	4
				RASAU	2
				RENGAT	2
	41	DUNGUN	4	DUNGUN	2
				TELEMBOH	2

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Terengganu	42I	IBAI	3	IBAI	3
	42L	LANDAS	2	LANDAS	2
	42M	MARANG	5	KERAK	2
				MARANG	1
				TEMALA	2
	43	TERENGGANU	9	BERANG	2
				NERUS	3
				PUEH	2
				TERENGGANU	2
	44	SETIU	3	SETIU	1
				TARONG	2
	46	BESUT	4	BESUT	2
				JERNIH	2
Kelantan	47K	KEMASIN	1	KEMASIN	1
	47S	SEMERAK	2	SEMERAK	2
	48	KELANTAN	38	ARING	2
				BELATOP	2
				BER	1
				BEROK	2
				BETIS	1
				CHIKU	2
				GALAS	1
				KELANTAN	4
				KELESA	2
				KERAK	2
				KERILLA	2
				KETIL	2
				NAH	3
				PEHI	2
				PENGKALAN CHEPA	1
				PENGKALAN DATU	3
				PERGAU	2
				PERTOK	2
				RELAI	2
	49	GOLOK	4	GOLOK	2
				TASIK GARU	2
Sarawak	50	KAYAN	4	KAYAN	3
				SEMATAN	1
	51	SARAWAK	15	KUAP	2
				MAONG KIRI	1
				SANTUBONG	1
				SARAWAK	6

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Sarawak				SARAWAK KANAN	1
				SARAWAK KIRI	1
				SEMENGGOH	2
				TABUAN	1
	51BS	SAMARAHAN	2	SAMARAHAN	2
	52	SADONG	6	KARANGAN	1
				SADONG	3
				TARAT	2
	53	LUPAR	7	AI	1
				LUPAR	3
				SEKERANG	1
				SETERAP	1
				UNDUP	1
	54	SARIBAS	2	RIMBAS	1
				SARIBAS	1
	55	KERIAN	3	KERIAN	2
				SEBLAK	1
	56	RAJANG	18	BINATANG	1
				JULAU	1
				MERADONG	1
				RAJANG	14
				SARIKEI	1
	57	OYA	3	OYA	3
	58	MUKAH	4	MUKAH	4
	59	BALINGAN	2	BALINGAN	2
	60	TATAU	1	TATAU	1
	61	KEMENA	3	KEMENA	2
				SIBIU	1
	62	SIMILAJAU	1	SIMILAJAU	1
	63	SUAI	1	SUAI	1
	64	NIAH	5	NIAH	2
				SEKALOH	3
	65	KABULOH	6	KABULOH	2
				KEJAPIL	1
				SATAP	1
				SIBUTI	2
	66	MIRI/LUTONG	4	LUTONG	2
				MIRI	2
	67	BARAM	4	BARAM	4
	68	LIMBANG	5	LIMBANG	5
	69	TRUSAN	1	TRUSAN	2
	70	LAWAS	2	LAWAS	2

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Sabah	71	MENGKALONG	3	LARUTAN	1
				LINGKUNGAN	1
				MENGKALONG	1
	72	PADAS	7	BUNSIT	1
				LIAWAN	1
				PADAS	3
				PANGATAN	1
				TANDULU	1
	73	MEMBAKUT	1	MEMBAKUT	1
	75	PAPAR	2	PAPAR	2
	76	MOYOG	11	INANAM	3
				LIKAS	1
				MENGKATAL	2
				MOYOG	3
				TELIPOK	2
	77	DAMIT/TUARAN	6	DAMIT	2
				SONG SAI	1
				TUARAN	3
	78	KEDIAMAN	3	TEMPASUK	2
				TENGHILAN	1
	79	BINGKONGAN	3	BANDAU	1
				MENGGARIS	1
				TANDEK	1
	80	BENGKOKA	1	BENGKOKA	1
	83	SUGUT	6	BONGKUD	1
				LOHAN	2
				MERALI	1
				SUGUT	2
	84	LABOK	8	KINIPAR	2
				LIWAGU	2
				MALIAU	1
				SAPI	2
				SUALONG	1
	85	KAYA	1	MOUNAD	1
	86	KINABATANGAN	4	KINABATANGAN	2
				KOYAH	1
				TENEGANG BESAR	1
	87	SEGAMA	1	SEGAMA	1
	88	SILABUKAN	2	SILABUKAN	2
	89	TINGKAYU	1	TINGKAYU	1
	90	KALUMPANG	5	INTAN	1
				KALUMPANG	2

Jadual 5.0 : Jabatan Alam Sekitar : Senarai Lembangan Sungai dan Sungai-sungai yang Dipantau, 2000)

Table 5.0 : Department of Environment : List of the River Catchments & Rivers Monitored 2000

(sambungan / continued)

NEGERI STATE	KOD WKA WQR CODE	LEMBANGAN SUNGAI RIVER CATCHMENT	BILANGAN STESEN NUMBER OF STATIONS	SUNGAI DIAWASI RIVERS MONITORED	BILANGAN STESEN NUMBER OF STATIONS
Sabah				PANG BURONG 1	1
				PANG BURONG 2	1
	91	TAWAU	5	APAS	1
				BALUNG	1
				TAWAU	3
	93	UMAS-UMAS	1	UMAS-UMAS	1
	94	BRANTIAN	1	BRANTIAN	1
	95	KALABAKAN	2	KALABAKAN	2

WKA : Wilayah Kualiti Air

WQR : Water Quality Region

Jadual 5.1 : Jabatan Alam Sekitar : Stesen Pemantauan Kualiti Air Sungai, 1995 - 2000

Table 5.1 : Department of Environment : River Quality Monitoring Stations, 1995 - 2000

JENIS PEMANTAUAN / TYPES OF MONITORING	TAHUN / YEAR					
	1995	1996	1997	1998	1999	2000
Pemantauan Manual / Manual Monitoring						
Lembangan Sungai / River Basin	115	116	117	120	120	120
Bilangan Stesen Pemantauan / Number of Monitoring Stations	821	909	909	900	902	902
Pemantauan Berterusan Automatik / Automatic Continuous Monitoring						
Lembangan Sungai / River Basin	2	4	6	8	10	10
Bilangan Stesen Pemantauan / Number of Monitoring Stations	2	4	6	8	10	10

PROGRAM PEMANTAUAN KUALITI AIR MARIN

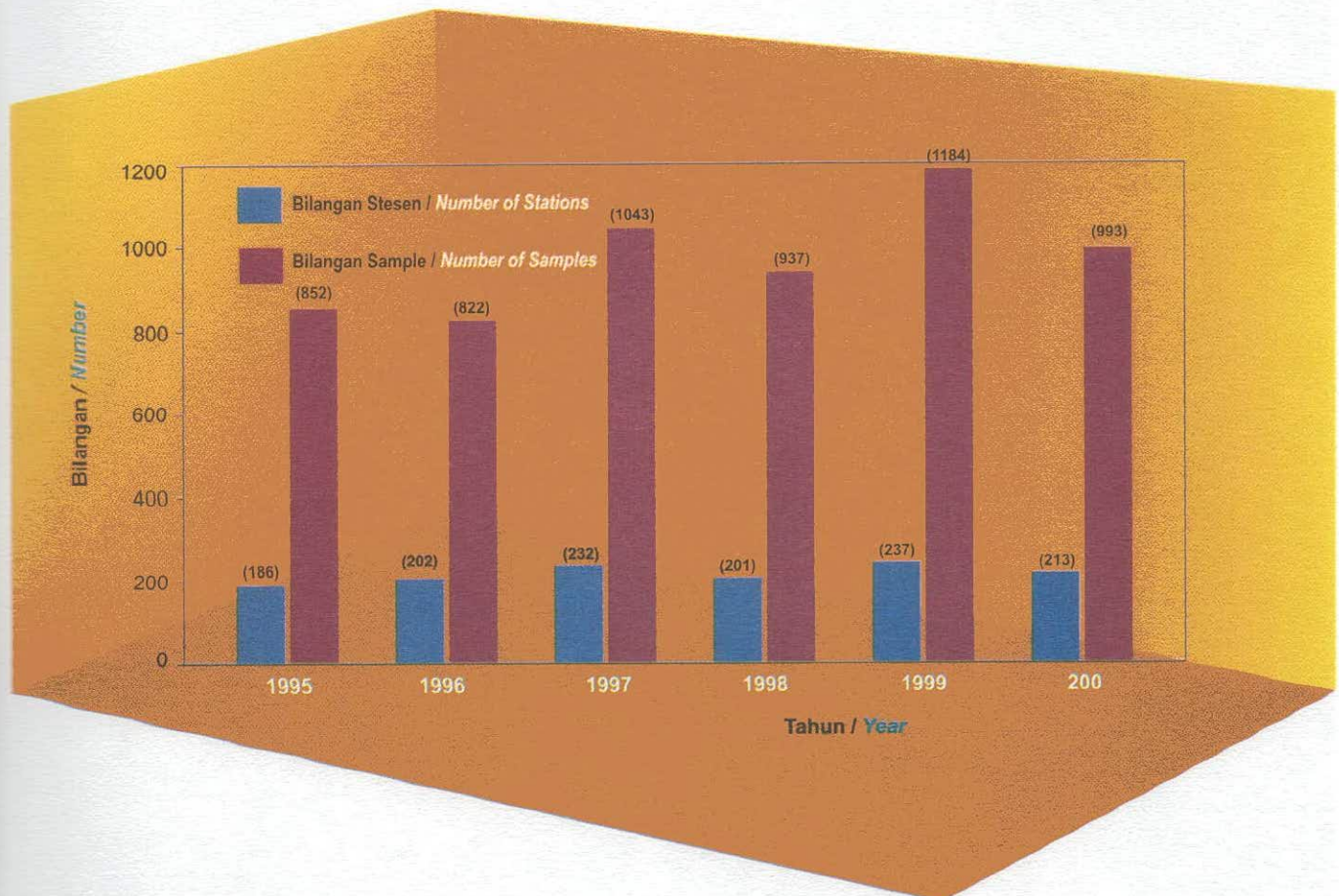
Pemantauan kualiti air marin telah dimulakan sejak tahun 1978 bagi Semenanjung Malaysia, manakala bagi Sabah dan Sarawak program ini bermula pada 1985. Stesen-stesen pemantauan air marin diwujudkan di kuala sungai dan pantai-pantai bagi memantau perubahan dalam kualiti air marin berdasarkan kepada kegunaannya seperti kawasan rekreasi, perikanan dan taman-taman laut.

Dalam tahun 2000, sebanyak 993 sampel telah dikutip dari 213 buah stesyen pemantauan (**Rajah 5.0**) dan taburan stesyen-stesyen tersebut adalah seperti di peta **5.2a** dan peta **5.2b**.

MARINE WATER QUALITY MONITORING PROGRAMME

Marine water quality monitoring for Peninsula Malaysia started in 1978, while for Sabah and Sarawak the programme started in 1985. Monitoring stations had been established at estuaries and coastal areas to monitor marine water quality with respect to their beneficial uses such as recreation, fishing and marine parks.

*In 2000, 993 samples were collected from 213 monitoring stations (**Figure 5.0**) and the distribution of stations are as shown in **Maps 5.2a and 5.2b**.*



Rajah 5.0 : Malaysia : Bilangan Stesen dan Contoh yang Dikutip, 1995 - 2000
Figure 5.0 : Malaysia : Number of Stations and Samples Collected, 1995 - 2000

Peta 5.2a : Semenanjung : Lokasi Stesen Pemantauan Marin, 2000
Map 5.2a : Peninsula : Location of Marine Monitoring Stations, 2000



Peta 5.2b : Sabah & Sarawak : Lokasi Stesen Pemantauan Marin, 2000
Map 5.2b : Sabah & Sarawak : Location of Marine Monitoring Stations, 2000



PROGRAM PEMANTAUAN KUALITI AIR MARIN PULAU-PULAU

Program ini telah bermula pada Julai 1998 dengan penubuhan rangkaian pengawasan pulau-pulau di Malaysia bagi melaksanakan pemantauan kualiti air laut di sekitar 71 buah pulau-pulau terpilih. Ia adalah bertujuan :

- untuk menghasilkan rangkaian 'baseline data' kualiti air laut;
- untuk memantau perubahan kualiti air laut di sekitar pulau-pulau; dan
- untuk menggunakan sebaik-baiknya data-data 'baseline' yang diperolehi untuk melindungi persekitaran pulau-pulau seperti menyediakan garis panduan untuk pembangunan.

Keseluruhannya, sebanyak 85 buah stesen pengawasan telah ditubuhkan di 71 buah pulau-pulau terpilih. Pulau-pulau tersebut dikategorikan sebagai Pulau Taman Laut (38 buah), Pulau Peranginan (25 buah), Pulau Dilindungi (5 buah) dan Pulau Pembangunan (3 buah). Frekuensi persampelan bagi Pulau Pembangunan adalah sebanyak 6 kali setahun manakala bagi pulau yang lainnya adalah sebanyak 4 kali setahun. Sepanjang tahun 2000, sebanyak 728 contoh air laut telah diambil.

Pengukuran parameter-parameter fizikal kualiti air marin dibuat secara *in-situ* seperti suhu, pH, konduktiviti, kemasinan, oksigen terlarut dan kekerohan 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). Percontohan bebola tar di pantai juga dilaksanakan.

PROGRAM PEMANTAUAN KUALITI AIR TANAH

Pada tahun 2000, sebanyak 188 sampel daripada 79 buah telaga pemantauan kualiti air tanah di Semenanjung Malaysia telah dianalisis. Pembinaan telaga-telaga pemantauan ini adalah di kawasan-kawasan yang dikategorikan mengikut gunatanah iaitu industri, tapak pelupusan sampah, pertanian, aktiviti luar bandar, padang golf, tapak penyimpanan radioaktif dan kawasan perbandaran (**Jadual 5.3 dan**

ISLAND MARINE WATER QUALITY MONITORING PROGRAMME

The programme was commissioned in July 1998 with the establishment of the island monitoring network in Malaysia to monitor marine water quality at 71 selected islands. The objectives were :

- *to establish an island marine water quality baseline database*
- *to monitor marine water quality changes around the islands*
- *to utilize the baseline database for the protection of the island marine environment such as providing guidelines for development*

Altogether, there were 85 stations at 71 selected islands categorized into Marine Parks (38), Resorts (25), Protected Islands (5) and Development Islands (3). The sampling frequency for Development Islands was six (6) times per year, while the frequency for the others was four (4) times per year. In 2000, a total of 728 samples were collected for analysis.

*Marine water quality monitoring includes measurement of in-situ parameters such as temperature, pH, conductivity, salinity, dissolved oxygen, turbidity; while laboratory analysis involves twelve 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). Tarball samplings on beaches were also conducted.*

GROUNDWATER QUALITY MONITORING PROGRAMME

*In 2000, as many as 188 groundwater samples were taken from 79 monitoring wells at 48 sites throughout the Peninsula for analysis. The wells were located in areas that were categorised according to landuse, namely industrial areas, solid waste landfills, agricultural areas, rural areas, golf courses, radioactive storage sites and urban/suburban areas (**Table 5.3 and Map 5.3**).*

Peta 5.3). Garispanduan Kualiti Air Minuman Kebangsaan digunakan sebagai petunjuk untuk menilai kualiti air bawah tanah.

Kualiti Air Tanah di Kawasan Wabak Japanese Encephaltis (JE)

Sebanyak 26 sampel telah diambil dari 12 telaga-telaga pemantauan yang dibina di kawasan-kawasan yang telah dilanda wabak JE bagi memantau kualiti air tanah. Telaga-telaga ini terletak di negeri-negeri Pulau Pinang, Perak, Selangor, Negeri Sembilan dan Johor.

The National Guidelines for Raw Drinking Water Quality were used as the benchmark to assess groundwater quality.

Groundwater Quality in Areas Affected by Japanese Encephaltis (JE) Outbreak

Twenty six groundwater samples were taken from 12 monitoring wells specifically constructed to monitor groundwater quality in areas that had been affected by the Japanese Encephalitis outbreak. The affected States were Pulau Pinang, Perak, Selangor and Johor.

Peta 5.3 : Semenanjung Malaysia : Lokasi Telaga Pemantauan Kualiti Air Tanah
Map 5.3 : Peninsular Malaysia : Location of Groundwater Quality Monitoring Wells



Jadual 5.3 : Jabatan Alam Sekitar : Lokasi Telaga Pemantauan Kualiti Air Tanah
Table 5.3 : Department of Environment : Location of Groundwater Quality Monitoring Wells

Bil.	Negeri / State	Lokasi / Location	Kategori	Category
1	PERLIS	Rimba Mas	Pertanian	Agriculture
2		Arau, Perlis	Bandar/Sub-Bandar	Urban/Suburban
3			Bandar/Sub-Bandar	Urban/Suburban
4	KEDAH	S.K. Darul Uloom, K. Batas	Pertanian/Bandar	Agriculture/Urban
5		Kulim, Hi-Tech	Industri	Industrial
6	P.LANGKAWI	Padang Mat Sirat. P. Langkawi	Pertanian/Bandar	Agriculture/Urban
7			Pertanian/Bandar	Agriculture/Urban
8	P.PINANG	Mak Mandin (Kastam)	Industri	Industrial
9		Mak Mandin (P.Penjaja)	Industri	Industrial
10		Bayan Lepas	Industri	Industrial
11		Ladang Valdor	Perkuburan Binatang	Animal Burial
12		Ladang Valdor	Perkuburan Binatang	Animal Burial
13		Ladang Valdor	Perkuburan Binatang	Animal Burial
14	PERAK	Pusing (Landfill)	Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
15		Lahat (Radioactive Storage)	Tapak Pelupusan Radioaktif	Solid Waste Landfill
16		Jalung, Sg. Siput	Perkuburan Binatang	Animal Burial
17			Perkuburan Binatang	Animal Burial
18		Bazaar PKNP, Ipoh	Perkuburan Binatang	Animal Burial
19	KUALA LUMPUR	Sg. Besi Landfill	Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
20		Tmn Beringin, Kepong	Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
21			Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
22		Sg. Besi Landfill	Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
23		Sg. Besi Landfill	Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
24		Royal Selangor Golf Club	Padang Golf	Golf Course
25	SELANGOR	CIAST, Shah Alam	Industri	Industrial
26			Industri	Industrial
27		S.K. SS 20, Shah Alam	Industri	Industrial
28		Saujana Golf, Subang	Bandar/Sub-Bandar	Urban/Suburban
29			Bandar/Sub-Bandar	Urban/Suburban
30		Sepang	Perkuburan Binatang	Animal Burial
31			Perkuburan Binatang	Animal Burial
32			Perkuburan Binatang	Animal Burial
33	NEGERI SEMBILAN	Senawang Edible Oil	Industri	Industrial
34		Kualiti Alam	Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
35			Tapak Pelupusan Buangan Pepejal	Solid Waste Landfill
36		Bkt. Pelanduk	Perkuburan Binatang	Animal Burial
37		Bkt. Pelanduk	Perkuburan Binatang	Animal Burial
38	MELAKA	Petronas	Industri	Industrial

Jadual 5.3 : Jabatan Alam Sekitar : Lokasi Telaga Pemantauan Kualiti Air Tanah
Table 5.3 : Department of Environment : Location of Groundwater Quality Monitoring Wells

(Sambungan / Continued)

Bil.	Negeri / State	Lokasi / Location	Kategori	Category
39	JOHOR	Kota Tinggi	Tapak Pelupusan	Landfill
40		Bkt. Bakeri, Muar	Tapak Pelupusan	Landfill
41			Tapak Pelupusan	Landfill
42		Tg. Puteri , Pasir Gudang	Industri	Industrial
43			Industri	Industrial
44		Ulu Choh, Pekan Nanas	Perkuburan Binatang	Animal Burial
45			Perkuburan Binatang	Animal Burial
46			Perkuburan Binatang	Animal Burial
47	PAHANG	Sek. Keb. Lepar	Pertanian	Agriculture
48		Nenasi	Sub-Bandar	Suburban
49		Kg. Tekek , Pulau Tioman	Intrusi Air Laut/Luar Bandar	Salt. Int/Rural
50			Intrusi Air Laut/Luar Bandar	Salt. Int/Rural
51	TERENGGANU	Kg. Kubang Badak	Tapak Pelupusan	Landfill
52			Tapak Pelupusan	Landfill
53		Teluk Kalong	Tapak Pelupusan	Landfill
54			Tapak Pelupusan	Landfill
55		Padang Pak Wan	Luar Bandar	Rural
56		Kg. Raja	Bandar	Urban
57			Bandar	Urban
58		Kertih	Industri	Industrial
59			Industri	Industrial
60		Kg. Merang	Bandar	Urban
61	KELANTAN	Pengkalan Chepa	Padang Golf	Golf Course
62			Padang Golf	Golf Course
63		Kg. Jembal	Pertanian	Agriculture
64		Eastern Garment, PC	Industri	Industrial
65			Industri	Industrial
66		Panji	Tapak Pelupusan	Landfill
67			Tapak Pelupusan	Landfill
68			Tapak Pelupusan	Landfill
69		Kubang Kerian	Padang Golf	Golf Course
70			Padang Golf	Golf Course
71		Rantau Panjang	Bandar/Sub-Bandar	Urban/Suburban
72			Bandar/Sub-Bandar	
73		Pasir Mas	Bandar/Sub-Bandar	
74		Sek. Keb. Jelawat	Luar Bandar	Rural
75		Kg. Gelong Badak	Luar Bandar	Rural
76		Kg. Beris Lalang	Pertanian	Agriculture
77		Kg. Gajah Mati	Pertanian	Agriculture
78			Pertanian	Agriculture
79			Pertanian	Agriculture

PREMIS YANG DITETAPKAN

Kilang Getah Asli Mentah (KG) dan Kilang Kelapa Sawit Mentah (KKS) adalah merupakan industri berasaskan pertanian yang diwartakan sebagai Premis Yang Ditetapkan di bawah Seksyen 18, Akta Kualiti Alam Sekeliling 1974, yang perlu mempunyai lesen menduduki dan mengguna premis.

