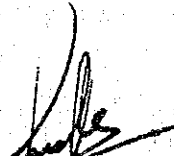



SCOPE OF WORK  
FOR  
AIR QUALITY MANAGEMENT STUDY  
FOR KELANG VALLEY REGION

AGREED UPON BETWEEN  
ECONOMIC PLANNING UNIT,  
PRIME MINISTER'S DEPARTMENT,  
ON BEHALF OF  
THE GOVERNMENT OF MALAYSIA  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

KUALA LUMPUR, 27 MARCH 1990

  
-----  
MR. MUHAMAD B. HAMZAH  
FOR THE DIRECTOR GENERAL  
ECONOMIC PLANNING UNIT,  
PRIME MINISTER'S DEPARTMENT,  
on behalf of  
THE GOVERNMENT OF MALAYSIA.

  
-----  
DR. HIDETSURU MATSUSHITA  
LEADER, PRELIMINARY  
SURVEY TEAM,  
ON BEHALF OF  
JAPAN INTERNATIONAL  
COOPERATION AGENCY

## I. INTRODUCTION

In response to the request of the Government of Malaysia, the Government of Japan has decided to conduct an Air Quality Management Study for Kelang Valley Region (hereinafter referred to as "the Study"), and in accordance with the relevant laws and regulations in force in Japan, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan will undertake the Study, in close cooperation with the authorities of Malaysia.

The present document sets forth the Scope of Work with regard to the Study.

## II. OBJECTIVE OF THE STUDY

The Study aims to prepare an implementable guideline for Air Quality Management in Kelang Valley Region with special emphasis on improving air quality monitoring capability, identification of major sources and recommend alternative measures.

## III. STUDY AREA

The Study area shall cover Kelang Valley Region.


## IV. SCOPE OF THE STUDY

In order to achieve the objective mentioned above, the Study shall cover the following items.


### 1. Data collection

#### (1) Meteorological Data


- a) Wind direction and velocity, temperature and humidity on the ground
- b) Vertical profile of the wind direction and velocity, and temperature. (including data related to the inversion layers)

*M.M.* 

- (2) Ambient Air Quality Data
  - a) SOx. (Sulfur oxides)
  - b) NOx. (Nitrogen oxides)
  - c) CO. (Carbon monoxide)
  - d) SPM. (Total Suspended particulate matter)
  - e) Respirable particles
  - f) Dust fallout
  - g) Photochemical oxidants and its precursors
  - h) Pb. (Lead)
  
- (3) Mobile Sources Data
  - a) Traffic volume by major road
  - b) Number of automobiles by type
  - c) Fuel analysis data
  - d) Fuel consumption
  - e) Emission factors for Malaysian driving modes
  
- (4) Stationary Sources Data
  - a) Type of facilities in factories (combustion facilities, volume and kind of fuel and height of chimney, etc.)
  - b) Emission factors by combustion facilities (SOx, NOx, SPM)
  - c) Fuel analysis data
  - d) Fuel consumption
  
- (5) Social Condition
  - a) Future projection of social indicators closely related to the Air Quality (urbanization, population, homes, industrial plants and traffic, etc.)
  - b) Socio-economic development plan and policy related to the Air Quality (GDP, energy consumption, law and regulation, etc.)
  
- (6) Institutional Conditions
  - a) State of the art of legislation and enforcement in Malaysia
  - b) Manpower and training system of the Department of Environment.

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2. Basic Survey
  - (1) Meteorological Survey
    - a) Ground
    - b) Vertical
  - (2) Survey of Mobile Sources
    - a) Traffic survey (number of cars by type, by road, and average speed)
    - b) Emission factors.
  - (3) Survey of Stationary Sources
    - a) Facilities of factories
    - b) Emission factors
  - (4) Survey of Ambient Air Quality
  - (5) Survey of Elemental Composition of particles
3. Development and Application of Simulation Models
  - (1) Development of a simulation model.
  - (2) Validation of the model using an independent data set.
  - (3) Application of validated model to analyse the effect of emission sources of SOx and NOx.
4. Recommendation of Air Quality Management
  - (1) To evaluate on the effectiveness of present and proposed control measures on the stationary and mobile sources; inclusive of technical and economic implications.
  - (2) To prepare schedules of required emission reductions and implementation plans for the necessary air quality monitoring and effectiveness monitoring of the emission reductions.
  - (3) To provide rough estimates of the viable alternative action plans.
  - (4) To strengthen existing institutional setup and proposed manpower development for the effective implementation of the above measures.

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## V. WORK SCHEDULE

The Study shall be carried out in accordance with the attached tentative schedule in the Annex.

## VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Malaysia.

1. Inception Report;

Twenty (20) copies within one (1) month from the date of the commencement of the Study.

2. Progress Report (1);

Twenty (20) copies within four (4) months from the commencement of the Study.

3. Interim Report;

Twenty (20) copies within eight (8) months from the commencement of the Study.

