

Fig. 7 Location Map of RESP Wells

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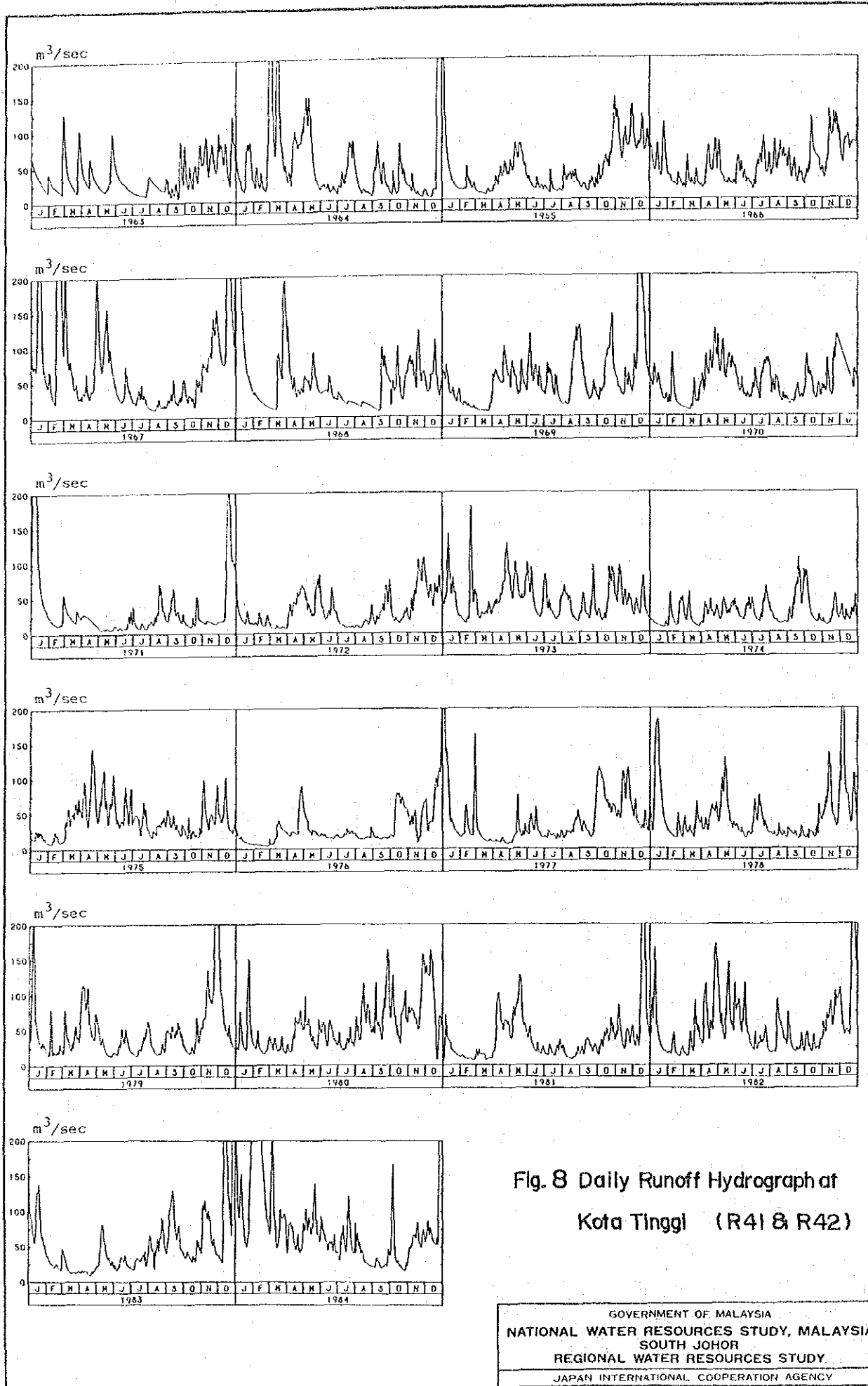
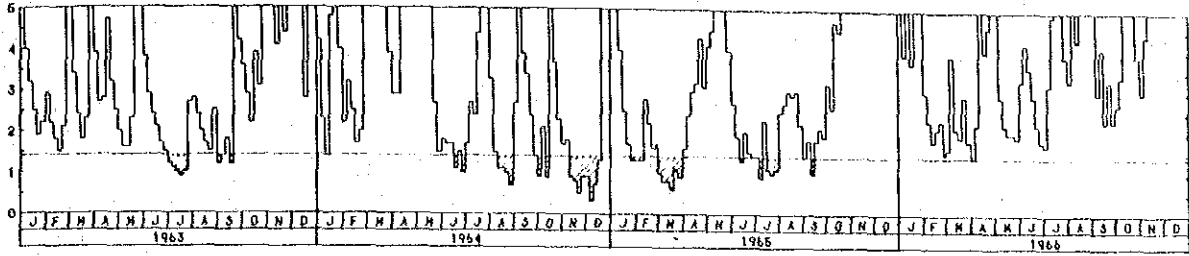


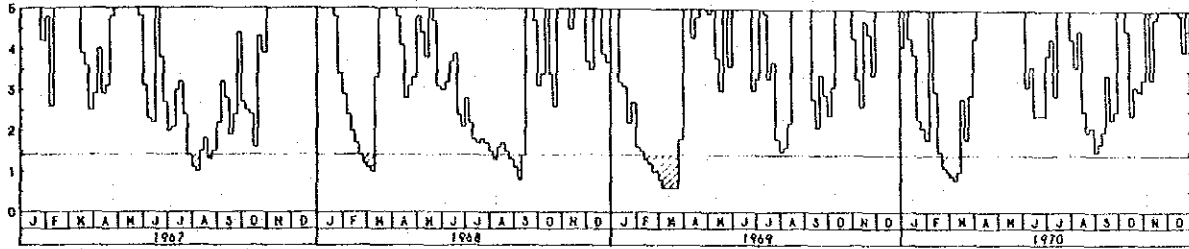
Fig. 8 Daily Runoff Hydrograph at  
Kota Tinggi (R41 & R42)

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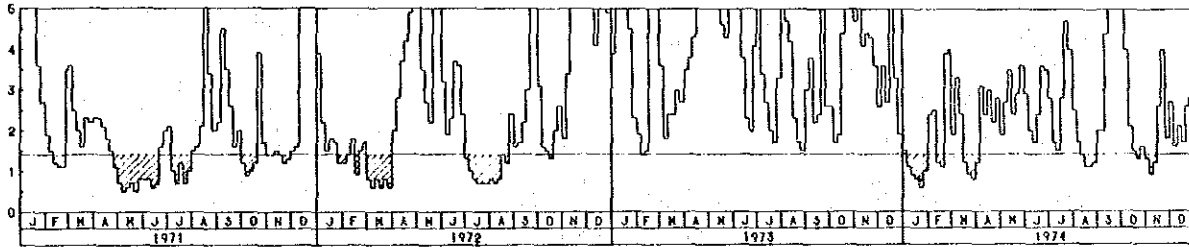
10<sup>3</sup>Mld