Kilang Getah Asli Mentah

Pada tahun 2000, sejumlah 128 buah kilang getah asli mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Getah Asli Mentah) 1978. Daripada 128 buah, 107 telah dilesenkan untuk melepaskan effluen yang diolahnya ke dalam alurair, 7 buah kilang ke atas tanah, 2 buah kilang ke dalam alurair dan tanah serta 12 buah kilang mengitar semula effluen. (**Rajah 5.1**).

Di sepanjang tahun 2000, sejumlah 211 lawatan penguatkuasaan ke atas Kilang Getah diseluruh negara telah dijalankan oleh pegawai-pegawai penguatkuasa JAS. Lawatan penguatkuasaan yang lebih kerap telah dilakukan terhadap premis yang mempunyai status pematuhan yang rendah. Hasil daripada lawatan penguatkuasaan sebanyak 49 buah KG telah diambil tindakan undang-undang termasuk tindakan menghadapkan sebuah kilang ke mahkamah kerana melakukan pelbagai kesalahan di bawah peraturan berkenaan. (**Rajah 5.1**). Status pematuhan secara keseluruhan bagi KG adalah sebanyak 62 %.

Kilang Kelapa Sawit Mentah

Pada tahun 2000, sejumlah 343 buah kilang kelapa sawit mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Kelapa Sawit Mentah) 1977. Bilangan tersebut telah menunjukkan pertambahan sebanyak 6 buah kilang berbanding dengan tahun lalu. Daripada 343 buah KKS, 195 buah kilang telah dilesenkan untuk melepaskan effluen yang diolahnya kedalam alurair, 105 buah kilang keatas tanah dan 43 buah kilang ke dalam alurair dan juga ke atas tanah.

PRESCRIBED PREMISES – AGRO-BASED

Raw natural rubber factories and crude palm oil mills are agro-based premises prescribed under Section 18 of the Environmental Quality Act 1974 which require licence for occupation or use under the Act.

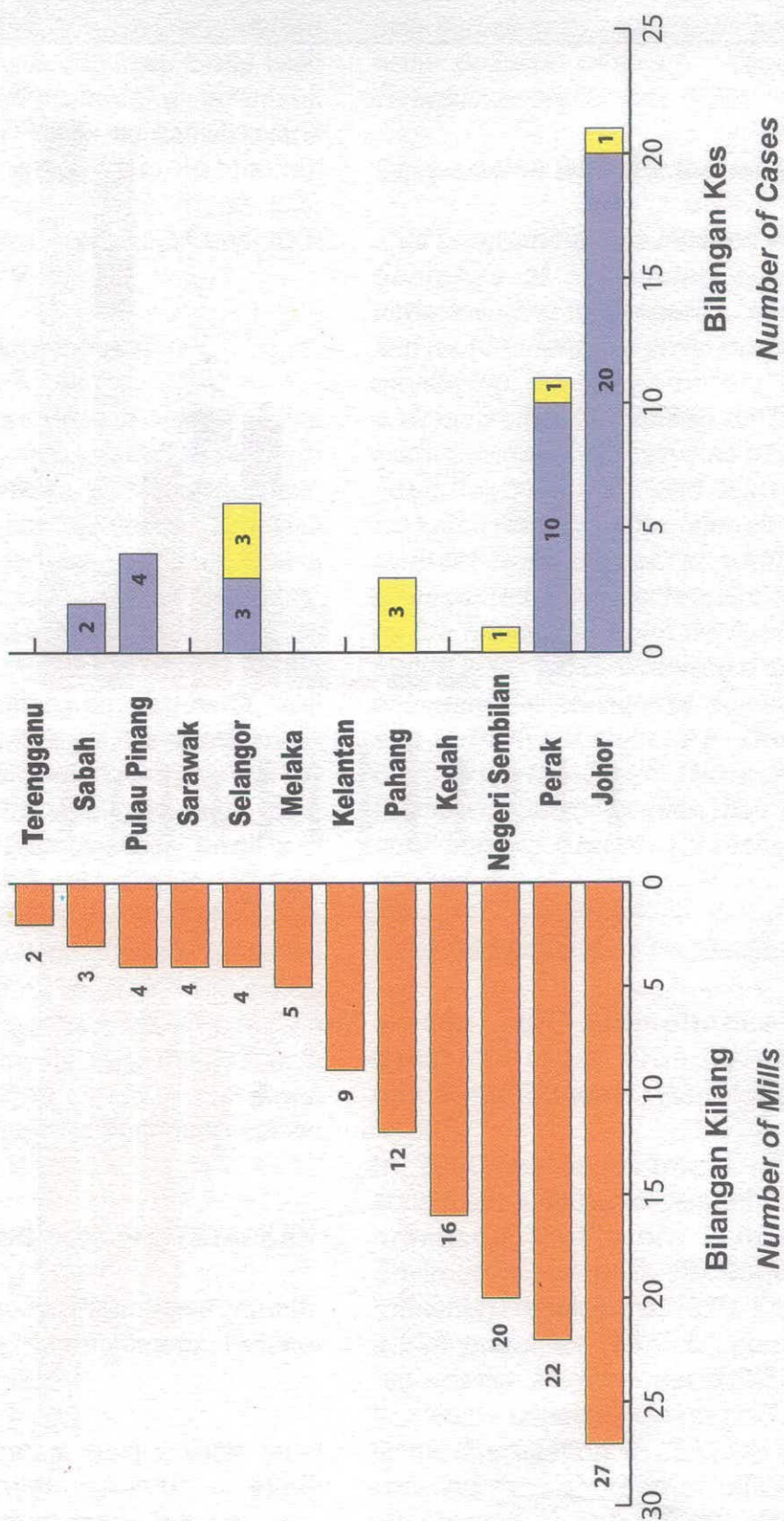
Raw Natural Rubber

*In the year 2000, 128 raw natural rubber factories were licensed under the Environmental Quality (Prescribed Premises)(Raw Natural Rubber) Regulations 1978, a decrease of six compared to the previous year. Of these 128 premises, 107 had been licensed to discharge treated effluent into watercourses, 7 onto land, 2 combined land and watercourse and 12 effluent recycling. (**Figure 5.1**).*

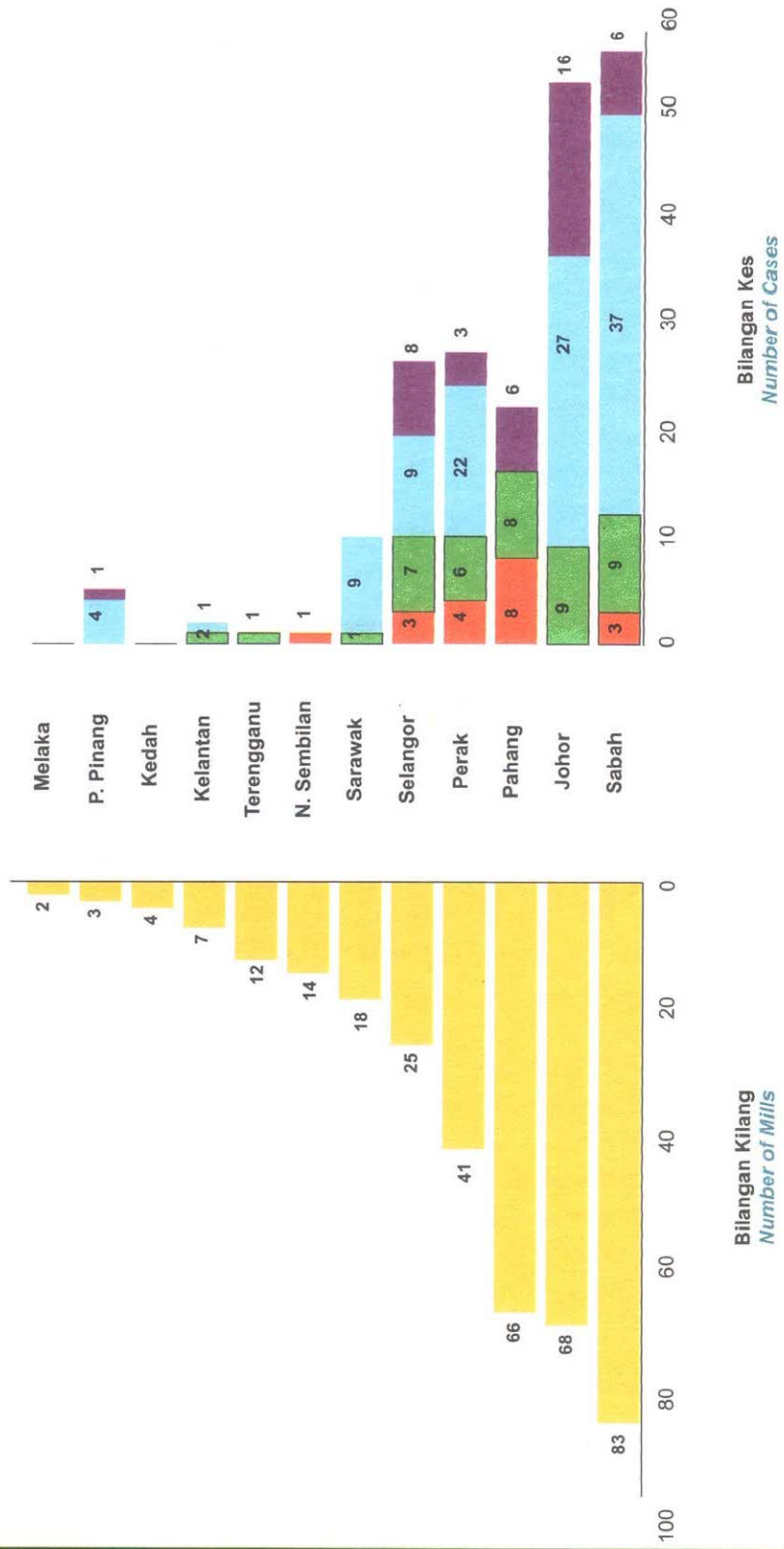
*Throughout 2000, 211 visits to rubber factories were conducted by enforcement officers of the State DOE, especially for factories with low compliance status. Resulting from these visits, legal actions were taken on 49 factories including one taken to court for offences under the said regulations. (**Figure 5.1**). Overall compliance status for rubber factories was 62 %.*

Crude Palm Oil

In the year 2000, 343 crude palm oil mills were licensed under the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977. This represented an increase of 6 mills compared to the previous year. Of these 343 premises, 195 were licenced for discharge into watercourses after treatment , 105 onto land and 43 for both watercourses and land disposal.



Rajah 5.1 Malaysia: Bilangan Kes Tindakan Undang-Undang Terhadap Kilang Getah Asli Mentah, 2000
Figure 5.1 Malaysia: Legal Action Against Raw Natural Rubber Factories, 2000



Rajah 5.2 Malaysia: Bilangan Kes Tindakan Undang-Undang Terhadap Kilang Kelapa Sawit Mentah, 2000

Figure 5.2 Malaysia : Legal Action Against Crude Palm Oil Mills, 2000

Disepanjang tahun 2000, sejumlah 627 lawatan penguatkuasaan ke atas Kilang Kelapa Sawit di seluruh negara telah dijalankan oleh pegawai-pegawai penguatkuasa JAS. Hasil daripada lawatan penguatkuasaan sebanyak 213 buah kilang telah diambil tindakan undang-undang termasuk menghadapkan, 20 buah KKS ke mahkamah kerana melakukan pelbagai kesalahan melibatkan pencemaran udara dan air (effluen). (Rajah 5.2). Status pematuhan secara keseluruhan bagi KKS adalah sebanyak 38 %.

Kerjasama Dengan Sektor Industri

Program ini dilaksanakan dengan objektif utama untuk meningkatkan lagi kerjasama dan pemahaman kepada pihak swasta tentang perkembangan dan keperluan terkini tentang kawalan serta pengawasan alam sekitar. Sehubungan dengan ini, JAS telah menubuhkan Jawatankuasa Konsultatif Pengilang-Pengilang Getah dan Kelapa Sawit yang bertindak sebagai forum untuk membincangkan status pematuhan undang-undang dan isu serta hasil penyelidikan. Dari segi perancangannya jawatankuasa ini akan bermesyuarat sekurang-kurangnya dua kali setahun. Selain dari itu wakil JAS juga turut menghadiri mesyuarat Jawatankuasa Teknikal di bawah Persatuan Minyak Sawit Malaysia (Malasian Palm Oil Association - MPOA). Pada 27 Mac 2000, JAS telah mengaturkan pertemuan antara YB Menteri Sains Teknologi dan Alam Sekitar (YB Datuk Law Hieng Ding) dengan Pengusaha-Pengusaha Ladang dan Kilang Sawit Malaysia bagi menjelaskan perlunya mereka bekerjasama untuk mengawal pembakaran terbuka bagi membendung episod jerebu.

SEKSYEN PREMIS YANG BUKAN DITETAPKAN

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

Pada tahun 2000 Jabatan Alam Sekitar telah menjalankan sebanyak 3,460 lawatan penguatkuasaan ke atas premis industri yang tertakluk di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan dan Effluen-Effluen

Throughout the year, 627 visits to Crude Palm Oil mills were undertaken by DOE enforcement officers. As a result actions were taken on 213 mills including 20 court cases for various air and water pollution offences. (Figure 5.2). Overall compliance status was 38%.

Cooperation with the Industry Sector

This programme was initiated with the primary objective of enhancing cooperation and understanding with regard to new development and requirements for environmental control and monitoring. For this purpose, DOE established a Consultative Committee for the Rubber and Palm Oil Industry to serve as a forum to discuss compliance status and issues as well as research findings. The committee is expected to meet twice a year. In addition, DOE was represented at the Technical Committee set up by the Malaysian Palm Oil Association. On 27 March 2000, DOE organised a dialogue session between the Minister of Science, Technology and the Environment, Y.B. Datuk Law Hieng Ding with the Palm Oil Industry and the Plantation Sector to seek their cooperation on open burning in order to prevent the occurrence of haze.

NON PRESCRIBED PREMISES

Status of Compliance with the Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979

In 2000 the Department of Environment conducted 3,460 enforcement visits to industrial premises that were subjected to the Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979. From these visits, 2,924 premises (84.5 %) complied with the regulations; while the rest of 536 premises failed to comply especially in respect of compliance limits (Regulation 8), factory expansion and creating new sources of effluent discharges (Regulation 4) and effluent discharges not at approved point of discharges (Regulation 16).

Perindustrian) 1979. Daripada jumlah tersebut didapati sebanyak 2,924 premis mematuhi peraturan ini. Sementara itu baki 536 buah kilang gagal mematuhi terutamanya terhadap pematuan piawai pelepasan effluen (Peraturan 8), kelulusan untuk pembesaran kilang (Peraturan 4) dan pelepasan effluen bukan di takat pelepasan yang diluluskan (Peraturan 16).

Jadual 5.3 menunjukkan industri seperti makan dan minuman, penyudahan logam dan sadur elektrik dan tekstil di dapati masing-masing merekodkan purata peratus pematuan sebanyak 59%, 61% dan 66%. Kebanyakan industri di dapati sukar untuk mematuhi parameter-parameter berikut iaitu keperluan oksigen biokimia (BOD), keperluan oksigen kimia (COD), pepejal terampai (SS), minyak dan gris (O&G) dan logam berat seperti nikel, sianid, tembaga dan pelambun. Sebab-sebab utama kegagalan untuk mematuhi parameter-parameter di atas adalah kerana ketidakcekapan pengendalian sistem pengolahan effluen (SPE) dan beroperasi tanpa SPE terutamanya untuk industri kecil dan sederhana. Bagaimanapun Jabatan Alam Sekitar akan terus mempertingkatkan kerja-kerja penguatkuasaan bagi memastikan pihak industri mematuhi dan memperbaiki keadaan tersebut.

Kajian Semula Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan dan Effluen-Effluen Perindustrian) 1979

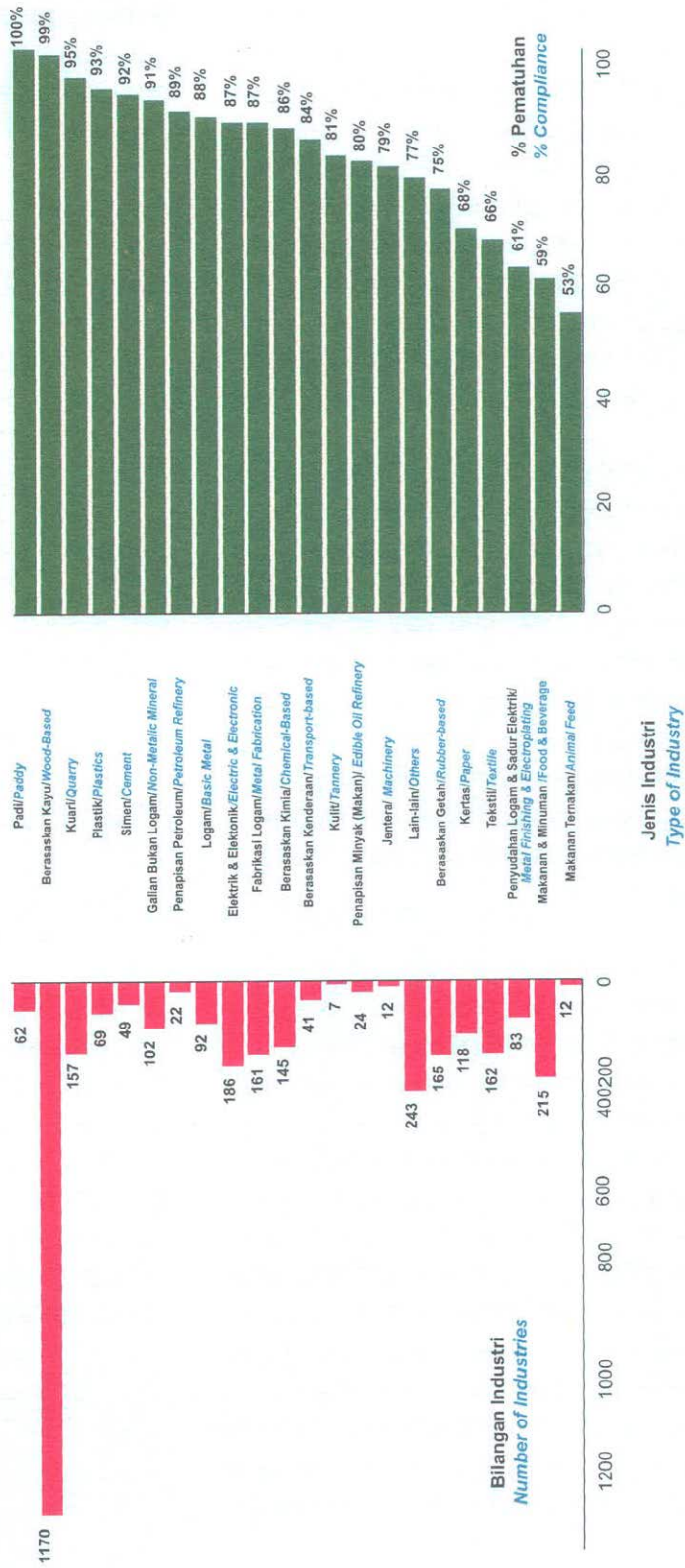
Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan dan Effluen-Effluen Perindustrian) 1979, pada masa kini sedang di kaji dan dipinda dalam usaha untuk memperbaiki dan memperketatkan undang-undang ini supaya lebih sesuai dengan perkembangan teknologi sosio-ekonomi terkini. Di antara perkara-perkara yang diberi pertimbangan di dalam pindaan ini termasuklah mengadakan peruntukan untuk penghantaran laporan sukutahunan, kesalahan-kesalahan yang boleh dikompaun, piawai khusus untuk sektor industri, pendekatan baru kaedah kawalan, tambahan beberapa parameter pencemaran air dan sebagainya.