4. Progress Report (2);

Twenty (20) copies within thirteen (13) months from the commencement of the Study.

5. Draft Final Report;

Twenty (20) copies within seventeen (17) months from the commencement of the Study.

The Malaysian Government will provide the Study Team with their comments within one (1) month after its receipt of the Draft Final Report.

6. Final Report

Forty (40) copies within two (2) months after receipt of the Government of Malaysia's comments on the Draft Final Report. All comments given by the Malaysian Government will be compiled in the preparation of the final report.

The Study Team should ensure that all data, information, maps, materials and findings connected with the Study are kept confidential and not revealed or disposed of to any third party except with the prior written consent of the Government of Malaysia. Such maps and aerial photographs are to be returned to the Government of Malaysia immediately upon completion of the Study. All reports when finalized and submitted to the Government of Malaysia shall remain the property of the Government of Malaysia.

*J.M.* *[Signature]*

TENTATIVE STUDY SCHEDULE

|                              | 1         | 2 | 3 | 4 | 5 | 6           | 7 | 8         | 9 | 10 | 11 | 12 | 13          | 14 | 15 | 16 | 17        | 18 | 19 | 20       |  |
|------------------------------|-----------|---|---|---|---|-------------|---|-----------|---|----|----|----|-------------|----|----|----|-----------|----|----|----------|--|
| FIELD WORK<br>IN<br>MALAYSIA |           |   |   |   |   |             |   |           |   |    |    |    |             |    |    |    |           |    |    |          |  |
| OFFICE WORK<br>IN<br>JAPAN   |           |   |   |   |   |             |   |           |   |    |    |    |             |    |    |    |           |    |    |          |  |
| REPORTS                      |           |   |   |   |   |             |   |           |   |    |    |    |             |    |    |    |           |    |    |          |  |
|                              | △<br>IC/R |   |   |   |   | △<br>P/R(1) |   | △<br>IT/R |   |    |    |    | △<br>P/R(2) |    |    |    | △<br>DF/R |    |    | △<br>E/R |  |

Remarks : IC/R : Inception Report

P/R : Progress Report

IT/R : Interim Report

DF/R : Draft Final Report

E/R : Final Report

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*[Signature]*

## VII. UNDERTAKING OF THE GOVERNMENT OF MALAYSIA

To facilitate smooth conduct of the Study the Government of Malaysia shall take the following necessary measures;

1. To inform the members of the Study Team of any existing risk in the study area and to take any measures deemed necessary to secure the safety of the Study Team.
2. To ensure the necessary entry permits for the Study Team to conduct field surveys in Malaysia and exempt them from consular fees.
3. To exempt the members of the Study Team from taxes and duties, as normally accorded under the provision of Malaysian General Circular No. 1 of 1979, on equipment, machinery and other materials brought into and out of Malaysia for the conduct of the Study.
4. To exempt the members of the Study Team from Malaysian income tax on their official emoluments in respect of their period of assignment in Malaysia in connection with the conduct of the Study, but the Government of Malaysia shall retain the right to take such emoluments into account for the purpose of assessing the amount to be applied to income from other sources.
5. To provide the necessary facilities to the Study Team for remittance as well as utilization of funds introduced into Malaysia from Japan in connection with the conduct of the Study.
6. To secure permission for entry into private properties or restricted areas for the conduct of the Study.
7. To provide the Study Team with medical services when needed but the expenses will be chargeable to the members of the Study Team.
8. To provide the Study Team with available data, maps and information necessary for the execution of the Study.
9. To make arrangements for the Study Team to take back to Japan the data, maps and materials connected with the Study, subject to the approval of the Government of Malaysia, in order to prepare the reports.
10. To appoint counterpart personnel to the Study Team during the study period.
11. To provide the Study Team with suitable office space with clerical service and necessary office equipment in Kuala Lumpur.

*H.M. [Signature]*

12. To provide the Study Team with adequate means of local transport for official travel only.
13. To indemnify any member of the Study Team in respect of damages arising from any legal action against him in relation to any act performed or omissions made in undertaking the Study except when the two Governments agree that such a member is guilty of gross negligence or willful misconduct, and
14. To nominate the Department of Environment of Ministry of Science, Technology and Environment to act as the main counterpart agency for the Study and the Economic Planning Unit as the main coordinating body in relation to other relevant governmental and non-governmental organizations.


#### VIII. UNDERTAKING OF JICA

In order to conduct the Study, JICA shall take the following measures:

1. To dispatch, at its own expense, the Study Team to Malaysia, and
2. To pursue technology transfer to the Malaysian counterpart personnel in the course of the Study.

#### IX. CONSULTATION

JICA and the Government of Malaysia shall consult each other in respect of any matter that is not agreed upon in this document and which may arise from or in connection with the Study.

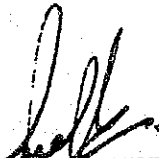
H.M. 




