

PROGRESS REPORT FOR MASTER PLAN
FOR
SEWERAGE AND DRAINAGE SYSTEM PROJECT
BUTTERWORTH/BUKIT MERTAJAM METROPOLITAN AREA
MALAYSIA

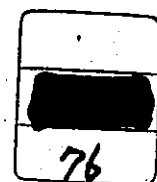
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DECEMBER, 1976

JAPAN INTERNATIONAL COOPERATION AGENCY



PROGRESS REPORT

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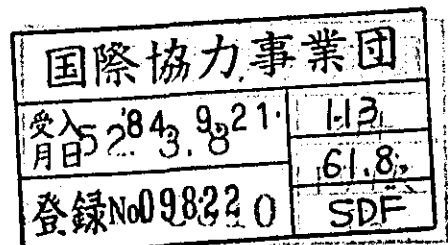
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I. Introduction

This report is prepared in order to dissolve field activities of Nihon Suido Consultant at Province Wellesley, Penang, Malaysia, during the period of November and December, 1976 mainly for the purpose of data collection on Sewerage and Drainage System Project in Butterworth/Bukit Mertajam Metropolitan area in accordance with the work schedule indicated in the Contract between the Japan International Cooperation Agency (JICA) and Nihon Suido Consultants Co. Ltd. (NSC), for consulting services required for preparation of the Master Planning for the Project.

Prior to the commencement of the field work of the consulting services for the Project, the Inception Report was prepared to cover all activities to be carried out for the Project within the scope of work and terms of reference given for consulting services, including implementation schedule with proposed approach to the Project. This Inception Report was approved by Project Supervisory Committee established by JICA and submitted to the Government of Malaysia upon arrival of the Japanese team, consisted of representatives of JICA, Project Supervisory Committee and NSC, at the end of October 1976.

After obtaining the concurrence of the Government of Malaysia on the Inception Report, the initial field work was commenced from November 1st. From the commencement up to the present date, the field work, mainly for collection of data and field investigation necessary for preparation of study report as defined in the Inception Report, were performed satisfactorily in accordance with time schedule, owing to the full cooperation rendered in an efficient manner by officials concerned of Federal Government, State Government and Municipal Councils of Province Wellesley and that of Penang Island.

During the course of the field work, the necessary arrangement was made by the Malaysian Government for the appointment of the Technical Committee and the Steering Committee for the Project in

order to reflect the desire of the Government on the basic approach and the proposed plan for the Project to be embodied in the final Report on Master Plan. Arrangement was also made for the provision of Malaysian counterpart staff to the NSC team for the purpose of transfer to technology during the period of field activities.

The NSC team is grouped into five working units assigned to each specific tasks during the field activities which will continue into the period of home work for integrate comprehensive Master Plan Report. Those specific tasks are: City Planning, Sewerage, Drainage, Industrial Wastewater Quality, and Economic Aspect, as defined in the Chapter III Staff Organization of the present Report.

Based on the data obtained from the field work performed until the end of December, 1976, the home work as defined in the Inception Report will be performed from January, 1977, to submit the draft Interim Report by the end of March, 1977.

II Overall Organization

The members of the Steering and Technical Committee of the Government of Malaysia and the Japanese Supervisory Committee, JICA, are as follows:

A. Steering Committee:

Mr. Ali Yusof	- Ministry of Local Government (K.L.)
Mr. Bashah bin Nordin	- Representative of EPU (K.L.)
Mr. A. Sekarajasekaran	- Ministry of Health (K.L.)
Mr. Mohd. Rusli bin Haji Hussein	- State Government (Penang)
Mr. Loo Kam Weng	- Municipal Council, P.W.
Mr. Koh Kok Ee	- Public Works Department (Penang)
Mr. Abdullah bin Taha	- Survey Department (Penang)
Mr. Mohamed Ishak Ariff	- Town and Country Planning (Penang)

Mr. Ali Yusof serves as Chairman of the Committee.

B. Technical Committee:

- | | |
|------------------------|---------------------------------------|
| Mr. A. Sekarajasekaran | - Ministry of Health (K.L.) |
| Mr. Ali Yusof | - Ministry of Local Government (K.L.) |
| Mr. Choo Ewe Guan | - Municipal Council, P.W. |
| Mr. Lim Peng Weng | - Municipal Council, Penang Island |

Mr. A. Sekarajasekaran serves as Chairman of the Committee.

C. Japanese Supervisory Committee:

- | | |
|------------------|---|
| Dr. M. Kashiwaya | - Head, Water Quality Control Division
Public Works Research Institute
Ministry of Construction |
| Mr. Y. Nakagawa | - Deputy Head, Sewerage Planning Division
Sewerage and Sewage Purification Dept.
City Bureau, Ministry of Construction. |
| Mr. T. Murayama | - Technical Officer, River Basin &
Sewerage Division.
Sewerage and Sewage Purification Dept.,
City Bureau, Ministry of Construction. |
| Mr. K. Urata | - Technical Officer
Municipal Sewerage Division
Sewerage and Sewage Purification Dept.,
City Bureau, Ministry of Construction. |
| Mr. A. Shinbuchi | - Assistant Chief, Design Division
Planning Dept.
Japan Sewerage Works Agency. |

Dr. M. Kashiwaya serves as Chairman of the Committee.

D. Nihon Suido Consultants (NSC)

- | | |
|---------------|--|
| Mr. A. Saita | - Project Manager |
| Mr. T. Ueno | - Co-Project Manager, Site Representative
of NSC. |
| Mr. H. Shono | - Senior Engineer |
| Mr. S. Shibui | - Senior Engineer |

Mr. M. Miyamoto	- Urban & Sanitary Engineer
Mr. Y. Hirau	- Civil Engineer
Mr. O. Fujikawa	- Sanitary Engineer
Mr. T. Horikawa	- Civil Engineer
Mr. M. Kajikawa	- Civil Engineer
Mr. T. Mizutani	- Chemist
Mr. H. Yuasa	- Economist

Additional staff of the following partially participated in the field activities:

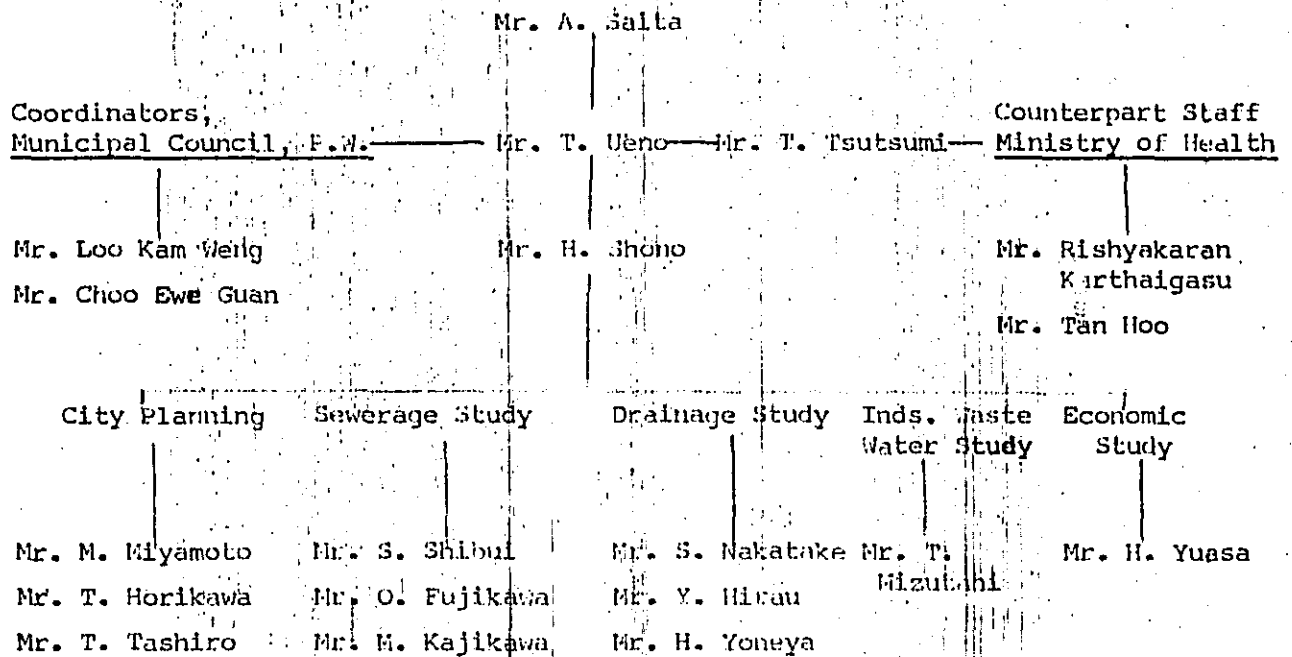
Mr. T. Tsutsumi	- Senior Engineer
Mr. S. Nakatake	- Senior Engineer
Mr. H. Yoneya	- Sanitary Engineer
Mr. T. Tashiro	- Sanitary Engineer

Mr. A. Saita, Project Manager, is responsible for overall operation of the Project throughout the Contract period, and Mr. T. Ueno, Co-Project Manager, serving as Site Representative of NSC, supervises entire work throughout the period of the Project. Mr. T. Tsutsumi, one of the Senior Engineer serves as overall technical advisor to the team activities during the life of the Project.

III Staff Organization of the Consultant

Organization of NSC team together with the Coordinators from Municipal Council, Province Wellesley and counterpart Staff from the Ministry of Health, Federal Government are shown as follows:

Organization Chart



Mr. Loo and Mr. Choo serving as Coordinators, are concurrently the members of Steering and Technical Committees respectively.

In addition to the above, Land Surveyor, Jurukur Ananth was employed for the period of 3 weeks to undertake a part of ground survey to augment that of the NSC team.

IV Conferences

Series of conference with the Government Officials have been held during the period of the field work, mainly for the purpose of coordination, among which major conferences are listed below, with minutes of their meetings attached in Annex C of the present Report.

- A. 28th October, 1976 - Initial conference with Representatives of Economic Planning Unit and Ministry of Health,

at EPU conference room in Kuala Lumpur.

Inception Report was submitted by Representative of JICA, with additional comments by Chairman of the Japanese Supervisory Committee and NSC Project Manager. The Report was accepted and establishment of Technical and Steering Committee, inter alia, with the date of meetings were agreed upon.

B. 19th November, 1976 - Meeting with Steering Committee at State Government Office, Penang.

Progress of the field activities by NSC team was reviewed with satisfaction and the following 3 items proposed by NSC were accepted by the Committee as proposed.

- a) Target year of the Master Plan to be the year 2,000.
- b) Delineation of study area for sewerage and drainage, the sewerage area being identical to that of the WHO Assignment Report and the drainage area covering wider range of area including its catchment area as proposed and presented in the maps prepared by NSC.
- c) Use of metric system with condition that imperial system be also indicated in the bracket.

V. Progress of Activities

A. General

The progress of activities during the period followed as close as practicable to the work diagram shown in Annex A of the present Report, which is proposed and approved in the Inception Report.

The weekly work schedules were established as shown in Annex B, with advice and cooperation of Coordinators Municipal Council, P.W. for each of the survey work units as defined in Chapter III, Staff Organization. Brief meeting sessions were also held regularly at the beginning of the day's work by all the staff members and Coordinators, Municipal Council, P.W. for the purpose of Coordinating the various activities of the team.

The data required by the team were readily provided whenever available by the following agencies, for which the team is most grateful: Town & Country Planning, Penang Development Cooperation, Public Works Department, Drainage & Irrigation Department, Medical & Health Department, Penang Water Authority, Labour Department, Engineering Department, Harbour Authority, State Economic Planning Unit and Board of Management of Municipal Council, P.W., all in the State Government of Penang, and Ministry of Health, Statistic Department, Ministry of Environment, Meteorological Department and Economic Planning Unit of the Federal Government.

In addition to the above, site investigations, land survey, house visits and factory inspections were undertaken in order to augment the data collected by courtesies of the above referred agencies.

Throughout the period, in-service training for the counterpart staff of Ministry of Health have been undertaken at the Project site, for participation in collection and preliminary review of information, technical discussions and reconnaissance of Project site.

Contribution to the progress of activities referred above by Coordinators from Municipal Council, P. W., namely, Mr. Loo and Mr. Choo, through their generous cooperation and coordination at all times are most worthy to note. Special mention is hereby made to record our thanks to them and to the Government which they represent.

B. Activities

1) Activity I - Collection of Data through Questionnaire

Questionnaires were prepared and directed to the agencies concerned residents of the area and industrial establishment, for which either written or verbal replies were provided.

The basic approach of this activity was to establish weekly schedule plan as provided in Annex B, and to pursue the work systematically as practical as possible. The details findings of the activity are shown in the following pages, with supplementary information described in Summary of Daily Works, Annex E of the present Report.

a) Data from Ministry of Health

1. WHO Assignment Report, Nov. 1973 by Mr. F. Agard, Wio Engineer.
2. George Town Sewerage Study, Nov. 1968 by Proctor & Redfern International Limited, Canada.
3. Municipality of Ipoh Sewerage Feasibility Study, March 1974
 - i Final Report - vol. I sections S.O. - II inclusive
 - ii " " - vol. II sections 12-15 inclusive
 - iii " " - Drawings

by ENEX, New Zealand.

4. Kuala Lumpur and Environs

Master Plan for Sewerage and Sewage Disposal, June 1975

- i. Summary Volume
- ii. Volume 1 Perspectives
- iii. Volume 2 The Master Plan
- iv. Volume 3 Implementation
- v. Volume 4 Preliminary Engineering Designs
- vi. Report Drawings

by D. Balfour & Sons in association with Malaysia
International Consultants Sdn. Bhd.