Figure 5.3 shows that industrial premises such as food and beverage, metal finishing, electroplating and textile recorded compliance of 59 %, 61 % and 66 % respectively. Many industrial sources encountered difficulty in complying with parameters such as Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Suspended Solids (SS), Oil and Grease and heavy metals like nickel, cyanide, copper and lead. The main reasons for non-compliance were inefficient effluent treatment systems and absence of effluent treatment systems especially for small and medium industries.

The Department of Environment will continue its enforcement efforts to bring about higher compliance and improvement of environmental quality.

Review of Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979

The Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979 are currently under review so as to improve and strengthen existing provisions in line with current state of technological and socio-economic development. Among the matters under consideration are: requirements of quarterly reports, compoundable offences, specific standards for specific industrial sector, new control mechanisms and additional parameter standards and so on.



Rajah 5.3 Jabatan Alam Sekitar : Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan dan Effluen-Effluents Perindustrian) 1979 : Status Pematuhan Industri, 2000
 Figure 5.3 Department of Environment : Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979 : Compliance Status, 2000

Status Pematuhan Industri-Industri Pembuatan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978, Bagi Tahun 2000

Pada tahun 2000, 67% daripada 2454 punca pencemaran udara atau premis yang telah dilawati didapati telah mematuhi Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978. Daripada jumlah ini, didapati industri penapisan minyak masak dan penapisan minyak petroleum berjaya mencapai peratus pematuhan yang paling tinggi iaitu 100%, diikuti oleh industri kertas dan tekstil (88%) serta industri makanan dan minuman (83%). (**Rajah 5.4**).

Pematuhan yang rendah di kalangan industri-industri sektor galian bukan logam adalah disebabkan oleh pencemaran habuk yang timbul akibat ketiadaan alat kawalan pencemaran udara ataupun alat kawalan yang tidak berfungsi. Lain-lain peraturan yang seringkali tidak dipatuhi oleh sebilangan besar industri khususnya yang kecil dan sederhana termasuklah; tiada kelulusan bertulis bagi pemasangan alat-alat pembakaran bahanapi atau cerobong; pembakaran terbuka sisa-sisa kilang; atau pelepasan asap hitam daripada cerobong melebihi tempoh yang dibenarkan.

Industri-industri besar yang berpotensi tinggi mencemarkan alam sekitar seperti industri simen, kilang besi dan keluli, stesen janakuasa dan lain-lain kilang yang seringkali menjadi punca aduan oleh orang awam telah diarahkan oleh JAS supaya memasang sistem pengawasan secara berterusan dan mengemukakan laporan pengawasan kepada JAS secara bulanan. Sebilangan besar industri-industri yang telah memasang sistem ini termasuklah industri simen, petrokimia, kimia, terminal minyak mentah, loji gas asli cecair, insinerator buangan terjadual, dan stesen janakuasa; sementara yang lainnya masih dalam proses pemasangan/perolehan sistem ataupun memohon penangguhan tempoh pemasangan kerana masalah kewangan dan sebab-sebab lain.

Compliance Status : Environmental Quality (Clean Air) Regulations 1978

*In the year 2000, 67% of the 2454 air pollution sources or premises visited were found to have complied with the Environmental Quality (Clean Air) Regulations 1978. Out of these, edible and petroleum refineries achieved 100 % compliance, followed by the paper and textiles sector (88%) and the food and beverages industry (83%). (**Figure 5.4**).*

The low compliance rate among the non-metallic mineral sector was due to dust pollution arising from inefficient or ineffective air pollution control equipment. Other common offences committed by a large number of premises, particularly the small and medium sized industries (SMIs) were : no written approval for the installation of fuel-burning equipment or chimney; open burning of industrial wastes; or black smoke emission from chimneys exceeding the allowable limit.

Large industries with high polluting potential such as cement plants, iron and steel mills, petroleum refineries, power plants and other industries that were frequent targets of public complaints, had been directed by DOE to install continuous emission monitoring system (or CEMS) and to submit monthly monitoring results to DOE. Industries that had installed such CEMS were cement, petrochemical and chemical industries, crude oil terminals, liquefied natural gas plants and power plants; while the rest were either in the process of acquisition/installation or had applied for postponement due to financial constraints and various other reasons.



Rajah 5.4 Jabatan Alam Sekitar : Status Pemuatan Industri-Industri Pembuatan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978, Bagi Tahun 2000
 Figure 5.4 Department of Environment : Environmental Quality (Clean Air) Regulations, 1978 Compliance By Industries, 2000

BUANGAN TERJADUAL

Kebenaran Bertulis dan Lesen Premis Yang Ditetapkan

Sejumlah 14 Kebenaran Bertulis telah diberikan oleh Ketua Pengarah JAS untuk pembinaan premis yang ditetapkan bagi merawat dan melupuskan buangan terjadual. Kebenaran Bertulis ini telah diisukan kepada 3 pelan rawatan luar tapak, 4 pelan rawatan bahan kimia luar tapak, 5 insinerator buangan terjadual, satu tapak pelupusan selamat dan 1 penstoran luar tapak.

Bilangan pengangkut buangan terjadual yang berlesen telah meningkat dari 96 pada tahun 1999 kepada 101 pada tahun 2000; 22 bagi mengangkut sisa rawatan di luar tapak, 63 bagi mengangkut sisa bagi dieksport atau diimport untuk tujuan rawatan; dan 16 lagi bagi mengangkut sisa untuk diguna semula di pusat kemudahan yang dibenarkan.

Di samping itu, sejumlah 203 lesen telah dikeluarkan untuk pusat kemudahan yang sedia ada dan baru terutama bagi perolehan kembali, insinerator, rawatan di atas tanah, rawatan luar tapak, dan tapak pelupusan selamat dan lain-lain (Rajah 5.5)

IMPORT DAN EKSPORT BUANGAN TERJADUAL

Pada tahun 2000, sejumlah 4,878.02 tan metrik buangan telah dieksport. Buangan yang dieksport terdiri daripada mangkin terpakai industri dan enapcemar logam berat daripada 25 pengeluar buangan untuk pemerolehan kembali logam di negara lain. Sebanyak 7 permohonan telah diberi kebenaran untuk mengimport 125,875 tan metrik buangan untuk tujuan penggunaan sebagai bahan mentah pemprosesan. (Rajah 5.6 dan 5.7)

SCHEDULED WASTES

Written Permission and Licences for Prescribed Premise

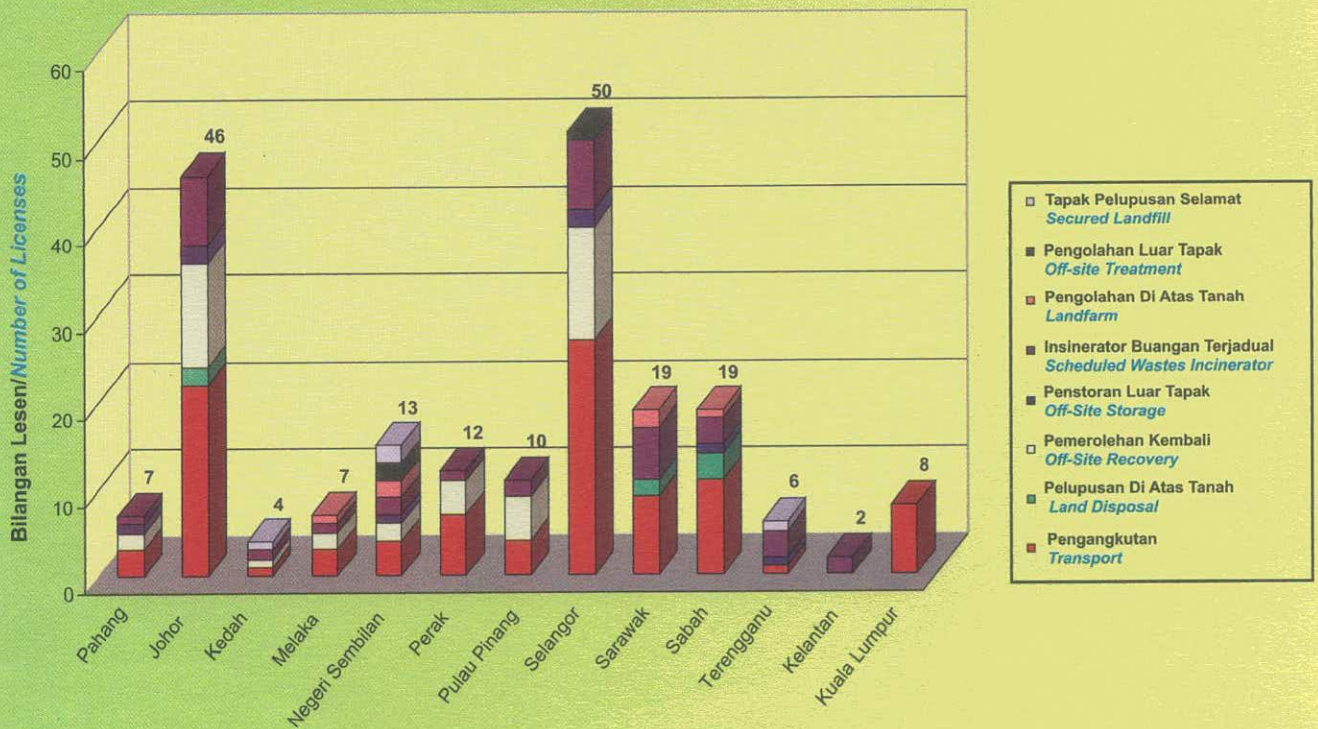
A total of 14 Written Permissions were granted by the Director General for the construction of prescribed premises to treat and dispose scheduled wastes. Written Permissions were issued to 3 metal-based off-site recovery plants, 4 chemical off-site recovery plants, 5 scheduled waste incinerators, one secured landfill and 1 off-site storage.

The number of licensed scheduled waste transporters increased from 96 in 1999 to 101 in the year 2000; 22 for transporting wastes to off-site treatment and disposal facilities, 63 for transporting wastes that were either exported or imported for recovery purposes, and 16 for transporting wastes for reutilization at approved facilities.

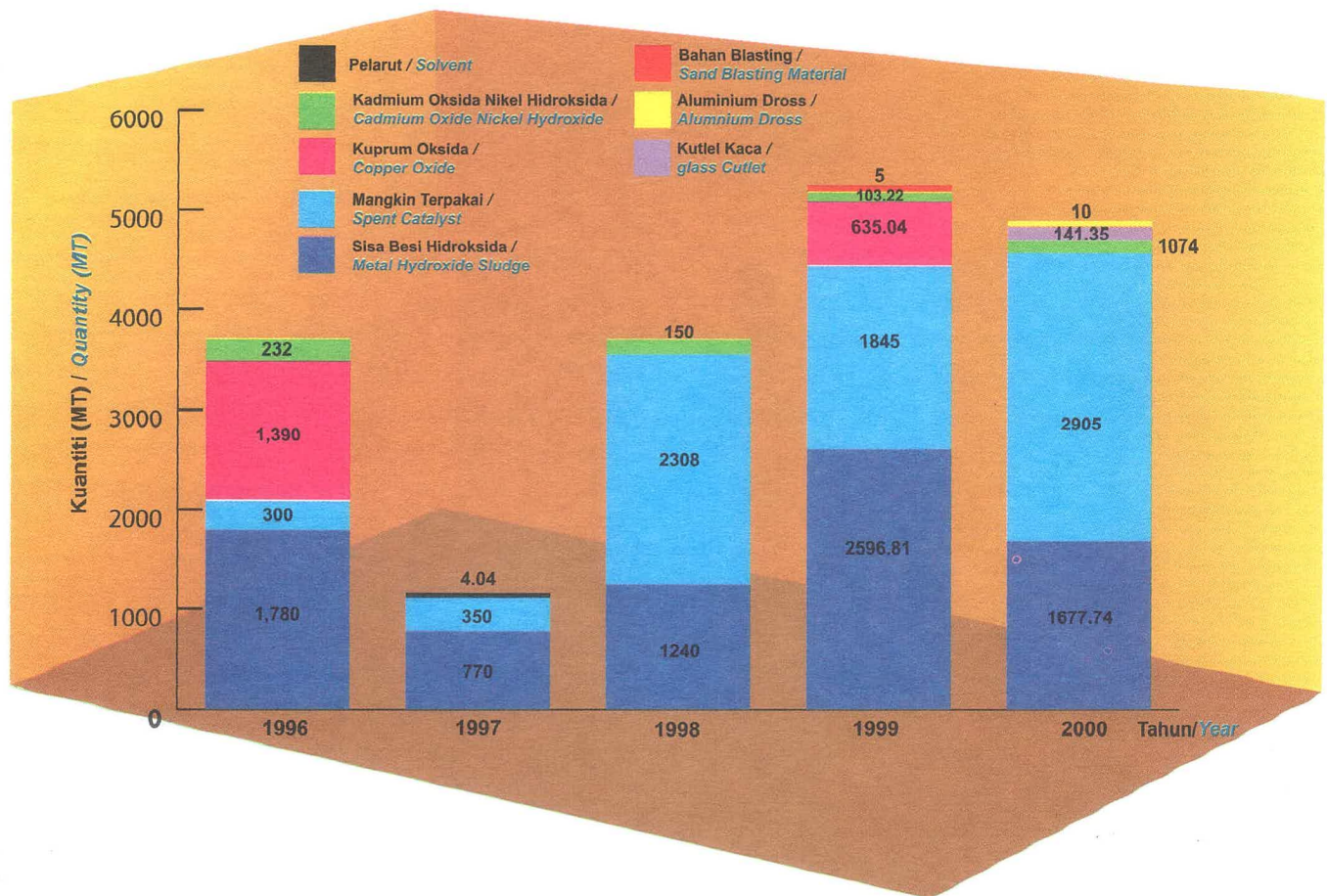
In addition, a total of 203 licences were issued for both existing and new facilities for off-site recovery, off-site storage, incinerators, land treatment, off-site treatment, secured landfills and others. (Figure 5.5).

IMPORT AND EXPORT OF SCHEDULED WASTES

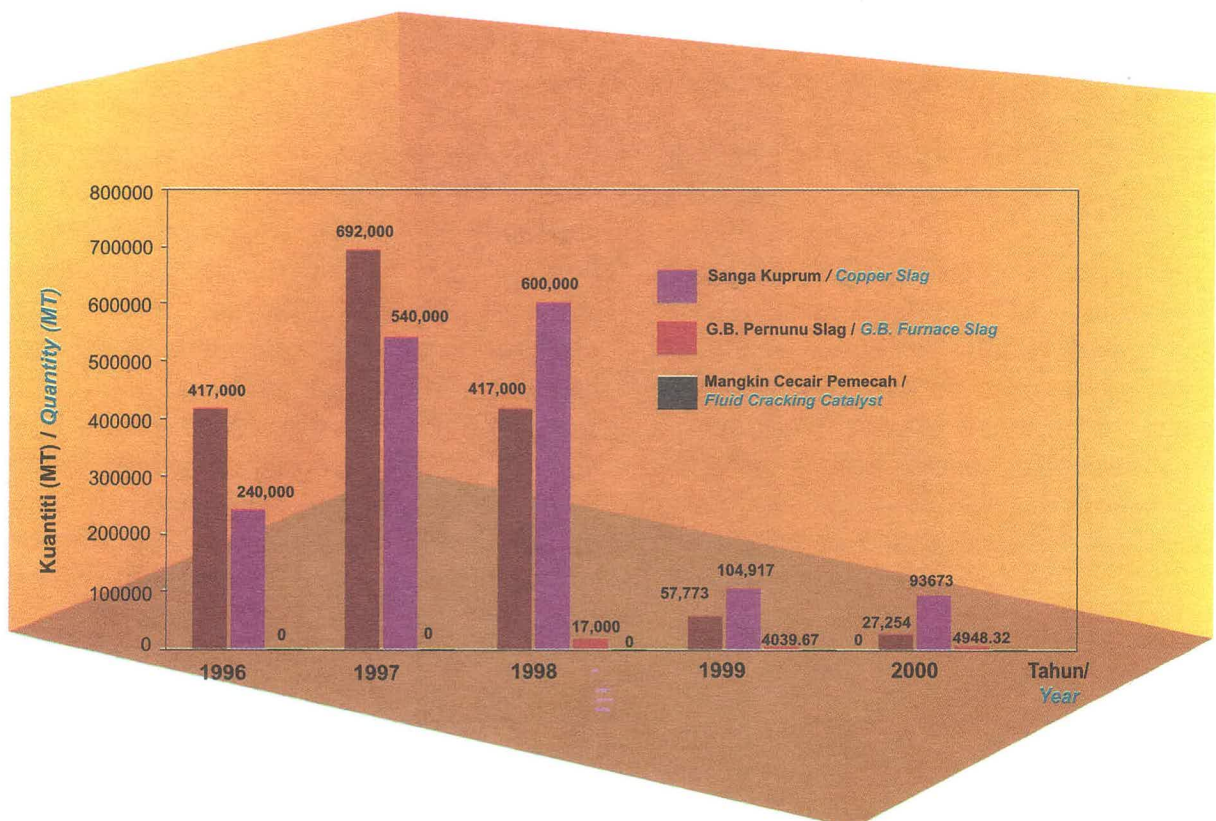
A total of 4,878.02 tonnes of scheduled wastes were exported in 2000. The exports comprised mainly of spent industrial catalysts and metal hydroxide sludges from 25 waste generators. These wastes were destined for recovery in other countries. Seven applicants received approvals to import 125,875 tonnes of wastes to be used as raw materials in their processes. (Figure 5.6 and 5.7)



Rajah 5.5 Jabatan Alam Sekitar : Lesen-Lesen Yang Dikeluarkan bagi Kemudahan Pengolahan dan Pelupusan Buangan Terjadual, 2000
 Figure 5.5 Department of Environment : Licensed Scheduled Wastes Treatment and Disposal Facilities, 2000



Rajah 5.6 Jabatan Alam Sekitar : Kuantiti dan Jenis Buangan Terjadual yang Dieksport, 1996 - 2000
 Figure 5.6 Department of Environment : Volume and Type of Wastes Exported, 1996 - 2000



Rajah 5.7 Jabatan Alam Sekitar : Kuantiti Buangan Terjadual Mengikut Jenis, 1996 - 2000
 Figure 5.7 Department of Environment : Volume and Type of Wastes Imported, 1996 - 2000

PENGUATKUASAAN TERHADAP AKTIVITI PEMBAKARAN TERBUKA

ENFORCEMENT AGAINST OPEN BURNING ACTIVITIES



Pembakaran Terbuka yang tidak dikawal
Uncontrolled Open Burning

Malaysia terus mempertingkatkan tindakan-tindakan penguatkuasaannya terhadap aktiviti-aktiviti pembakaran terbuka dalam negara. Pasukan-pasukan rondaan Jabatan Alam Sekitar (JAS) melaksanakan pengawasan harian melalui darat di kawasan-kawasan yang seringkali terbakar, sebagai tambahan kepada pengawasan melalui udara yang dilaksanakan dengan kerjasama Unit Udara Polis. Dialog-dialog mengenai pembakaran terbuka diteruskan dengan pertubuhan-pertubuhan dan agensi-agensi Kerajaan berkaitan, serta pemilik dan pengusaha ladang.