MINUTES OF MEETING  
FOR  
AIR QUALITY MANAGEMENT STUDY  
FOR KELANG VALLEY REGION

AGREED UPON BETWEEN  
ECONOMIC PLANNING UNIT,  
PRIME MINISTER'S DEPARTMENT,  
ON BEHALF OF  
THE GOVERNMENT OF MALAYSIA  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

KUALA LUMPUR, 27 MARCH 1990

  
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MR. MUHAMAD B. HAMZAH  
FOR THE DIRECTOR GENERAL  
ECONOMIC PLANNING UNIT,  
PRIME MINISTER'S DEPARTMENT,  
on behalf of  
THE GOVERNMENT OF MALAYSIA.

  
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DR. HIDEITSURU MATSUSHITA  
LEADER, PRELIMINARY  
SURVEY TEAM,  
ON BEHALF OF  
JAPAN INTERNATIONAL  
COOPERATION AGENCY


MINUTES OF THE FIRST TECHNICAL COMMITTEE MEETING FOR  
AIR QUALITY MANAGEMENT STUDY FOR KLANG VALLEY REGION'

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Date : 23 Mac 1990  
Time : 9.00 am  
Venue : Control Room  
Department of Environment  
12th floor, Wisma Sime Darby  
Jalan Raja Laut  
Kuala Lumpur

Present:

1. Ir. Tan Meng Leng, KMN - Department of Environment  
(Chairman)
2. Dr. Hidetsuru Matsushita - Air Quality Management  
Study Team (AQMST),  
National Institute of  
Public Health, Japan
3. Mr. Seigo Matsumoto - AQMST, Social Development  
Study  
Department, JICA
4. Mr. Susumu Ota - AQMST, Environment  
Agency,  
Japan
5. Mr. Fumio Ueno - ASMST, Hokkaido  
Prefectural  
Government, Japan
6. Dr. Mitsuru Fujimura - AQMST, Nippon  
Environmental  
Pollution Control Center
7. Mr. Shunichi Hamada - Embassy of Japan
8. Mr. Kuniaki Nagata - JICA officer
9. Prof. Dr. Sham Sani - Universiti Kebangsaan  
Malaysia
10. Dr. V. Sooryanarayana - Universiti Malaya
11. Dr. Muhamad Awang - Universiti Pertanian  
Malaysia


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- |     |                                    |   |   |
|-----|------------------------------------|---|---|
| 12. | Miss Zainab Hashim                 | - | Universiti Pertanian<br>Malaysia                      |
| 13. | Mr. Rashid bin Mohd. Yusof         | - | Universiti Teknologi<br>Malaysia                      |
| 14. | Mr. Ahmad Hamizan Hasan            | - | PETRONAS  |
| 15. | Mrs. Norasiah Yahya                | - | Kelang Valley Planning<br>Secretariat                 |
| 16. | Miss Wan Nor Saadah Wan<br>Jaafar  | - | Kelang Valley Planning<br>Secretariat                 |
| 17. | Mr. Harjeet Singh                  | - | Selangor State<br>Secretariat                         |
| 18. | Mr. Lum Kon Woon                   | - | Chemistry Department                                  |
| 19. | Mr. Abdul Rahman bin Haji<br>Ahmad | - | Cityhall of Kuala Lumpur,                             |
| 20. | Mr. Masami Mizuguchi               | - | JICA Air Quality Management<br>Expert attached to DOE |
| 21. | Mr. Mohd. Subki bin Abdul<br>Hamid | - | Department of Environment<br>(DOE)                    |
| 22. | Mr. Aminuddin Ishak                | - | DOE   |
| 23. | Mr. Ismail Ithnin                  | - | DOE   |
| 24. | Mrs. Raseli Mat Lazim              | - | DOE   |
| 25. | Miss Hanili Ghazali                | - | DOE<br>(Secretary)                                    |

**ABSENT:**

Representatives from:

1. Universiti Kebangsaan
2. Universiti Pertanian
3. WHO / PEPAS
4. The National Electricity Board
5. Department of Meteorological Services

*H.M.* 

## 1. INTRODUCTION

The Chairman, Mr. Tan Meng Leng, Deputy Director General (Operations), DOE, welcomed all present to the first Technical Committee Meeting on Air Quality Management Study For Klang Valley Region. He mentioned that this meeting, other than to review together the proposed Scope of Work, would also provide the opportunity for members of the Malaysian National Air Quality Task Force to meet the preliminary survey team from Japan. The background of the study was given by the chairman. After the agenda was approved by the meeting, the Chairman briefed the members on the current development, programmes and control measures on air quality management being undertaken by the DOE:

### I. EMISSION LOADS REDUCTION


The targeted areas involve reductions of pollutants from combustion from stationary and mobile sources.

#### 1.1 Pollutants from Waste Disposal

Other than the prohibition of open burning and restrictive emissions under the Clean Air Regulations, progressive reduction of trade waste disposal in 150 odd incinerators in the Klang Valley is expected to begin soon when the proposal is accepted by the Environmental Quality Council. Pollution loads from alternative disposal in the proposed municipal incinerators would be much less and waste heat load recovered. The proposal by local authorities to relocate polluting industries would further remove some of the sources.