5. Consumer Price Index for Peninsular Malaysia (Monthly)
Aug. 1976.
 6. National Accounts of Peninsular Malaysia, 1960-1971
 7. 1970 Population and Housing Census
 8. Population Projections for the States of Peninsular
Malaysia 1970-1980
 9. Industrial Statistics Peninsular Malaysia, May 1976.
- b) Data from Medical and Health Department, Penang State Government
1. Number of Patients of Communicable Disease, 1973-1975,
M.H.O. Pulau Pinang, by Dr. Chee Chin Jeang.
 2. Health Condition.
 3. Follow Up Measures taken by the LPKTSP on the Pollution
Kuala Juru.
 4. Minute of Anti-Pollution Committee, State Penang.

c) Data from State Economic Planning Unit, Penang State Government

1. Penang Master Plan Report, March 1970

- i. Vol. 1 Summary and Recommendations
- ii. Vol. 2 Part 1, The Resource Base and the Socio-Economic Programme
- iii. Vol. 2 Part 2, The Resource Base and the Socio-Economic Programme
- iv. Vol. 2 Annex, Special Reports and Appendices
- v. Vol. 3 The Outline Physical Plan
- vi. Vol. 3 Annexes, Supplemental Data and Special Report for the Outline Physical Plan
- vii. Vol. 4 Analytical Maps and Proposed Physical Outline Plan, 1965, by Robert R. Nathan Associates Inc. Consultants.

2. Population (1970) by Mukim, Penang State Government

3. Industrial Sector, Land Occupied, etc. Penang State Government.

d) Data from Survey Department, Penang State Government

1. Maps

- i. 1/63,360 SIRI L 7010
CHETAKAN 5-PPNM
SYIT 23
- ii. 1/25,000 Province Wellesley
SYIT 28B and 28D
KAPALA BATAS
- iii. 1/10,000 Bukit Mertajam
SIRI L905
CHETAKAN I-PPNF
SYIT Page III

- iv. 1/7,500 Butterworth
SIRI L905
CHETAKAN I-PPNM
SYIT Page III

e) Data from Town and Country Planning, Penang State Government

1. Maps

- i. Index Map
Penang Island and Province Wellesley 1940
- ii. Penang Land Utilization Map, Base Map
- iii. Population Dispersion & Settlement Pattern 1970
State Department of Town & Country Planning, 1972.
- iv. Population Dispersion of Settlement Pattern 1957
State Department of Town & Country Planning, 1973.
- v. Projected Distribution of Urban Population 1990
State Department of Town & Country Planning 1976.

2. Penang Development and its Impact on the Environment, May 1974.

f) Data from Public Works Department, Penang State Government

- 1. Roads Maintained by JKR in Butterworth/Bukit Mertajam Metropolitan Area.
- 2. Plan Showing Location of Boring Data
- 3. Cost Unit Price for Construction, Penang State
 - i. Labor cost
 - ii. Price of basic materials
 - iii. Unit cost of basic items of construction (including labor and materials)
 - iv. Combined unit cost for construction (including labor and materials)

g) Data from Drainage and Irrigation Department, Penang State Government

1. Hydrological Data

i.	Streamflow Records	1910 - 1940
ii.	" "	1941 - 1960
iii.	" "	1960 - 1965
iv.	" "	1965 - 1970
v.	Rainfall	1879 - 1958
vi.	" "	1959 - 1965
vii.	" "	1965 - 1970

2. Hydrological Procedures

- i. No.1 estimation of the design rainstorm
- ii. No.4 magnitude and frequency of flood in Peninsular Malaysia
- iii. No.5 rational method of flood estimation for rural catchments in Peninsular Malaysia
- iv. No.11 design flood hydrograph estimation for rural catchments in Peninsular Malaysia
- v. No.12 magnitude and frequency of Low flows in Peninsular Malaysia
- vi. No.13 the estimation of Storage-draft rate characteristics for rivers in Peninsular Malaysia.
- vii. No.16 flood estimation for urban areas in Peninsular Malaysia.

3. Planning and Design Procedures

Procedures No.1 Urban Drainage design standards and procedures for Peninsular Malaysia 1975.

4. Report on flood problems in West Malaysia, Aug. 1971, by The Water Resources Committee

5. Hydrological Procedure No.8 KL, 1973

Hydrological Design Standards of Malaysia by Mr. T. D. Heiler.

6. List of Hydrological Stations, State of Penang
Bil(11) dlm. JET. PE.34/8
 7. Location Map of Hydrological Stations
 8. Pinang Tunggal Pumping Scheme
 9. List of Existing Pumping Station
 10. Table of Rainfall Record
 11. Flood Area Map
 12. Sungai Juru Dam and Gate Report
- h) Data from Penang Development Corporation, Penang State Government
1. List of Industrial Establishments (Frai, Bayan Lepas, Mak Mandin)
 2. Guide lines for Evaluation of Industrial Waste-water Effluents.
 3. List of Major Factories,
Map of Industrial Area in the Study Area.
- i) Data from Ministry of Environment, Federal Government
1. Result on Juru Pollution Survey by Ministry of Environment, 19...
- j) Data from Engineering Department, Municipal Council, Penang Island
1. Annual Report for the years 1974 & 1976
 2. Details of Manholes
 3. Organizational chart.

k) Data from Penang Water Authority, Penang State Government

1. Annual Report 1973
2. Layout of water
3. Industrial Consumption (Prai, Bayan Lepas, Mak Mandin)
4. Monthly Analysis of Water Consumption (1974-1976)
5. Raw Water Analysis
6. Water Demand Curves (1976)
7. Water Supply Area and Population
8. Penang Water Supply Project
 - i. Vol 1
 - ii. Vol 2
9. Preliminary Report.
10. Daily Rainfall Records (1954 - 1976)
11. Results on the Water Quality Tests (Raw water of city water)
12. Finance Report
13. List of major consumers of Piped Water

l) Data from Municipal Council, Province Wellesley

1. Nightsoil Collection (Area, Service Route, Cost)
2. Communal Septic Tank in Seberang Prai Maintained by Engineering Section M.C.P.W.
3. Monthly Expenditure for the Maintenance and Desludging Service and Drainage.
4. Town Boundaries (Butterworth, Bukit Mertajam)
5. Date of Septic Tank
6. Preparation of Master Plan for surface drainage of Butterworth Town.

7. Existing Drainage System of Butterworth Area.
 8. Data Sheet of Chemical and/or bacteriological examination, on Septic Tank Effluents, Industrial Waste-water Effluents, Drains and Rivers, and Coastal Sea Waters.
 9. List of Small Scale Factories in Butterworth Area with Distribution Map, Copies of Questionnaires Sheet of S.S.I. Survey carried by Univ. Sc. Malaysia.
 10. List of Factories in Mak Mandin Area
 11. Distribution Map of Major Factories in Province Wellesley
 12. Organization Chart for Engineering Section
 13. The Municipal Ordinance (SS. Cap. 133)
 14. Rural Board, Province Wellesley Building By-Laws, 1950.
 15. Dangerous Unhealthy or Offensiv Tradisand Garages By-laws 1974.
- m) Data on Domestic Sewage by Field Survey

In addition to the effort to collect data from the Government agencies concerned, questionnaire were prepared and directed to the selected households in the Project area for the purpose of the survey on domestic water consumption rate, wastewater disposal system and night-soil disposal system, together with average income level according to the different types of house accomodation. The information obtained would usefully be employed in determining per capita sewage flow rate projection and also for socio-economic study of the Master Plan.

Careful preparation was undertaken, on consultation with the staff members of Municipal Council, P.W. in selecting areas and identifying the types of houses and their residents for sampling purpose in order to secure reasonably reliable picture, to the extent possible, on overall domestic situation of the Project area. Seven housing types were selected, reflecting the level of standard

of livings, which are classified as: Kampung houses (wooden houses), one-storied attached terrace houses, Two-storied attached terrace houses, Flat houses, Commercial houses, Semi-detached houses, and Isolated houses. The location of these houses covers areas most likely to be considered with high priority in the phased program of the Master Plan.

The questionnaire as attached in Annex D were delivered through Municipal Council, Province Wellesley, to the residents of the selected houses, and were collected by the counterpart staff and the Consultants, visiting the houses to the extent possible.

The number of households selected by 7 types are as follows:

1. Kampung houses (wooden houses)	20	houses
2. One-storied attached terrace houses	41	"
3. Two-storied attached terrace houses	20	"
4. Flat houses	16	"
5. Commercial houses	19	"
6. Semi-detached houses	10	"
7. Isolated houses	4	"
	Total	130 houses

The findings of the survey is indicated in Tables 1-3 number of the questionnaires collected as 73.

Table -1 Per Capita Water Consumption Rate by Housing Type

Water consumption rate l/cap./day	Number of households by housing type							
	Total	A	B	C	D	E	F	G
less than 51								
51 - 100	5	1	2		2			
101 - 150	18	5	2	6	4		1	
151 - 200	17	5	7	1	3		1	
201 - 250	10	3	4	1			1	1
251 - 300	9	3	2	2	2			1
301 - 350	4		1	1			1	1
351 - 400	2		1	1				
more than 400	8	1	3	3				1
Total	73	18	22	15	11		4	4
Average	190	181	199	200	157		213	325

Note: A-- Kampong house
 B-- One-storied attached terrace house
 C-- Two-storied attached terrace house
 D-- Flat house
 E-- Commercial house
 F-- Semi-detached house
 G-- Isolated house

Table - 2 Monthly Income by Housing Type

Income M\$/month	Number of households by housing type							
	Total	A	B	C	D	E	F	G
less than 201	12	11	1					
201 - 400	24	7	12	2	3			
401 - 600	16	1	5	4	6			
601 - 800	7			3	2			2
801 - 1000	6		3				2	1
1001 - 1200	3			1			1	1
more than 1200	2		1				1	
Total	70	19	22	10	11		4	4
Average	500	200	500	600	500		1300	900

Note: A-- Kampong house
 B-- One-storied attached terrace house
 C-- Two-stories attached terrace house
 D-- Flat house
 E-- Commercial house
 F-- Semi-detached house
 G-- Isolated house

Table - 3 - Number of Persons of Household by Housing Type

Number of persons Persons/Household	Number of households by housing type							
	Total	A	B	C	D	E	F	G
less than 3	12	3	1	1		6		1
3 - 4	18	6	3	5	2	2		
5 - 6	27	6	8	5	2	3	2	1
7 - 8	16	2	8		3	1	2	
9 - 10	9	1	1	2	2	2		1
11 - 12	6	2		1	2			1
13 - 14	1		1					
15 - 16	2		1	1				
more than 16	1					1		
Total	92	20	23	15	11	15	4	4
Average	6	5	7	6	7	5	7	7

Note: A-- Kampong house
 B-- One-storied attached terrace house
 C-- Two-storied attached terrace house
 D-- Flat house
 E-- Commercial house
 F-- Semi-detached house
 G-- Isolated house

n) Data on Industrial Wastewater by Field Survey

For the purpose of getting information for study of industrial wastewater collection and treatment method, factory survey was conducted through questionnaire and field visits.

Industries were first classified into 12 categories covering major industrial activities in the Project area, and 45 factories were selected from among them by the list given by Municipal Council, P.W. and others concerned, as indicated in Annex E, with due consideration on those which are considered to have ability to provide data required.

The questionnaire as provided in Annex D were delivered to all of these 45 factories selected, followed by the visits to the factory sites to the extent possible. Number of questionnaire collected are 45.

Activity II. Ground Survey

Topographical maps available here in Penang have centerlines of the Survey Ordinance Datum (SOD) in every 25 feet in Bukit Mertajam area and 50 feet in Butterworth area, but no center lines exist for the flat area which consist majority of the Project area.

Conference was held with the Survey Department, and it was suggested that the Department staff could help the required survey. However, due to the time schedule of the NSC team, this generous offer was not possible to be materialized, and local land surveyor was employed from among those recommended by the Municipal Council, P.N., for the necessary survey at Butterworth area, and Bukit Mertajam area was covered by the NSC team itself using the rented instrument.

These surveys were conducted covering entire area of the Project with the degree by which sufficient information of ground surface levels required for the Master Plan would be collected, including cross sections and slopes of existing main drains.

Activity III. Survey on Domestic Sewage Quantity and Quality

As one of the basic information for per capita waste load and wastewater flow rate projection, quality and quantity analysis of open-ditches beside the residences selected were performed.

Three Housing blocks were selected whereby open concrete ditches surround and the domestic wastewater discharged into these ditches directly at the corner of the block by gravity. At the corner of the ditch, V-notch was installed to measure flow rate, and the sampling and investigation were carried out. These performances were done during 6:00 am to 12:00 pm of the day for every 1 to 2 hours for sampling and every 15 to 30 minutes for flow rate measurement.

These blocks selected include average typical residence in the Project area, and no night-soil is discharged into open-ditch. The waste load by night-soil is naturally not estimated in this study.