10<sup>3</sup>Mld

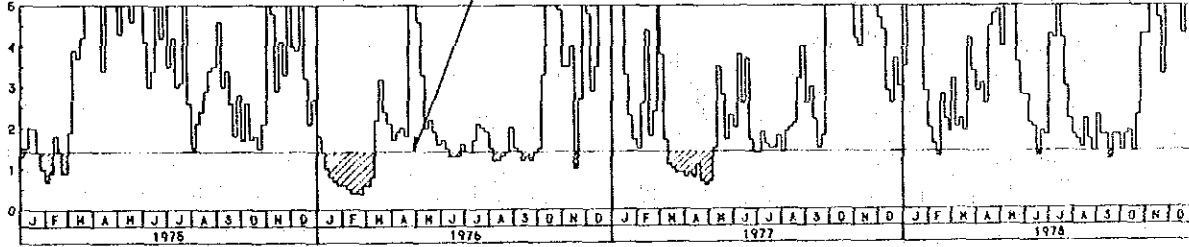


10<sup>3</sup>Mld

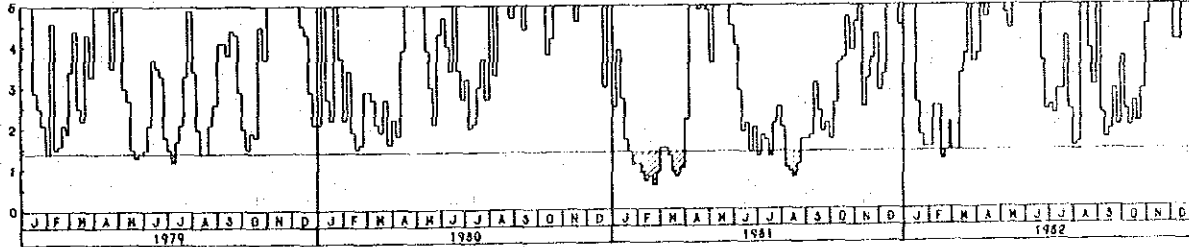


2005 Water Demand and River Maintenance Flow

10<sup>3</sup>Mld



10<sup>3</sup>Mld



10<sup>3</sup>Mld

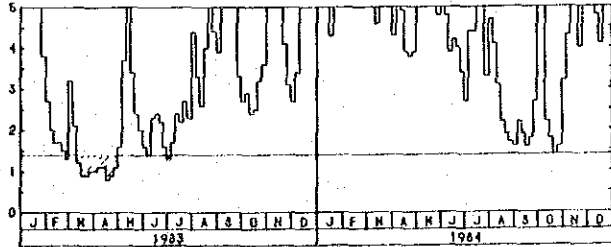


Fig. 9 Illustration of Water Deficit at Intake R41 & R42 in the Johor River

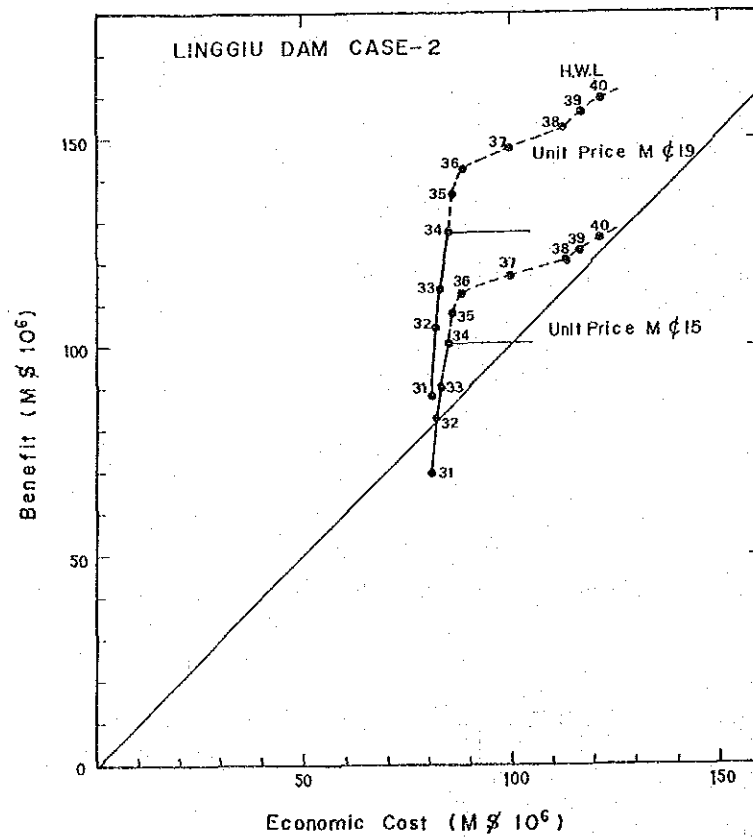
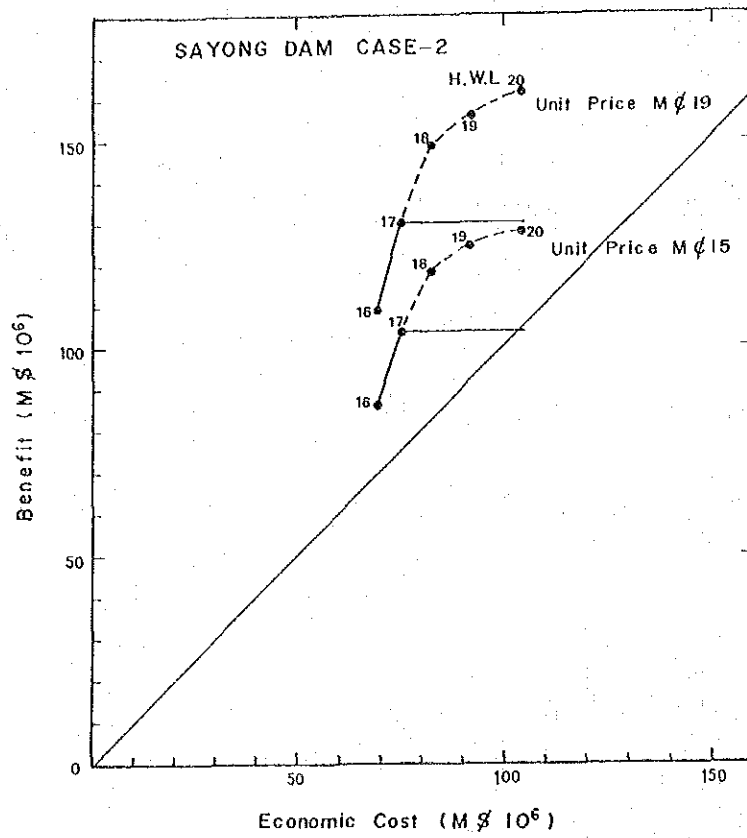


Fig.10 Relationship between Economic Benefit and Cost by Varying Scale of Dam

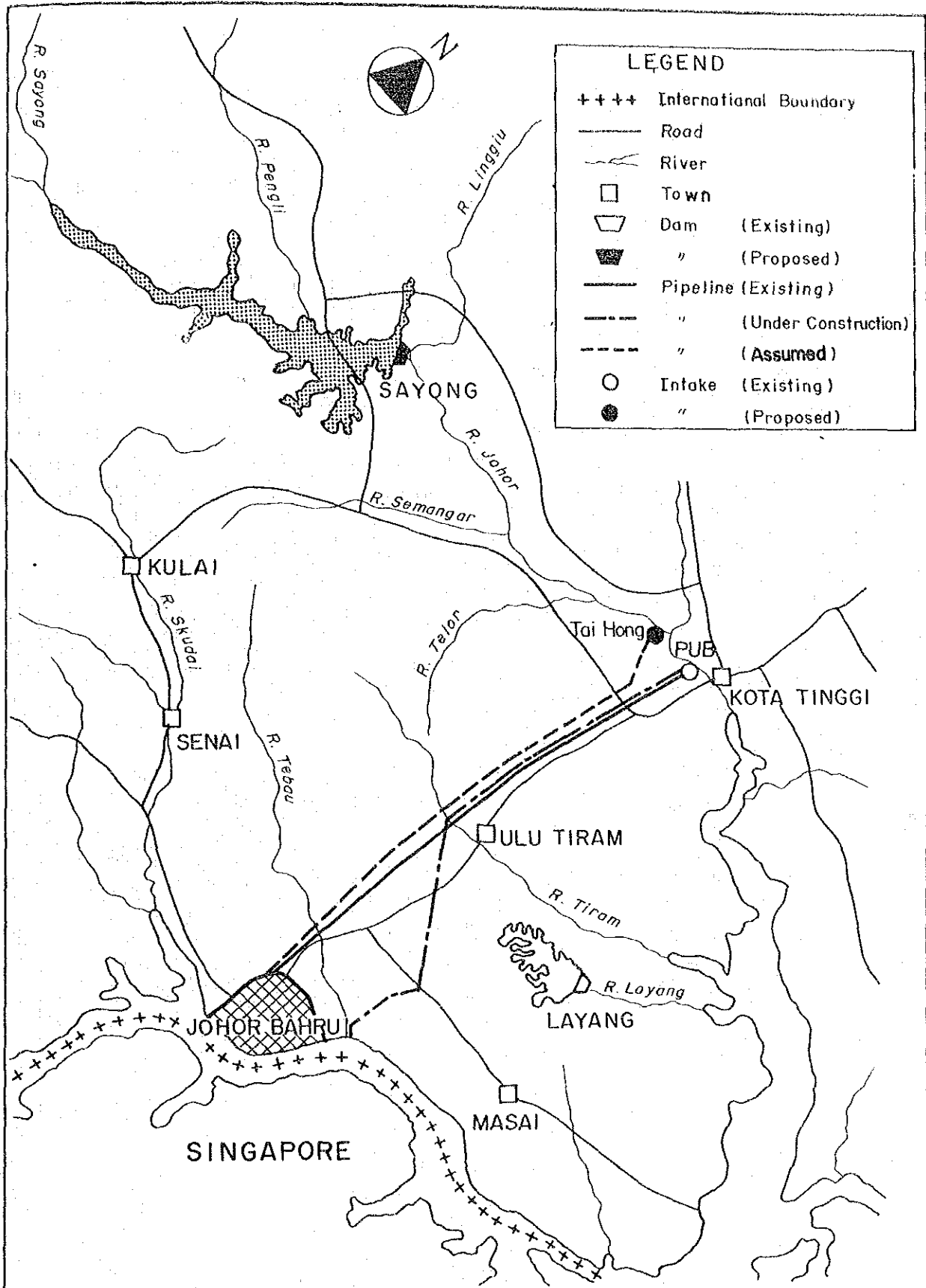


Fig. 11 Layout of Pipeline

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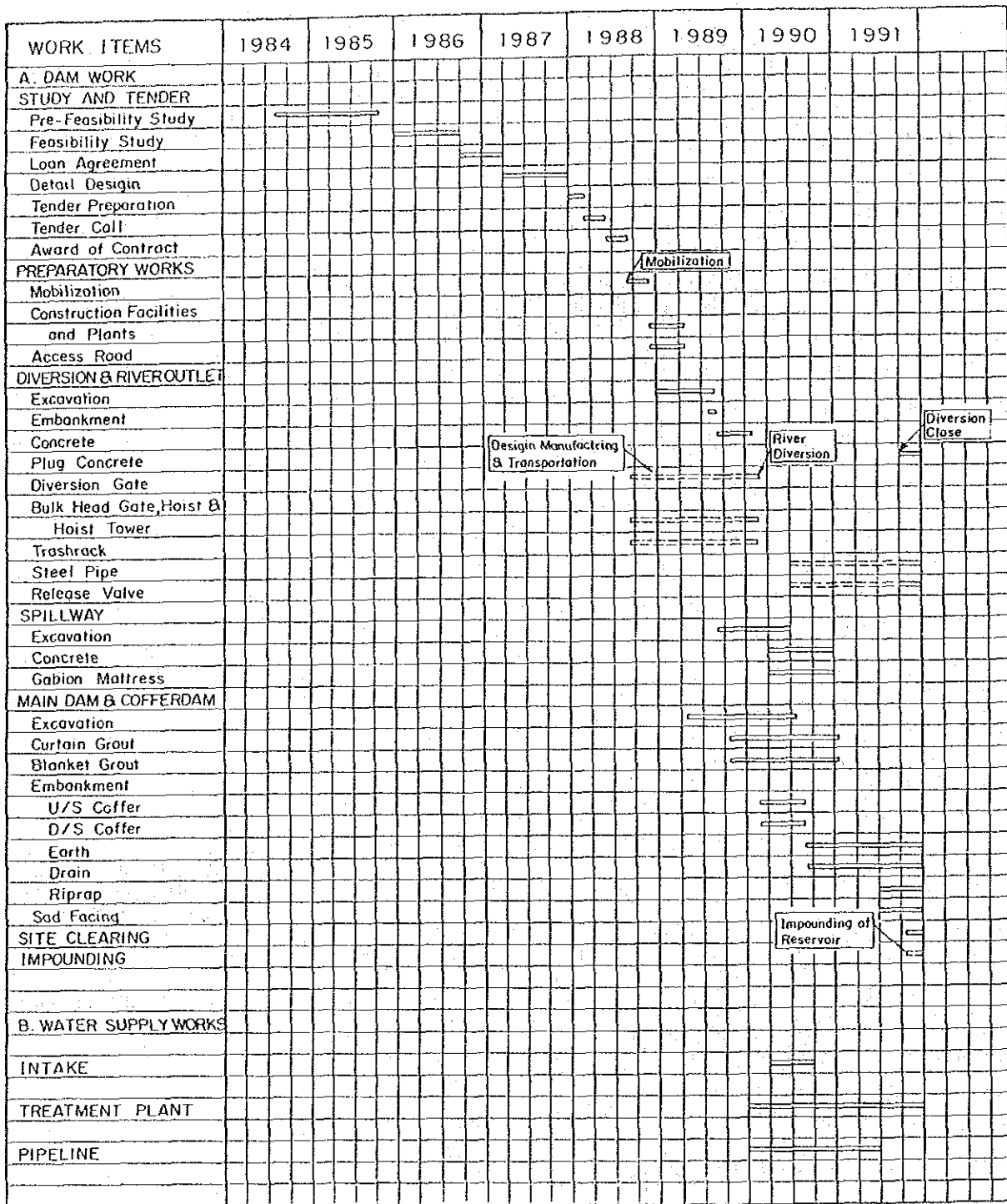