#### 1.2 Control of Fuel Burning Equipment

The compulsory use of gaseous fuel such as LPG for selected public service vehicles has been incorporated in the proposed motor vehicles emission control regulations, mainly to reduce particulate load. Power generation accounts for a major portion of gaseous pollutants; while the National Electricity Board has plan to install gas-fired facilities in some of their generation plants, there has been no firm decision made on desulphurization or switch from fuel oil to other alternative fuels yet. It is felt that a detailed cost-benefit analysis and implications to

J.M. 

the rural electrification schemes and to the industries should be known to the decision makers before the present cost-effective "dispersion" approach is to be dropped or modified.

### 1.3 Pollutants from mobile sources

Emissions from new petrol and diesel engines/vehicles will be controlled to meet the requirements similar to EEC Directives 24, 49 and 15.04. It is not anticipated that existing vehicles would be required to retrofit e.g. catalytic convertor. Parallel effective transport policy would have to be implemented if this regulatory approach were to arrest the rising level of pollution from mobile sources in the Klang Valley.


## II AIR QUALITY MONITORING

### 1.4 Monitoring Programmes

Fully aware that an efficient air quality monitoring programme is essential to meaningful air quality management plan, and that full operating monitoring equipment is a prerequisite to obtain the necessary feed back and adjustment, the DOE has spent the last 2 1/2 years to rationalise the network and upgrade the quality of work. Due to lack of skilled instrument engineers and technicians in the Department as well as in Malaysia, many of the automatic equipment have been found to be non repairable and at least 60% will have to be written off. The experience is also common to other agencies operating such instrument which use complex and uncommon electronic circuitary.

### 1.5 Determination of Haziness and Photochemical Oxidant

The Chairman informed members that at present, the Department of Environment has no capacity to develop any air quality model especially for planning purposes; in view of this external assistance and advice would be welcome. For Klang Valley, he particularly mentioned the urgent needs for predicting models for photooxidants in views of the mobile sources emission and the topography of the Klang Valley. In subsequent discussion, the Study Team agreed to pay emphasis on this area.

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## 2. COMMENTS RECEIVED

### 2.1 The Addition of Catalytic Converter to Motor Vehicles


Prof. Sham Sani sought clarification on the possibility of addition of catalytic converter to old motor vehicles to control emission. Dr. Hidesuru Matsushita said that the most effective way of controlling gasoline motor vehicles emission would be the use of catalytic converter. With the use of such converter the carcinogenes could be reduced from a tenth to a hundredth times. Dr. Matsushita therefore gave strong recommendations for Malaysia to add on catalytic converter on existing motor vehicles. Mr. Chairman explained that DOE strategy was based on technical and cost considerations. He however suggested this proposed "add-on to existing vehicles" alternative be examined by the Study Team. This was agreed by the Meeting.

### 2.2 Alternative Fuel for Power Generation

En. Hamizan from Petronas informed members that Petronas will be constructing the second gas processing plant with the purpose of supplying gas of low sulphur content to reduce the sulphur from power plants throughout Malaysia. Another project that will be carried out is the MTBE project in Kuantan with the purpose of replacing lead in petrol. Mr. Chairman added that the Sultan Salahuddin Power Station in Klang is equipped with facilities for triple firing for fuel oil, coal and gas.

### 3.0 Discussion on Outlines of Proposed Study

The chairman called upon Dr. Matsushita to present outlines of work of the proposed study. Dr Matsusita thanked the Technical Committee for the cooperation given for this study and informed that Japan International Corporation Agency organised the preliminary survey team to make clear the scope of work and the draft was made based on the Terms of Reference received from Malaysia (The original Draft is as in Attachment I).

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#### 4.0 Comments on Scope of Work

##### 4.1 Objective of the Study

All members of the Malaysian Air Quality Task Force were unanimous that the study should provide assistance to improve and implement Air Quality Monitoring Programme and not just another paper study. They recommended that the objective of the study be steered to suit Malaysian actual needs and this was finally agreed by both sides. The Objective of the Study would now be 'The Study aims to prepare a guideline for the Air Quality Management in Klang Valley Region with special emphasis on air quality monitoring improvement and identification of major pollution sources and recommend alternatives control measures'.

##### 4.2 Data Collection


With reference to Section (2) Ambient Air Quality Data, it was proposed that data on dust fallout and respirable particles be included in the list. Dr. Muhamad Awang proposed on the possibility of carrying out biomonitoring concurrently within the scope of work. He mentioned on the use of tobacco plant as indicator of presence of certain level of ozone in the air. In response to this, Dr. Matsushita mentioned that biomonitoring is one possible way to indicate air pollution.