The location of selected housing blocks are indicated in Figure - 1. . . and the findings of sampling and measurement are shown in Table - 4

TABLE 4 The Findings of Survey for Domestic Wastewater
Quantity and Quality (Commercial and Residen-
tial Area)

Time	Q	WT	pH	DO	BOD	COD	SS	Cl ⁻	Remarks
	m ³ /d	C		ppm	ppm	ppm	ppm	ppm	
6:00	69.1	24.2	6.6	1.8	70	120	52	383	
7:25	198.7	-	-	-	-	-	-	-	
8:00	190.1	25.0	6.6	2.5	95	120	56	435	
10:00	725.8	25.2	6.8	-	170	240	136	115	
12:00	224.6	26.0	6.6	2.3	95	40	56	75	
14:00	241.9	26.3	6.3	1.9	185	80	71	114	
16:00	483.8	27.0	6.7	1.3	135	240	34	78	
18:00	527.0	24.9	6.7	2.1	115	365	38	68	
20:00	535.7	24.6	6.2	2.5	215	120	77	77	
22:00	941.8	24.2	6.3	3.7	95	120	64	60	heavy rain
24:00	241.1	23.3	6.2	3.1	95	120	27	120	

Q Quantity of Water Flowing
 WT Water Temperature
 DO Dissolved Oxygen
 BOD Biochemical Oxygen Demand
 COD Chemical Oxygen Demand
 SS Suspended Solids

NOTE Date : 25 Nov. 1976

Location : Jalan Bagan Luar, Butterworth

To be continued

TABLE 4

The Findings of Survey for Domestic Wastewater
Quantity and Quality (Residential Area - 1)

Time	Q	WT	pH	DO	BOD	COD	SS	Cl ⁻	Remarks
	m ³ /d	C		ppm	ppm	ppm	ppm	ppm	
7:40	-	-	-	-	365	195	30	16	
8:30	6.2	23.8	6.5	2.0	360	455	47	41	
9:30	24.8	23.8	6.9	2.4	285	195	39	31	
10:30	16.9	27.9	7.8	1.1	300	325	49	29	
11:30	19.3	26.4	7.1	1.5	130	195	24	25	
13:30	26.2	28.1	5.5	2.3	180	195	26	44	
15:30	12.6	27.6	5.3	2.0	315	115	34	37	
17:30	18.1	27.0	6.3	0.7	225	155	38	26	
18:30	19.3	26.8	6.5	1.2	215	80	23	29	
19:30	20.6	26.5	6.8	0.9	240	80	18	37	
21:30	7.5	25.9	7.2	0.7	370	115	16	35	
23:30	4.4	24.9	6.8	0.3	195	155	34	43	

Q Quantity of Water Flowing

WT Water Temperature

DO Dissolved Oxygen

BOD Biochemical Oxygen Demand

COD Chemical Oxygen Demand

SS Suspended Solids

NOTE Date : 4 Dec. 1976

Location : Tingkat Bagan Baru Sepuloh, Butterworth

To be continued

TABLE 4 The Findings of Survey for Domestic Wastewater
Quantity and Quality (Residential Area - 2)

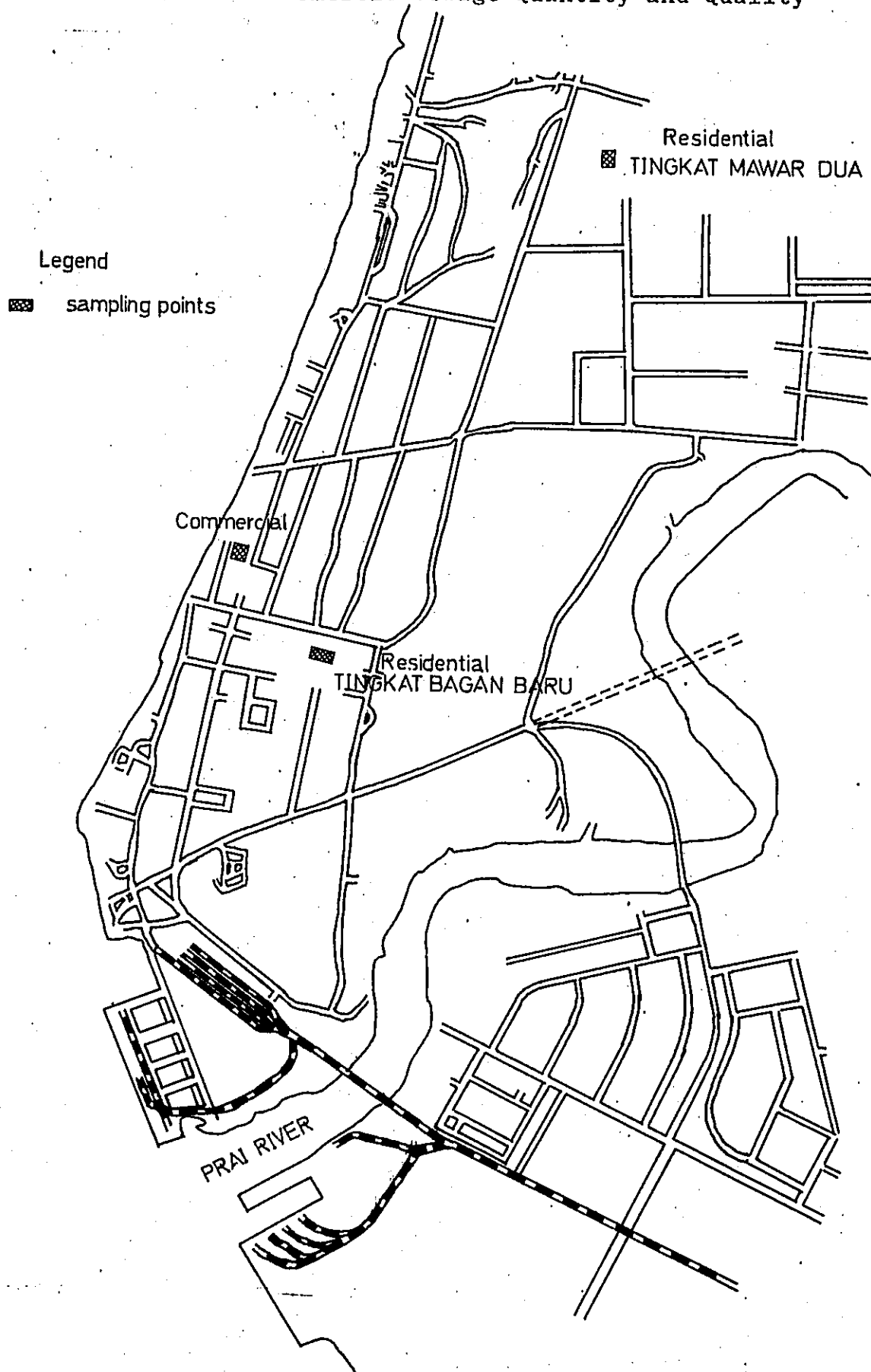
Time	Q	WT	pH	DO	BOD	COD	SS	Cl ⁻	Remarks
	m ³ /d	C		ppm	ppm	ppm	ppm	ppm	
7:30	9.8	26.8	7.2	4.5					
8:30	10.8	27.0	6.8	4.3					
9:30	4.0	27.1	6.7	3.9					
11:30	3.4	28.9	6.2	3.5					
13:30	4.0	30.6	6.2	4.1					
15:30	4.2	29.6	7.0	1.5					
17:30	10.8	28.6	6.7	4.8					
19:30	6.2	28.4	-	-					
21:30	6.2	-	-	-					
23:30	0.9	-	-	-					

Q Quantity of Water Flowing
 WT Water Temperature
 DO Dissolved Oxygen
 BOD Biochemical Oxygen Demand
 COD Chemical Oxygen Demand
 SS Suspended Solids

NOTE Date

Location : Tingkat Mawar Dua, Butterworth

FIGURE 1 The Location of Sampling Points for Domestic Sewage Quantity and Quality



Activity IV. Survey on River and Waterways Water Quality

Water qualities of rivers and waterways in the Project area were surveyed for approximately three weeks during the month of December 1976.

The Prai, the Juru and their tributaries together with "monsoon" and "industrial" drains were surveyed, and they are shown in Figure 2

Most of the samples were collected at surface, and water temperature, pH, dissolved oxygen and electric conductivity were analyzed at the site by portable "water quality checker", which are consisted of thermister, pH-electrodes, dissolved oxygen electrode and electric conductivity meter.

The samples collected from the Prai were additionally analyzed on suspended solids, chemical oxygen demand, coliform bacteria and chloride in laboratory.

Analytical methods used are follows:

- SS : glass fibre filter method (GF/C)
- COD : potassium permanganate consumption, 27-30°C 4 hrs.
- Coliform: desoxy cholate method
- Chloride: silver nitrate titration

The findings of analysis are shown in Table 5

The dissolved oxygen state of waterways in the project area is shown in Figure 3

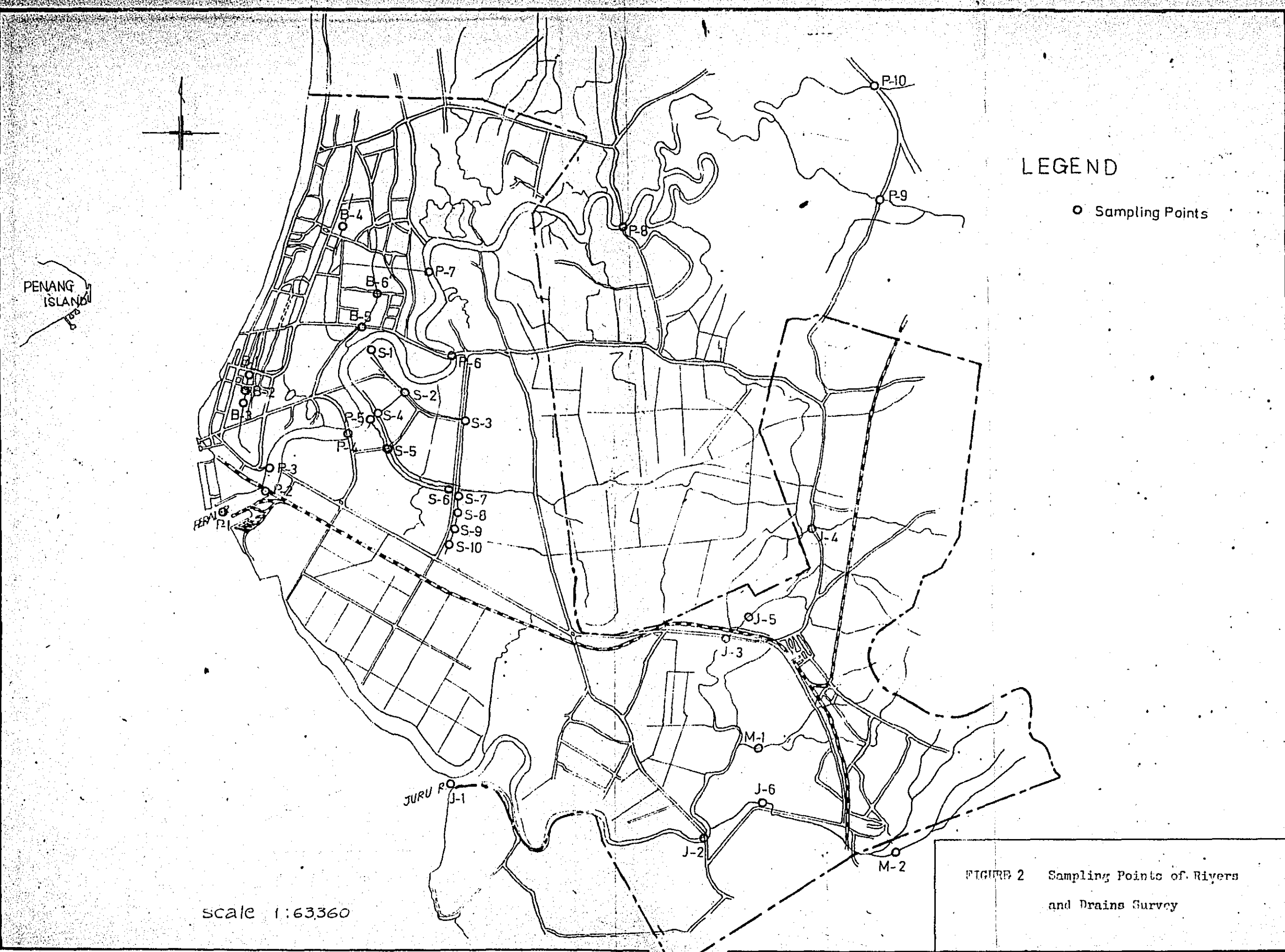
TABLE 5 Water Quality of Rivers and Drains in the Project Area

No. of Station	Date/Time	WT	pH	EC	DO	COD	SS	Cl ⁻	Coli-forms
		C			ppm	ppm	ppm	ppm	N/ml
P-1	16 Dec.13:00	28.6	7.3	32.5	5.2	3.4	15	9500	-
P-1	17 Dec. 7:45	27.1	7.0	41.9	6.0	1.8	8	14700	-
P-2	9 Dec.16:20	28.9	8.3	47.2	8.4	-	-	-	-
P-3	3 Dec.14:20	32.2	6.0	41.3	5.3	8	303	12190	138
P-4	9 Dec.15:55	29.3	8.2	45.1	8.7	-	-	-	-
P-5	4 Dec. 9:57	27.7	6.9	28.2	4.2	-	-	-	-
P-6	4 Dec.10:10	27.7	6.7	22.6	3.9	3	15	7160	561
P-6	9 Dec.14:00	28.4	7.6	32.2	4.4	-	-	-	-
P-7	9 Dec.15:00	29.2	7.7	27.1	5.2	-	-	-	-
P-8	4 Dec.11:00	27.2	6.8	0.1	3.8	2	20	222	25
P-9	4 Dec.11:40	25.8	7.2	0.4	7.5	1	21	9	110
P-10	4 Dec.11:45	28.2	6.7	0.4	4.3	1	11	8	43
J-1	5 Dec. 9:20	27.4	6.6	37.2	3.6	-	-	-	-
J-1	17 Dec. 8:44	26.7	7.8	43.6	6.9	3.3	62	15600	15
J-2	5 Dec. 8:50	27.9	6.2	3.8	0.5	-	-	-	-
J-3	5 Dec.12:30	28.4	6.5	0.1	0.9	-	-	-	-
J-4	5 Dec.12:55	26.6	6.6	0.2	2.0	-	-	-	-
J-5	5 Dec.11:35	30.1	5.8	0.5	0.3	-	-	-	-
J-6	5 Dec.12:40	27.7	6.5	0.2	0.7	-	-	-	-