Fig.12 Construction Time Schedule for Sayong Dam and Water Supply Works

**LEGEND**

-  Inundation Area
-  Major Town/Village Inundated by Past Floods

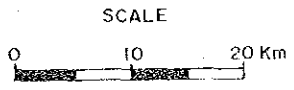
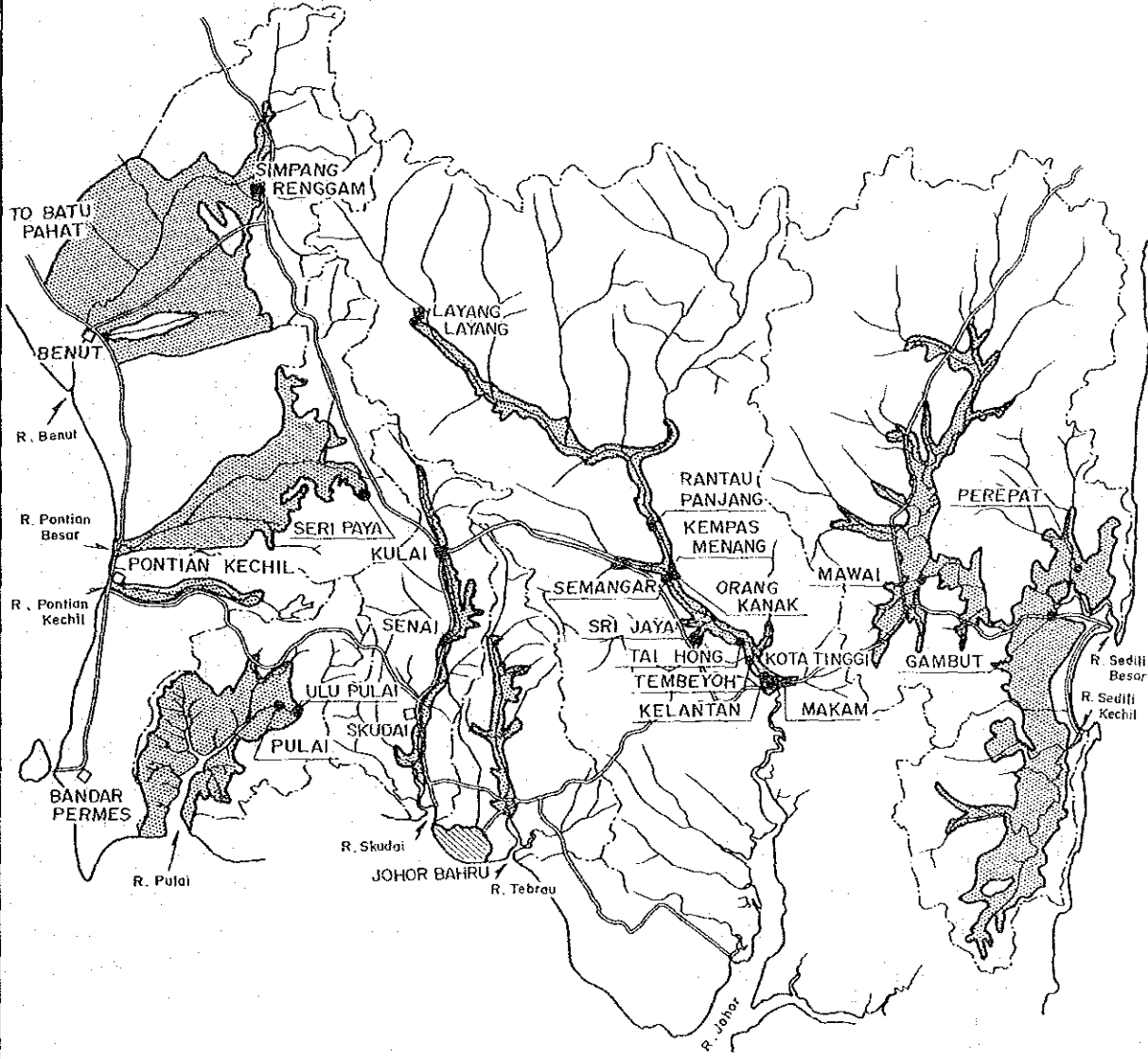


Fig.13 Recorded Maximum Inundation Area

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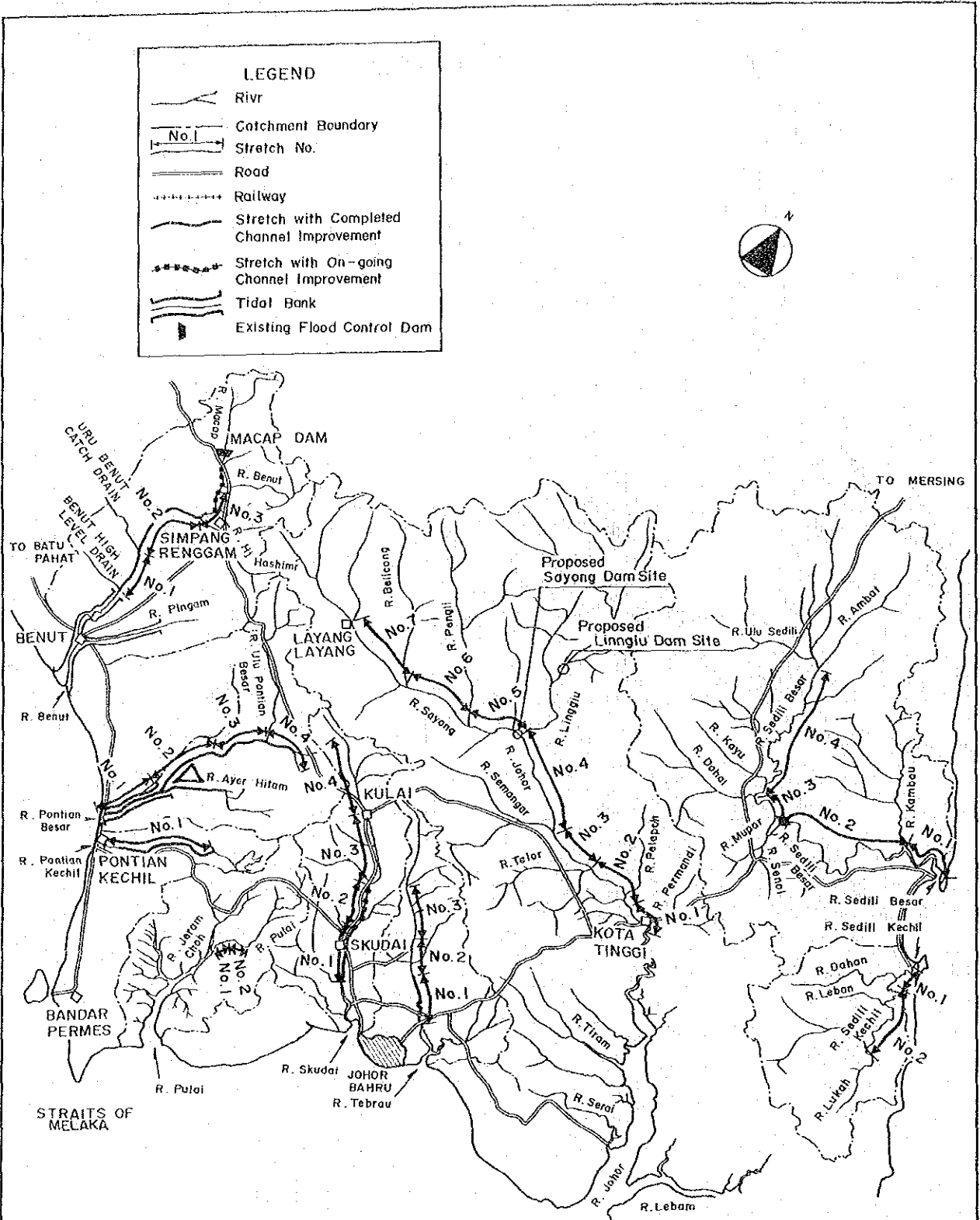