##### 4.3 Basic Survey

With reference to the meteorological survey, Prof. Sham Sani sought the confirmation of conducting the vertical profile for meteorological parameters such as temperature and wind for Klang Valley. Encik Abdul Rahman from City Hall sought confirmation from survey team on the study coverage. Dr. Matsushita informed members that the study would cover Klang Valley and all the parameters. JICA would provide the equipment that are not available and measurements are for the period of the study; survey will be conducted taking into consideration the seasonal variations.

##### 4.4 Development and Application of Simulation Models

With reference to the development and application of simulation models, Encik Mohd. Rashid from Universiti Teknologi Malaysia sought clarification from the study team on the model that would be used. In response to

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this, Dr. Matsushita informed members that for a start the simulation model used in Japan will be applied for air quality in Malaysia. Encik Rashid further stressed upon the fact that there is a need for the validation of the simulation model used because of the limited set of data available. He also suggested that the survey team consider looking into 2 different models.

#### 4.5 Structure Measures

Puan Norasiah suggested that structure measures in addition to non-structure measures be drawn up. Previous studies have come up with the non-structure measures, that is, formulation of various guidelines but the method to implement such guidelines was not drawn up. She emphasised on the fact that structure measures be put up with regards to the monitoring instruments to be used and also on the emission control as such measures would enable the implementation of comprehensive air monitoring activities right away.


#### 4.6 Recommendation of Air Quality Management

On the output of the study, the 'Recommendation' in the draft of the Scope of Work, the Meeting agreed on the following amended outputs:

- (1) To evaluate on the effectiveness of present and proposed control measures on the stationary and mobile sources, inclusive of technical and economic implications;
- (2) To prepare schedules of required emission reductions and Implementation Plans for the necessary air quality monitoring and effectiveness monitoring of the emission reductions;

The Meeting agreed that the "Implementation Plan" would include Assistance Plans and Action Plans.

- (3) To provide rough estimates of the viable alternative Action Plans ;and
- (4) To strengthen existing institutional setup and proposed manpower development for the effective implementation of the above measures.

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## 5.0 Other Matters

### 5.1 Repairing Universiti Pertanian Malaysia (UPM) monitoring station


Dr. Muhamad Awang from UPM put up a request on the possibility of repairing UPM's monitoring station such as the supply of spare and consumable parts to put the instruments into operation again.

### 5.2 Counterparts

The Chairman informed the Meeting that, other than DOE as the main counterpart agency, it will be assisted by other related agencies and institution of higher learnings.

6.0 The meeting adjourned at 12.10 p.m. with words of thanks to all members for their valuable time, assistance given and ready agreement to proposals put forward by DOE and members of Task Force.

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QUESTIONNAIRE  
ON  
AIR QUALITY MANAGEMENT STUDY FOR KELANG VALLEY REGION

Department of Environment  
Ministry of Science, Technology and Environment

JICA Preliminary Survey Team

In order to understand sufficiently the background and state of air pollution problem in Kelang Valley Region, the team would appreciate very much if you could prepare the following data and informations before our arrival.

1. Data and information desired to be obtained

(1) Data and information on the existing system for air pollution monitoring and meteorological survey as well as data obtained from the monitoring and the survey.

- a. No. of measuring points and their sites (locations and height above ground level).
- b. Measuring items.
- c. Measuring frequency and duration.
- d. Measured results (year to year variations of the yearly averages, seasonal variations of the monthly averages, daily and hourly maximum and minimum values).
- e. System for treatment of measured results.

(2) Current situation concerning emission sources.

- a. Maps of land utilization in Kuala Lumpur (those clearly indicating locations of industrial areas, large factories, residential areas, major roads, etc.).

- b. No. of factories and enterprises (by industry and size).
  - c. No. of smoke and soot emitting installations among those mentioned above (b) (by kind and size).
  - d. No. of automobiles (by kind, age and fuel).
  - e. Traffic volume of automobiles (by kind).
  - f. Population and No. of households.
  - g. Fuel consumption (by kind and purpose).
  - h. Number, locations and sizes of waste disposal plants.
- (3) Current situation and future plans concerning air pollution control.
- A. Measures for factories and enterprises.
    - (a) Current situation and future plans concerning installation of equipment for smoke and soot treatment .
    - (b) Plans for shifting to better quality fuels.
    - (c) Plans for relocation of factories.
  - B. Control measures for automobiles.
    - (a) Exhaust gas reduction measures.
      - a) Fuel improvement
      - b) Engine improvement
    - (b) Measures for reduction of traffic volume, improvement of traffic flow.
- (4) Administration and research organizations and systems concerned with air pollution control.
- a. Organizational structure, jurisdiction, No. of personnel and budget of relevant administration and research organizations.
  - b. Relevant laws.
  - c. Relevant equipments owned by research organizations.
- (5) Support system for implementation of the Study.
- a. Counterpart
  - b. Organizational structure, budget, personnel and the number and level of engineers of organizations in charge of the implementation.