To be continued

TABLE 5 Water Quality of Rivers and Drains in the Project Area
(Continue)

No. of Station	Date/Time	WT C	pH	EC	DO ppm	COD ppm	SS ppm	Cl ⁻ ppm	Coli- forms N/ml
B-1	7 Dec.14:30	33.4	5.8	0.6	0.9	-	-	-	-
B-2	7 Dec.14:45	34.4	6.6	0.6	0.7	-	-	-	-
B-3	7 Dec.15:00	33.4	6.7	0.6	0.7	-	-	-	-
B-4	14 Dec.18:30	28.8	7.0	0.5	1.1	-	-	-	-
B-5	3 Dec.15:00	31.3	6.2	4.8	0.1	-	-	-	-
B-6	3 Dec.15:10	33.7	6.2	0.5	0.5	-	-	-	-
S-1	3 Dec.15:50	30.7	6.4	8.1	11.5	-	-	-	-
S-2	3 Dec.15:45	30.7	6.4	2.6	12.9	-	-	-	-
S-3	3 Dec.14:40	31.8	6.6	0.2	11.7	-	-	-	-
S-4	3 Dec.15:58	28.5	6.6	0.2	0.2	-	-	-	-
S-5	3 Dec.16:10	28.2	6.2	0.7	0.5	-	-	-	-
S-6	3 Dec.16:15	31.4	6.1	0.1	0.5	-	-	-	-
S-7	3 Dec.16:40	30.5	7.8	0.6	0.9	-	-	-	-
S-8	3 Dec.16:35	27.7	7.8	0.1	2.3	-	-	-	-
S-9	3 Dec.16:30	32.0	7.9	0.4	0.7	-	-	-	-
S-10	3 Dec.16:32	32.3	7.9	0.3	1.8	-	-	-	-
S-11	3 Dec.16:25	33.5	8.5	0.6	21.9	-	-	-	-
M-1	5 Dec.11:40	28.4	6.5	0.3	0.7	-	-	-	-
M-2	5 Dec.10:00	24.7	7.3	0.3	2.3	-	-	-	-



LEGEND

○ Sampling Points

FIGURE 2 Sampling Points of Rivers and Drains Survey

scale 1:63360

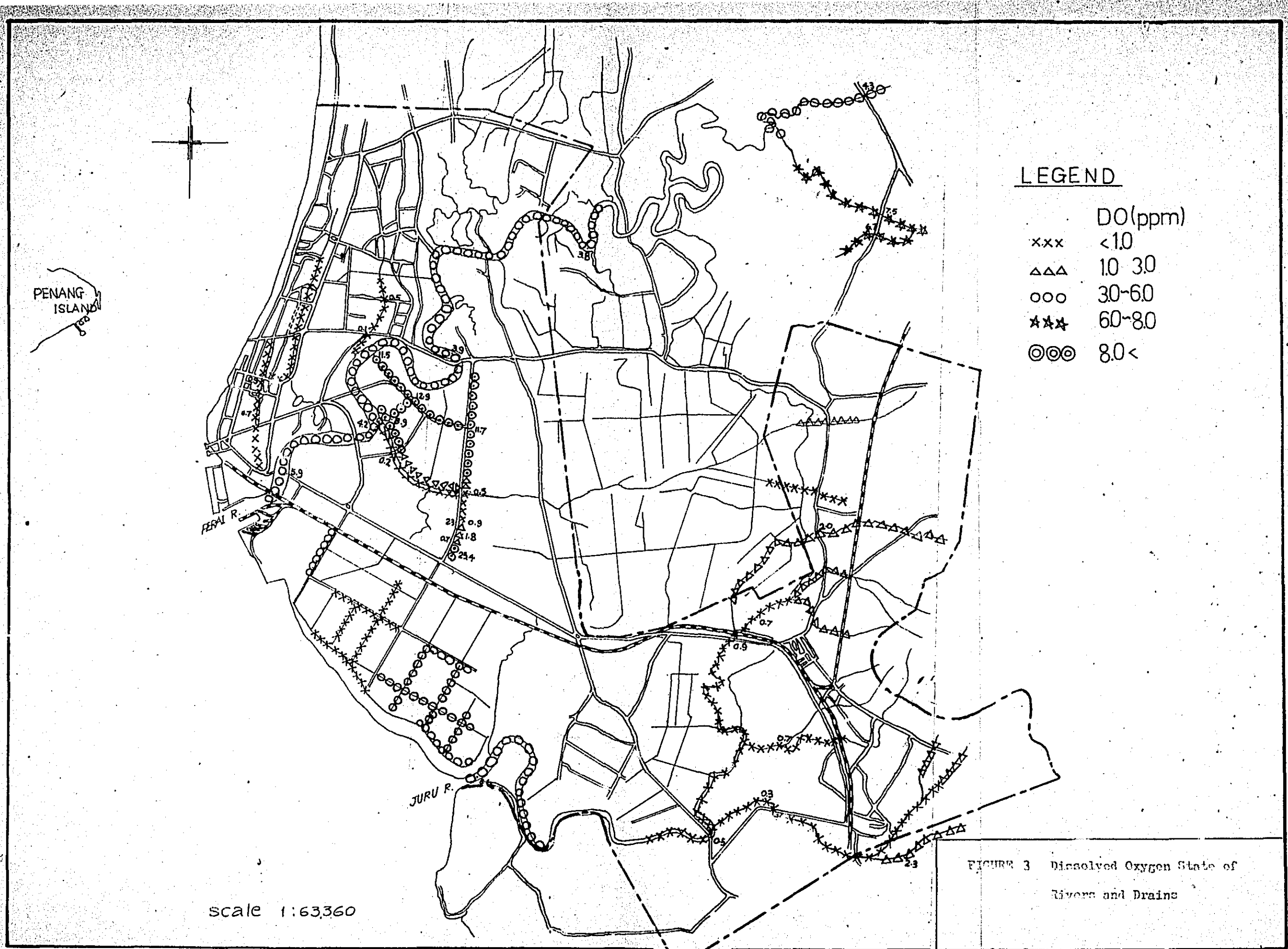


FIGURE 3 Dissolved Oxygen State of Rivers and Drains

Activity V. Survey on Sea Water Quality

Sea survey were carried out for two days during the month of December, 1976, along the east coast of the Penang channel extending from the River mouth of the Prai to 13 km south and north respectively (see Figure 4). The sea water samples were taken at the surface at 26 points as shown in Figure 4 , and analysis was made for:

1. Water temperature (W.T.)
2. PH
3. Electric Conductivity (E.C.)
4. Dissolved Oxygen (D.O.)
5. Chemical Oxygen Demand (COD)
6. Chlorinity
7. Suspended Solids (S.S.)
8. Coliform bacteria (Coliforms)

WT, PH, EC, and DO were immediately tested after sampling by thermister, PH-electrode, Electric conductivity meter and DO meter (electrode) respectively. The other components were analyzed at the Government laboratory as soon as possible after they were brought back.

Analytical methods used were follows:

Chlorinity : Silver Nitrate Titration
SS : Glass Fibre Filtrater
COD : Potassium Permanganate Consumption (27^o-30^o, 4 hrs.)
Coliform : Desoxy cholate method

The results of analysis are shown in Table 6

TABLE 6 The Results of Seawater Analyses (The Penang Channel)

No. of Station	WT °C	pH	EC m ₂₅	Chlori- nity ‰	DO ppm	COD ppm	SS ppm	Coli- forms N/ml
1	27.1	7.7	47.7	18.4	6.8	1.6	3	5
2	27.3	7.9	46.7	18.4	6.8	1.3	14	8
3	27.6	8.0	47.9	17.0	6.8	1.2	9	2
4	27.5	8.0	47.8	17.3	6.8	1.1	5	0
5	27.4	8.0	48.0	17.2	7.0	1.4	12	0
6	27.6	8.0	47.8	17.3	7.5	1.3	3	2
7	27.7	7.9	48.3	17.2	7.3	2.0	20	0
8	27.9	7.8	43.9	14.6	6.9	2.7	21	0
9	28.3	8.0	49.2	17.3	6.9	1.4	14	0
10	28.6	8.0	49.1	17.2	7.1	1.8	27	1
11	28.6	8.0	49.0	17.2	7.3	1.8	55	0
12	28.2	7.9	48.8	-	6.3	-	-	-
13	26.5	7.9	46.8	17.3	6.8	1.5	14	1
14	26.7	8.0	47.7	17.3	7.3	1.5	11	4
15	27.1	7.5	46.3	17.1	7.5	1.5	24	0
16	26.4	8.1	46.1	17.1	7.2	1.6	12	0
17	27.0	8.0	48.0	17.3	7.5	1.0	5	0
18	27.3	8.0	47.7	17.3	7.7	1.3	16	0
19	27.3	7.9	47.7	17.2	7.2	1.3	3	1
20	27.5	7.9	47.7	17.4	6.8	1.0	8	4
21	27.6	7.9	47.5	17.2	7.9	1.1	5	7
22	28.6	8.3	47.7	17.8	7.3	0.8	6	0

To be continued

TABLE 6 The Results of Seawater Analyses (The Penang Channel)
(Continue)

No. of Station	WT	pH	EC	Chlori- nity	DO	COD	SS	Coli- forms
	°C		mS	‰	ppm	ppm	ppm	N/ml
23	28.2	8.3	47.8	17.4	7.5	1.2	3	2
24	28.2	8.3	48.2	17.3	7.3	1.4	12	35
KP	28.6	7.3	32.5	9.5	5.2	3.4	15	125
22	28.4	7.7	38.2	12.5	5.5	3.2	8	145
KP	27.1	7.0	41.9	14.7	6.0	1.8	8	20
KP*	26.2	7.5	43.1	17.0	6.8	2.4	114	305
KJ	26.7	7.8	43.6	15.6	6.9	3.3	19	15
KJ**	25.7	7.8	41.2	16.5	6.1	2.3	62	30

* 2.7 m deep

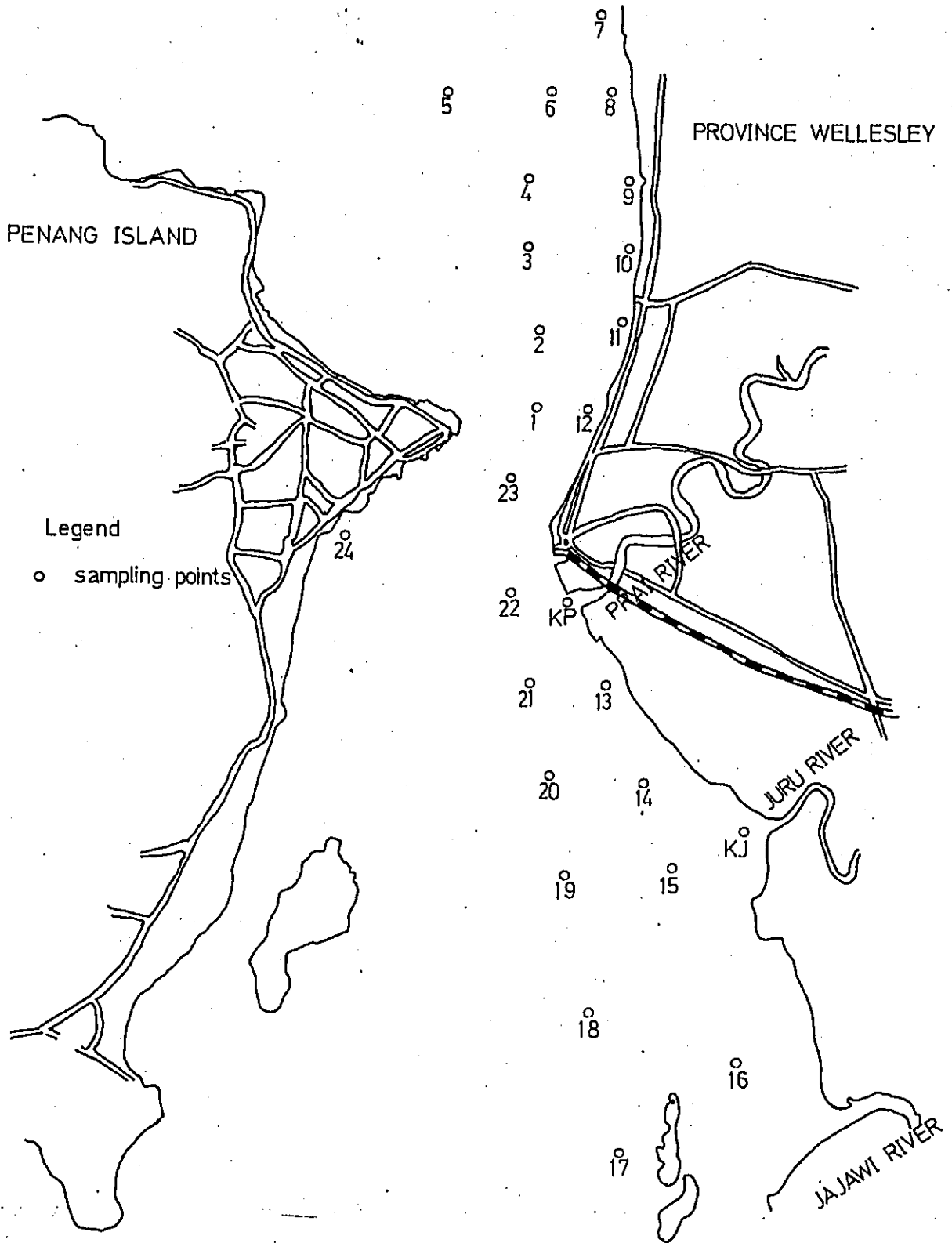
** 5.0 m deep

The Surveys were carried out on 16th and 17th December, 1976.