Fig.14 River Stretches and Existing/ On-going Flood Mitigation Works

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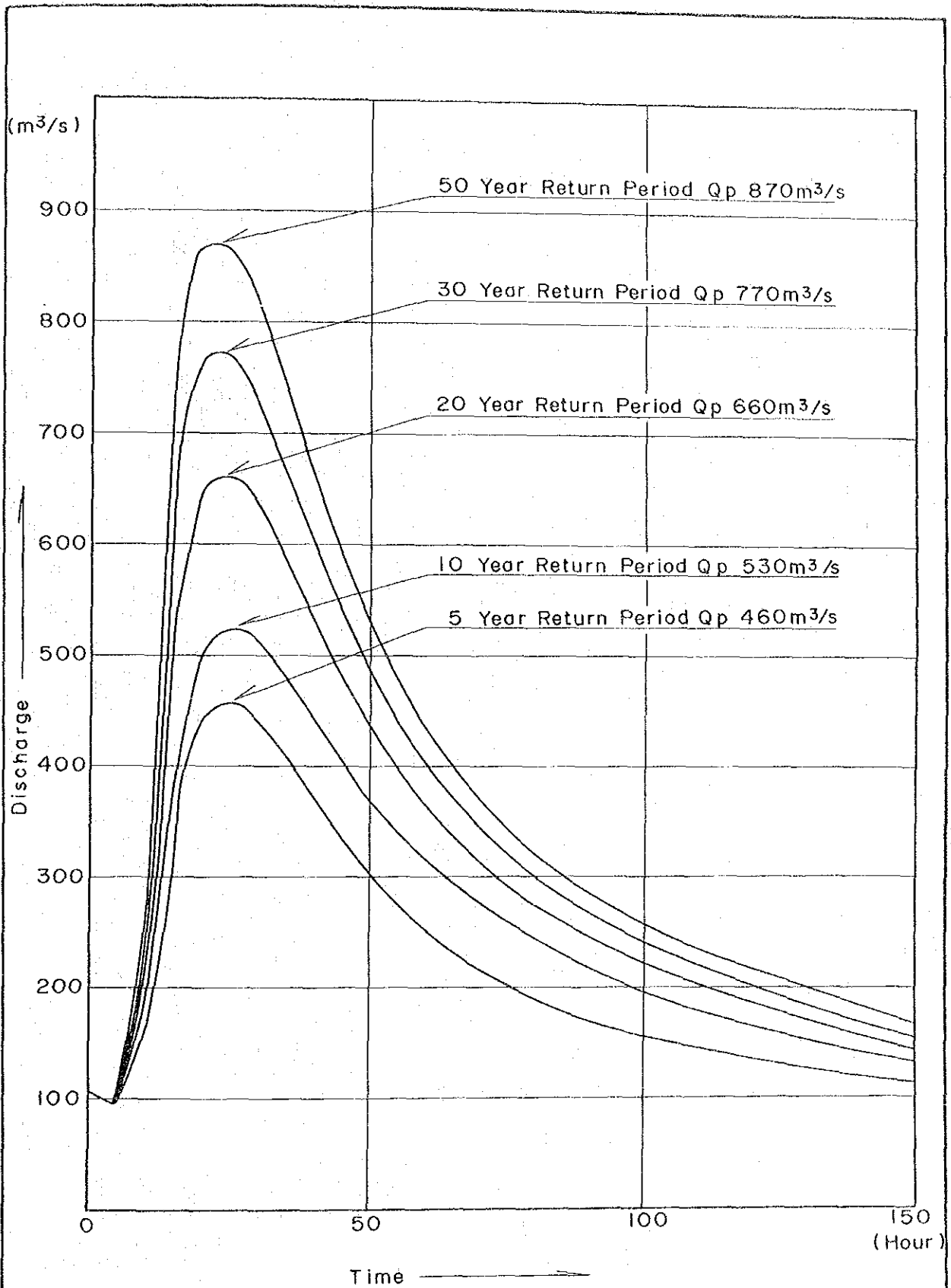
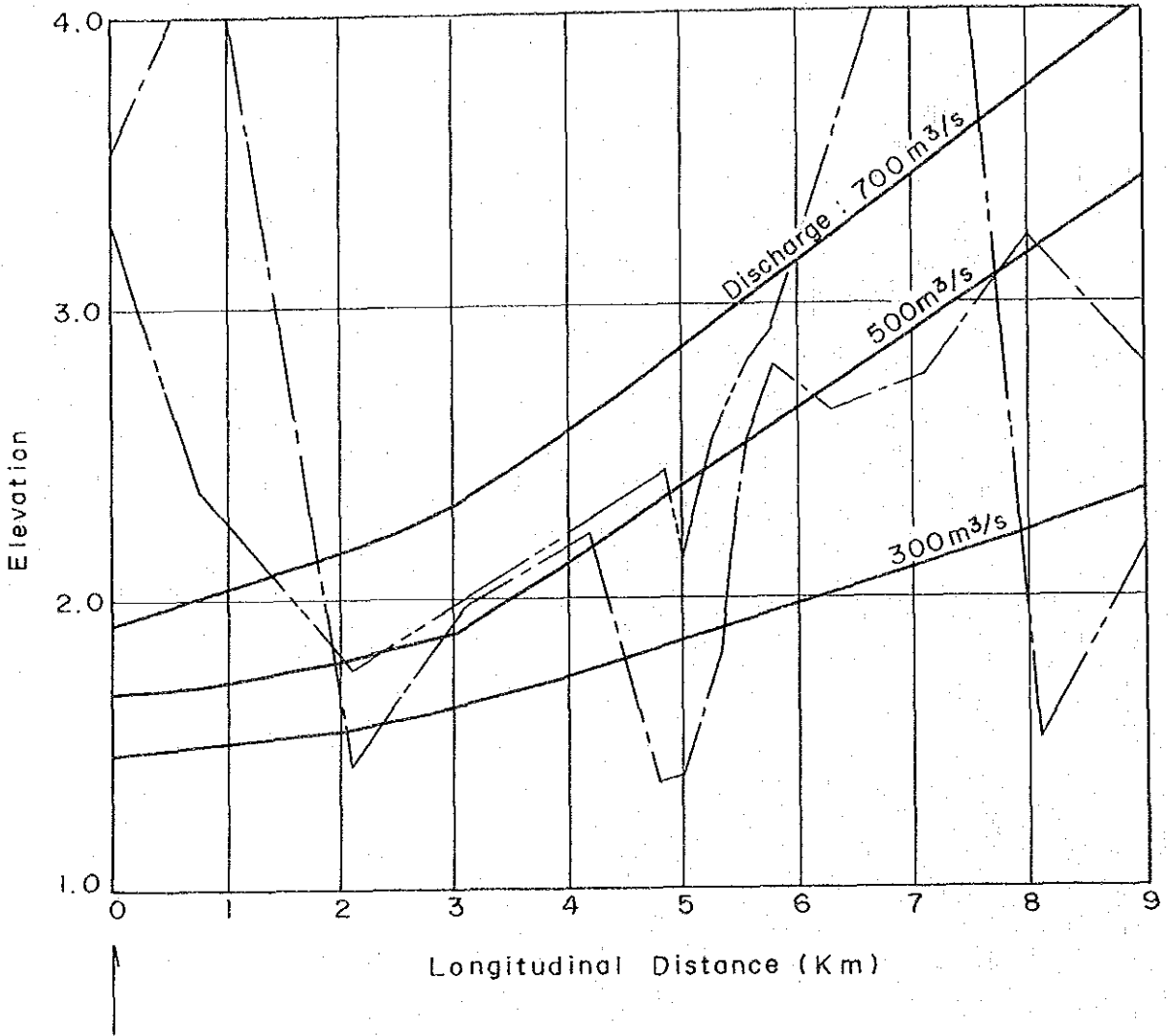


Fig. 15 Probable Flood Hydrographs at Model River Stretch.

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(M Above MSL)



Cross Sectional Survey Point No. 1

LEGEND	
—————	: Water Surface Profile
- - - - -	: Existing Left Bank Profile
- · - · -	: Existing Right Bank Profile