## 1. DOE Report・行政資料類

- 1-① "Environmental Quality Report, 1988", 204pp.
- 1-② "Development of Criteria and Standards for Air Quality,  
Final report (May, 1989), Vol.1 Main Text"
- 1-③ "Development of Criteria and Standards for Air Quality,  
Final report (May, 1989), Executive Summary"
- 1-④ アジア開発銀行 Report, "Klang Valley Environmental Improvement Project"  
抜粋 Chap.4 Air Quality Management
- 1-⑤ Fifth Malaysian Plan (1986-1990), 抜粋. Chap.IX
- 1-⑥ Guidelines for the Siting and Zoning of Industries
- 1-⑦ Environmental Quality (Clean Air) Regulations 1978. P.U.(A) 280.
- 1-⑧ Motor Vehicles (Control of Smoke and Gas Emission) Rules 1977. P.U.(A)  
414.
- 1-⑨ Environmental Quality (Control of Lead Concentration in Motor Gassoine)  
Regulations 1985. P.U.(A) 296.
- 1-⑩ Environmental Quality (Prescribed Activities) (Environmental Impact  
Assessment) Order 1987. P.U.(A) 362.
- 1-⑪ Environmental Quality (Scheduled Wastes) Regulations 1989. P.U.(A) 139.

## 2. DOE, 測定データ類

- (1)DOE 測定局配置図 (写真付), 49pp.
- (2)Klang Valley地区大気監視局リスト (output)
- (3)保有機器リスト (output)
- (4)測定結果年集計表 (output), SO<sub>2</sub> (1979~1986)  
SPM (1979~1988)  
Pb (1978~1988)  
dust fallout (1978~1988)
- (5)1990年 Hi-vol.スケジュール表

### 3. 気象データ

"Annual Summary of Meteorological Observations 1987"より、

- 気象台 index
- 年集計表： 国際空港(Subang)： 風, 温度, 湿度, 日照, 雨量
- " : Petaling Jaya
- " : マラヤ大学

### 4. 交通センサス資料ほか

- 各州別年次・車種別年次・月別 登録台数 4pp.
- 州別・年次別・保有台数等 5pp.
- Selangor州 交通量 17pp.
- Wilayah Persekutuan (Kuala Lumpur)交通量 7pp.
- エネルギー消費 1pp.

### 5. 発電所関係資料

- バンフレット "Coal Technology"
- " "Phase II"
- 月間データリスト (1989) (output, 1pp.)
- ボイラ排ガス監視チャートoutput例 (O<sub>2</sub>, CO), 及び系統図
- 気象状況監視 output 例, 及び日記録, 月間記録output
- 使用機器の Instruction manual 表紙.

### 6. UPM (マレーシア農科大学)

- JICA供与機器のリスト：  
紀本電子工業からの Invoice (2pp.) 及び Packing list (5pp.)
- Research report : Dr.Muhamad Awang."Effects of Air Pollution on Agricultural Horticultural Crops" 28pp.

## 7. UTM (マレーシア工科大学)

- パンフレット (UTM 化学天然資源工学部)
- Dr. Rashid 経歴・実績・文献リスト

## 8. 地 図

- Kuala Lumpur 市街 (1/15,000)
- Selangor州 (1/125,000), 2枚組
- 州別道路里程図, 10枚組





面会者リスト

○首相府経済企画庁 (E P U) , 社会開発サービス局

Mr. Mohd. Hamzah Principal Asst. Director 次長

○科学技術環境省, 環境局 (Department of Environment, D O E)

Mr. Tan Meng Leng Deputy Director General 副局長

Ms. Hanili Ghazali Environmental Control Officer

ほか (「3 - 1 関係機関の概要」参照)