All samples were collected at the surface except marked ones.

WT	Water Temperature	COD	Chemical Oxygen Demand
EC	Electric Conductivity	SS	Suspended Solids
DO	Dissolved Oxygen		

FIGURE 4 Sampling Points of Sea Survey



Activity VI Socio-Economic Study

Independent and often joint effort with engineering studies have been undertaken during the period for collection of data required for socio-economic study

"Third Malaysian Plan" and Penan Master Plan" provided by courtesy of Federal and State Governments respectively serves as useful sources of information as regards overall general socio-economic outlook of the country and the state, particularly in connection with the development envisaged during the immediate future, including public utility systems together with industrial and housing scheme.

"Population Census of Malaysia, 1970" is also a useful data for projection of the future growth, on the basis of which preliminary analysis is being undertaken according to the sub-divided areas of the Project site. The work is expected to continue as joint undertaking by engineering staff and the economist in identifying the population density in particular according to the sub-areas, for which sewerage system will be developed.

Preliminary survey was also conducted on household income level in conjunction with the domestic sewerage studies, which seems to serve useful for assumption of willingness as well as capability of households involved in Project area to pay for the services by proposed sewerage and drainage system.

The data obtained during the period includes current practice of revenue for public utility system. While further study is required on the matter, it is encouraging to note that basic data sufficiently reliable for future planning are in hand, on the basis of which alternative estimation for the different magnitude of the Project under the assumption of establishing self-supporting enterprise will be undertaken with full cooperation and close coordination with the engineering projection.

VI Conclusion

In retrospect, the field activities of the past two months entertained by NSC team at Butterworth and Bukit Mertajam was, generally speaking, rewarding and satisfactory. While dedication to the work by the members of the team and Government counterparts should be commended, the success of the undertaking owe heavily to the courtesy and cooperation of all levels of the Government of Malaysia, for which NSC expresses profound gratitude.

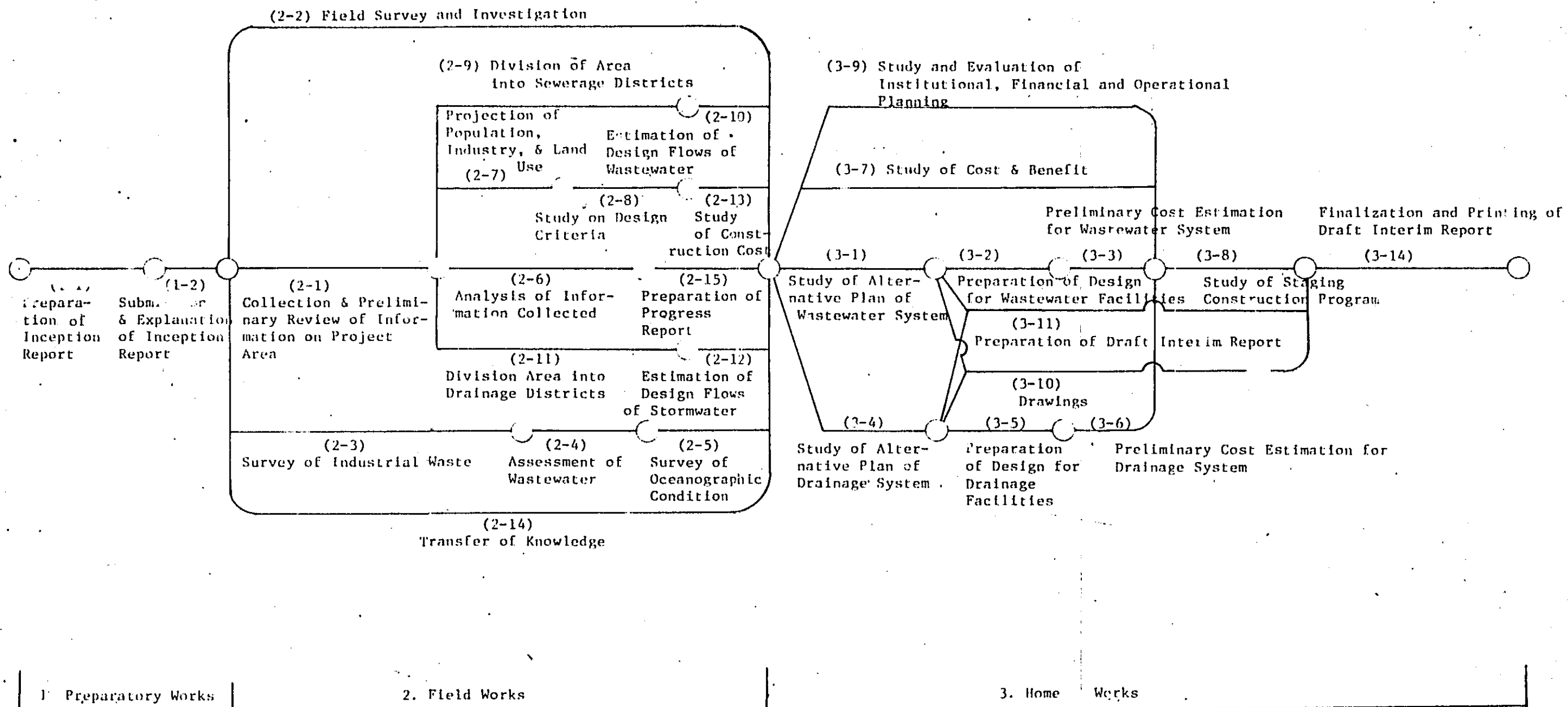
During the course of data collection as described in details in the foregoing Chapters, together with annexes attached, certain degree of general understanding of the situation and consequent preliminary concept for the different approaches for the Project have arisen, but reference to these are reserved in this Report due to the premature stage of way of thinking. Further careful in-depth consideration shall be undertaken during the course of home work which will follow from January 1977 onward in accordance with the work schedule in the Inception report, which is reproduced as Annex A of the present Report.

ANNEXES

- A) Work Diagram for Sewerage and Drainage Project
- B) Weekly Work Schedule
- C) Minutes of Conferences
- D) Form of Questionnaire
- E) List of Industries - Factories included in the Industrial waste-water Survey
- F) Daily Work Record During the Period

(A) Work Diagram for Sewerage and Drainage Project in Butterworth/Bukit Mertajam Area in Malaysia

1976			1977		
OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH



B) Weekly Work Schedule for Site Investigation

Week	Questionnaire			Ground Survey	Survey of Domestic Sewage Quantity & Quality	Survey of Industrial Waste Water Quality	Survey of River & Drain Quality	Survey of Sea Water Quality
	(a)	(b)	(c)					
1. (Nov. 1st - 7th)								
2. (Nov. 8th - 14th)								
3. (Nov. 15th - 21st)								
4. (Nov. 22nd - 28th)								
5. (Nov. 29th - Dec 5th)								
6. (Dec 6th - 12th)								
7. (Dec. 13th - 19th)								
8. (Dec 20th - 30th)								

Note: (a) Department Concerned
 (b) Domestic Sewage
 (c) Industrial Wastewater

Ground Survey includes the Site exploration, leveling and cross measurement

C) Minutes of Conferences

1) First Meeting with Government of Malaysia (Prepared by EPU, Federal Government)

Date: 28th October, 1976

Time: 10.00 am - 12.00

Place: EPU Conference Room in Kuala Lumpur.

Attendance

Encik. Bashah Nordin	- Economic Planning Unit - Chairman EPU
Cik Rosmah Hj. Jentera	- EPU
Encik A. S. Sekaran	- Ministry of Health (MOH)
Encik P. Lauriault	- MOH (World Health Organisation)
Encik Lum Wee Kee	- MOH
Mr. T. Kasai - JICA, K	- JICA, Kuala Lumpur Office
Mr. H. Yuasa	- Nihon Suido Consultants (NSC)
Mr. Shibus	- NSC
Mr. M. Miyamoto	- NSC
Mr. T. Ueno	- NSC
Mr. K. Urata	- Ministry of Construction Supervisory Committee
Mr. A. Saita	- Project Manager (NSC)
Dr. M. Kashiwaya	- Ministry of Construction
Mr. S. Kanai	- Japan International Cooperation Agency
Mr. Y. Nakagawa	- Ministry of Construction
Encik Ab. Khalil Ab. Hamid	- EPU - Secretary

Introduction

1. Mr. Chairman welcomed all members present especially members of the Japanese delegation and briefed the meeting on the importance of sewerage project which is normally undertaken by foreign consultants. The Consultants were then called upon to brief the meeting on the project.

2. Mr. A. Saita apologised for not giving sufficient time to enable members to read the Inception Report distributed during the meeting. However he was able to give a resume during the meeting.

3. The Consultant explained that there was a need for close local cooperation in collecting necessary data and other relevant information for the above study. Other similar studies such as Kuala Lumpur Sewerage Study and Ipoh Sewerage Study might be useful in providing further data for the Study.

4. Mr. Chairman assured the Consultants that the Government would provide all the data available and the coordinators for the Study would be appointed at both central and state levels.

5. The Master Plan Study would take thirteen months in which, for the first six months the Study team would be stationed in Malaysia and the remainder in their home office. The collection of data would take two months and based on the data a tentative evaluation will be made. The Consultants suggested that a preliminary discussion with the Government would be held after receiving all necessary data.

6. The Ministry of Health would provide the Consultant with reports on Kuala Lumpur Sewerage Study and Ipoh Sewerage Study. Further the Consultant would like to have all the relevant maps of certain specifications which are not available in Penang. Mr. Chairman again assured the Consultants that such requirements would be made available by contacting the coordinator of EPU at the central level. Permission to bring back all the necessary prerequisite to home office would be arranged.

Conclusion

1. The meeting agreed as follows:

1. A Steering Committee would be set up consisting of the following:-

- (i) representative of the EPU - Chairman
- (ii) representative of the Ministry of Local Government and Federal Territory
- (iii) representative of the Ministry of Health
- (iv) representative of the Board of Management Local Government, Seberang Perai
- (v) representative of the State Government of Penang
- (vi) representative of Jabatan Kerjaraya Pulau Pinang/ Headquarters
- (vii) representative of Penang Survey Department

2. Technical Committee, consisting of:

- (i) representative of the Ministry of Health
- (ii) representative of the Board of Management of Local Government, Seberang Perai
- (iii) representative of the Penang City Council

Meeting would be held whenever necessary.

3. Local support required by the Consultants are:

- (i) Office space All to be provided by the Board of
- (ii) Secretariat's staff Management of Local Government
- (iii) Vehicles Seberang Perai

- (iv) Survey team
- (v) Reports - from Ministry of Health and EPU
- (vi) Counterpart - two or three engineers from the Ministry of Health and the Local Government of Seberang Perai.
- (vii) Miscellaneous expenses - from EPU vote.

4. A meeting of the Steering Committee would be held on 19th November, 1976 at 9.30 in Penang's State Planning Unit office.

5. The meeting also agreed to write to the Japanese Embassy concerning the transfer of knowledge to the Malaysia counterpart personnels by the Consultants. The following work component of the study should be carried out in Malaysia:

- (i) Study of Alternative Plan of Waste water and Drainage system
- (ii) Preparation of Design for Waste water and Drainage facilities
- (iii) Preliminary Cost Estimates for Wastewater and Drainage system
- (iv) Study of Cost and Benefit.

6. A second Steering Committee meeting would be held at EPU Conference Room sometime in December, 1976.

2) Meeting with Steering Committee (Prepared by HSC)

Date : 19th November, 1976

Time : 10.00 am - 12.00

Place : State Government office in Penang

Attendance

From Malaysian Government

Mr. Bashah bin Nordin, Chairman, E.P.U. (K.L.)

Mr. Ali Yusof, Dy Secretary General Ministry of Local Government

Mr. A. Sekarajasekaran, Ministry of Health

Mr. Lum Weng Kee, Ministry of Health

Mr. How Pow Hwee, JKR, Penang

Mr. Mohd. Rusli bin Haji Hussain, State Secretariat, Penang

Mr. Abdullah bin Taha, Director of Survey, Penang

Miss Cheah Gaik Lian, State Secretariat, Penang

Mr. Loo Kam Weng, Wakil LPKT: Pulau Pinang

Mr. Choo Ewe Guan, Chief Engineer LPKT, Province Wellesley

Mrs. Michelle Ann Teoh, Asst. Director, State Planning Department

Mr. Rishyakaran K, General Health Engineer, Kementerian Kesihatan,
Local Counterpart

From Consultants (Nihonsuido Consultants Co. Ltd.)

Mr. Akira Saita, Project Manager

Mr. Takeshi Ueno, Co-Project Manager

Mr. Hiroshi Shono

Mr. Shunsuke Shibui

Mr. Masafumi Miyamoto

Mr. Tatsuo Mizutani

Mr. Tetsuo Horikawa

Mr. Mitsuharu Kajikawa

Mr. Osamu Fujikawa

Mr. Yasushi Hirau

Mr. Hiromichi Yuasa

Subject: Review of Project Preparation and Progress of Data Collection

Followings were discussed and confirmed in the meeting.