Fig.16 Water Surface Profile of Model River Stretch

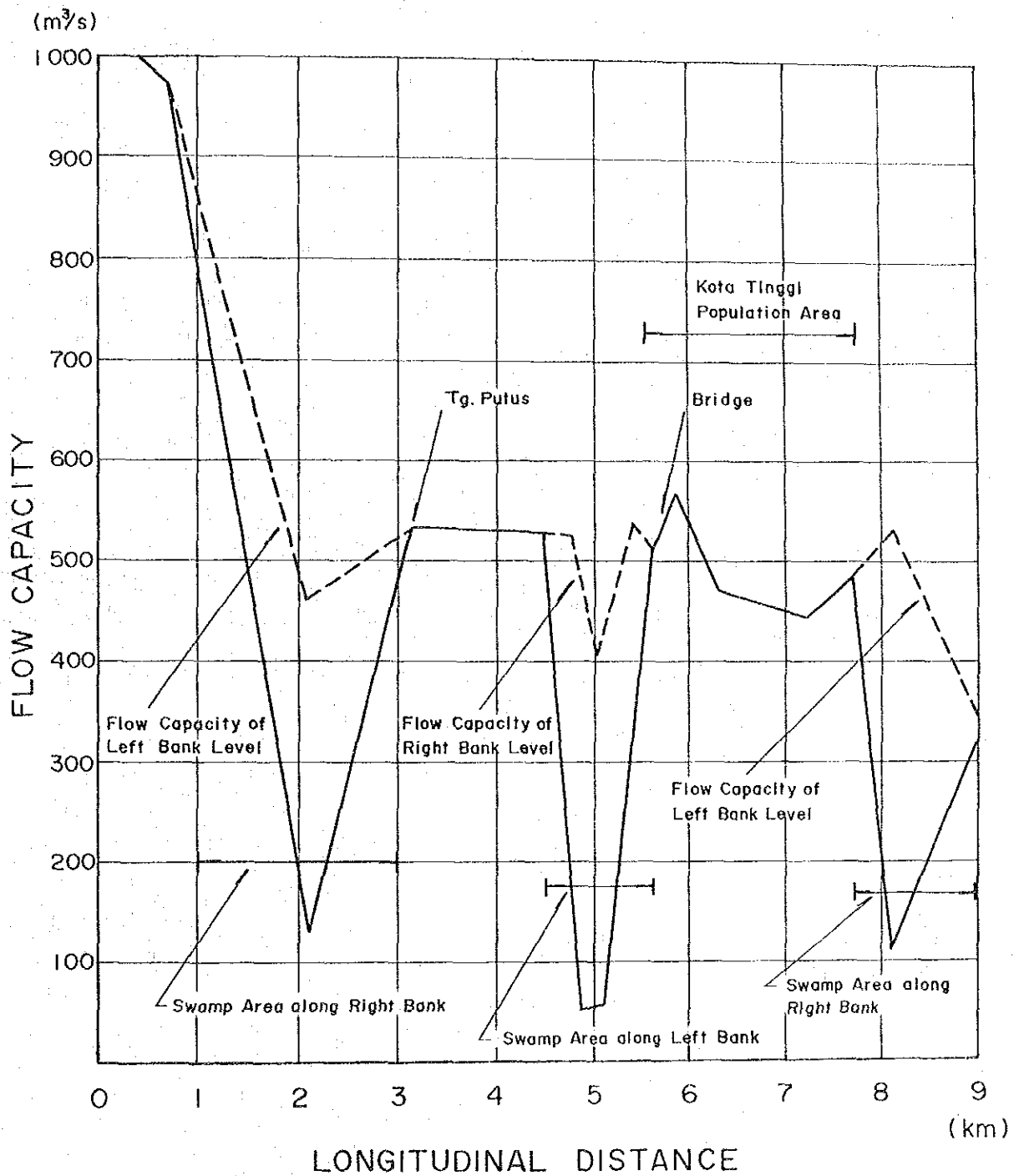


Fig.17 Present Flow Capacity of Model River Stretch

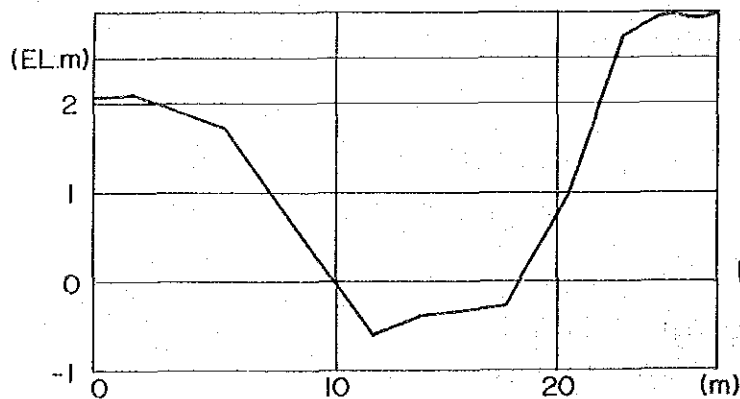
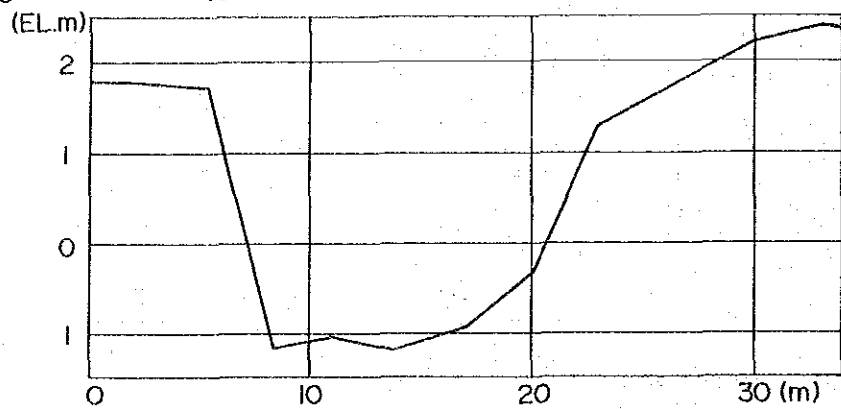
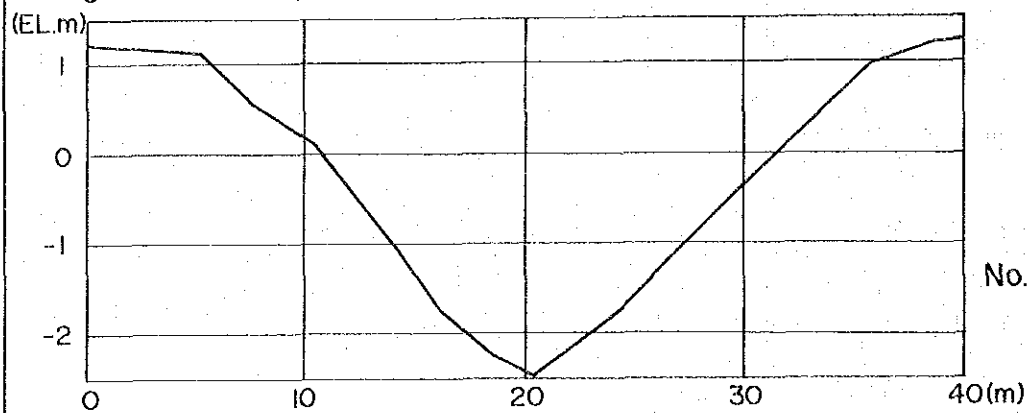
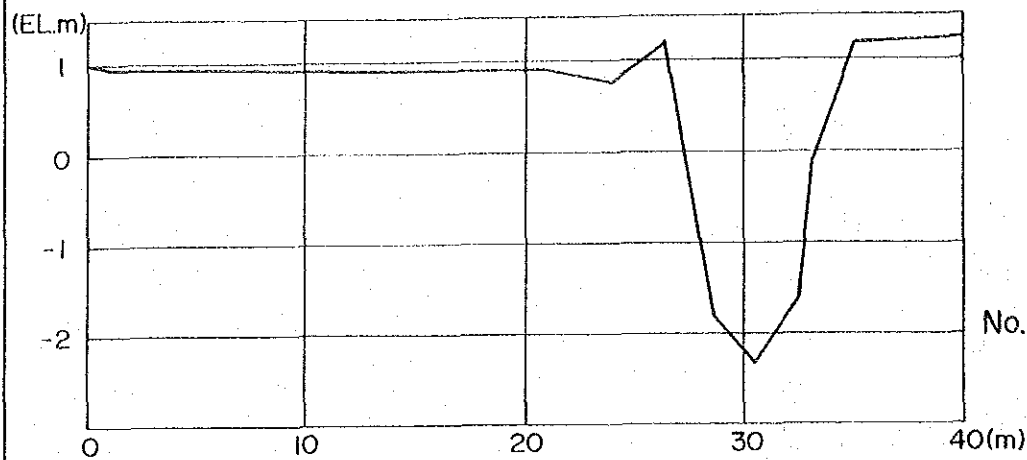
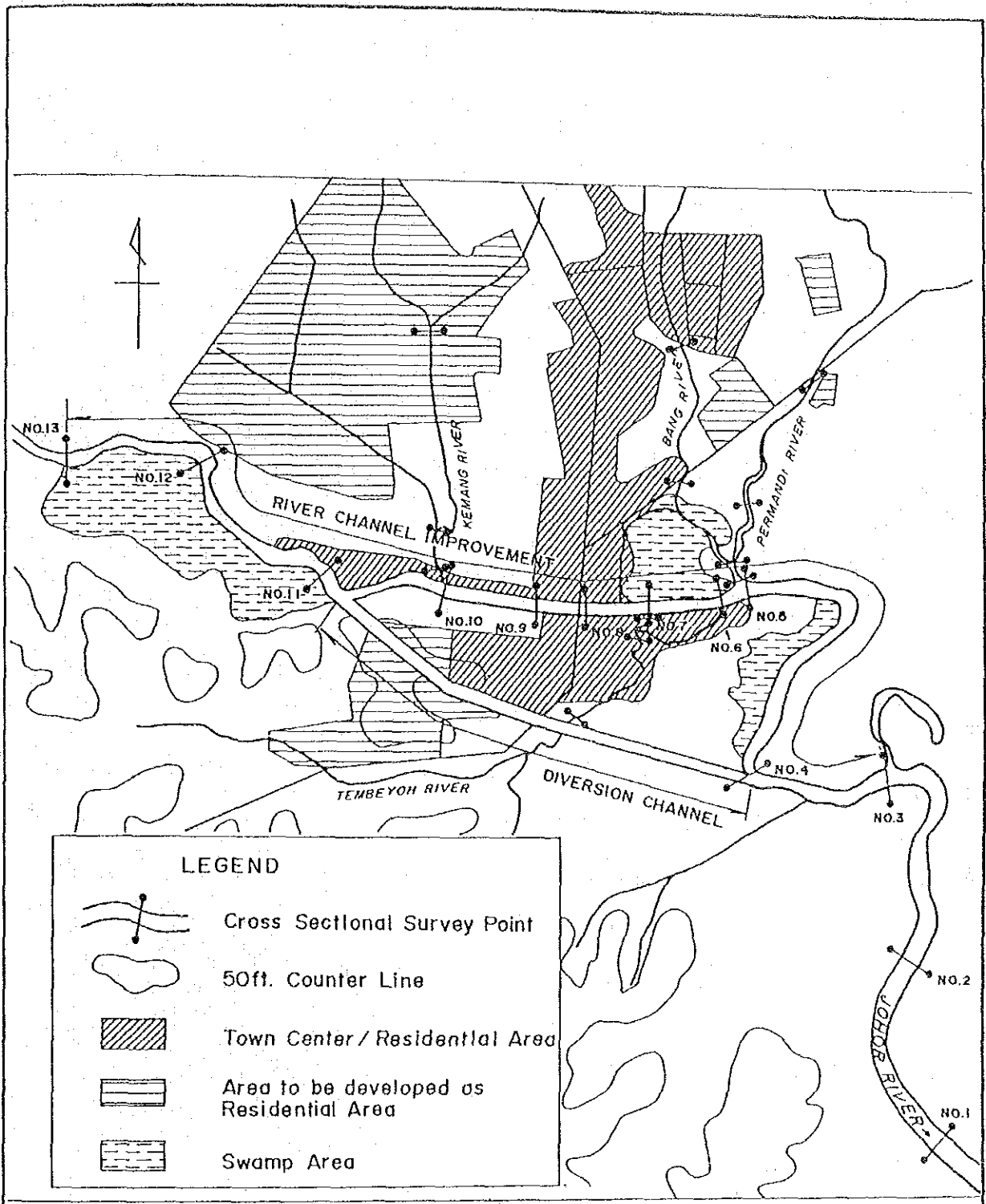