Tahun 2000 menandakan era baru dalam penguatkuasaan terhadap aktiviti pembakaran terbuka. Satu undang-undang baru, Perintah Kualiti Alam Sekeliling (Perwakilan Kuasa) (Penyiasatan Pembakaran Terbuka) 2000 telah dikuatkuasakan pada 21 Ogos 2000 di mana kuasa bagi menyiasat kesalahan melakukan aktiviti-aktiviti pembakaran terbuka di bawah seksyen 29A Akta Kualiti Alam Sekeliling, 1974 telah diperwakilkan kepada beberapa agensi iaitu Jabatan Perkhidmatan Bomba dan Penyelamat, Polis DiRaja Malaysia, Kementerian Kesihatan dan Pihak Berkuasa Tempatan, termasuk Dewan Bandaraya Kuala Lumpur dan Majlis Perbandaran Labuan. "Standard Operating Procedure (SOP)" bagi Kerja-Kerja Penyiasatan Pembakaran Terbuka telah disediakan sebagai

Malaysia stepped up enforcement action on open burning activities in the year 2000. Daily ground surveillance of fire-prone areas were undertaken in addition to the aerial surveillance carried out with the co-operation of the Police Air Wing. Dialogues were held regularly with relevant organizations, government agencies, plantation owners as well as operators.

The Environmental Quality (Delegation of Powers) (Investigation of Open Burning) Order 2000 came into force on 21 August 2000 whereby powers for investigation of open burning offences under section 29A of the Environmental Quality Act, 1974 were delegated to several agencies namely, the Fire and Rescue Services Department, the Royal Malaysian Police, the Health Ministry and the Local Authorities including Kuala Lumpur City Hall and the Labuan Municipality. A Standard Operating Procedure (SOP) for investigation of open burning offences had been prepared as a guide for investigating officers and personnel. Short courses on investigation of open burning offences were conducted for relevant agencies under the "training-the-trainers" concept. Such courses could be expanded to the State level and be conducted by the respective DOE State Offices.

panduan bagi semua pegawai-pegawai dan anggota penyiasat. Kursus-kursus mengenai Penyiasatan Pembakaran Terbuka telah juga dijalankan kepada agensi-agensi berkenaan melalui konsep "training-the-trainers". Kursus-kursus ini akan dikembangkan ke peringkat negeri di mana ianya akan dikendalikan oleh Pejabat-Pejabat JAS Negeri berkaitan.

Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Pembakaran Terbuka) 2000, yang dikuatkuasakan pada 21 Ogos 2000 membenarkan 15 aktiviti yang ditetapkan untuk dikecualikan daripada larangan pembakaran terbuka. Namun, aktiviti-aktiviti pembakaran ini hanya boleh dijalankan mengikut syarat-syarat tertentu yang juga telah ditetapkan dalam Perintah ini. Namun begitu, pembakaran terbuka di kawasan tanah gambut adalah tidak dibenarkan sama sekali.

Sepanjang tahun 2000, sejumlah 1801 kes pembakaran terbuka telah dikesan dan disiasat, termasuk "hot spots" yang dikesan melalui satelit. Bilangan kes-kes yang dikesan mengikut negeri dan jenis pembakaran adalah seperti yang ditunjukkan dalam **Rajah 5.8**, sementara bilangan kes-kes yang dikesan mengikut bulan dan jenis pembakaran adalah seperti yang ditunjukkan dalam **Rajah 5.9**. Daripada jumlah ini, 582 kes adalah pembakaran terbuka aktiviti-aktiviti yang dikecualikan daripada larangan pembakaran terbuka, di bawah Perintah yang berkaitan dengan pembakaran terbuka. Bilangan terbesar pembakaran terbuka berlaku di ladang-ladang (582 kes), diikuti oleh belukar (387 kes). Paling banyak bilangan pembakaran terbuka dikesan dalam bulan Julai (514 kes), Ogos (276 kes) dan Mac (185 kes), iaitu dalam musim panas dan kering.

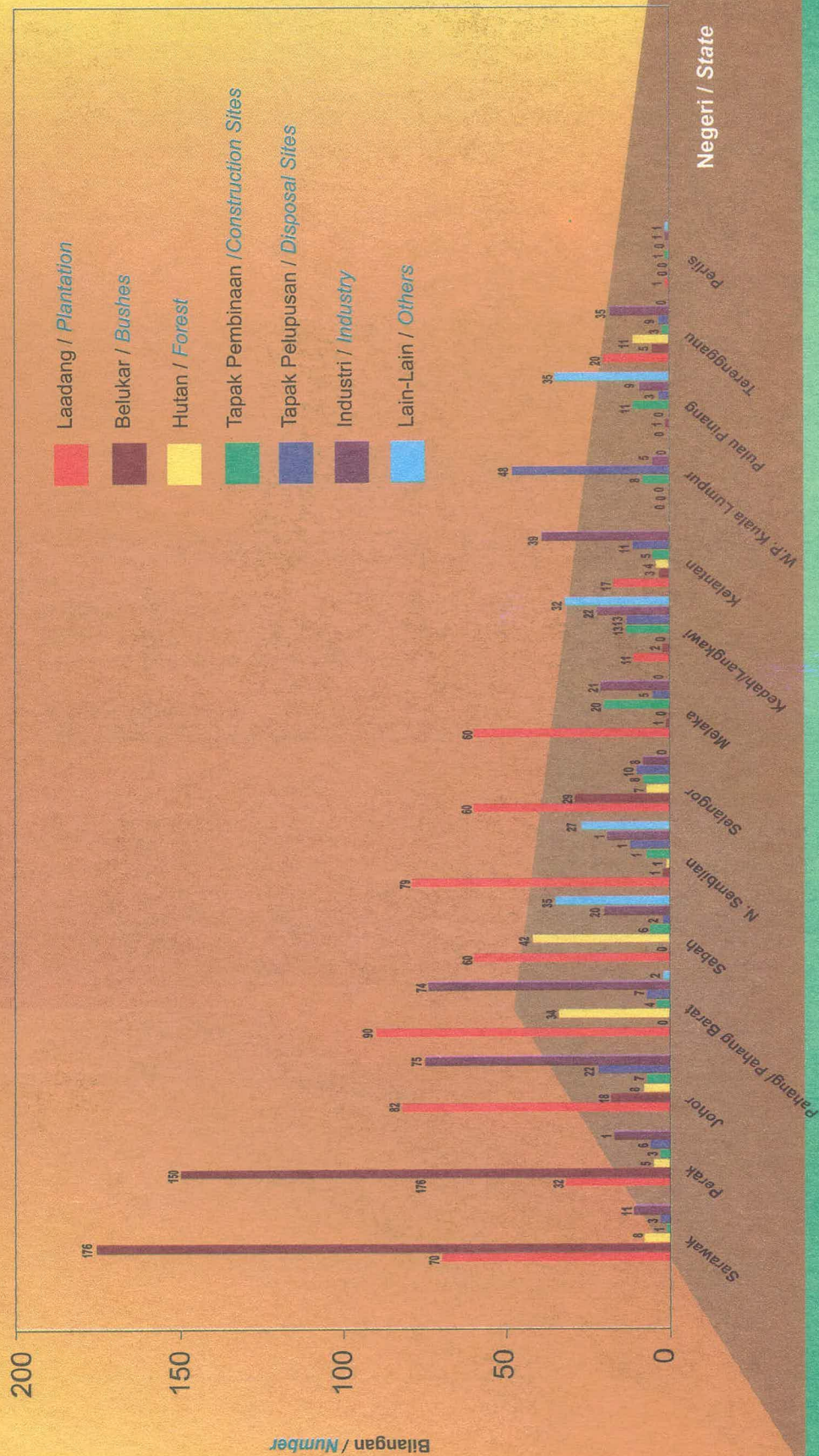
Semenjak pelancaran operasi mencegah pembakaran terbuka di seluruh negara pada 8 April 1998 sehingga 31 Disember 2000, sejumlah 1098 kes telah dikompaun yang berjumlah RM1,628,600.00. Sejumlah 105 kes telah didakwa dan dikenakan denda sejumlah RM931,700.00.

The Environmental Quality (Prescribed Activities) (Open Burning) Order 2000, also came into force on 21 August 2000 whereby 15 prescribed activities were exempted and could only be carried out according to specific conditions stipulated in the Order. However, open burning in peat soil areas is prohibited.

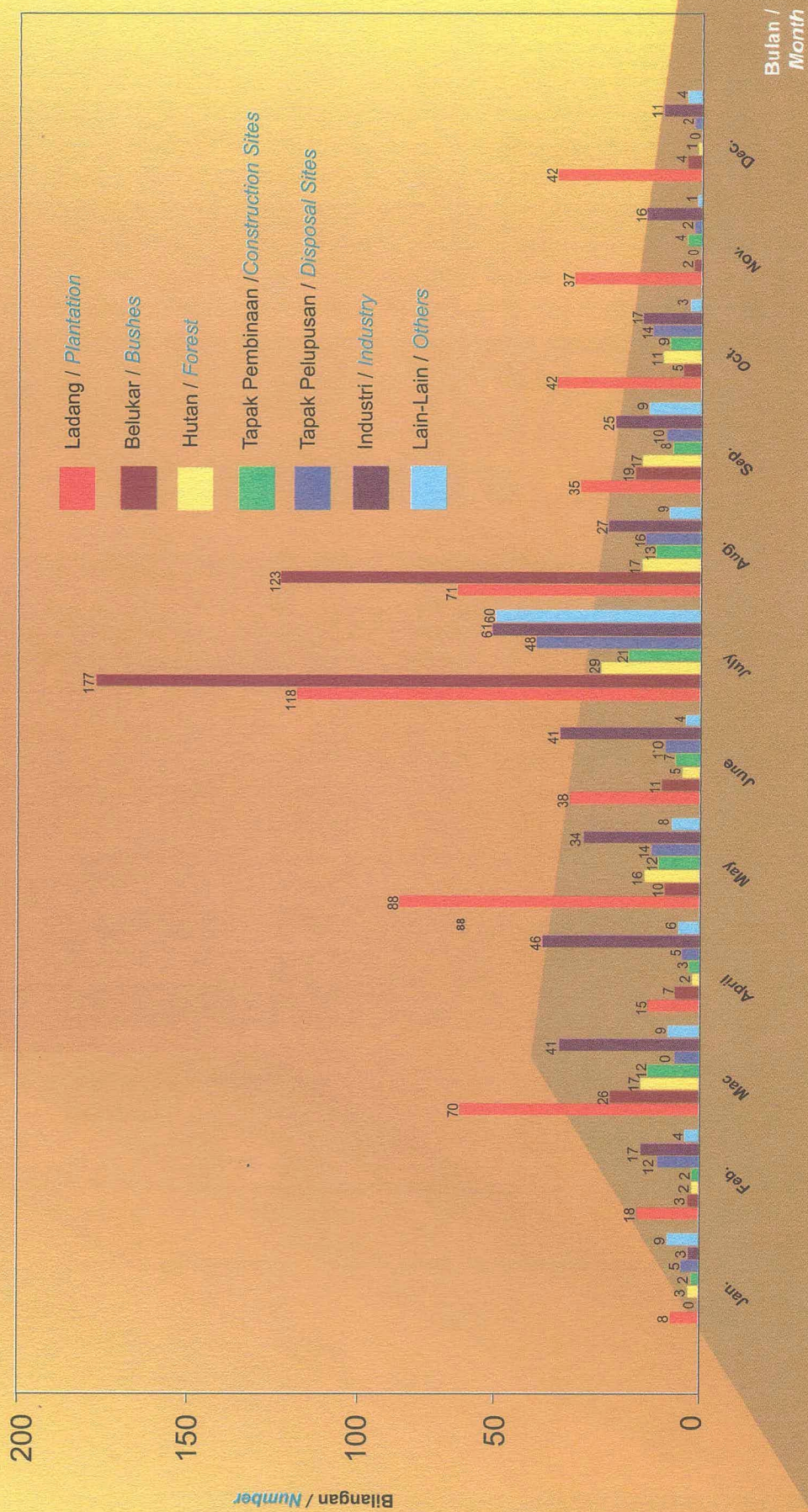
*Throughout the year, a total of 1801 cases of open burning were detected and investigated, including "hot spots" detected via satellites. The number of cases detected according to States and types of burning is as shown in **Figure 5.8**, while the number of monthly cases detected and types of burning is as shown in **Figure 5.9**. Out of these, 582 cases were open burning activities allowable under the Open Burning Order.*

The most number of open burning cases were detected in plantations (582), and bushes (387), particularly in the months of July (514), August (276) and March (185), when weather conditions were hot and dry.

Since the launch of the nationwide operation to prevent open burning from 8 April 1998 till 31 December 2000, a total of 1098 cases had been compounded amounting to RM1,628,600.00. A total of 105 cases were prosecuted in court and fined a total of RM931,700.00.



Rajah 5.8 Jabatan Alam Sekitar : Bilangan Kes Pembakaran Terbuka Mengikut Negeri, 2000
 Figure 5.8 Department of Environment : Number of Open Burning Cases By State, 2000



Rajah 5.9 Jabatan Alam Sekitar : Bilangan Kes Pembakaran Terbuka Bulanan, 2000
 Figure 5.9 Department of Environment : Number of Open Burning Cases By Month, 2000

LESEN PERLANGGARAN

Menurut peruntukan di bawah Seksyen 22(1) dan 25(1), Akta Kualiti Alam Sekeliling 1974, lesen boleh dipohon bagi tujuan perlanggaran mengikut syarat-syarat yang dibenarkan bagi pelepasan bendasing ke atmosfera atau melepaskan effluen ke saliran. **Rajah 5.10** menunjukkan bilangan permohonan bagi lesen perlanggaran bagi tahun 1990-2000.

Pada tahun 2000, bilangan permohonan telah bertambah kepada 101 (38.4%) daripada 73 pada tahun 1999; 94 permohonan (93.1%) bagi seksyen 25(1) dan 7 permohonan (6.9%) bagi Seksyen 22(1). Daripada jumlah ini, 78 permohonan telah diluluskan (77.2%), sementara baki 23 (22.8%) telah ditolak (**Rajah 5.11**).

LESEN PERLANGGARAN BAGI BUANGAN DAN RAWATAN KUMBAHAN

Permohonan bagi lesen perlanggaran di bawah Seksyen 25(1) turut diterima daripada Indah Water Konsortium Sdn. Bhd. (IWK), konsortium yang bertanggungjawab menguruskan loji-loji kumbahan melalui perjanjian penswastaan.

Rajah 5.12 menunjukkan bilangan permohonan yang diterima daripada IWK sejak tahun 1994. Pada tahun 2000, bilangan permohonan meningkat kepada 3140 daripada 2475 pada tahun 1999; 2777 (88.4%) permohonan adalah permohonan memperbaharui lesen manakala 363 (12%) permohonan lagi adalah permohonan lesen baru (**Rajah 5.13**).

CONTRAVENTION LICENCES UNDER SECTIONS 22(1) AND 25 (1)

*In accordance with the provisions of Section 22(1) and 25(1) of the Environmental Quality Act 1974, applications for licences may be made for the purpose of contravention of acceptable conditions of emissions into the atmosphere or effluent discharges into watercourses. **Figure 5.10** shows the number of applications for contravention licences from 1990 – 2000.*

*In the year 2000, the number of applications increased to 101 (38.4 %) from 73 in 1999; 94 applications (93.1 %) in respect of Section 25(1) and 7 applications (6.9 %) for Section 22(1). Of these applications, 78 applications were approved (77.2 %), while the remaining 23 (22.8 %) were rejected. (**Figure 5.11**).*

CONTRAVENTION LICENCES FOR SEWAGE DISCHARGE (SECTION 25 (1))

Applications for contravention under Section 25(1) were also received from Indah Water Konsortium Sdn. Bhd. (IWK) which is responsible for managing sewerage treatment plants under a privatization agreement.

***Figure 5.12** shows the number of applications received from IWK since 1994. In the year 2000, the number increased to 3140 from 2475 in 1999; 2777 (88.4 %) licenses were for renewal purposes, while 363 (11.6 %) were new applications. (**Figure 5.13**).*

PENGAWASAN MELALUI UDARA

Seperti tahun-tahun sebelumnya, aktiviti pengawasan pencemaran alam sekitar melalui udara dengan kerjasama Unit Udara Polis (UUP). Peruntukan sebanyak RM 3 juta telah dibekalkan untuk menggunakan helikopter dan pesawat kepak kaku.

Pengawasan melalui udara telah dijalankan untuk mengesan punca pencemaran seperti aktiviti-aktiviti pembakaran terbuka, pelepasan asap cerobong industri yang berlebihan, pencemaran pantai atau persisiran pantai, pemantauan pembangunan di kawasan tanah tinggi dan pulau-pulau pada tahun 2000. Maklumat yang diperolehi akan disampaikan ke Bilik Kawalan Ibu Pejabat JAS bahawa sebanyak 600 penerbangan telah dijalankan dan 500 kes pencemaran telah dikesan.

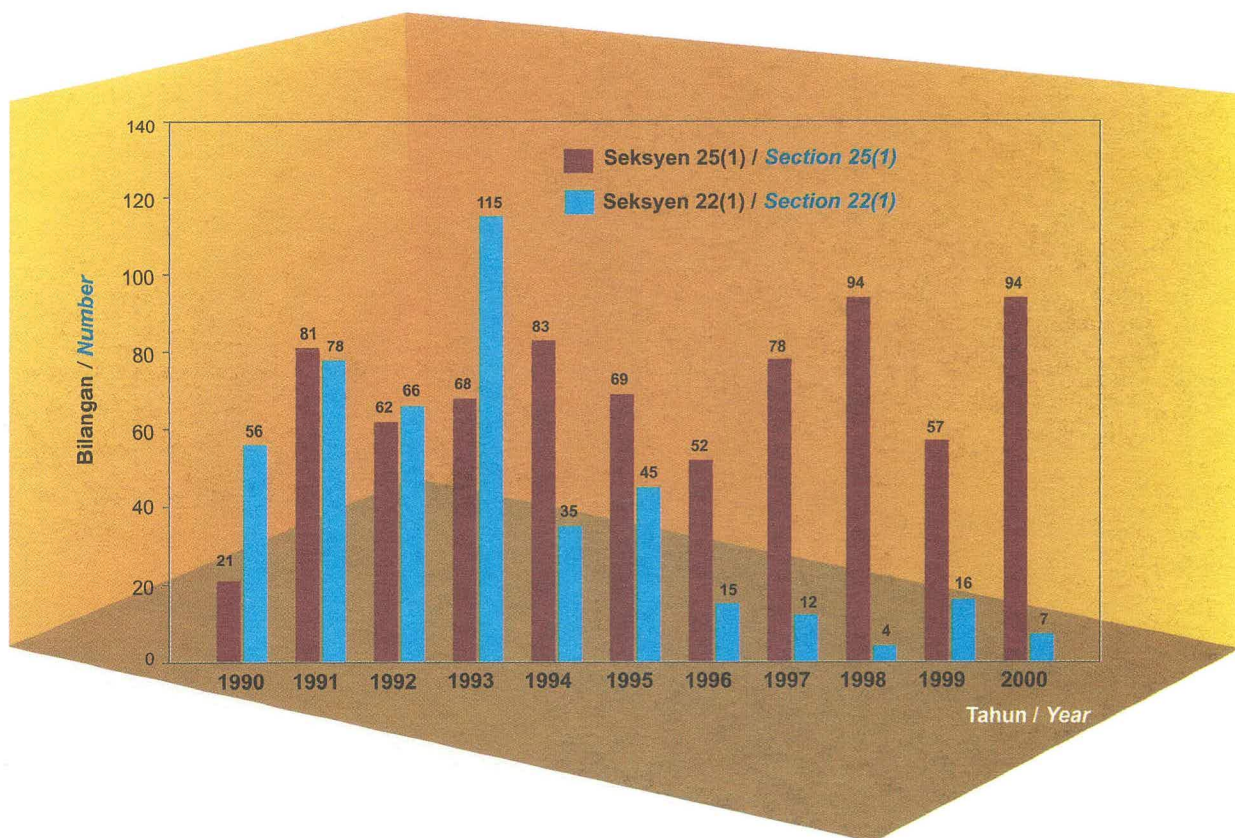
Dari semasa ke semasa, Pusat Operasi JAS turut menerima laporan daripada Unit Tentera Udara dan Syarikat Penerbangan MAS mengenai kejadian pencemaran seperti pencemaran minyak dan pembuangan minyak atau sisa minyak secara haram di perairan negara.