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添付資料-7 クランバレー地域大気環境局の状況

STATUS OF AIR MONITORING STATIONS FOR KLANG VALLEY

| NO | EQUIPMENT | AREA          | NAME OF STATION                                | LATITUDE |       | LONGITUDE |       | HEIGHT                 | ACTUAL LOCATION                         | OBJECTIVE OF STATIONS SET-UP  |
|----|-----------|---------------|--|----------|-------|-----------|-------|------------------------|---|---|
|    |           |               |  | d        | m' s° | d         | m' s° | ABOVE GROUND LEVEL (m) |   |   |
| 1  | DOG       | KUALA LUMPUR  | BANGSAR DENTAL CLINIC, KUALA LUMPUR            | 3        | 7 0   | 101       | 41 0  | 2.5                    | GARAGE ROOF                             |   |
| 2  | HVS       | KUALA LUMPUR  | BANGSAR DENTAL CLINIC, KUALA LUMPUR            | 3        | 7 0   | 101       | 41 0  | 2.0                    | ON THE HVS STAND IN FRONT OF THE CLINIC | TO DETERMINE LEAD CONCENTRATION FROM JALAN BANGSAR  |
| 3  | DOG       | PETALING JAYA | JOHNSON & JOHNSON PETALING JAYA                | 3        | 7 0   | 101       | 39 0  | 2.5                    | GARAGE ROOF                             | TO DETERMINE LEAD CONCENTRATION FROM PETALING JAYA INDUSTRIAL AREA.                                       |
| 4  | HVS       | PETALING JAYA | JOHNSON & JOHNSON PETALING JAYA                | 3        | 7 0   | 101       | 39 0  | 1.0                    | ON THE HVS STAND IN THE PREMISE         | TO DETERMINE LEAD CONCENTRATION FROM PETALING JAYA INDUSTRIAL AREA.                                       |
| 5  | DOG       | SHAH ALAM     | SIRIM, SHAH ALAM                               | 3        | 4 0   | 101       | 32 0  | 1.5                    | ON THE HVS STAND IN THE PREMISE         | TO DETERMINE AIR QUALITY STATUS OF RESIDENTIAL AREA AND THE POLLUTION LEVEL OF SHAH ALAM INDUSTRIAL AREA. |
| 6  | HVS       | SHAH ALAM     | SIRIM, SHAH ALAM                               | 3        | 4 0   | 101       | 32 0  | 10.0                   | BUILDING ROOF TOP                       | TO DETERMINE AIR QUALITY STATUS OF RESIDENTIAL AREA AND THE POLLUTION LEVEL OF SHAH ALAM INDUSTRIAL AREA. |
| 7  | HVS       | KUALA LUMPUR  | UNIVERSITI MALAYA, KUALA LUMPUR                | 3        | 7 0   | 101       | 39 0  | 1.0                    | IN THE FIELD                            | TO DETERMINE AIR QUALITY STATUS OF RESIDENTIAL AREA.  |
| 8  | HVS       | KUALA LUMPUR  | PUDU FIRE STATION, JALAN PUDU, KUALA LUMPUR.   | 3        | 8     | 101       | 43    | 3.0                    | OFFICE ROOFTOP                          | TO DETERMIN LEAD CONCENTRATION FROM JALAN PUDU.   |
| 9  | DOG       | KUALA LUMPUR  | JINJANG COMMUNITY HALL, JINJANG, KUALA LUMPUR. | 3        | 13    | 101       | 37    | 2.5                    | OFFICE ROOFTOP                          | TO DETERMINE THE POLLUTION LEVEL FROM SAWMILLS  |

(DOEデータ)

| NO | EQUIPMENT | AREA          | NAME OF STATION   | LATITUDE |    |    | LONGITUDE |    |    | HEIGHT ABOVE GROUND LEVEL (m) | ACTUAL LOCATION          | OBJECTIVE OF STATIONS SET-UP  |
|----|-----------|---------------|---|----------|----|----|-----------|----|----|-------------------------------|--------------------------|---|
|    |           |               |   | d        | m' | s" | d         | m' | s" |                               |                          |   |
| 10 | DDG       | SEMBAK        | PETRONAS LAB.<br>ULU KLANG, SELANGOR                                  | 3        | 10 | 0  | 101       | 45 | 0  | 10.6                          | OFFICE ROOFTOP           | TO DETERMINE THE POLLUTION LEVEL FROM ULU KLANG INDUSTRIAL AREA.  |
| 11 | DDG       | SELANGOR      | SEK. MEN. SELAYANG<br>BARU, SELAYANG,<br>SELANGOR.                    | 3        | 16 |    | 101       | 39 |    | 2.5                           | CORRIDOR ROOFTOP         | TO DETERMINE THE POLLUTION LEVEL FROM SELAYANG INDUSTRIAL AREA.   |
| 12 | DDG       | SELANGOR      | MOBIL OIL (M)SDN.BHD<br>BATU CAVES, SELANGOR.                         | 3        | 14 |    | 101       | 41 |    | 2.5                           | WEIGHBRIDGE ROOFTOP      | TO DETERMINE THE POLLUTION LEVEL FROM BATU CAVES INDUSTRIAL AREA.   |
| 13 | DDG       | SELANGOR      | KAMPONG TENGAH<br>BAMPANG, SELANGOR.                                  | 3        | 9  |    | 101       | 46 |    | 2.5                           | HOUSE ROOFTOP            | TO DETERMINE THE POLLUTION LEVEL FROM QUARRY.   |
| 14 | DDG       | KUALA LUMPUR  | NO. 16,<br>COPD CEUPACS ROAD,<br>TAMAN CEUPACS,<br>CHERAS, K. LUMPUR. | 3        | 4  | 0  | 101       | 45 | 0  | 1.5                           | ON TOP OF THE FENCE POST | TO DETERMINE THE POLLUTION LEVEL FROM SAWMILLS.   |
| 15 | DDG       | PETALING JAYA | COLGATE PALMOLIVE<br>PETALING JAYA.                                   | 3        | 7  |    | 101       | 38 |    | 3.0                           | CANTEEN ROOFTOP          | TO DETERMINE THE POLLUTION LEVEL FROM PETALING JAYA INDUSTRIAL AREA.  |
| 16 | DDG       | SHAH ALAM     | SRJK (T) SIMPANG<br>RENGGAN, SHAH ALAM.                               | 3        | 5  |    | 101       | 32 |    | 2.5                           | CORRIDOR ROOFTOP         | TO DETERMINE THE AIR QUALITY STATUS OF RESIDENTIAL AREA AND THE POLLUTION LEVEL FROM SHAH ALAM INDUSTRIAL AREA. |
| 17 | DDG       | SHAH ALAM     | SEK. REN. KEB. SHAH<br>ALAM, SHAH ALAM.                               | 3        | 4  |    | 101       | 31 |    | 2.5                           | CORRIDOR ROOFTOP         | TO DETERMINE THE AIR QUALITY STATUS OF RESIDENTIAL AREA AND THE POLLUTION LEVEL FROM SHAH ALAM INDUSTRIAL AREA. |