Fig 18 Existing Cross Section of Permandi River



LEGEND	
	Cross Sectional Survey Point
	50ft. Counter Line
	Town Center / Residential Area
	Area to be developed as Residential Area
	Swamp Area

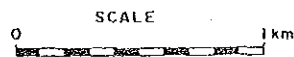


Fig.19 General Map of Model River Stretch

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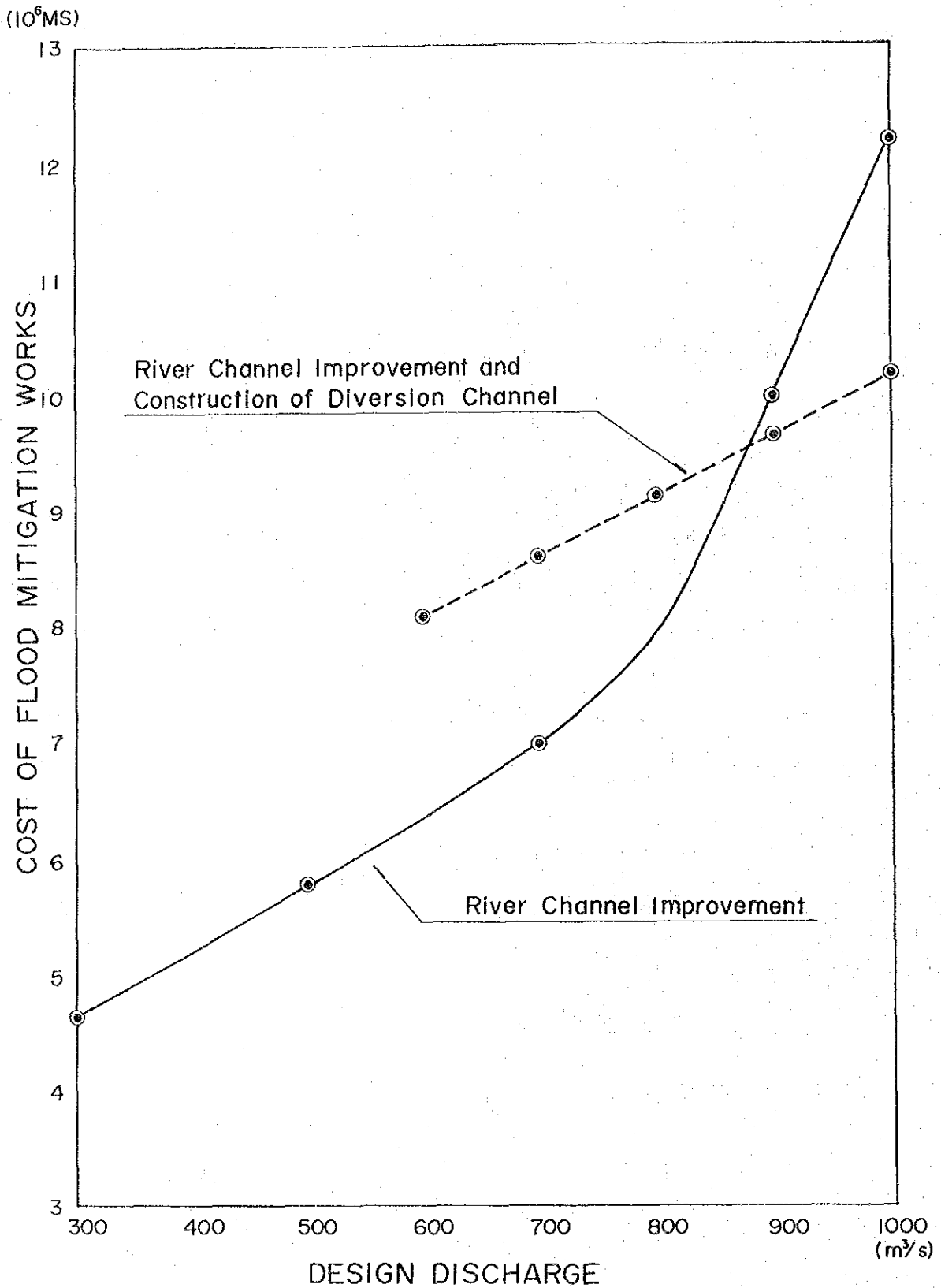
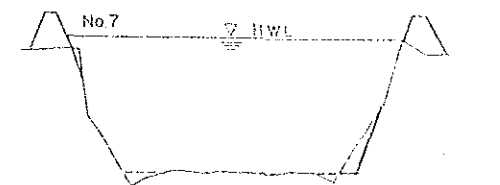
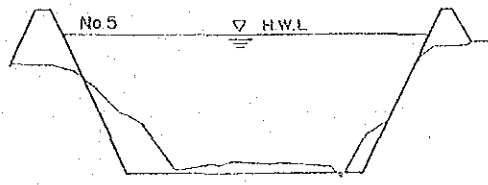
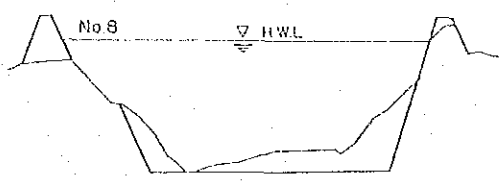
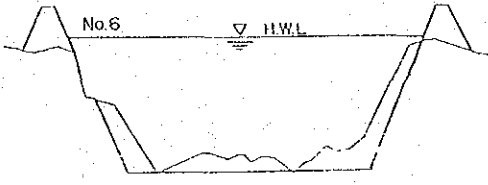


Fig.20 Cost of Flood Mitigation Works  
vs. Design Discharge



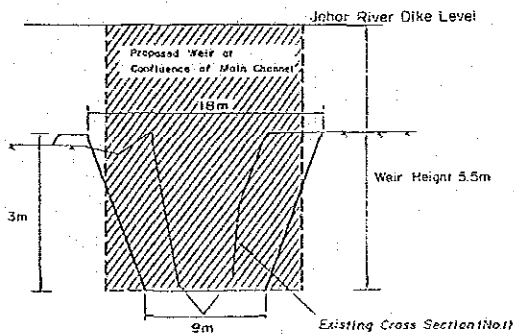
0m —  
-5m —



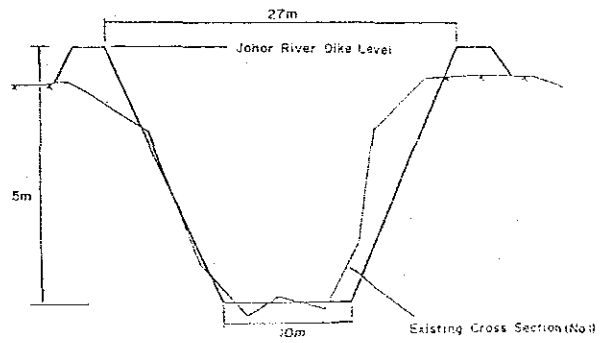
0m —  
-5m —

SCALE VERTICAL 1/200  
HORIZONTAL 1/1000

Johor River



Permandi River



Tembayan River

Fig. 21 Typical Cross Section for Model River Stretch

I T E M		P E R I O D				
		1st Y E A R	2nd Y E A R	3rd Y E A R	4th Y E A R	5th Y E A R
W O R K S C H E D U L E	PREPARATION • D/D	■		■	■	■
	MAIN CHANNEL IMPROVEMENT (IMPROVED LENGTH)		■			
			(0.7km)	(2.6km)	(1.0km)	(2.4km)
	TRIBUTARIES IMPROVEMENT					
	PERMANDI RIVER				■	
	TEMBEYOH RIVER					■
	RE-CONSTRUCTION OF BRIDGE			■		
CONSTRUCTION OF WEIR		■				
W O R K V O L U M E	EXCAVATION (10 <sup>3</sup> m <sup>3</sup> )		6 0	6 5	6 7	6 5
	EMBANKMENT (10 <sup>3</sup> m <sup>3</sup> )		3 0	4 0	4 0	2 8
	SOD FACING (10 <sup>3</sup> m <sup>2</sup> )		2 3	3 0	3 0	2 1
	ROAD PAVEMENT (10 <sup>3</sup> m <sup>2</sup> )		4	1 6	6	1 4