AIRBORNE SURVEILLANCE

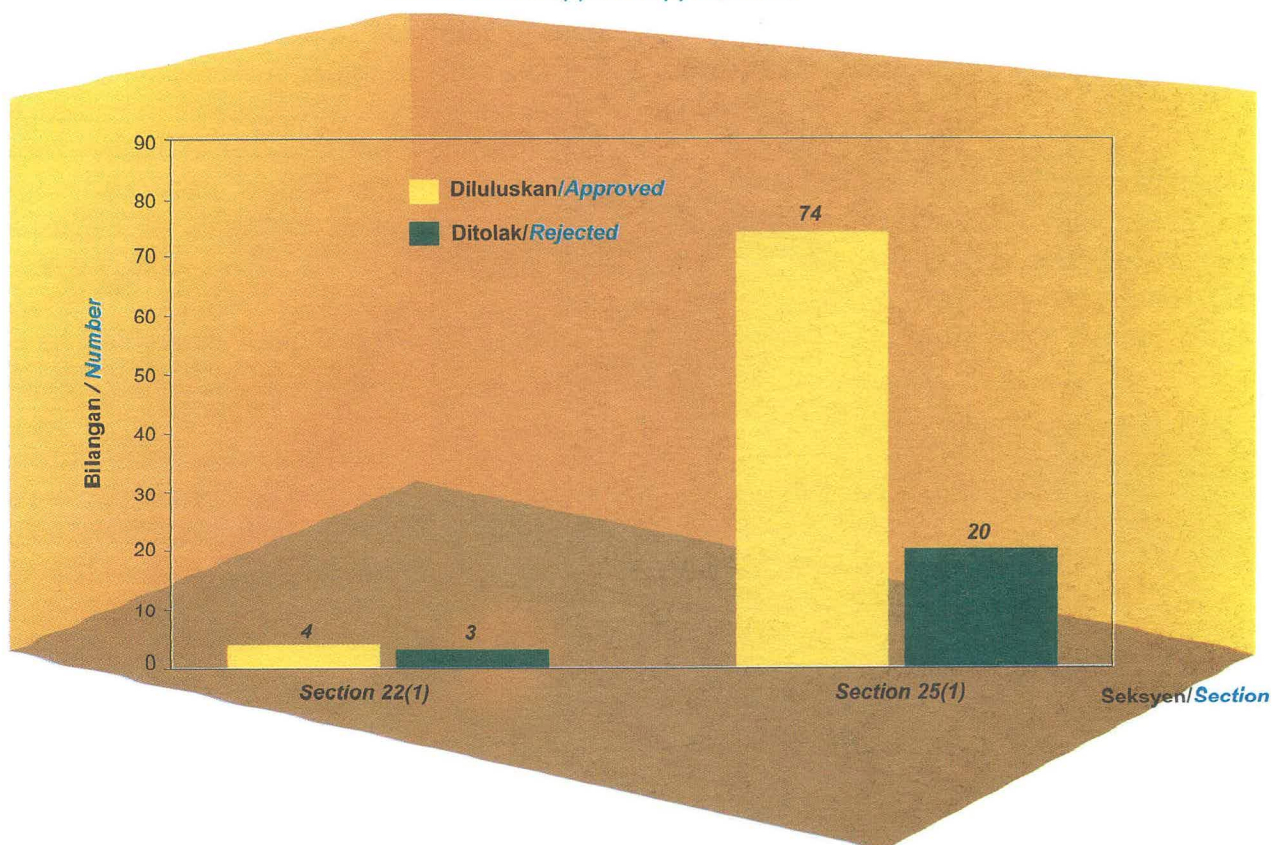
Like in previous years, air surveillance was conducted in 2000 with the assistance of the Royal Police Air Wing. An allocation of RM 3 million was provided for the use of helicopters and fixed-winged aircrafts.

Airborne surveillance was carried out to detect sources of pollution such as open burning activities, excessive smoke emissions from industrial stacks, coastal and marine pollution, monitoring of highland and island development and the like. Information obtained would be radioed to the DOE Operation Centre at the Head Office and to State Offices for necessary action. In the year 2000, 600 flights were carried out and 500 cases of violations were detected.

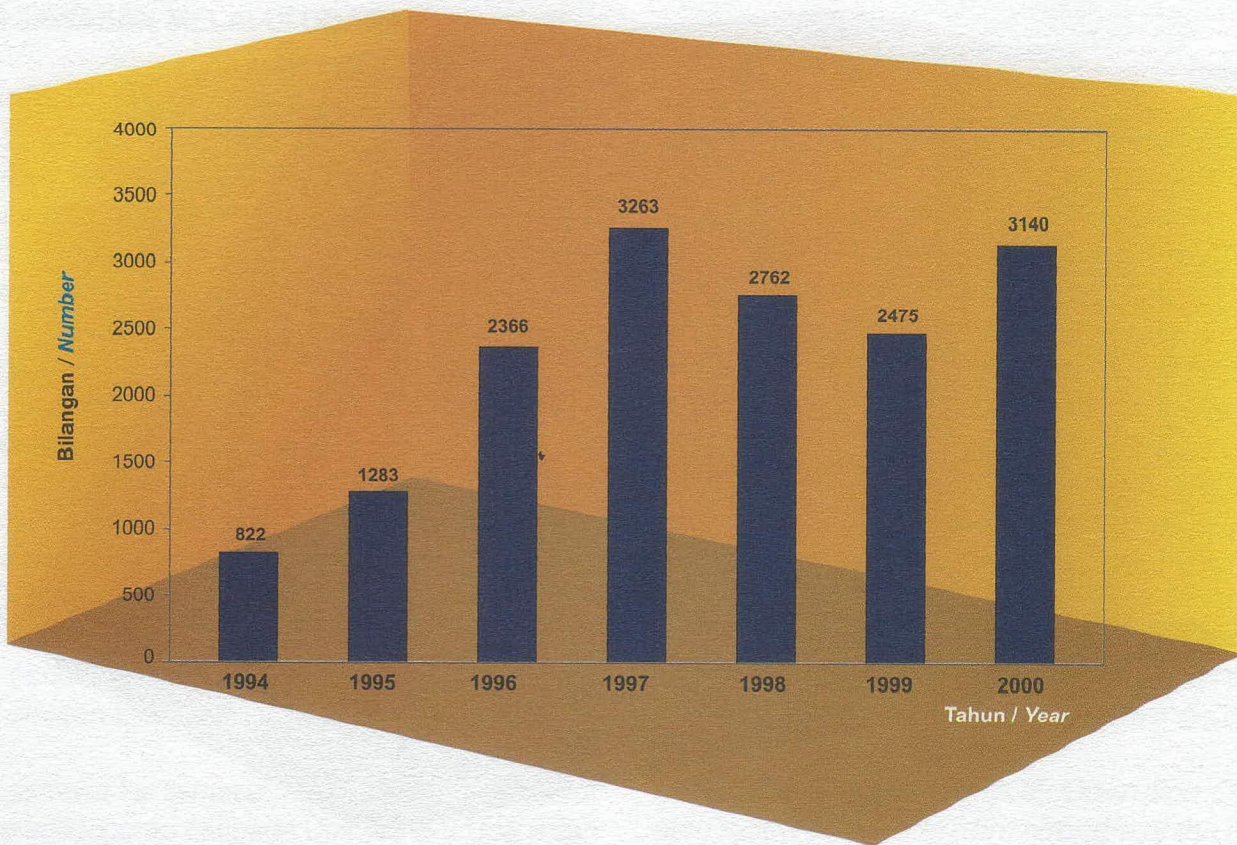
From time to time, the DOE Operation Centre also received reports from aircrafts of the Royal Malaysian Air Force and Malaysian Airline System (MAS) on pollution incidences such as oil pollution and illegal oily water discharges in Malaysian waters.



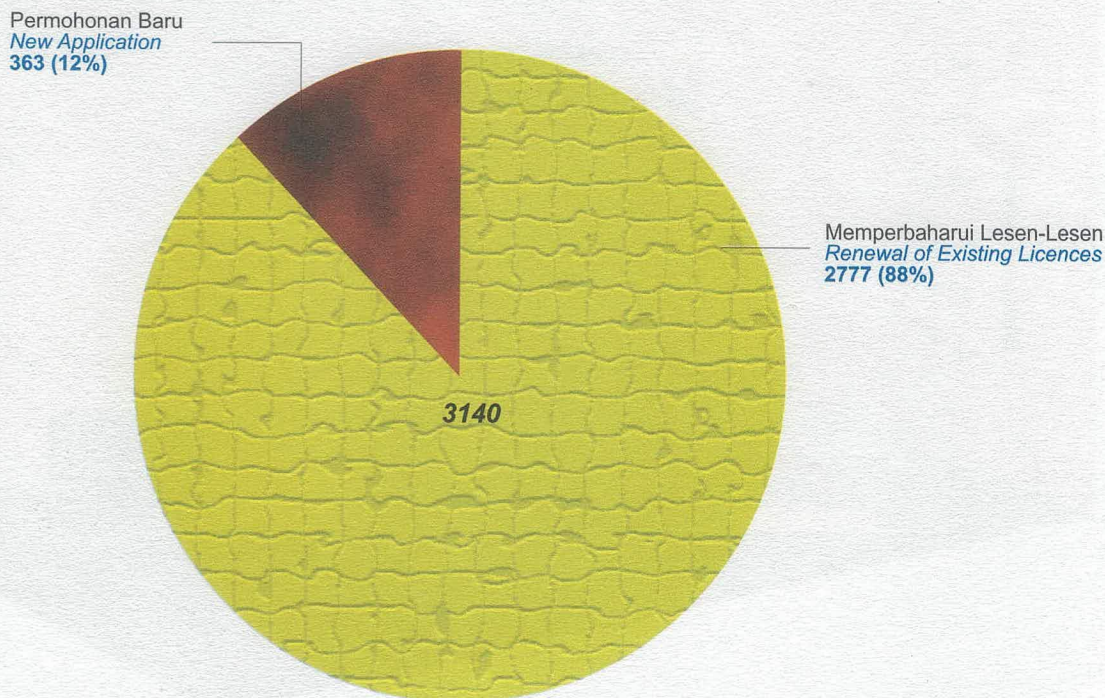
Rajah 5.10 Jabatan Alam Sekitar : Bilangan Permohonan Lesen Pelanggaran Di Bawah Seksyen 25(1) dan 22(1) AKAS 1974 (1990-2000)
 Figure 5.10 Department of Environment : Number of Applications For Contravention Licences Under Section 25(1) and 22(1) EQA 1974



Rajah 5.11 Jabatan Alam Sekitar : Permohonan Lesen Pelanggaran, 2000
 Figure 5.11 Department of Environment : Number of Applications for Contravention Licences, 2000



Rajah 5.12 Jabatan Alam Sekitar : Lesen Pelanggaran IWK Di Bawah Seksyen 25(1), AKAS 1974 ,(1994-2000)
Figure 5.12 Department of Environment : IWK Contravention Licences Under Section 25(1) EQA 1974, (1994-2000)



Rajah 5.13 Jabatan Alam Sekitar : Lesen Pelanggaran IWK Di Bawah Seksyen 25(1) AKAS 1974, (2000)
Figure 5.13 Department of Environment : IWK Contravention Licences Under Section 25(1) EQA 1974, 2000

PUNCA-PUNCA BERGERAK (KENDERAAN BERMOTOR)

Bilangan kenderaan bermotor yang berdaftar di Malaysia sehingga akhir tahun 2000 adalah sebanyak 10.6 juta, penambahan sebanyak 700,000 buah kenderaan (atau 7 %) berbanding dengan tahun 1999. Dari sejumlah 700,000 buah kenderaan baru yang didaftarkan ini, kategori motosikal dan kereta adalah yang paling tinggi bilangannya dengan masing-masing sebanyak 300,000 unit (atau 43 %), manakala baki selebihnya sebanyak 100,000 unit (14 %) adalah dari lain-lain jenis kenderaan termasuk lori, bas dan van.

Taburan bilangan kenderaan bermotor di Malaysia mengikut negeri adalah seperti di **Rajah 5.14**. Wilayah Persekutuan Kuala Lumpur masih mendahului negeri-negeri lain dengan mempunyai bilangan kenderaan yang tertinggi sebanyak 2.2 juta (atau 21 %) daripada keseluruhan yang berdaftar di negara ini; diikuti oleh negeri Johor, Selangor, Pulau Pinang dan Perak.

Berdasarkan kepada inventori beban pelepasan bahan pencemar, kenderaan bermotor di atas dianggarkan melepaskan sebanyak 2.04 juta tan metrik karbon monoksida(CO), 112,872 tan metrik hidrokarbon(HC), 190,293 tan metrik oksida nitrogen(NOx) dan 15,954 tan metrik bahan partikulat(PM) ke atmosfera terutamanya disekitar kawasan bandar.

Kawalan Pelepasan Asap/Gas Dari Kenderaan Bermotor

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

Di bawah peraturan-peraturan di atas, semua model-model baru kenderaan bermotor yang diperkenalkan pada atau selepas 1 Januari 1997 perlu mematuhi standard pelepasan 91/441/EEC bagi kereta, 93/

MOBILE SOURCES (MOTOR VEHICLE)

By the end of 2000, there were about 10.6 million registered motor vehicles in Malaysia, an increase of 700,000 (7%) compared to 1999. Out of these 700,000 new vehicles registered, motorcycles made up 43% (300,000), passenger cars 43% (300,000), while the remaining 100,000 (14%) comprised of various vehicular types such as lorries, buses and vans.

The distribution of registered vehicles throughout the States is given in Figure 5.14. The Federal Territory of Kuala Lumpur topped the other States with a vehicle population of 2.2 million (21%) followed by Johor, Selangor, Pulau Pinang and Perak.

According to emission load calculations, atmospheric pollutants from the 10.6 million vehicles would consist of 2.04 million metric tones of carbon monoxide, 112,872 metric tones of hydrocarbon, 190,293 metric tones of oxides of nitrogen and 15,954 metric tones of particulate matter.

Control Of Gaseous Emissions From Motor Vehicles

Pollutants emitted from vehicular exhausts such as carbon monoxide (CO), hydrocarbon (HC), oxides of nitrogen (NOx) and particulates are controlled under the Environmental Quality (Control of Emission from Diesel Engines)



Penguatkuasaan program AWASI
AWASI Enforcement Programme

59/EEC bagi kenderaan kommersil ringan dan ECE R 49-02(atau EURO 1) bagi kenderaan berat. Mulai pada atau selepas 1 Januari 2000, semua kereta model baru dikehendaki mematuhi standard pelepasan 94/12/EC.

Pematuhan oleh kenderaan - kenderaan model baru

Ujian pematuhan pelepasan ke atas model-model kenderaan baru di atas berdasarkan ujian kelulusan jenis adalah dilaksanakan melalui pemeriksaan ke atas Sijil Pematuhan Pelepasan atau Laporan Ujian Pelepasan yang dikeluarkan oleh pihak kilang pembuat kenderaan atau makmal ujian pelepasan kenderaan yang diiktiraf diperingkat antarabangsa.

Dari pemeriksaan yang dijalankan oleh JAS pada tahun 2000, semua 11 model kereta yang baru yang diperkenalkan dinegara ini didapati mematuhi standard pelepasan 94/12/EC yang telah ditetapkan oleh peraturan-peraturan JAS.

Kawalan pelepasan asap hitam ke atas kenderaan diesel

Peraturan bagi mengawal pelepasan asap daripada kenderaan diesel telah menetapkan supaya semua kenderaan diesel yang sedang beroperasi di jalanraya dikehendaki mematuhi had pelepasan asap hitam yang telah ditetapkan, ia itu 50 Unit Asap Hartridge. Penguatkuasaan peraturan ini dilaksanakan melalui Program AWASI(Area Watch And Sanction Inspection). Melalui Program AWASI ini, skuad bergerak JAS akan menahan dan menguji kenderaan diesel dengan menggunakan meterasap Hartridge.

Di sepanjang tahun 2000, sebanyak 946 operasi penguatkuasaan AWASI telah dilaksanakan diseluruh negara. Dalam operasi tersebut, sebanyak 108,017 buah kenderaan diesel telah diperhatikan pelepasan asapnya secara visual. Dari jumlah tersebut, sebanyak 3,542 buah kenderaan telah disaman kerana gagal mematuhi had 50 Unit Asap Hartridge yang telah ditetapkan, manakala 960 daripadanya telah dikenakan perintah larangan beroperasi sehingga dibaikpulih dan lulus ujian asap semula oleh JAS. Pematuhan keseluruhan pelepasan asap

Regulations 1996, and the Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996.

Under these regulations, all new models of motor vehicles introduced on or after 1 January 1997 would have to comply with the requirements of 91/441/EEC for motorcars, 93/59/EEC for light commercial vehicles and ECE R 49-02 (EURO 1) for heavy vehicles. Beginning on or after 1 January 2000, all new models of vehicles have to comply with 94/12/EC emission standard.

Compliance By New Vehicle Models Of Vehicles.

Emission compliance testing on new motor vehicles based on type approval testing was implemented based on Emission Compliance Certificates or Emission Test Reports provided by vehicle manufacturers or by internationally recognised Vehicle Emission Testing Laboratories.

In the year 2000, all new models of vehicles introduced into the country were found to comply with 94/12/EC emission standard as stipulated in the regulations.

Control Of Black Smoke Emissions From Diesel Vehicles

The regulations for the control of emission from diesel vehicles stipulate that all diesel vehicles on the road are required to comply with the black smoke emission limits of 50 Hartridge Units. Enforcement was carried out through the AWASI Programme (Area Watch and Sanction Inspection). Under this program, mobile squads would stop and test diesel vehicles with the Hartridge Smokemeter.

Throughout 2000, a total of 946 AWASI enforcement operations were conducted in the country. Some 108,017 diesel vehicles were visually inspected, of which 3,542 were summoned for failing to comply with the 50 Hartridge limit, 960 of them were issued with

hitam oleh kenderaan diesel adalah sebanyak 96.7%.
(Rajah 5.15 dan 5.16)

Tindakan mahkamah telah juga diambil ke atas 55 pemandu serta tuan-tuanpunya kenderaan kerana gagal menjelaskan kompaun asap hitam yang telah dikenakan.

Pelepasan gas CO dan HC ke atas kenderaan petrol

Peraturan yang mengawal pelepasan gas daripada kenderaan petrol (1996) juga menghendaki supaya semua kenderaan petrol yang beroperasi di jalanraya mematuhi pelepasan gas CO dan HC. Had yang telah ditetapkan adalah seperti berikut:

	Kenderaan Lama (Model sebelum 1 Januari 1997 <i>Old Motor Vehicles</i> (Model before 1 January 1997)	Kenderaan Baru (Model selepas 1 Januari 1997 <i>New Motor Vehicles</i> (Model after 1 January 1997)
Had CO yang dibenarkan <i>CO permissible limits</i>	4.5%	3.5%
Had HC yang dibenarkan <i>HC permissible limits</i>	800ppm	600ppm

Penguatkuasaan peraturan bagi injin petrol ini masih lagi dalam peringkat pengenalan kepada orang ramai melalui pelaksanaan kempen-kempen kesedaran. Di sepanjang tahun 2000, sejumlah 1089 buah kenderaan petrol telah diuji pelepasan CO dan HC dari ekzos kenderaan masing-masing. Dari sejumlah ini, 845 (77.6%) kenderaan telah mematuhi had CO dan HC.

Usaha-usaha awal telah dirancang untuk melaksanakan program mewujudkan pusat-pusat ujian yang diluluskan oleh JAS pada awal tahun 2001 bagi tujuan membolehkan orang ramai menghantar kenderaan mereka untuk menjalani ujian pelepasan CO, HC dan juga asap hitam. Pusat-pusat ini turut dapat memperbaiki kenderaan yang tidak mematuhi had yang ditetapkan.