1. Mr. Bashah bin Nordin, the Chairman of this meeting introduced the members of Steering Committee and Technical Committee which were provided to facilitate the progress of the Project as follows:

a. Steering Committee Members

- Mr. Bashah bin Nordin, representative of E.P.U. (K.I.)
- Mr. Sekarajasekaran, Ministry of Health (K.I.)
- Mr. Lum Wee Kee, Ministry of Health (K.L.)
- Mr. Ali Yusof, Ministry of Local Government (K.I.)
- Mr. Mohd. Rusli bin Haji Hussein, State Government (Penang)
- Mr. Loo Kam Weng, Local Government (Penang, LPKT, 3F)
- Mr. Koh Kok Ee, Public Works Department (Penang)
- Mr. Abdullah bin Taha, Survey Department (Penang)
- Mr. Mohamed Ishad bin Ariff, Town and Country Planning (Penang)

b. Technical Committee Members

- Mr. Sekarajasekaran, Ministry of Health (K.L.)
- Mr. Ali Yusof, Ministry of Local Government (K.L.)
- Mr. Choo Ewe Guan, LPKT.SP.
- Mr. Lim Peng Weng, LPKT Penang.

The Chairman said that all above members are provided to facilitate the study concerned and especially the members of technical committee will closely involved in the study and perform day to day consultation with consultants assigned in this study.

2. The Chairman raised the question about the Local Government's supports on provision of office space, transportation, counterpart and survey staff if they were satisfactorily provided. Mr. Loo replied representing local government that every item was provided to the extent that the Consultants are satisfied.

3. It was confirmed that the coordinators will be provided from the government to ensure the coordination between the Consultant and local government.

4. Mr. Saita representing the Consultants mentioned his appreciation for satisfactory arrangement provided by local government for the proceeding of the study as well as the collection of data. He confirmed that the map was already obtained. He expressed his hope to bring the map to Japan with permission of the Government of Malaysia by the dependable means such as sending by Embassy's vouch.

5. The Consultants explained the progress of data collection referring the report submitted at the meeting.

6. The Chairman raised the question about the possibility of the extension of the field work of the Consultants for three months to enable the transfer of technical knowledge in Malaysia. In response to the inquiry of the Chairman, Mr. Saita replied that the matter seemed to be under consideration by the Japanese Embassy at K.L. and JICA at TOKYO. While he personally felt that the request from the Ministry of Health would be difficult to accommodate at this late stage for JICA, the position of the Consultants was flexible and was prepared to comply with any decision which would be agreed upon on the government level of both parties.

7. The Consultants proposed following schedule tentatively agreed with the Supervisory Committee, JICA and Consultants to be held for review of progress report.

Dec. 21 : Arrival of Japanese Supervisory Committee
22 : Courtesy call to Japanese Embassy
23 : Leaving for Penang
24 : Preparation of Progress report
25 : " "
26 : " "
27 : Submission and explanation of Progress Report (in the afternoon)
28 :
29 : Leaving for Kuala Lumpur
30 : Submission and explanation of Progress Report (for Federal Government)
31 : Leaving for Tokyo,

Mr. Jaita pointed out to the meeting that the proposed schedule was on the basis of clearance on different governmental level, but since the meeting now firmly decided on function and organization of the Steering Committee & the Technical Committee, this would not suit to the operation on the side of Malaysian government. He invited comments and advice of the members of the meeting, keeping in mind that itinerary of the Supervisory Committee for Malaysia would not be able to revise but its schedule in Penang and K.L. might be flexible in accordance with the wishes of the Committees. The consensus of the opinion of the members of the meeting was that the clearance of progress Report should be planned on two different levels, namely, on Technical Committee level and Steering Committee level, both to be held at K.L. and that these meetings during the holidays were not practical. The opinion was also expressed that the advance copies of the draft Report should be given instead of being shown at the meeting for any intelligent comment from the members. It was agreed that the matter would be studied by the members of the Committees and would be informed to the Consultants of any decision on the matter within next week.

8. The Consultants reemphasized the necessity to take the map and other reports borrowed from the government to Japan and requested their permission to bring them out.

The government of Malaysia noted this and promised to give the confirmation for it.

9. The Consultants proposed the target year of the Master Plan of the Project to be the year 2000, and it was approved.

10. The Consultants proposed the Project area to be covered by Master Plan, indicating the border line on the map as per sewerage and drainage area. The Government of Malaysia mentioned that they have no objection on proposed area. In this connection, the Government of Malaysia notified the Consultants that some portions of Penang Master Plan prepared in 1970 would be revised.

11. The Consultants proposed the metric system of weights and measures to be utilized in the study report.

The Government of Malaysia expressed no objection for metric system, however, the request was made to add the figures calculated by imperial system in the bracket for the convenience.

12. The Chairman finally asked the members of the government if they have any question or comment on the items proposed by the Consultants.

It was confirmed that they had no further question and comments.

D) Form of Questionnaire

1) Questionnaire for Domestic Sewage

1. Location
2. Occupation
3. Average monthly income of household
4. Number of persons employed in household
5. Number of persons living in household
6. Type of house (a) Lift house
 (b) Normal house
7. What is the present method of sewage disposal used in your household ?
8. How much do you pay for the present system of sewage disposal ?
 (a) ₹ / month / bucket
 (b) ₹ / month / septic tank
9. Do you have any complaints against the present system of sewage disposal ?
10. Should your household be connected to sewers, how much more would you be willing to pay ?
11. What is your household's source of water supply?
 (a) Pipe water
 (b) Well
 (c) Others
12. How much does your household's average monthly water bill amount to ?
13. If you are at present using a night soil bucket or pit latrine, please state your preference.
 - (1) Use of pit latrine
 - (2) Use of Night soil bucket
 - (3) Flush toilet connect to a septic tank - private
 - (4) Flush toilet connect to a septic tank - communal
 - (5) Flush toilet connect to a sewer

2) Questionnaire For Industrial Waste Water

1. Physical Data

Name of Factory _____

Address _____ (phone) _____

Capital _____ unit

Factory Site Area _____ unit Floor Space _____ unit

2. Annual Variation of the Number of Employees

<u>Present</u>	Future Projection (if available)
at start of factory operation _____	
1970 _____	1980 _____
1972 _____	1985 _____
1974 _____	1990 _____
1976 _____	2000 _____

3. Major Products

a) List of Major Products

b) Annual Variation of Quantity of Major Products

1st year of production 19 _____	Future Projection (if available)
_____	_____
1970 _____	1980 _____
1972 _____	1985 _____
1974 _____	1990 _____
1975 _____	2000 _____

4. Major Raw Materials and Chemicals such as acids, alkalines/
catalyzer

5. Water Consumption Data:

	Quantity (unit	Source*
for Boiler	_____	_____
for Raw Material (process consumption)	_____	_____
for Washing	_____	_____
for Cooling	_____	_____
Others	_____	_____
Total	_____	_____

* Note: Sources of Water ---- Municipal Water/Ground Water/
Surface Water/Sea Water/Others

6. Waste Water

- 1) Is there any facility for waste water treatment in your factory?
YES / NO
- 2) If YES, what kind of wastewater is treated by the facility ?
Process Wastewater / Toilet wastewater / Both
- 3) What kind of treatment is utilized ?

	Process Waste water	Toilet Waste later
Septic Tank without Filter Bed		
Septic Tank with Filter Bed		
Imhoff Tank		
Activated Sludge Process		
Waste Stabilisation Pond		
Others (name of Facilities)	_____	

- 4) What components are treated by the Facilities ?
Organic Matter / Suspended Solid / Turbidity / Oils / pH / Heavy Metals / Harmful Inorganics (As, CN, etc) / Harmful Organics (phenols, etc) / Color / Odor
- 5) Have you data on wastewater quality of your factory ?
YES / NO
- 6) If YES, please provide following information:
 - a) Name of Laboratory who analyzed sample
 - b) Date of Wastewater Quality Test
 - c) Results of Wastewater Quality Test, if available

d) Which of following pollutants present in the Wastewater:

Organic Matter / Suspended Solid / Oils/
Strong Acids / Strong Alkalines / Phenols/
Cyanide (CN⁻) / Hg / Cd / Pb / Cr / As /
Chlorinated Hydrocarbons / Organic Phosphorus /
Detergents

e) Is there any sampling site of wastewater in your
factory for water quality tests ?

YES / NO



Date _____ Name of Person filling this QUESTIONNAIRE

Position in Firm

REFERENCE No. _____

E) LIST OF INDUSTRIES/FACTORIES SELECTED
FOR INDUSTRIAL WASTE/WATER SURVEY

Ref. No.	Type of Industry/Product	Name of Industry/Factory	Address	Remarks	
1	FOOD	Sea Food	Prai Industrial Estate	1-1	
			Prai Industrial Estate	1-2	
			4340, Mak Mandin Industrial Estate	1-3	
	Oil Product		Prai Industrial Estate		1-4
			Prai Industrial Estate		1-5
			Prai Industrial Estate		1-6
			Mak Mandin Industrial Estate		1-7
	Others		Mak Mandin Industrial Estate		1-8
			Prai		1-9
			4624, Mak Mandin Industrial Estate		1-10
			Bagan Serai Industrial Estate		1-11

Ref. No.	Type of Industry/Product	Name of Industry/Factory	Address	Remarks
20	TEXTILE Spinning Fabrics Dyeing Others	A Penfibre Sdn. Bhd.	Prai Free Trade Zone	20-12
		B Kanebo Spinning Mills (M) Sdn. Bhd.	Prai Free Trade Zone	20-13
		C India Malaysia Textiles	Mak Mandin Industrial Estate	20-14
		D Texsyn Fibre Industries	Prai Industrial Estate	20-15
		E Pentex Sdn. Bhd.	Prai Wharf Free Trade Zone	20-16
		F Allied Malayan Development Ltd. United Chemical Industries	Mak Mandin Industrial Estate	20-17
39	FURNITURE	Nan Sin Dyeing Works (M) Sdn. Bhd.	Bagan Serai Industrial Estate	20-18
		Coco Industry Sdn. Bhd.	Prai Free Trade Zone	20-19
26	CHEMICAL Fertiliser Petroleum Chemical Medical Others	Sika (M) Sdn. Bhd.	Mak Mandin Industrial Estate	20-20
		Agricultural Chemicals (M) Sdn. Bhd.	Prai Industrial Estate	59-45
		Borden Chemical (M) Sdn. Bhd.	Prai Industrial Estate	26-21
		Federal Fertiliser Co. Sdn. Bhd.	Prai Industrial Estate	26-22
		Malayan Electro-Chemical Indust. Sdn. Bhd.	Prai Industrial Estate	26-23
		Blood Protection Co. (M) Sdn. Bhd.	Prai Industrial Estate	26-24
		Century Chemical Works Sdn. Bhd.	Mak Mandin Industrial Estate	26-25
27	PETROLEUM	Syarikat Eastern Powder Sdn. Bhd.	Prai Industrial Estate	26-26
		Summit Petroleum (M) Sdn. Bhd.	Mak Mandin Industrial Estate	26-27
			Prai Industrial Estate	27-28

Ref. No.	Type of Industry	Name of Industry/Factory	Address	Remarks
28	RUBBER	Viking Askim Sdn. Bhd. Central Plastic Corporation Sdn. Bhd.	Prai Free Trade Zone Prai Industrial Estate	28-29 28-30
30	CERAMICS	Rume Industries (M) Berhad Schott Glass (M) Sdn. Bhd.	Jalen 219, Off Federal Highway P. O. Box 21, Penang Prai Free Trade Zone	30-31 30-32
31	IRON	Malayawatta	Prai	31-33
32	NON-FERROUS METALS	Federal Cables, Wires & Metal Manufacturing Sdn. Bhd. Fujisash (M) Metal Industries Sdn. Bhd. Penang Pewter and Metal Arts Sdn. Bhd.	Mak Mandin Industrial Estate Prai Industrial Estate Mak Mandin Industrial Estate	32-34 32-35 32-36
33	FABRICATED METALS	North Malaya Engineering Trading	Mak Mandin Industrial Estate	33-37
35	ELECTRONICS	S.E.C. (Radio & P.V.) (M) Sdn. Bhd.	Prai Free Trade Zone	35-38
36	TRANSPORT EQUIPMENTS	Armstrong Cycle Parts Sdn. Bhd. Suzuki Assemblers (M) Sdn. Bhd.	Prai Industrial Estate Prai Industrial Estate	36-39 36-40
39	OTHERS	Yuasa Battery (M) Bhd. Malakuda Umbrella Frame Ind. Sdn. Bhd. Malaysia Aica Sdn. Bhd. Adhesive Tapes Inc. (M) Bhd.	Prai Industrial Estate Prai Industrial Estate Mak Mandin Industrial Estate Prai Industrial Estate	39-41 39-42 39-43 39-44

F. Daily Work Records During the Period

Summary of Daily Work

Date	Content
Oct. 27	Arrived at Kuala Lumpur by JAL 713 Japanese Supervisory Committee (JSC) Messrs. M. Kashiwaya, Y. Nakagawa, K. Urata Japan International Cooperation Agency (JICA) Mr. Kanai Nihon Suido Consultants Co., Ltd. (NSC) Messrs. A. Saita, T. Ueno, S. Shibui, M. Miyamoto, H. Yuasa
28	Submission & Explanation of Inception Report (at E.P.U.) 10:00 - 12:00 Attendants: E.P.U. Messrs. Bashah Nordin, Fang Pin Siew, Khalil Mrs. Rosnah Hj Jentra Ministry of Public Health Messrs. P. Laurialt, Lum Beng Kee, Sekarajasekaran Japanese Mission All Member and Mr. T. Kasai (Resident Representative, JICA) Courtesy Call Embassy of Japan 15:00 - 16:30 Sewerage and Drainage Department, City Hall, Kuala Lumpur 12:00 - 14:00 Mr. Lee Fong Yew: JSC, JICA, NSC Subject: KL Sewerage Master Plan

Ministry of Public Health

15:00 - 16:00

Messrs. Sekarajasekaran, Laurialt, Lum
JSC, JICA, NSC

Subject:

Preparation of Malaysian Side for the Project
Steering Committee and Technical Committee
Counterpart-staff
Data and Information
Refer to List of Data Obtained

30 Ministry of Environment

8:30 - 9:30

Mr. Goddin Singan (chemical engineer)
Senior Assistant Director, Dept. of Environment
Messrs. M. Kashiwaya, E. Miyamoto

Subject:

Pollution of Juru River

Mr. Maheswaran (chemist) Director Water Pollution
(joined in the middle of meeting)

K.L. Wastewater Treatment Plant

10:00 - 13:00

JSC, JICA and NSC

Wardleburn Oxidation Pond for Military Houses (6,000 persons)

Daily Flow 2.5 mgd. ; Water Quality;

Pantai Valley Sewage Purification Works

Night Soil Treatment in anaerobic Digestion, 9,000 persons
of 8,000 gal/day

Sewage Treatment (25,000 persons)

Daily Flow 14 mgd. ; Water Quality

Statistic Dept.