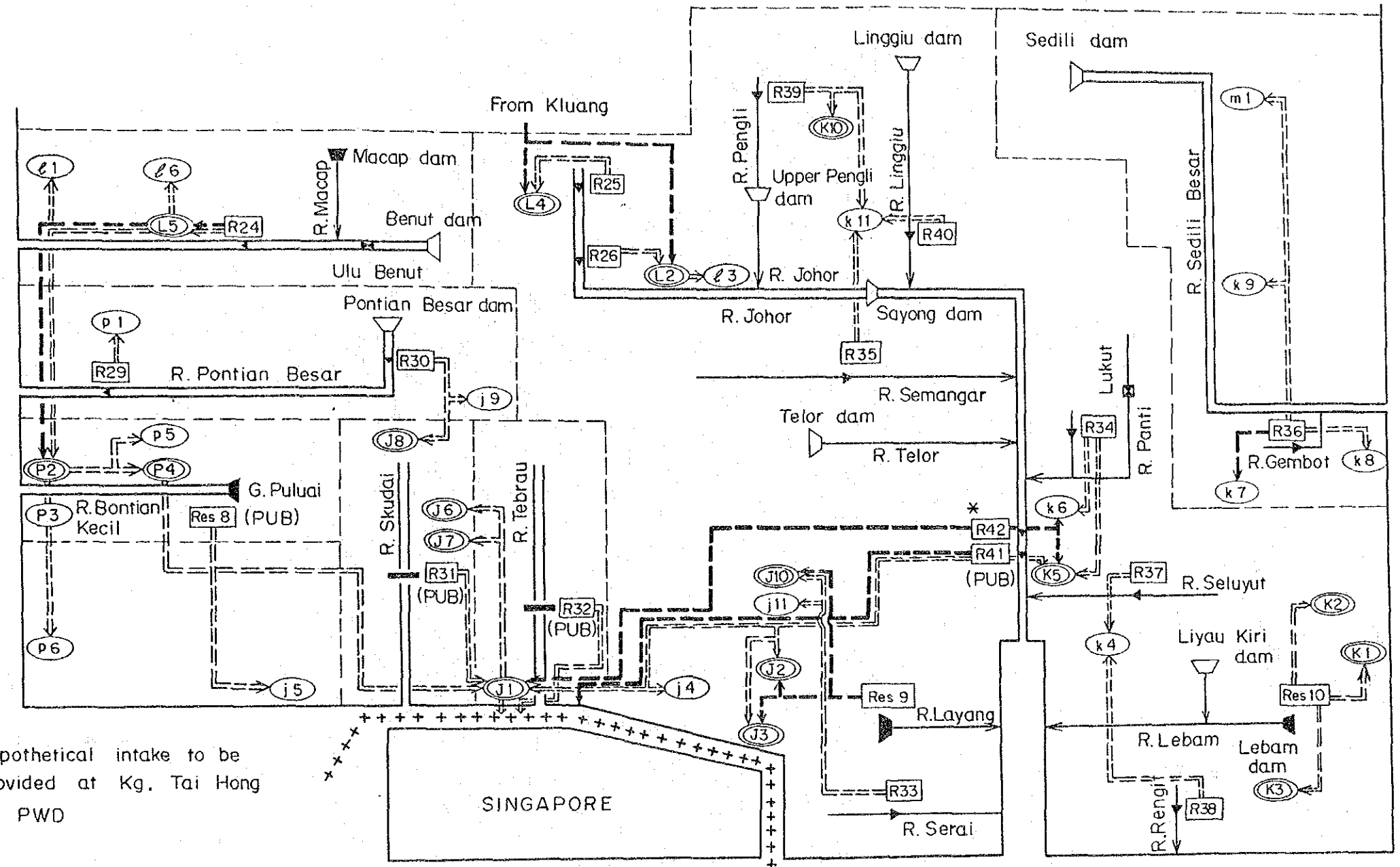
Fig. 22 Construction Schedule of River Channel Improvement for Model River Stretch of Johor River



# *PLATES*

SOUTH CHINA SEA

STRAITS OF MELAKA



Remarks : \* , Hypothetical intake to be provided at Kg. Tai Hong by PWD

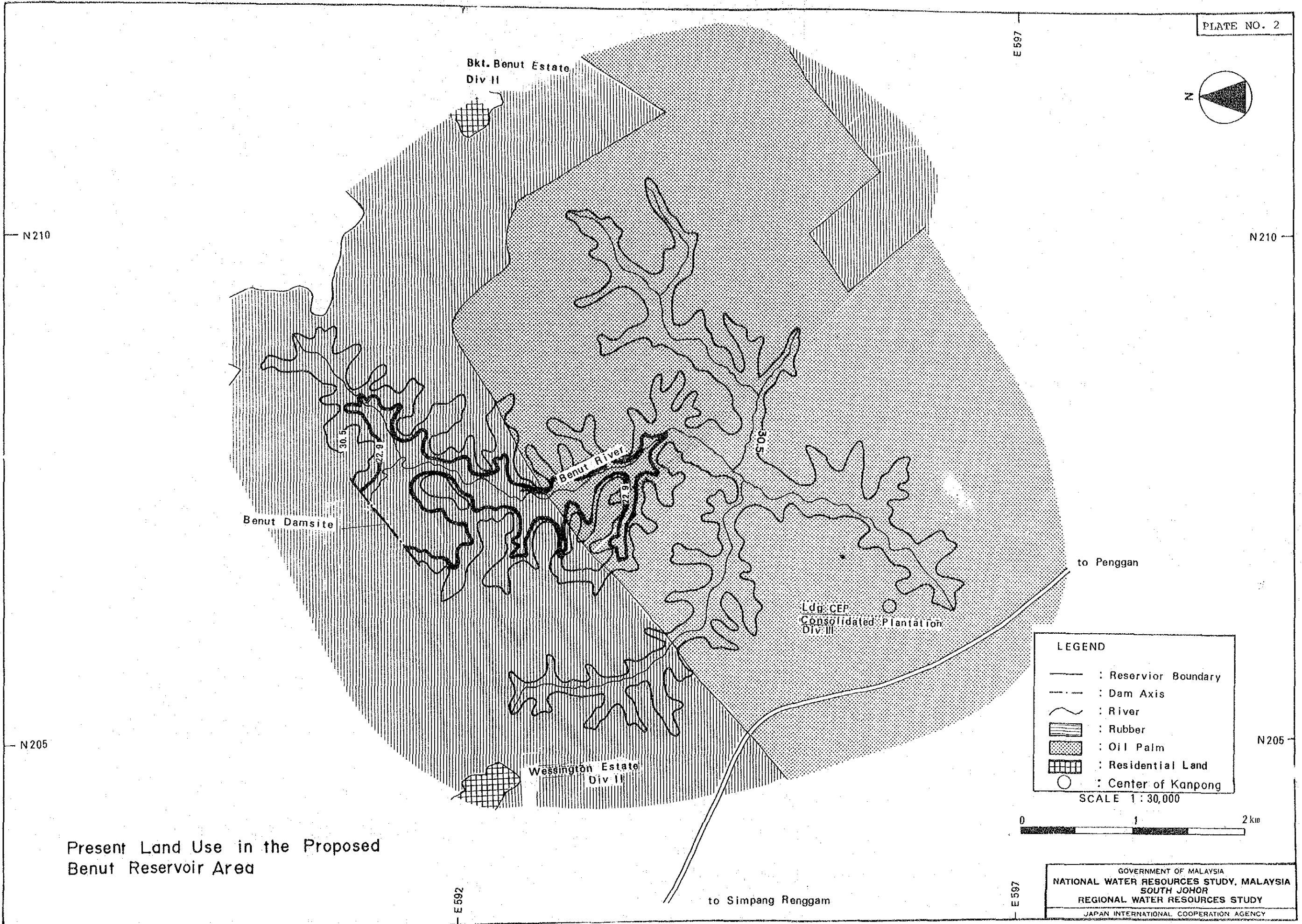
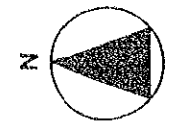
SINGAPORE

Name of Town and Mukim of Demand center  
Name of District

LEGEND			
	Main Stream		Dam in Operation
	Tributary		Dam Proposed
	Existing Pipeline		Barrage for Domestic and Industrial Water
	Proposed Pipeline		Intake for Domestic and Industrial Water
	Boundary of River Basin		Intake for Irrigation
	Demand Center (Town)		No. of Intake for Domestic and Industrial Water
	Demand Center (Rural)		

Johor Bahru	Kota Tinggi	Pontian	Kluang & Mersing
J 1 Johor Bahur	K 1 Bandar Penawah	p 1 Api Api, Benut	l 1 Ulu Benut, Macap
J 2 Masai	K 2 P4	Ayer Balo	L 2 Layang Layang
J 3 Pasir Gudang	K 3 P7	Sg. Pinaggan	l 3 Layang Layang
j 4 Johor Bohur Tebrau Pelentong	k 4 Johor Lama, Pantai Timur Pengerang	P 2 Pontian Kecil	L 4 Renggan
j 5 Pulai, Tg. Kupang	K 5 Kota Tinggi	k 3 Pontian, Rimba Terjun	L 5 Simpang Renggam
J 6 Kulai	k 6 Kota Tinggi	P 4 Pekan Nanas	l 6 Renggam
J 7 Senai	K 7 P2	k 5 Jeram Batu	m 1 Mersing
J 8 Kelapa Sawit	k 8 Sedili Kecil		
j 9 Senai Kulai, Sedenak	k 9 Ulu Sg. Sedili Besar, Sedili Kambang	k 6 Ayer Masin, Serkat Sg. Karang	
J10 Ulu Tiram	K10 Bandar Tenggara		
j11 Sg. Tiram	k 11 Ulu Sg. Johor		