PETROL TANPA PLUMBUM

Dalam menyahut seruan Kerajaan untuk mempertingkatkan kualiti minyak petrol ke arah penggunaan petrol tanpa plumbum, syarikat-syarikat minyak di Malaysia telah mula mempromosikan

prohibition orders and only allowed back on the road after rectification and retesting by DOE. The overall compliance for diesel vehicles was 96.7% (Figure 5.15 and 5.16).

Fifty five drivers and vehicle owners were prosecuted in court for failure to settle compound fines.

CONTROL OF CO AND HC GAS EMISSIONS FROM PETROL VEHICLES

The 1996 regulations for the control of gaseous emissions from petrol vehicles stipulate that all vehicles on the road are required to comply with the CO and HC limits as follows:

The enforcement of emission limits for petrol engines is still in its preliminary phase, mainly on awareness campaigns. However in 2000, a total of 1,089 petrol driven vehicles were tested for CO and HC emissions. From this sample size, only 845 vehicles (77.6%) complied with the CO and HC limits.

Steps are underway to plan and establish or designate DOE approved testing centers in 2001 so as to enable vehicle owners to send their vehicles for CO, HC and black smoke testing. These centres could also serve as repair centres for non-complying vehicles.

UNLEADED PETROL

In response to the government directive to improve fuel quality and use of unleaded petrol, oil companies operating in Malaysia started promoting the use of unleaded petrol from 1991. Since then, the sale of unleaded petrol increased from year to year until it achieved 100% in 1999. From feedback submitted by oil

petrol tanpa plumbum dipasaran negara sejak 1991. Sejak itu, peratus penjualan petrol tanpa plumbum telah meningkat dari tahun ke tahun dan telah mencapai tahap 100 % pada tahun 1999. Dari kompilasi laporan bulanan jualan runcit yang dikemukakan oleh kesemua syarikat-syarikat minyak kepada JAS di sepanjang tahun 2000, adalah didapati semua stesen-stesen petrol di seluruh negara telah menjual petrol tanpa plumbum. Tren penjualan petrol tanpa plumbum dari pam minyak mulai 1993 hingga 2000 adalah seperti di **Rajah 5.17**.

BUNYI BISING KENDERAAN BERMOTOR

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

Dari operasi penguatkuasaan yang telah dijalankan oleh pejabat-pejabat negeri JAS Polis DiRaja Malaysia (Cawangan Trafik) di sepanjang tahun 2000, sejumlah 3,522 motosikal telah menjalani ujian pelepasan bunyi bising. Dari jumlah ini, 565 telah disaman kerana melanggar had bunyi bising yang dibenarkan. Peratus pematuhan secara keseluruhannya ialah 84 % (**Rajah 5.18**).

Pada tahun 2000, sejumlah 2847 buah motosikal baru yang meliputi 25 model yang berlainan telah di uji di lima kilang pemasangan dan peratus pematuhannya ialah 100% (**Rajah 5.19**).

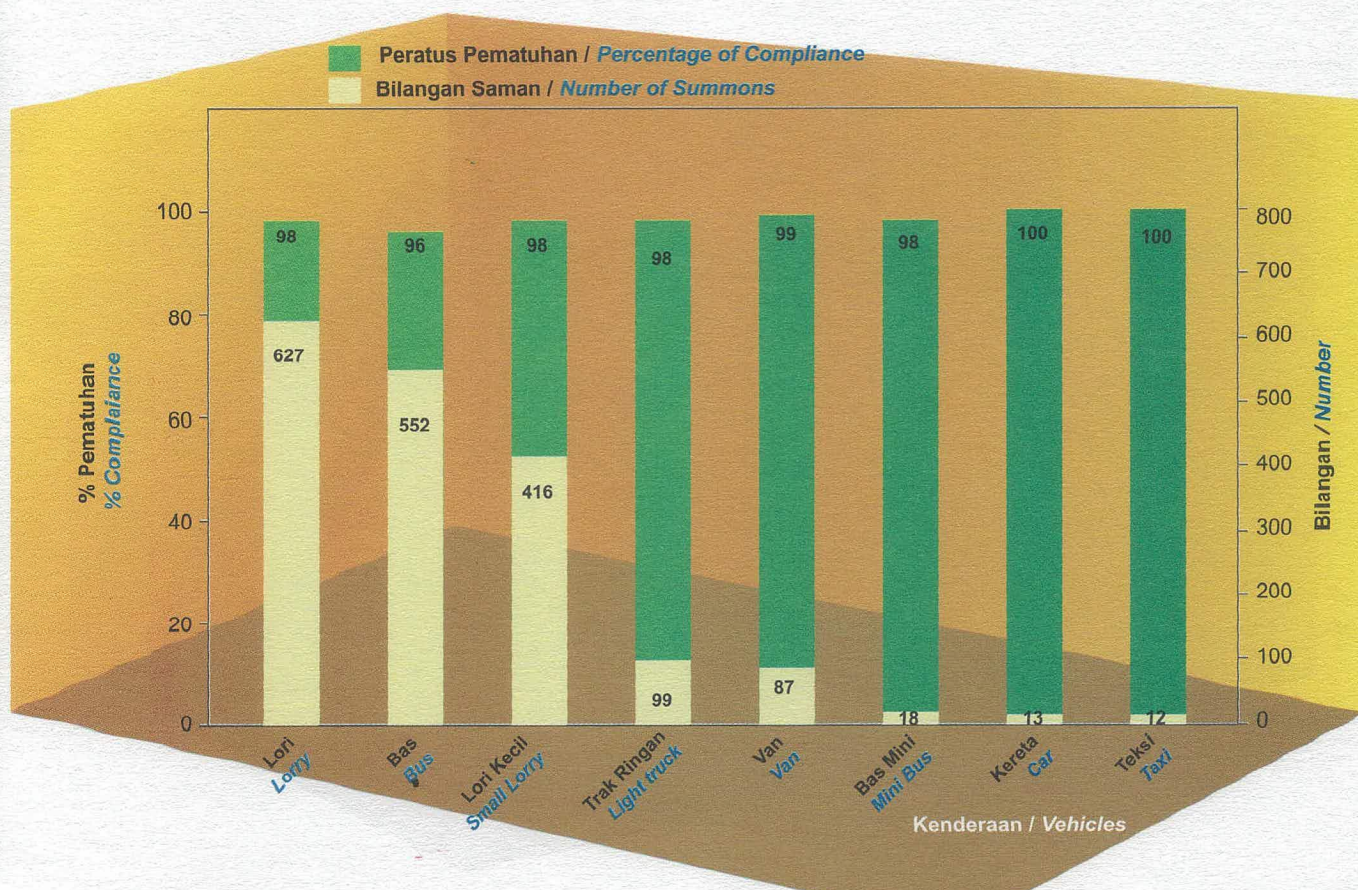
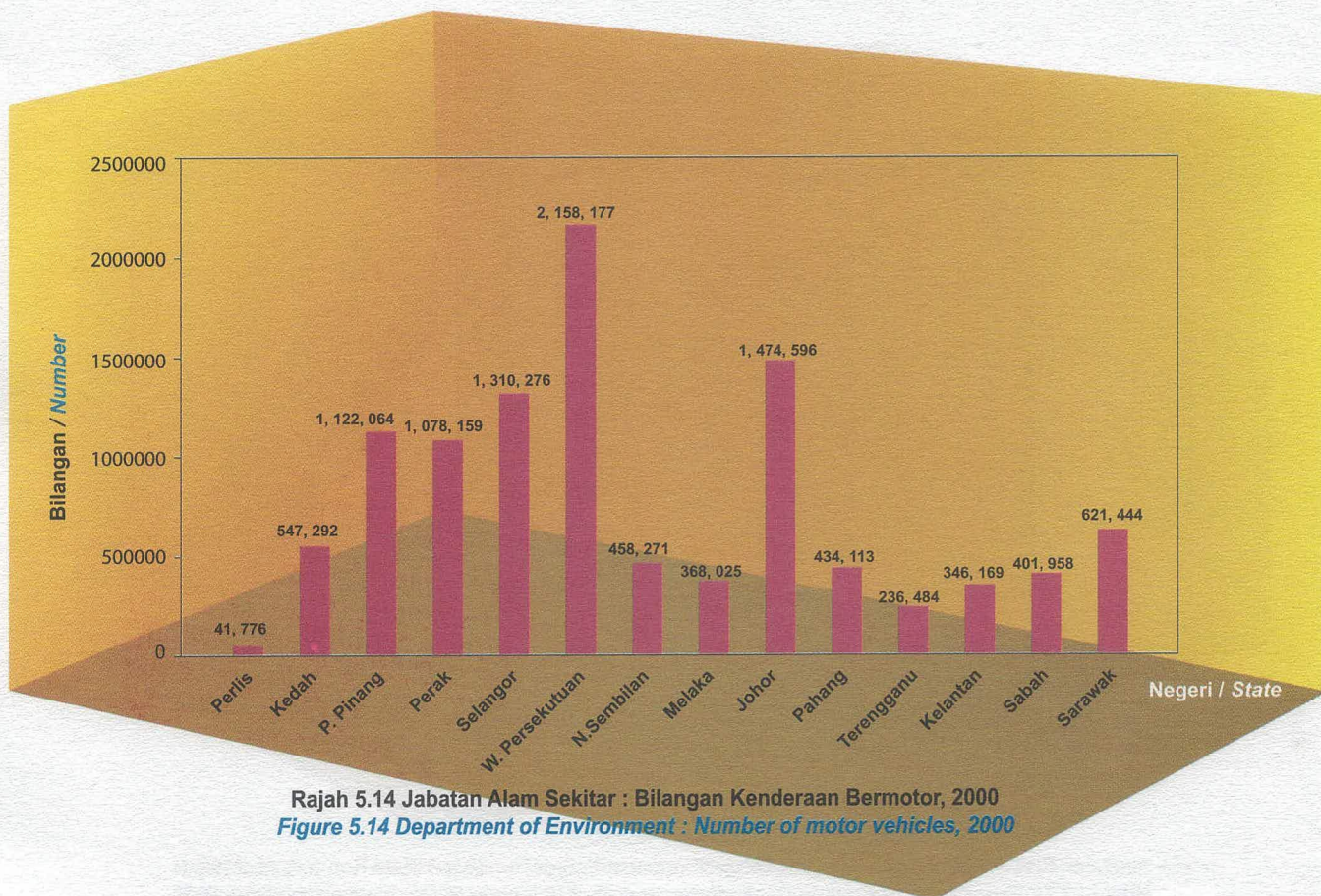
*companies throughout the country in 2000, it was reported that all petrol stations in the country were selling unleaded petrol. The sales figure of unleaded petrol between 1993 to 2000 is as shown in **Figure 5.17**.*

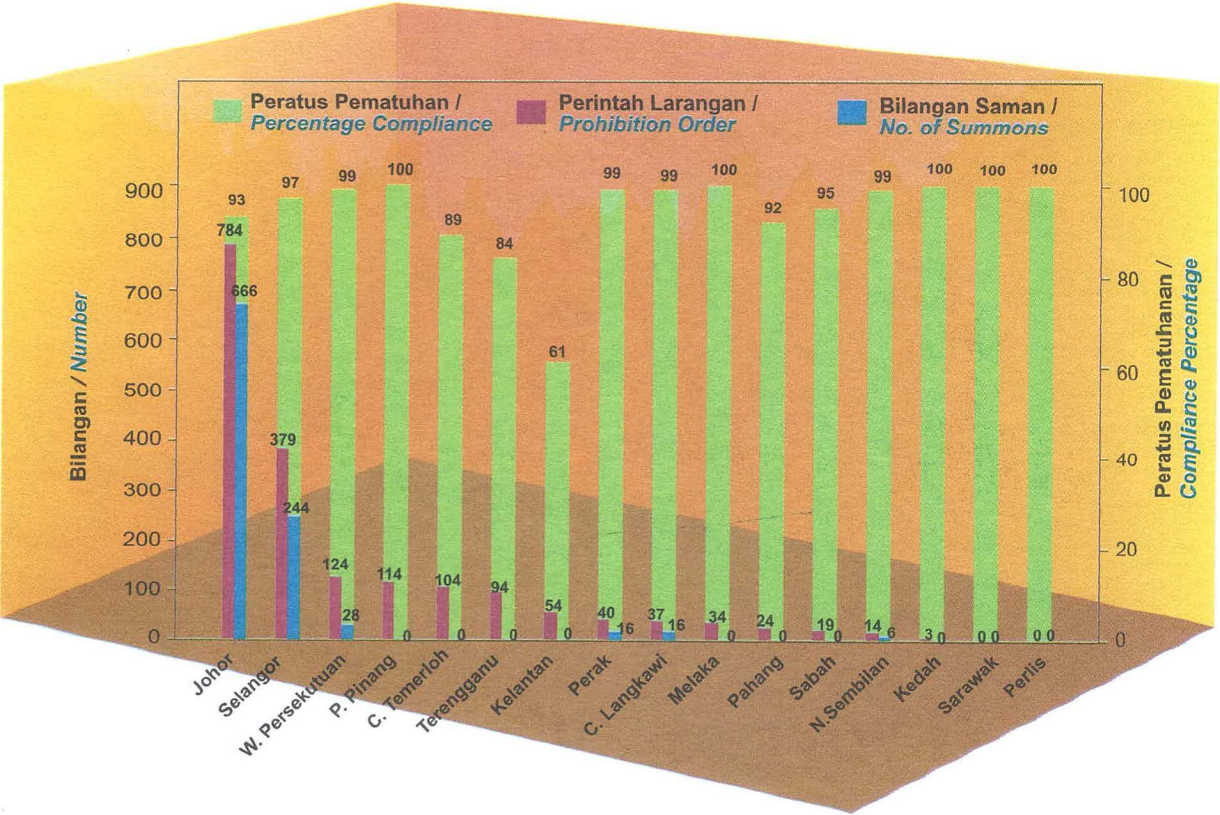
NOISE FROM MOTOR VEHICLES

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

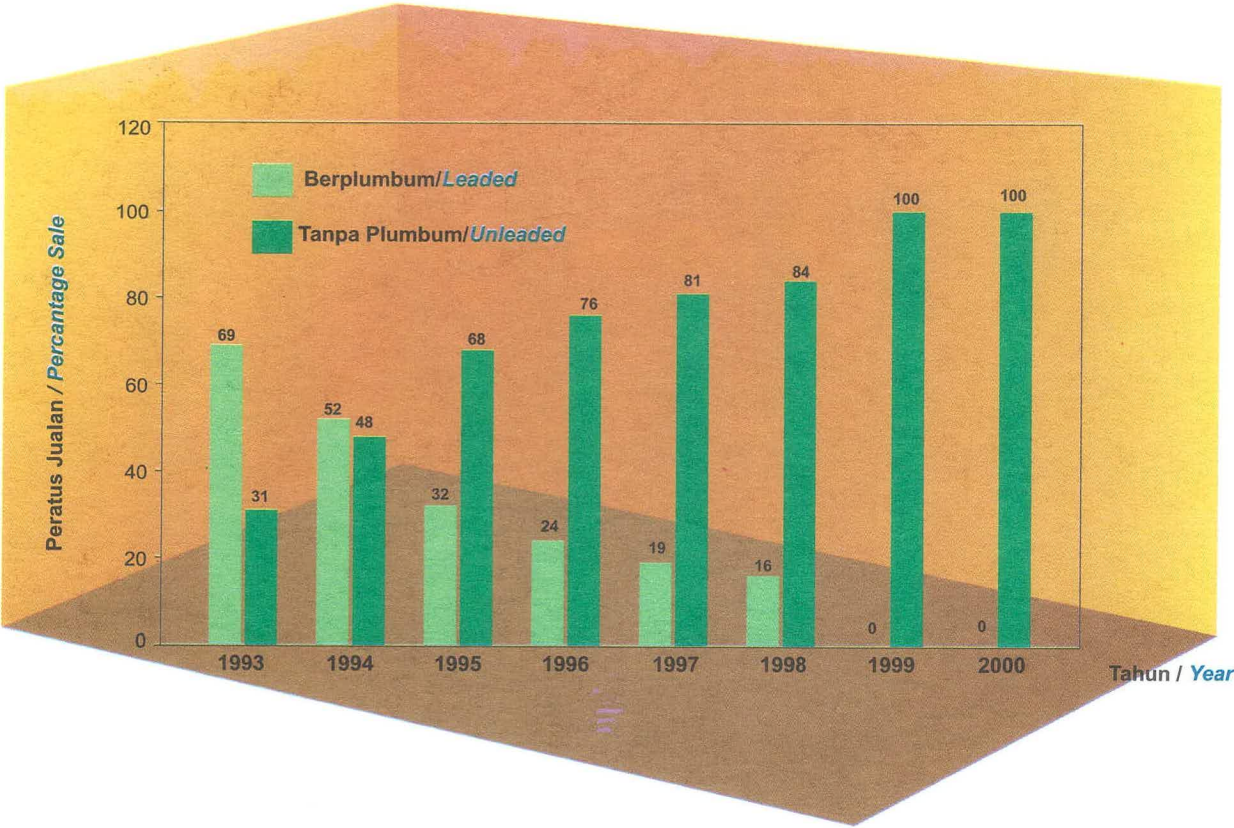
*Based on curbside enforcement campaigns that were conducted by State DOE Offices with the cooperation of the Traffic Police in 2000, a total of 3,522 motorcycles were tested, and 565 were compounded for exceeding the noise limits. The overall compliance was 84% (**Figure 5.18**), an improvement of 6.2% over 1999.*

*In 2000, 2,847 new motorcycles comprising of 25 different models were randomly tested at the five assembly plants in the country and the compliance was 100% (**Figure 5.19**).*