| NO | EQUIPMENT | AREA         | NAME OF STATION   | LATITUDE |    | LONGITUDE |    | (HEIGHT) | ACTUAL LOCATION                  | OBJECTIVE OF STATIONS SET-UP  |
|----|-----------|--------------|---|----------|----|-----------|----|----------|----------------------------------|---|
|    |           |              |   | d        |    | o         |    | (ABOVE)  |                                  |   |
|    |           |              |   | m'       | s" | m'        | s" | LEVEL    |                                  |   |
| 18 | DDG       | KLANG        | KAMPONG SRI KENANGAN<br>JALAN LANDASAN,<br>KLANG.                     | 3        | 3  | 101       | 28 | 3.0      | 'SURAU' ROOFTOP                  | TO DETERMINE THE POLLUTION LEVEL<br>FROM LLN POWER STATION.           |
| 19 | DDG       | KLANG        | (NO. 18, JALAN MERPATI)<br>TAMAN ENG ANN,<br>KLANG.                   | 3        | 5  | 101       | 39 | 2.5      | ON TOP OF THE<br>GATE POST       | TO DETERMINE AIR QUALITY STATUS<br>FROM RESIDENTIAL AREA.             |
| 20 | DDG       | KLANG        | F. E. MAGNETWIRE,<br>BUKIT RAJAH, KLANG.                              | 3        | 5  | 101       | 30 | 4.0      | GUARD HOUSE<br>ROOFTOP           | TO DETERMINE THE POLLUTION LEVEL<br>FROM BUKIT RAJAH INDUSTRIAL AREA  |
| 21 | DDG       | KLANG        | NO. 48, JALAN MERU<br>KLANG.  | 3        | 5  | 101       | 29 | 3.5      | HOUSE ROOFTOP                    | TO DETERMINE THE POLLUTION LEVEL<br>FROM BUKIT RAJAH INDUSTRIAL AREA. |
| 22 | DDG       | KLANG        | (NO. 10, JALAN MERU,<br>KLANG.  | 3        | 5  | 101       | 29 | 2.5      | ON TOP OF THE<br>GATE POST       | TO DETERMINE THE POLLUTION LEVEL<br>FROM BUKIT RAJAH INDUSTRIAL AREA. |
| 23 | HVS       | KUALA LUMPUR | DEVAN BANDARAYA<br>BUILDING,<br>JALAN RAJA LAUT,<br>KUALA LUMPUR.     | 3        | 10 | 101       | 42 | 15.0     | BUILDING ROOFTOP                 | TO DETERMINE LEAD CONCENTRATION<br>FROM JALAN RAJA LAUT.              |
| 24 | HVS       | KUALA LUMPUR | PUSAT SAINS<br>JALAN KELANTAN OFF<br>JALAN MANAMERU,<br>KUALA LUMPUR. | 3        | 8  | 100       | 41 | 3.5      | ON TOP OF THE<br>EQUIPMENT CABIN | TO DETERMINE LEAD CONCENTRATION<br>FROM JALAN MANAMERU.               |
| 25 | DDG       | SELANGOR     | SEKOLAH AGAMA<br>KAMPONG KENANGAN,<br>RAWANG, SELANGOR                | 3        | 19 | 101       | 35 | 2.5      | CANTEEN ROOFTOP                  | TO DETERMINE POLLUTION LEVEL<br>FROM EPIC CEMENT.                     |
| 26 | DDG       | BANGI        | NO. 20, JALAN 66/7,<br>BANDAR BARU BANGI,<br>KAJANG.                  | 2        | 55 | 101       | 46 | 2.5      | HOUSE ROOFTOP                    | TO DETERMINE POLLUTION LEVEL<br>FROM BANGI INDUSTRIAL AREA.           |
| 27 | DDG       | BANGI        | SEK. REN. KEBANGSAAN<br>BANDAR BARU, BANGI                            |          |    |           |    | 2.5      | CORRIDOR ROOFTOP                 | TO DETERMINE AIR QUALITY STATUS<br>FROM RESIDENTIAL AREA.             |





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