10:00 - 11:00

Cik Dorothy Fernandez, Social Statistics Unit

Messrs. T. Ueno, H. Yuasa and Mr. Lum Jeng Kee (Ministry of
Public Health)

Subject:

Socio-Economic Background

Financial Planning

Organization

Regulation

Refer to questionnaire for the Government
and List of Obtained Data

21:00 Arrival of the five engineers (NSC) by CX

Messrs. H. Shono, T. Torikawa, O. Fujikawa,
M. Kajikawa, Y. Hirau'

Oct. 31 13:00 MAS, Kuala Lumpur to Penang

All Member, JSC, JICA, NSC

19:00 - 20:00 Hotel Merlin

Mr. Loo, JSC, JICA, NSC (Saita, Ueno Miyamoto)

Subject:

Formal Schedule, others

Nov. 1 State Government Building

9:15 - 11:00

Messrs. Loo (BHEW), Zakaria (SEFU); Miss Lim Pao Li (PIC)

JSC, JICA, NSC

Subject;

Briefings on Government Development Plan & other matters
relevant to the project for the State of Penang and Province
Wellesley

Local Government, Province Wellesley

14:00 - 16:00

Mr. Choo, JSC, JICA, and NSC

Subject:

Maps, Counterpart-staff, Visa extension, Project Office,
Bank Account, etc.

Nov. 2 Preliminary Reconnaissance in the Project Area

9:30 - 12:45

Mr. Ang, JSC, JICA, NSC

Area Visit; Butterworth including Mak Mandin Industrial Area

2:00 - 16:00

Mr. Tan, and Same Member Stated Above.

Area Visit; Bukit Mertajam

Data Obtained ;

- o Distribution Map of Septic Tank (Mr. Ang)
(Communal Septic Tanks in Seberang Prai Maintained by
Engineering Section)
- o Butterworth Map (LPKTSF/160/75 (sp)) 1inch/10 chain

Nov. 3 Survey Department

9:00 - 12:00

Mr. Loo (LPKTSF), Mr. NairSD), Ueno, Shibui, Miyamoto, Fujikawa

Subject;

Related Maps (Refer to List of Obtained Data)

Submission & Explanation of Inception Report

State Government Building

14:30 - 16:00

Attendants;

State and Local Government Side

Messrs; Zakaria Bin Haji Man (Assist. Director; SEPU)

Koh Kok Ee (Director; PWD)

S. L. Nah (Engineering Manager; PDC)

Azizan Bin Ariffin (Director; DID)

Mah Huey Fong (District Engineer; DID Sebarang Prai)

Ahmad Shah (Director; MHD)

Chee Chin Seang (Deputy Director; MHD)

Khoo Keai Theam (Secretary ; LPKTSP)

Loo Kam Weng (Assistant Secretary; LPKTSP)

Choo Ewe Guan (Chief Engineer; LPKTSP)

Tuan Hj Mohamed Ishak Bin Hj Ariff (Director; TCP)

Miss Lim Lay Jean (Health Officer; LPKTSP)

Japanese Mission; All Member Stated Before

Subject;

Explanation of Inception Report,

Survey Schedule at the Site,

Member Introducing,

Request for Cooperation including distribution of
the Questionnaire for Related Department

Nov. 4 Preliminary Reconnaissance in the Project Area

9:30 - 15:55

Mr. Tan, JSC, JICA, NSC

Area Visit; Prai Industrial Area

Factory Visit; Ice and Storage, Sugar, Iron and Steel,
Textile, Dyeing,

13:30

Mr. A. Saita left for KL by MAS

Nov. 5

Immigration Office

8:30 - 9:30

Mr. Loo and All Member of NSC

Subject;

Extention of Visa

Project Office

11:30 - 12:10

Mr. Choo, Shono, Shibui, Fujikawa, Kajikawa, Mizutani,
Horikawa, Miyamoto

Subject;

Coordination Meeting for Data Collection

Preliminary Reconaissance in the Project Area

14:20 - 16:20

Mr. Tan, JSC, JICA, NSC

Area Visit;

Prai River (downstream, middle stream), Mak Mandin Industrial
Area, Bagan Serai Industrial Area.

Obtained Data

Related Maps	Bagan Serai Industrial Complex
	LPKTSP/56/76 (SP) 8 chains - 1 inch
	Mak Mandin Industrial Estate
	MDUSP/12/74 (RD) 4 chains - 1 inch
	Prai Industrial Complex
	LPKTSP/51/76 (SP) 8 chains - 1 inch

Nov. 6

Hotel Merlin

9:00 - 12:40

JSC, JICA, NSC(Ueno, Shono, Yuasa, Shibui, Miyamoto,
Fujikawa, Mizutani)

Subject:

Coordination Meeting of Japanese Committee & the Team Tentative on schedule for submission of Progress Report to be prepared. Proposed schedule as follows:

- Dec. 21 Arrival of Japanese Supervisory Committee
- 22 Courtesy Call Embassy of Japan
- 23 Leave for Penang
- 24 Preparation of Progress Report
- 25 :
- 26 :
- 27 Submission and Explanation of Progress Report
(in the afternoon)
- 28
- 29 Leave for Kuala Lumpur
- 30 Submission and explanation of Progress Report
(for Federal Government)
- 31 Leave for Tokyo

Nov. 7 JSC and JICA left for Tokyo via Kuala Lumpur,

Nov. 6 D.I.D.

9:30 - 13:10

Mr. Azizan, Mr. Oo

NSC (Horikawa, Hirau, Kajikawa)

Subject ;

Received Data (Refer to List of Data Obtained)

General information of rainfall, flooding record in the area

7. Holiday

8. Project Office (Butterworth)

Office Hour 8:00 - 16:00 (Mon. - Fri.)

8:00 - 13:00 (Sat.)

B.M.P.W.

10:45 - 12:00

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Shibui, Miyamoto,
Hirau, Horikawa)

Subject ;

1. Work Schedule of the Week including appointment with Department Concerned (see weekly schedule)
2. General Information
3. Extention of visa, Authority Card issued by LPKTSP
4. Procedure of Liaison between B.M.P.W. and NSC by meetings every morning (9:00-), except holidays

9. B.M.P.w.

9:00 - 9:30

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Shibui, Miyamoto, Kajikawa)

Subject;

Appointment of Department Concerned

9/11 2:30 SEPU Mr. Rusli

10/11 9:00 PDC

12/11 9:00 PWD Mr. Koh
17/11 9:00 LD Mr. Lyn

D.I.D.

9:00 - 10:00

Mr. Azizan, Mr. Oo Cim Kok, Mr. Lim Weng Yit
NSC(Hirau)

Subject;

Data explanation and the followings obtained

Report on Flood Problems in West Malaysia

DID Hydrological Procedure No.8

(Refer to List of Data Obtained)

S.E.P.U.

14:30 - 15:30

Mr. Mohd Rusli bin Hj Hussein, Mr. Loo
NSC (Ueno, Yuasa, Miyamoto, Horikawa)

Subject;

A. General Socio-Economic Background

B. Financial Planning

C. Organization

10.

B.M.P.W.

Mr. Choo, NSC (Ueno, Shono, Kajikawa, Fujikawa, Yuasa)

9:00 - 9:30

Subject;

General Matters

Nov. 10

T.C.P.

8:00 - 9:30

Mr. Ishak, Mr. Loo, NSC (Shibui, Miyamoto, Horikawa)

Subject;

1. Supporting Maps, 24 sheets (under making)
2. Distribution Map and Figure of Present Population Map
3. Future Population Map
4. Present and Future Land Use
5. Present and Future Networks of Road & Railway
6. Type of Main Buildings with Map
7. Geological Data (Ref. Mining Dept.)
8. Development Plans for the Project Area

P.D.C.

9:00 -

Mr. Nah, Mr. Loo, NSC (Mizutani, Hirau, Shibui)

Subject;

1. Kind and Size of Industries
2. Distribution Maps of Major Factories
3. List of Major Factories
4. Future Industrial Area with Map
5. Future Employed Person by Sector of Industry
6. River and Conservancy Plan
7. Industrial Estate Regulation
8. Analytical Data on Industrial Effluents
9. Future Industrial Water Consumption/Supply Planning
10. Planning on Zonation of Housing and Factories in Jurisdiction Areas
11. Others

Data Obtained;

List of Industrial Establishments in Mak Mandin

Industrial Estate

List of Industrial Establishments in Bayan Lepas Free Trade Zone

Industrial Estate

Guidelined for Evaluation of Industrial Waste Water Effluents

DII.D.

8:50 - 9:00

Mr. Oo, NSC (Hirau)

Subject;

Data Obtained

List of Hydrological Stations State of Penang

Map of Location of Hydrological Stations

Nov. 11 B.H.F.W.

9:00 - 9:20

Mr. Loo, NSC (Ueno, Yuasa)

Subject;

General Matters, Passport Received,

Full-time Counterpart Staff Joined (M. Rishyyakaran K.)

Data Obtained

(Refer to the List of Data Obtained "Statistics Dept.")

M.H.D.

9:30 - 10:30

Dr. Ahmad, Dr. Chee, NSC (Mizutani, Miyamoto, Horikawa)

Subject;

General Information on Disease, Mortality, Number of Hospitals.

Data on Industrial Waste Water Effluents

Data Obtained;

Follow Up Measures taken by the DEKESB on the Pollution of Kuala Juru

Minutes of Anti Pollution Committee, State Penang

Indas Laboratories SDN BHD

14:15 -

Mr. Ho, Mr. Yap NSC (Mizutani, Miyamoto)

Subject;

Water Quality Tests

Nov. 12

B.M.P.W.

9:00 - 9:15

Mr. Loo, Mr. Rishy, NSC (Ueno)

Subject;

General Matters

Data Obtained:

List of Major Factories

P.W.D.

9:00 - 10:00

Mr. Koh Kok Ee, NSC (Yuasa, Miyamoto, Horikawa, Kajikawa)

Subject;

General Information on Road+Railway

Data Obtained;

Unit Cost

Boring Test

(Refer to the List of Data Obtained)

E.D.

14:30 -

Mr. Thomas Gan, Mr. Ong Chin Lee,

NSC (Yuasa, Shibui, Fujikawa, Hirau)

Subject;

General Information on George Town's Sewerage System

Health Department, LEKTPSP

14:30 -

Dr. Lim, Mr. Kannusamy, NSC (Mizutani, Miyamoto)

Subject;

General Information on Environmental Protection Activity

Data Obtained:

Industrial Waste Water Quality Tests

Water Quality Test of Juru River

Sea Water quality Test

Effluent Quality of Septic Tank

13

B.M.P.W.

9:00 - 9:20

Mr. Loo, Mr. Choo, NSC (Ueno, Miyamoto, Hirau)

Subject;

General Matters

Nov. 13 P.W.A

9:00 - 11:00

Mr. Kam U-Tee, Mr. Lee, Mr. Ong Leng Joo

NSC (Yuasa, Mizutani, Horikawa, Fujikawa, Shibui, Rishy)

Subject;

Population Served by Administrative District

Water Supply for Domestic Use

Water Consumption for Commercial Area

Water Consumption by Industries

Organization

Water Resource

Chem. Dept.

11:00 -

Mr. Amarasinghan, NSC (Mizutani, Rishy)

Subject;

Water Quality Tests

14. Sunday

15. B.M.F.W.

9:00 - 9:20

Mr. Loo, NSC (Ueno, Yuasa)

Subject;

General Matters; Requested appointments for PWA, TCP, SEPU.

Factory Visit

11:00 -

Mizutani, Rishy

Subject;

Existing condition of drainage and sewerage system in
Prai Industrial Complex.

Hume Industries (M) BHD visited

Indus Laboratories (analytical & consulting chemist in local)

14:00 -

Mr. Yap, Mr. Ho, Mizutani

Subject;

Water Quality Tests

B.M.P.W.

14:30 - 15:30

Mr. Kannusamy, Miyamoto

Subject;

Night Soil Disposal System in Metropolitan Area

Field Survey

10:00 - 16:00

Shono, Hirau, Kajikawa

Nov. 16 B.M.P.W.