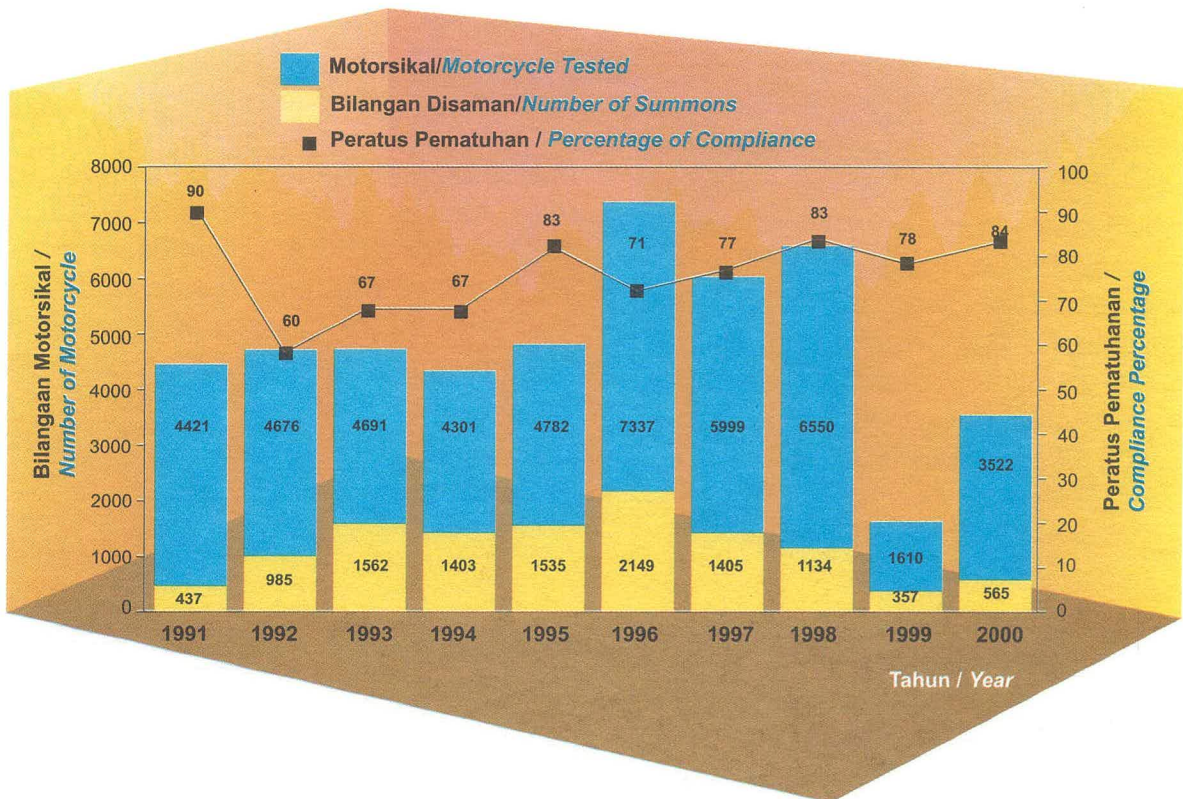




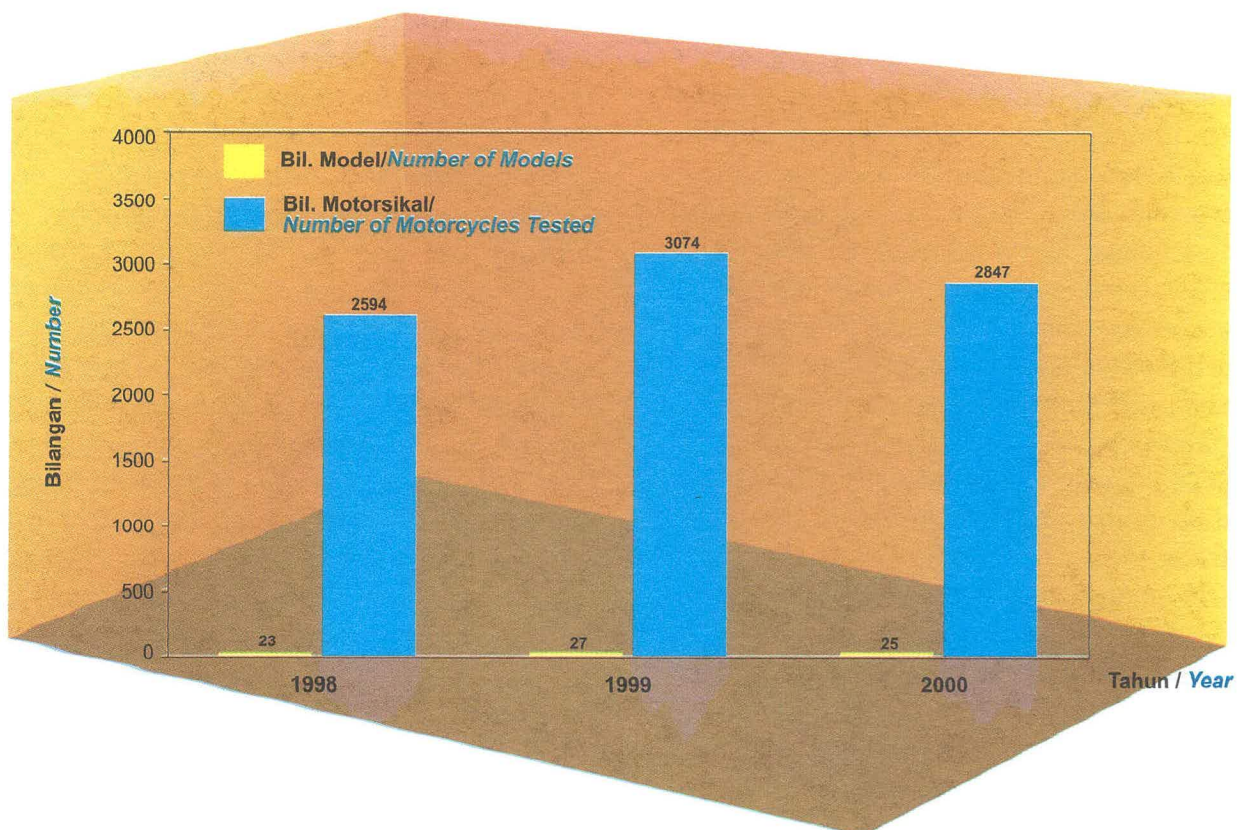
Rajah 5.16 Jabatan Alam Sekitar : Penguatkuasaan Pelepasan Asap Hitam Kenderaan, 2000
Figure 5.16 Department of Environment : Enforcement of Vehicular Black Smoke Emission, 2000



Rajah 5.17 Jabatan Alam Sekitar : Peratus jualan Gasolin Berplumbum dan Tanpa Plumbum, 1993-2000
Figure 5.17 Department of Environment : Sale of Leaded and Unleaded Gasoline, 1993-2000



Rajah 5.18 Jabatan Alam Sekitar : Penguatkuasaan Bunyi Bising Kenderaan Motosikal 1991-2000
 Figure 5.18 Department of Environment : Motorcycle Noise Environment Enforcement, 1991-2000



Rajah 5.19 Jabatan Alam Sekitar : Ujian Pelepasan Bunyi Bising Motosikal Oleh Syarikat Pengeluar Motosikal, 1998-2000
 Figure 5.19 Department of Environment : Noise Testing by Motorcycle Assemblers, 1998-2000

TINDAKAN UNDANG-UNDANG

PENDAKWAAN

Pada tahun 2000, sejumlah 158 premis/syarikat telah didakwa dan disabitkan kesalahan oleh mahkamah. Ini melibatkan denda berjumlah RM 3,506,800.00. Bilangan kes telah menurun sebanyak 49 peratus berbanding tahun lepas tetapi dari segi jumlah denda telah meningkat sebanyak 29 peratus. Kebanyakan kes yang didakwa melibatkan kesalahan pencemaran pengairan daratan di bawah Seksyen 25(1) AKAS, 1974 (**Rajah 5.20, 5.21 dan 5.22**).

KOMPAUN

Pada tahun 2000, sejumlah 1,645 kompaun dikeluarkan kepada premis-premis dan syarikat-syarikat disebabkan oleh berbagai kesalahan, dengan nilai RM 2,560,000.00. Daripada jumlah tersebut, 65 peratus merupakan kes-kes yang melibatkan pencemaran udara, sementara bakinya sebanyak 35 peratus melibatkan pengendalian bahan Buangan Terjadual yang tidak teratur. (**Rajah 5.23 dan 5.24**).

PERINTAH LARANGAN

Di bawah Seksyen 31A Akta Kualiti Alam Sekeliling 1974 (pindaan 1998), Ketua Pengarah Alam Sekeliling boleh mengeluarkan perintah larangan kepada pemilik atau penduduk kilang perindustrian atau menghalang kilang daripada beroperasi dan melepaskan bahan pencemar kepada alam sekitar. Perintah Larangan dikenakan adalah langkah terakhir selepas beberapa nasihat, amaran dan peringatan yang telah dikeluarkan kepada pengilang tetapi masih gagal dipatuhi. Pada tahun 2000, sebanyak 6 perintah larangan telah dikenakan. Dua (2) kes bagi kesalahan pencemaran air daratan iaitu kilang berasaskan logam dan kilang berasaskan getah sementara empat(4) lagi bagi kesalahan pencemaran udara yang melibatkan kilang kayu dan kilang berasaskan logam. Industri yang dikenakan tindakan ini hanya akan dibenarkan beroperasi setelah langkah-langkah baikpulih diambil bagi mencegah pencemaran alam sekitar dari berterusan.

LEGAL ACTION

PROSECUTION

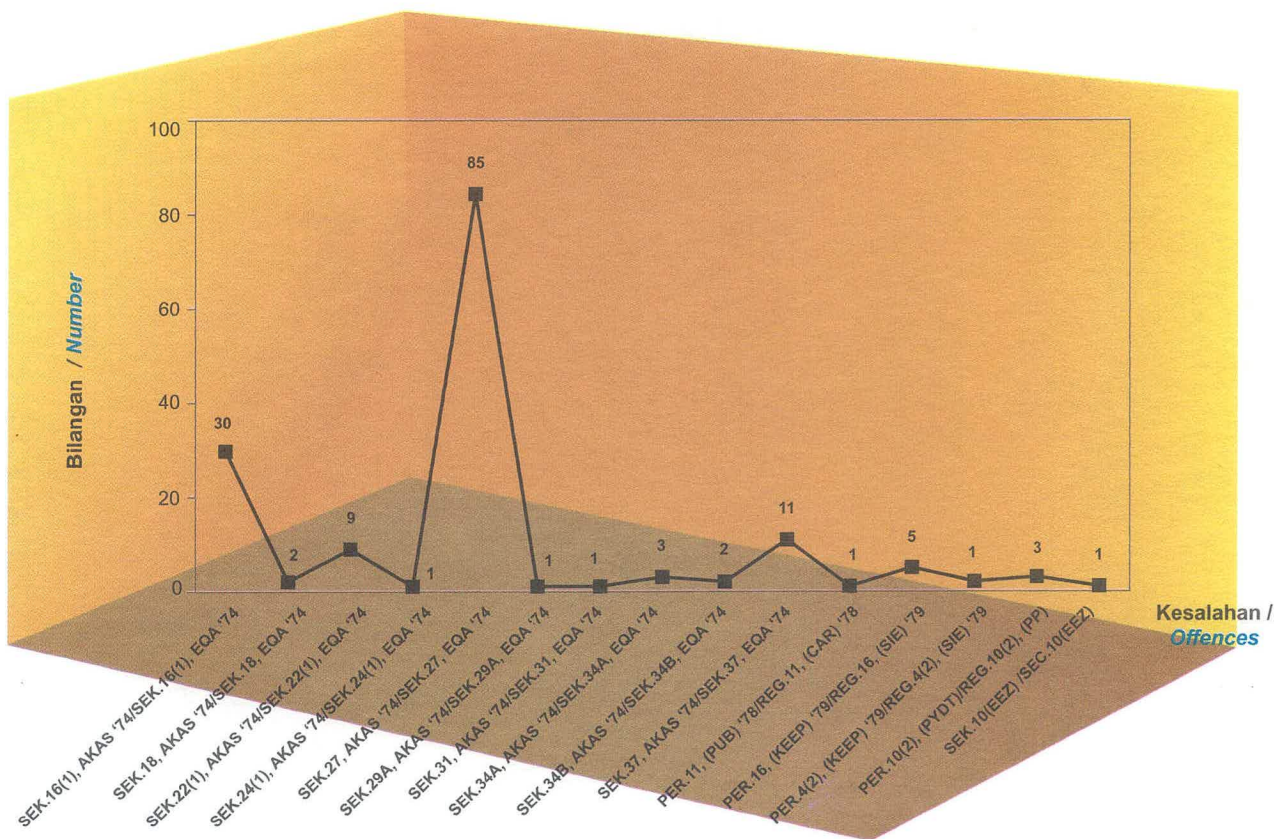
*A total of 158 premises and companies were taken to court and fined a total of RM 3,506,800.00. This represented an increase of 29 % in fines, though the number of cases decreased by 49 % compared to 1999. The majority of cases involved offences for pollution of inland waters under Section 25(1) of the Environment Quality Act, 1974 (**Figures 5.20, 5.21 and 5.22**).*

COMPOUNDS

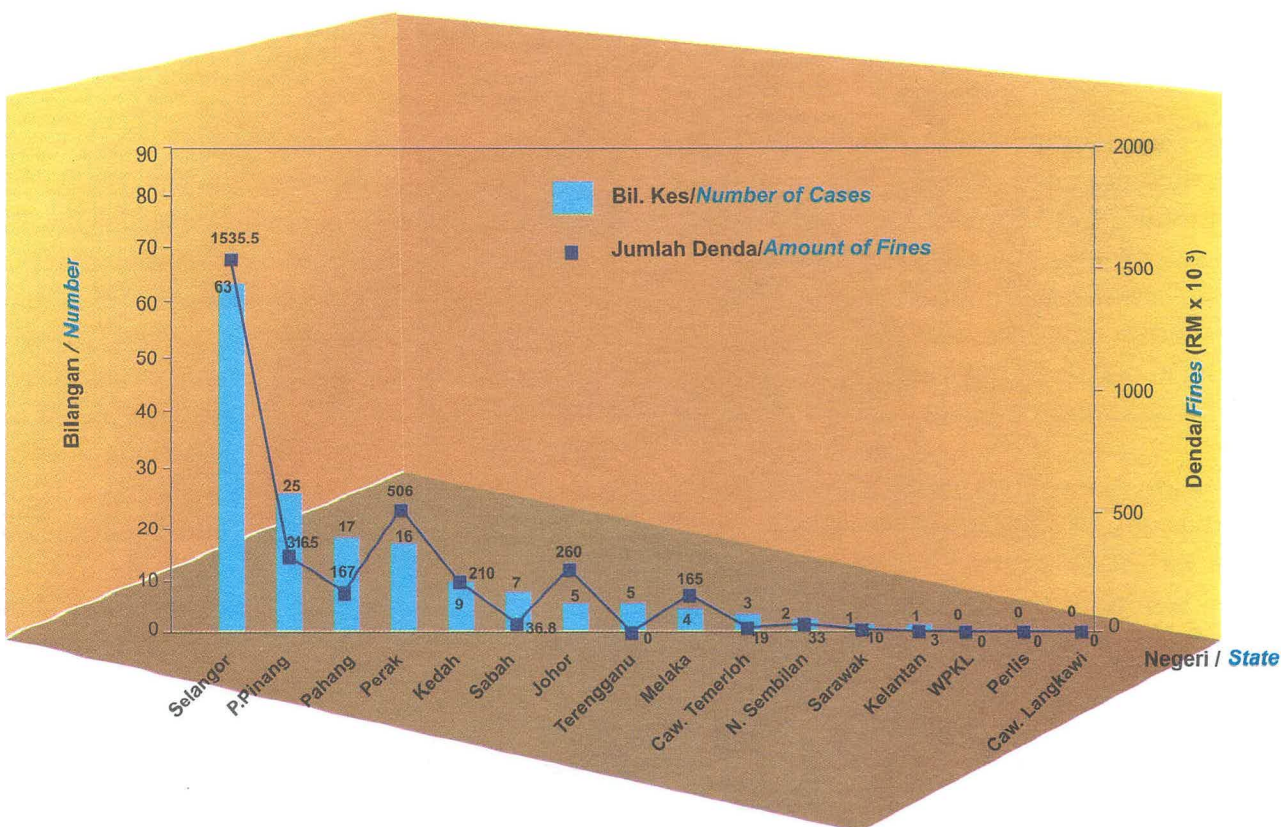
*A total of 1,645 compounds notices were issued against premises and companies for various offences amounting to RM 2,560,000.00. Out of this total, 65 % were for air pollution offences, while the remaining 35 % were offences involving handling of scheduled wastes (**Figure 5.23 and 5.24**).*

PROHIBITION ORDERS

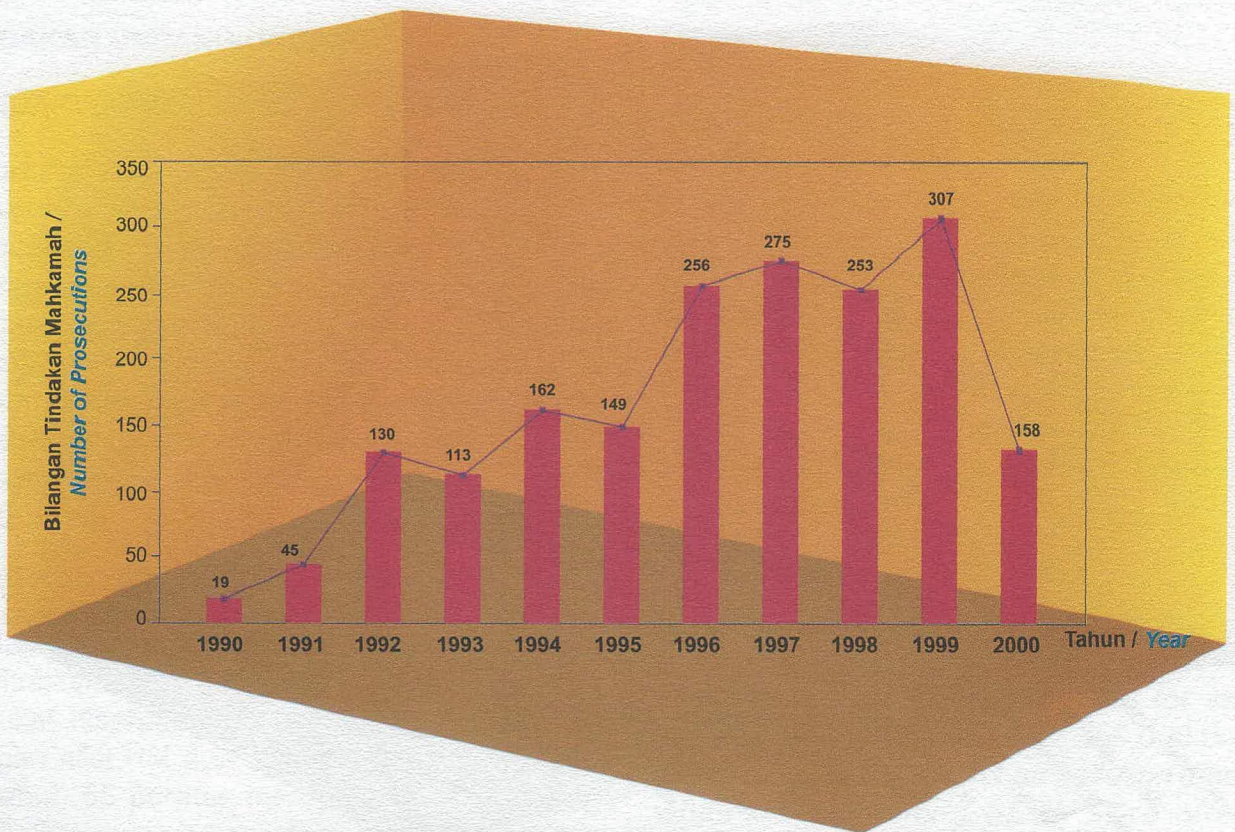
Under Section 31A of the Environmental Quality Act 1974 (amendment 1998), the Director General may issue prohibition orders to owners or occupiers of industrial premises or processes to stop operation and prevent further releases of environmentally hazardous substances or pollutants into the environment. Such prohibition orders are issued only as a last resort after repeated advice, warnings and reminders have been given but not heeded. In the year 2000, 6 prohibition orders were issued, 2 for inland water pollution from metal-based and rubber-based industries and 4 for air pollution offences involving wood-based and metal-based industries. Such premises were only be allowed to operate after remedial steps had been taken to prevent recurrence.



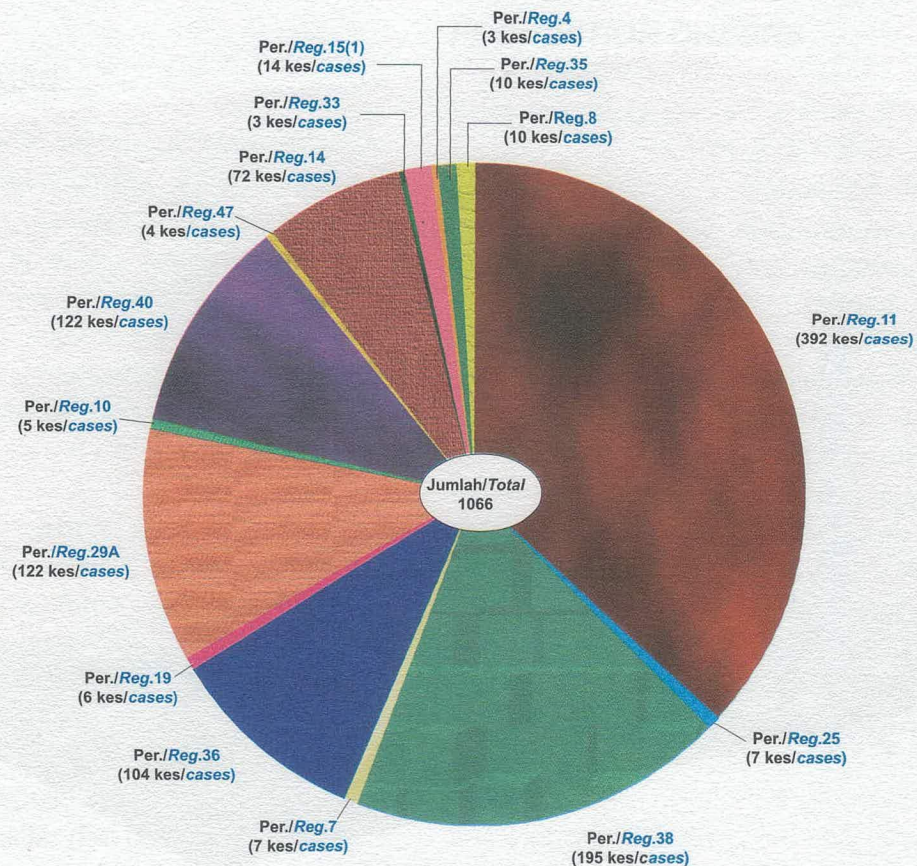
Rajah 5.20 Jabatan Alam Sekitar : Kes-kes pendakwaan dan jenis Kesalahan, 2000
Figure 5.20 Department of Environment : Prosecution cases and types of Offences, 2000



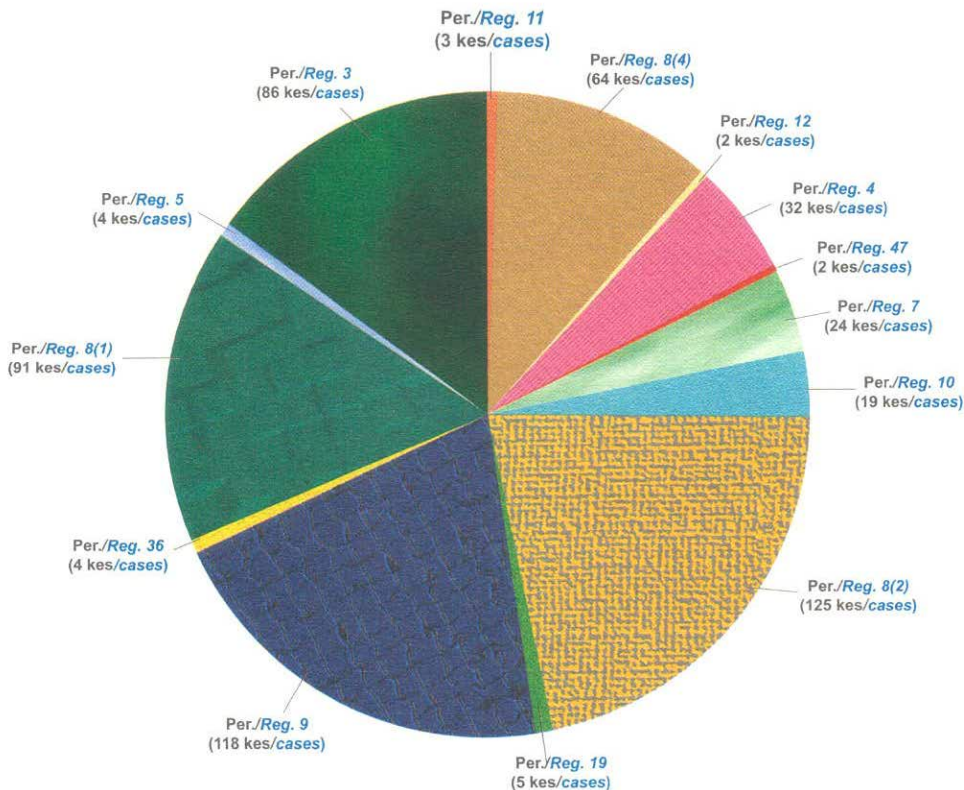
Rajah 5.21 Jabatan Alam Sekitar : Kes-Kes Yang Didakwa dan Hukuman Yang Dikenakan, 2000
Figure 5.21 Department of Environment : Cases Prosecuted and Fines Imposed, 2000



Rajah 5.22 Jabatan Alam Sekitar : Bilangan Kes Mahkamah, 1990-2000
 Figure 5.22 Department of Environment : Number of Court Cases, 1990-2000



Rajah 5.23 Jabatan Alam Sekitar : Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978- Komaun yang dikeluarkan, 2000
 Figure 5.23 Department of Environment : Environmental Quality (Clean Air) Regulations 1978- Compounds issued, 2000



Rajah 5.24 Jabatan Alam Sekitar : Peraturan Kualiti Alam Sekitar (Buangan Terjadual) 1989 - Kompaun yang dikeluarkan, 2000
Figure 5.24 Department of Environment : Environmental Quality (Scheduled Waste) Regulation 1989- Compounds Issued, 2000

MAKLUMBALAS TERHADAP PENGADUAN AWAM

Jabatan Alam Sekitar telah menerima sebanyak 2,284 aduan pencemaran alam sekitar pada tahun 2000. Jumlah ini berkurangan sebanyak 167 aduan (6.8 %) jika dibandingkan dengan tahun sebelumnya (**Rajah 5.25**). Daripada jumlah tersebut, JAS telah menyasat dan mengambil tindakan pembaikan atau penyelesaian ke atas 1,916 aduan. Sementara aduan yang selebihnya iaitu sebanyak 368 telah dirujuk kepada agensi-agensi lain yang berkenaan untuk tindakan selanjutnya kerana masalah yang diadukan tidak tertakluk di bawah bidangkuasa JAS.

Negeri Perak mencatat penerimaan aduan yang tertinggi iaitu sebanyak 329 (14.4%) daripada jumlah keseluruhan aduan, diikuti oleh Kuala Lumpur 304 (13.3%) dan Johor 271 (11.9%). Perlis pula mencatat penerimaan aduan yang terendah iaitu sebanyak 29. Pecahan bilangan dan jenis aduan yang diterima mengikut negeri adalah seperti **Rajah 5.26**.

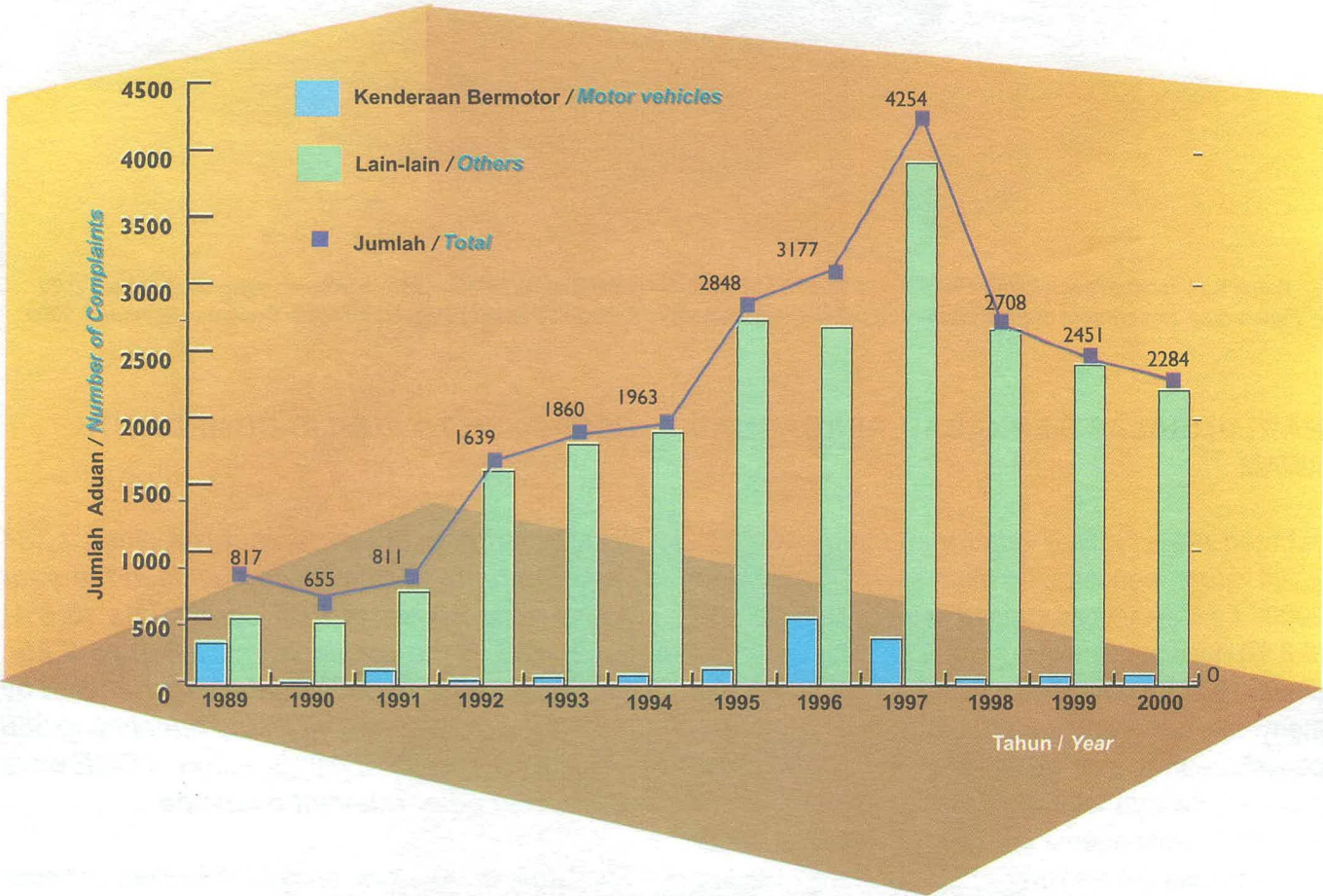
RESPONSE TO PUBLIC COMPLAINTS

*The Department of Environment received 2,284 environmental pollution complaints in the year 2000, a decrease of 167 complaints (6.8%) compared to the previous year (**Figure 5.25**). Of this total, 1,916 complaints were handled by the State DOE Offices, while the remaining 368 which were outside the jurisdiction of DOE were referred to other relevant agencies.*

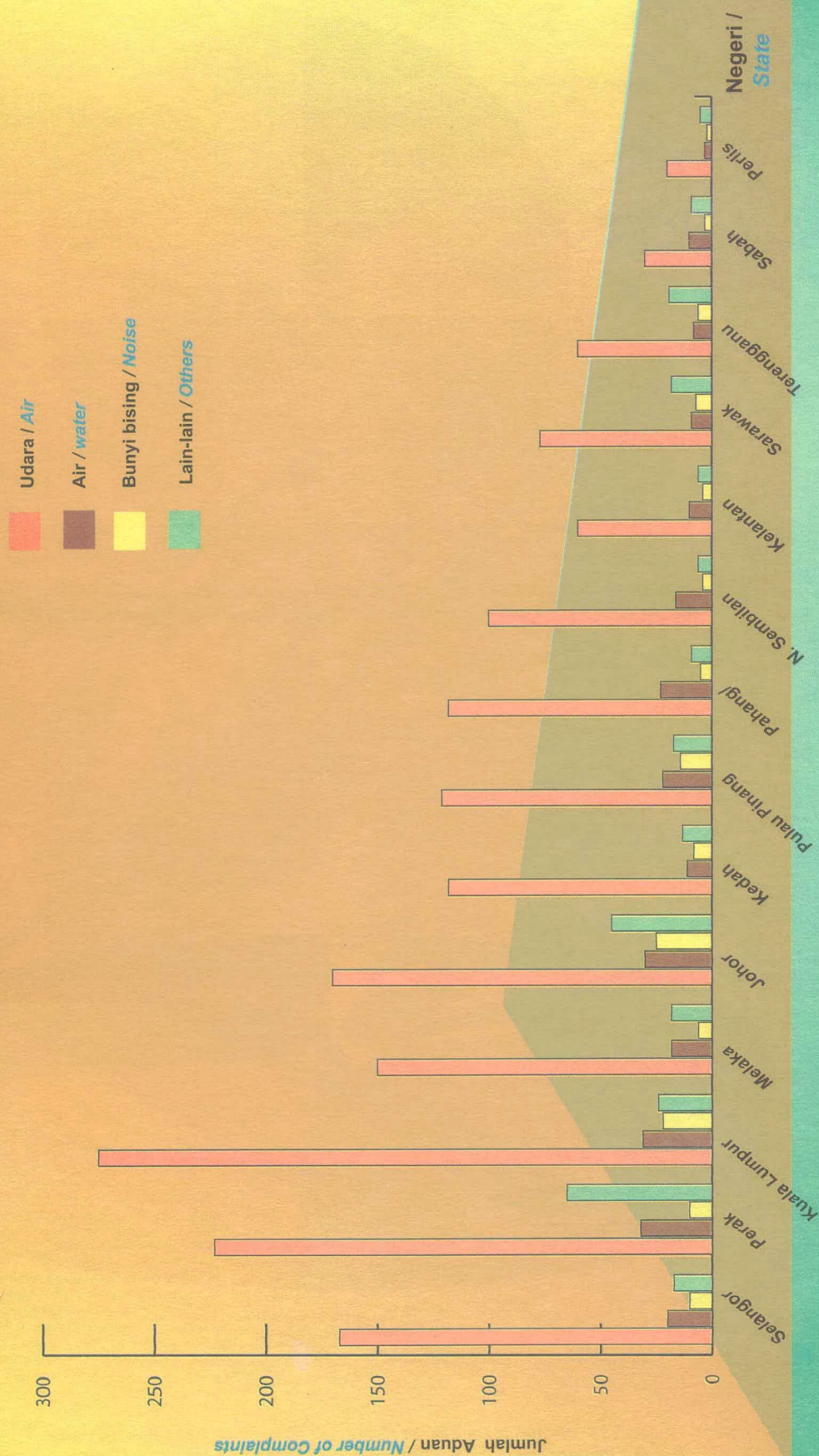
*The State of Perak recorded the highest number of complaints received 329 (14.4% of the total), followed by Kuala Lumpur (304, 13.3%) and Johor (271, 11.9%). Perlis recorded the least number (29, 0.01%) (**Figure 5.26**).*

Antara aduan-aduan yang kerap diterima adalah terdiri daripada pembakaran terbuka di tapak pelupusan sampah haram, pelepasan habuk dari sector industri berasaskan kayu dan kacau ganggu punca-punca bukan industri. Daripada jumlah keseluruhan aduan pencemaran yang diterima sebanyak 74% (1960) berkaitan pencemaran udara, 10% pencemaran air dan 5% bunyi bising (Rajah 5.27). Pemerhatian terperinci yang dibuat terhadap punca-punca aduan pencemaran udara, di dapati punca utama (30%) adalah pembakaran terbuka di tapak pelupusan sampah (Rajah 5.28).

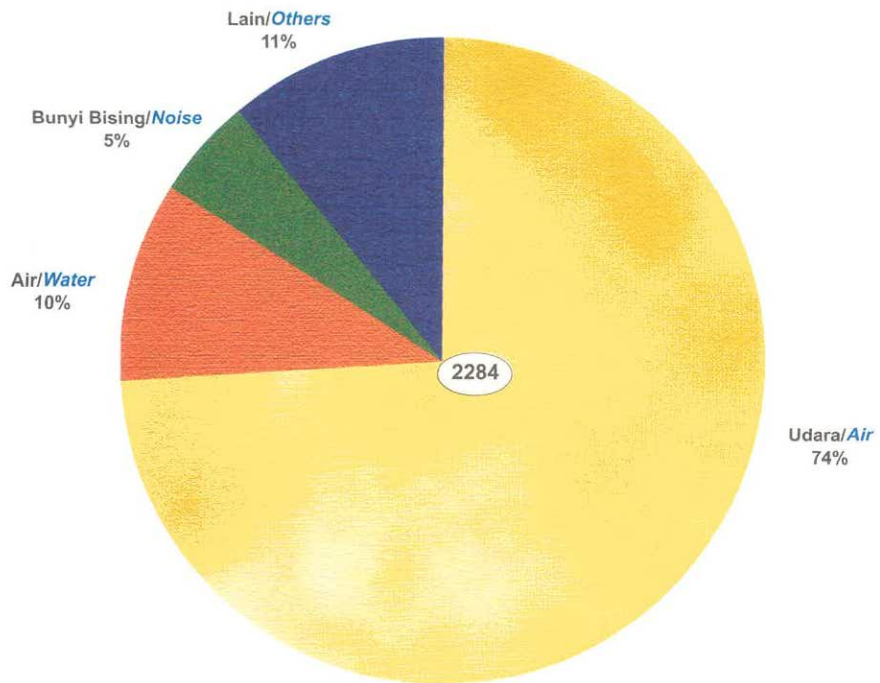
The most common complaints were open burning at illegal waste disposal sites, dust pollution from wood-based industries as well as non-industrial based complaints. Of the total number, 74% (1690) were for air pollution, 10% water pollution, and 5% noise pollution (Figure 5.27). Of the 1690 air pollution complaints, 30% were open burning at waste disposal sites (Figure 5.28).



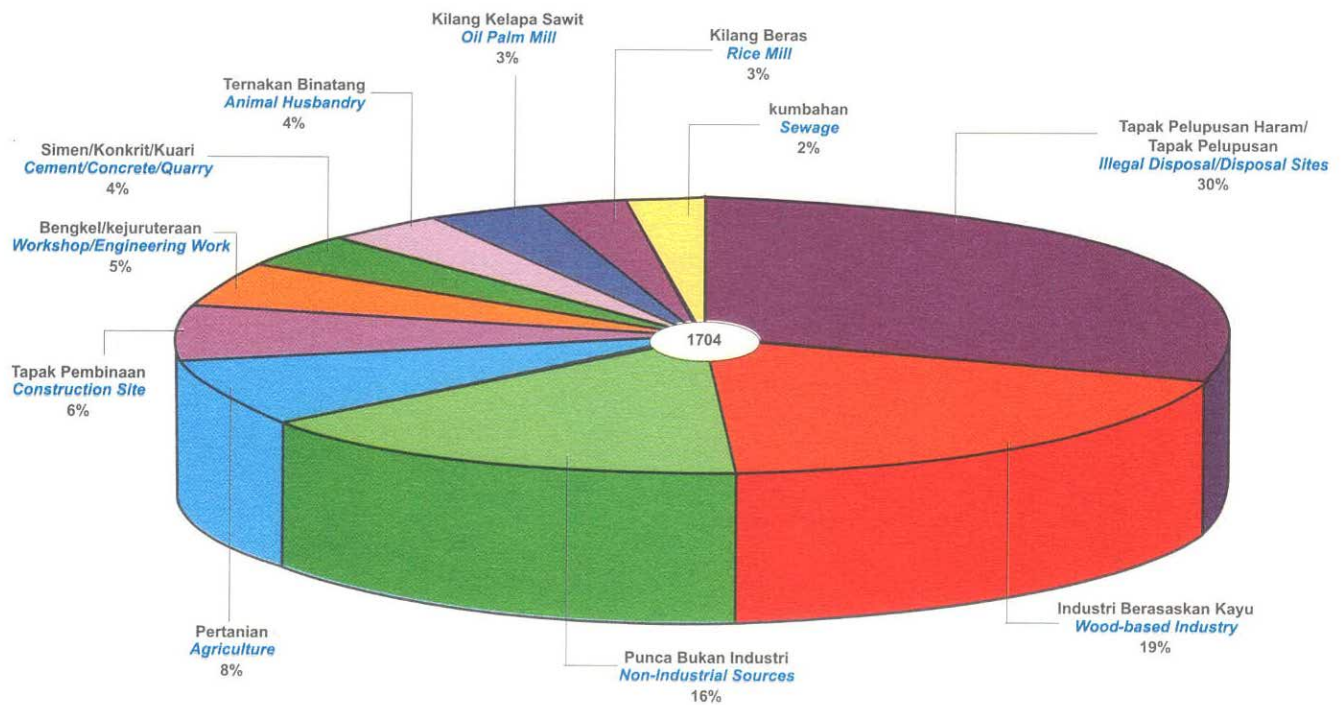
Rajah 5.25 Jabatan Alam Sekitar : Aduan-Aduan Yang Diterima Oleh JAS, 1988-2000
 Figure 5.25 Department of Environment : Complaints Received by DOE, 1989-2000



Rajah 5.26 Jabatan Alam Sekitar : Bilangan dan Jenis Aduan Yang Diterima Mengikut Negeri, 2000
 Figure 5.26 Department of Environment : Number and Types of Complaints Received by State, 2000



Rajah 5.27 Jabatan Alam Sekitar : Jenis-Jenis Pencemaran yang diadukan kepada Jabatan Alam Sekitar, 2000
 Figure 5.27 Department of Environment : Type of Complaints Received by DOE, 2000



Rajah 5.28 Jabatan Alam Sekitar : Punca-Punca Aduan Pencemaran Udara, 2000
 Figure 5.28 Department of Environment : Sources of Air Pollution Complaints, 2000