9:00 - 9:30

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Miyamoto, Horikawa)

Subject;

General matters and data obtained

Data obtained;

Kind and size of industries

Name of factories

List of Industrial Establishments

in Mak Mandin

Bayan Lepas

Prai

Location Maps

above data get from PDC

List of small size Factories in Butterworth and their
location map (University Science in Penang)

Appointed schedule; to visit

Penang Harbour Master and TCP

Chemical Dept.

11:00 -

Mr. Amarasingham, Mr. Hoong, Mizutani, Rishy

Subject;

Water Quality Tests

Project Office

14:00 -

NSC Member Meeting

Subject;

Schedule and Progress for the Work

Nov. 17 B.M.P.W.

9:00 - 10:30

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Miyamoto, Horikawa)

Subject;

Number of Attendants on Steering Committee Meeting 19th Nov.

Role and Function of B.M.P.W.

Existing Facilities of Night Soil Disposal

Others

D.I.D

14:20 - 14:40

Mr. Azizan, Mr. Lim NSC (Shibui, Hirau, Kajikawa)

Subject;

General Matters and Questionnaires handed

Health Dept. L.K.T.S.P

Dr. Lim, Mizutani

Subject;

Questionnaires for Factory

Septic Tank Effluent Quality

Data Obtained;

List of Factories in Mak Mandin Area

Distribution Map of Major Factories in B'worth

21:40

Project Manager, Mr. A. Saita, Arrived at Penang

Nov. 18 B.M.P.W.

9:00 - 9:40

Mr. Loo, NSC (Saita, Ueno, Yuasa, Hirau)

Subject;

Announcement of Saita's Arrival

Flooding in the Project Area

Organization and Finance in Province Wellesley

Health Dept. L.K.T.S.P

8:30 -

Dr. Lim, Mr. Kannusamy, Mr. Raju, Mizutani

Subject;

Discussion on Juru River study

T.C.P

9:20 - 10:20

Mrs. Michelle Teoh (Assist. Director)

NSC (Shibui, Miyamoto, Horikawa, Fujikawa)

Subject;

Aerial Photograph

National Mapping Department, Jalan Gurney, K.L. Tel-21311

Mr. C.S. Hood (Director of Survey and Topographic Section)

Price: Scale 1/25,000 Whole Penang State 2,240 M\$

1 inch : 8 chain 60 M\$/one

D.I.D Branch in Bukit Mertajam

15:00 - 16:30

Mr. Phuah, Mr. Ong, NSC (Shono, Miyamoto, Hirau)

Subject;

Maintenance of ditches and drains in the area

Definition of rivers, streams, and drainage (channel, ditch, drain)

Others

19 State Government Building; Steering Committee Meeting

See Attached Minutes on Meeting

Nov. 19 E.D

14:30 - 16:30

Mr. Thomas Gan, NSC (Yuasa, Shibui, Mizutani, Hirau, Fujikawa)

Subject;

Information on Construction Cost

Data Obtained;

Organization Chart.. Three Sheets

Annual Report 1974 & 1976

Details of Manholes

20 B.M.P.w.

9:00 - 10:00

Mr. Choo, NSC (Ueno, Yuasa, Mizutani, Hirau, Horikawa, Miyamoto, Rishy)

Subject;

Request Appointments for Departments Concerned

General Matters

21 Sunday

22 B.M.F.W

9:10 - 9:50

Mr. Loo, NSC (Ueno, Yuasa, Shibui, Miyamoto, Rishy)

Subject;

Recognition of Membership of Steering Committee and

Technical Committee

Request Appointments for Department Concerned

Other Matters

23 B.M.F.W

9:00 - 9:10

Mr. Loo, Ueno, Miyamoto

Subject;

Request of appointment for DID

Data Obtained;

The Municipal Ordinance, Rural Board, Province Wellesley

Nov. 23 P.W.A

9:00 -

Mr. Kam, NSC (Yuasa, Shibui, Fujikawa, Horikawa, Rishy)

Subject;

General Informations on "Penang State Water Supply Development Plan",
"Existing and Future Projection of Water Consumption" and Ground
Water Condition.

Data Obtained;

Annual Report

74' - Total Water Consumption

Location of Large Water Meter (more than 5") and their
Water Consumption Prai Industrial Estate, Penang
abstract of Master Plan

Result of Raw Water Quality

Land Survey Company

11:30 -

Consultation on Explanation of land survey quotation

List of Companies;

- i. Survey International Malaysia
- ii. Jurukor Malaysia Syarikat Senderian
- iii. Jurukor Amanah
- iv. United Surveyors
- v. Malaysia International Consultants Sdn. Bhd.

Indas Laboratories

8:30 - 9:00

Subcontractual Agreement for water quality analysis to be performed
in addition to laboratory work at Chemical Department

Medical and Health Department

14:30 - 15:30

Dr. Ahmad Shah, NSC (Miyamoto, Horikawa)

Subject;

Medical Expenses and Hospital Charges

24 B.M.F.W

9:00 -

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Miyamoto, Horikawa)

Subject;

General Matters

- Nov. 24 Preliminary Field Investigation
 14:00 -
 Shibui, Horikawa, Fujikawa
 Subject;
 Preparation of Survey for existing domestic water use
- 25 B.M.P.W.
 9:30 - 10:00
 Mr. Choo NSC (Yuasa, Shibui, Miyamoto, Hirau)
 Subject;
 General Matters
 Harbour Master
 9:30 -
 Mr. Michael O. Eland, NSC (ueno, Horikawa, Mizutani, Rishy)
 Subject;
 General information on Shore-Sea
 Data obtained;
 Tide Table and Sea Map
 Sampling of Domestic Waste-water was carried out
- 26 B.M.P.W
 9:00 -
 Mr. Choo, Mr. Loo, NSC(Ueno, Horikawa, Rishy)
 Subject;
 General matters
- 27 B.M.P.W
 9:00 - 9:30
 Mr. Loo, Shibui, Horikawa
 Subject;
 Request on appointments for Statistic Department, Ministry of Environment,
 Metrological Department, EPU, Ministry of Health, in KL.
 Questionnaires for residential houses
 Minutes of Steering Committee on the 19th Nov. by NSC was presented
 Data Obtained;
 Result of Water Quality, PWA
 Geological Map

Nov. 27 S.E.P.U

9:00 - 11:00

Mr. Rusli, Ueno, Yuasa

Subject;

Budget allocation for Sewerage and Drainage Programme in Penang State (relation to the Third Malaysian Plan)

A Scheme of Water Supply Expansion Programme in Province Wellesley

Budget Provision from Federal Government to LPKTSP

28 Sunday

29 B.M.P.W.

9:00 - 9:20

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Miyamoto)

Subject;

General Matters

New Counterpart Staff Joined; Mr. Tan Hoo, Chemist, Ministry of Health"

DID In Bukit Mertajam

14:00 -

Hirau, Kajikawa

Subject;

Distribution of bench mark and it's map obtained

Two Engineers, Mizutani and Horikawa went to KL on Business Trip

30 B.M.P.W

9:00 - 9:30

Mr. Choo, NSC (Yuasa, Shibui, Miyamoto)

Subject;

Requested Informations; New Housing Scheme (1972-'76), Population served by Septic-tanks, Standard Drawings of Septic-tank, Imhoff tank, Oxidation Pond, Annual Report (LPKTSP)

Ministry of Environment

10:00 -

Mr. Makeswaran, Mr. Goddin Singan, etc., NSC (Mizutani, Horikawa)

Mr. Lam

Subject;

Ocean Outfall and it's influence on George Town Sewerage

Report on Juru-River Pollution Study

Water quality Standard

- Nov. 30 Statistic Department
 8:30 -
 Miss Jean Paul (Census & Demography Section)
 Mr. Lum (Ministry of Health)
 NSC (Mizutani, Horikawa)
 Subject;
 Population in the Project Area
 Engineering Science
 15:00 -
 Mr. Richard Deussen
 Subject;
 Design Criteria of Oxidation Pond in Kuala Lumpur Sewerage Study
 Unit Prices of Construction in Kuala Lumpur
- Dec. 1 National Holiday (Hari Raya); Four Engineers arrived at Penang
 (T. Tsutsumi, S. Nakatake, H. Yoneya, T. Tashiro)
- 2 B.M.P.W.
 9:00 -
 Mr. Choo, NSC (Ueno, Yuasa, Miyamoto, Horikawa, Tsutsumi, Yoneya, Tashiro,
 Nakatake)
 Subject;
 Introduction of new members
 Request of information on septic-tank, Report on Water Supply Master
 Plan for Penang State
 Submission and explanation of Monthly Schedule (December)
 for field survey
- 3 No Meeting at B.M.P.W
 Survey Dept.
 11:00 - 11:40
 Kajikawa, Rishy
 Subject;
 Correction of bench mark map obtained from DID in BM
 P.W.D. Branch in Butterworth
 -
 Mr. Khong, Mr. Lee, NSC (Nakatake, Hirau, Kajikawa)
 Subject;
 Data Collection on Land Survey & Leveling

Dec. 4 B.M.P.W.

9:00 -

Mr. Choo, NSC (Ueno, Yuasa, Shibui, Nakatake, Horikawa)

Subject:

Questionnaires for factories and residential/commercial buildings

Rentals of survey instruments

Questionnaires for existing drainage system

5 Sunday

Preliminary Survey for River Water Quality Tests

7:00 - 14:00

Messrs. Ueno, Mizutani.

6 B.M.P.W.

9:00 -

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Miyamoto, Kajikawa, Tashiro,
Horikawa)

Subject;

Land survey (NSC itself)

Home visit for questionnaire

Data obtained:

State of Penang. The Operating Expenditure Budget of the State
Government of Penang, 1976

Estimate Revenue and Expenditure, 1976

Laws of Malaysia, Act 1971, Act 1972, Act 1974

Field Survey Started (Land Survey, Home Visits)

Dec. 7 B.M.P.W.

9:00 -

Mr. Choo, Mr. Joseph, NSC (Ueno, Yuasa, Nakatake, Miyamoto)

Subject;

Night-soil collection for bucket system in the Year 1974-1976

Property assessment

Data obtained:

Data on Infectious Diseases, MID

Annual Report of L.P.K.T.S.P. (written in Malaysian language)

8 B.M.P.W.

9:00 -

Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Shibui, Nakatake, Rishy, Tanq)

Subject;

General matters

Data obtained;

Water Supply Master Plan in Penang State

D.I.D. in BM

14 -

Mr. Mah, NSC (Hirau, Rishy)

Subject;

Drainage System in Industrial Estates

Operational Data on Pumping Station in Prai Industrial Estate

Data obtained:

Rainfall Records in Ibu Bekalan Sungai Kulims

Sungei Juru Dam and Gate, Province Wellesley Oct. 1966

Dec. 9

B.M.P.W.

9:30 - 9:50

Mr. Loo, NSC (Ueno, Miyamoto, Rishy)

Subject;

General matters

Notice on informal Meeting with Chairman, Municipal Council, P.W.
on 14th

14:30 -

Mr. Choo, NSC (Nakatake, Hirau)

Subject:

Drainage Practice in Province Wellesley

Data obtained:

Standard Cross Section of Planned Road

Map Showing Town Limit

Drawing of Road Section used in actual design

10 B.M.P.W.

9:00 - 10:00

Mr. Choo, Mr. Loo, Mr. Joseph, NSC (Ueno, Yuasa, Nakatake, Miyamoto)

Subject:

Extention of visa for newly arrived engineers

Tax System in Malaysia

General information on maintenance practice of drainage system

Data obtained:

Answers for Septic Tank's Questionnaires

Expenditure of bucket system

Mr. Kannusamy, Mr. Nakatake

Subject;

Maintenance practice in L.P.R.T.S.P (Drainage System)

- Dec. 11 B.M.P.W.
 9:00 - 9:20
 Mr. Loo, Mr. Choo, NSC (Ueno, Yuasa, Horikawa, Miyamoto)
 Subject:
 General matters
- 12 Sunday
- 13 B.M.P.W.
 9:00 - 10:00
 Mr. Loo, NSC (Shibui, Nakatake, Miyamoto, Rishy)
 Subject;
 Definition of technical terms in the drainage design
 Meeting with the Chairman, M.C.P.W. on Dec. 14th was cancelled.
14. B.M.P.W.
 Mr. Lum (Ministry of Health), Mr. Loo, Mr. Choo
 NSC (Ueno, Nakatake, Miyamoto, Horikawa
 Subject;
 Meeting with State Planning Officer on "Project Area"
 Information on the date of Progress Report meetings
 Mr. Tsutsumi returned to Tokyo
 Messrs. T. Ueno and S. Shibui, left for KL
15. B.M.P.W.
 9:00 - 10:00
 Mr. Loo, Mr. Choo, NSC (Nakatake, Horikawa, Miyamoto)
 Subject;
 Passports received
 Answer from DID received
 Mr. Saita, Project Manager, and two engineers visiting K.L.
 arrived at Penang

Dec. 16 B.M.P.W.

9:00 - 9:10

Mr. Loo Mr. Ueno

Subject;

General matters

Survey for coastal area started

17 B.M.P.W.

9:00 - 9:10

Mr. Loo, Mr. Ueno, Mr. Nakatake

Subject;

General matters

18 M.C.P.W. (Municipal Council of Province Wellesley)

9:20 - 10:10

Mr. Loo, NSC (Yuasa, Shibui, Nakatake Miyamoto)

Subject;

Submission of the team's Schedule from Dec 18th to 30th.

Explanation of newly born Municipal Council, Province Wellesley

Requested data on development areas with their precise

boundaries and general socio-economic conditions.