Water Demand and Supply System



Benut Damsite

Bkt. Benut Estate  
Div II

Benut River

Ldg. CEP  
Consolidated Plantation  
Div III

Wessington Estate  
Div II

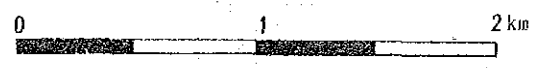
to Penggan

to Simpang Renggam

**LEGEND**

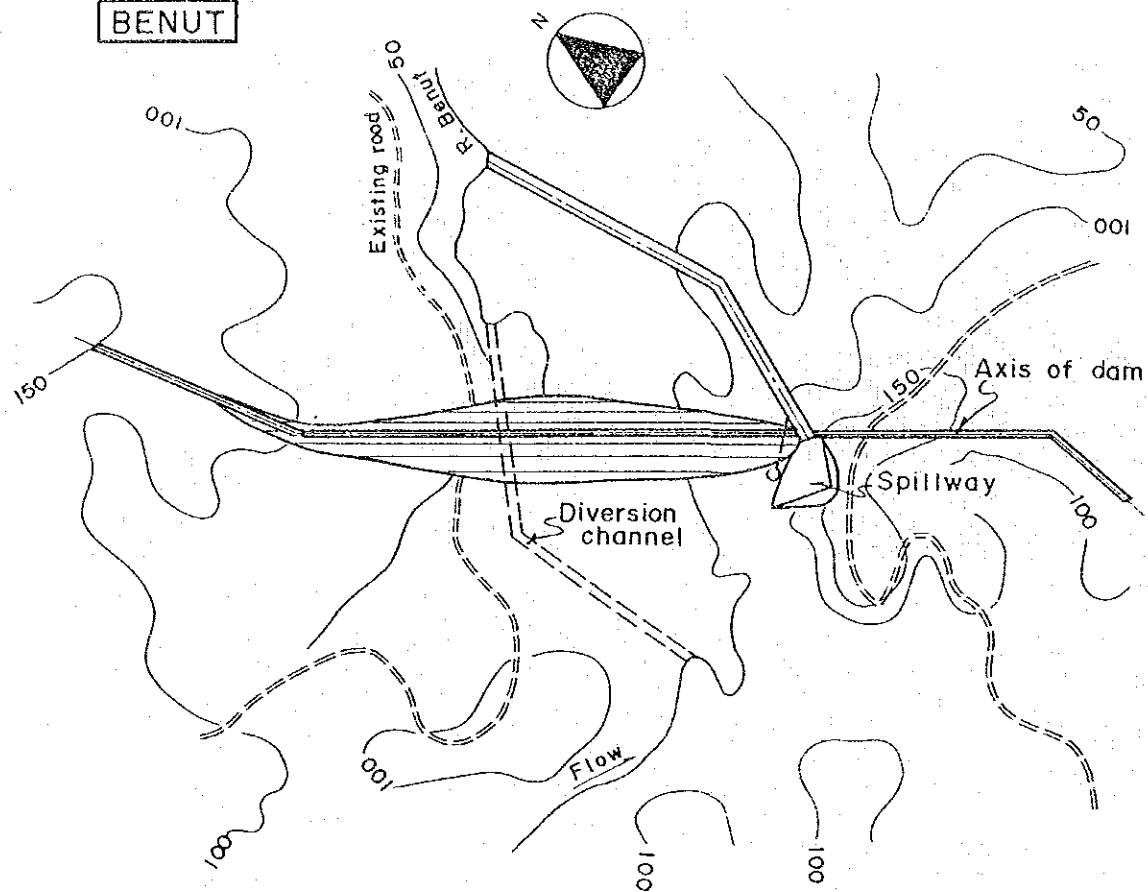
- : Reservoir Boundary
- - - : Dam Axis
- ~ : River
- [Hatched Box] : Rubber
- [Dotted Box] : Oil Palm
- [Grid Box] : Residential Land
- : Center of Kanpong

SCALE 1 : 30,000

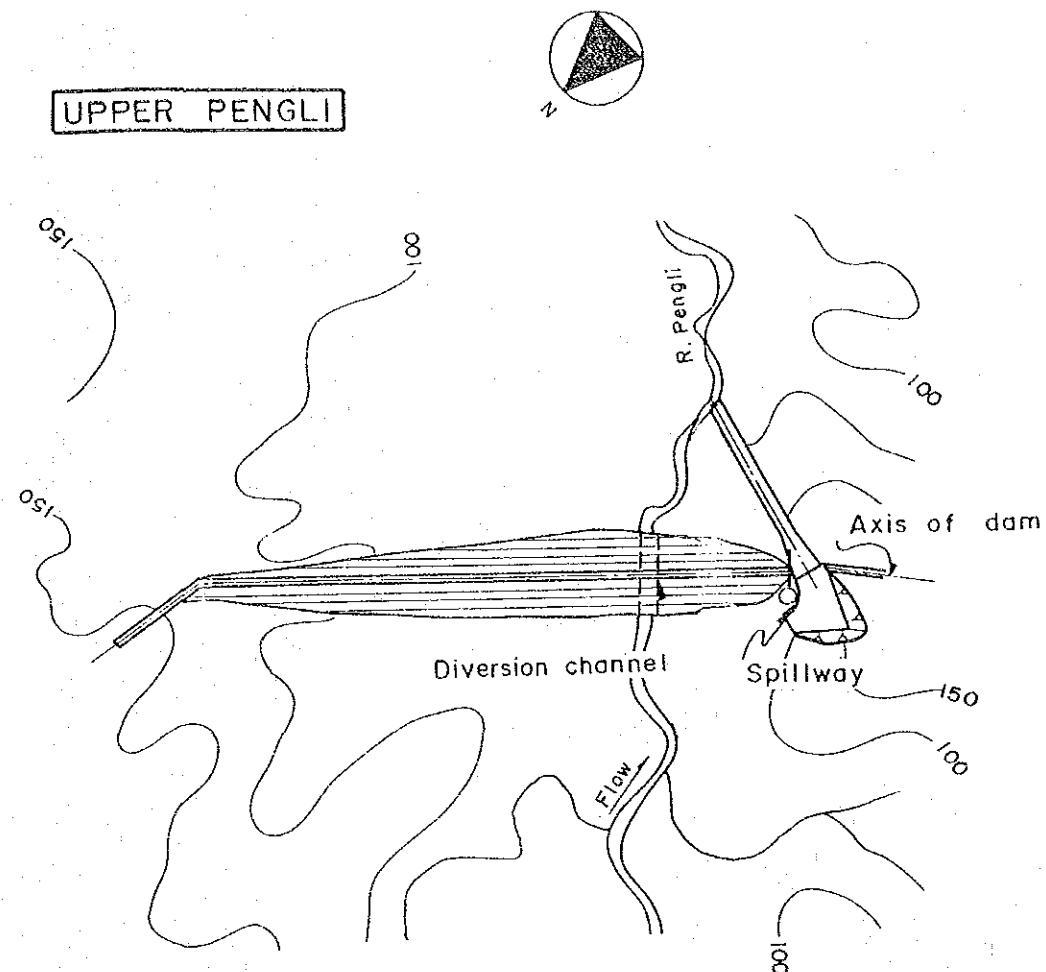


Present Land Use in the Proposed Benut Reservoir Area

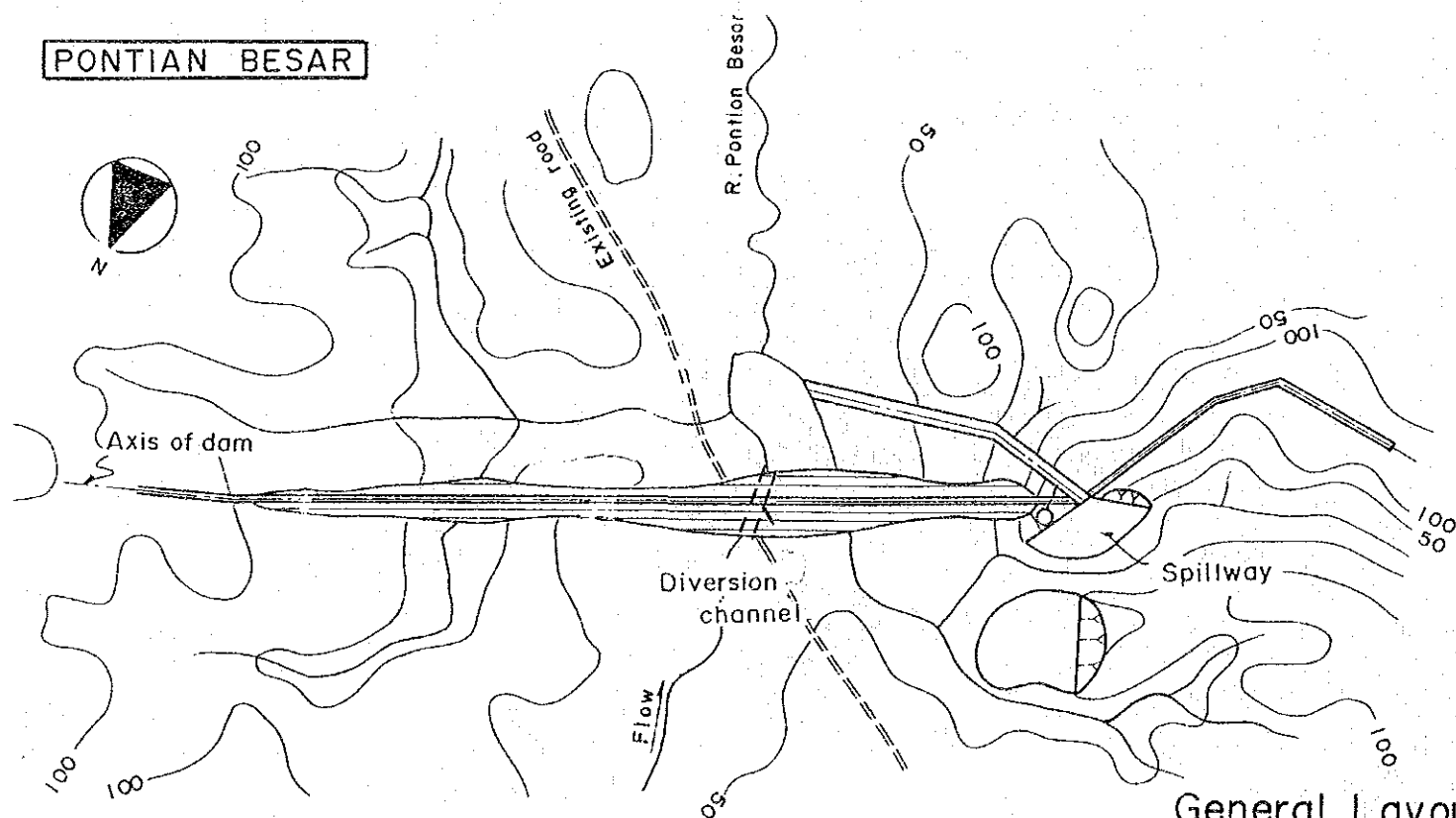
BENUT



UPPER PENGLI



PONTIAN BESAR



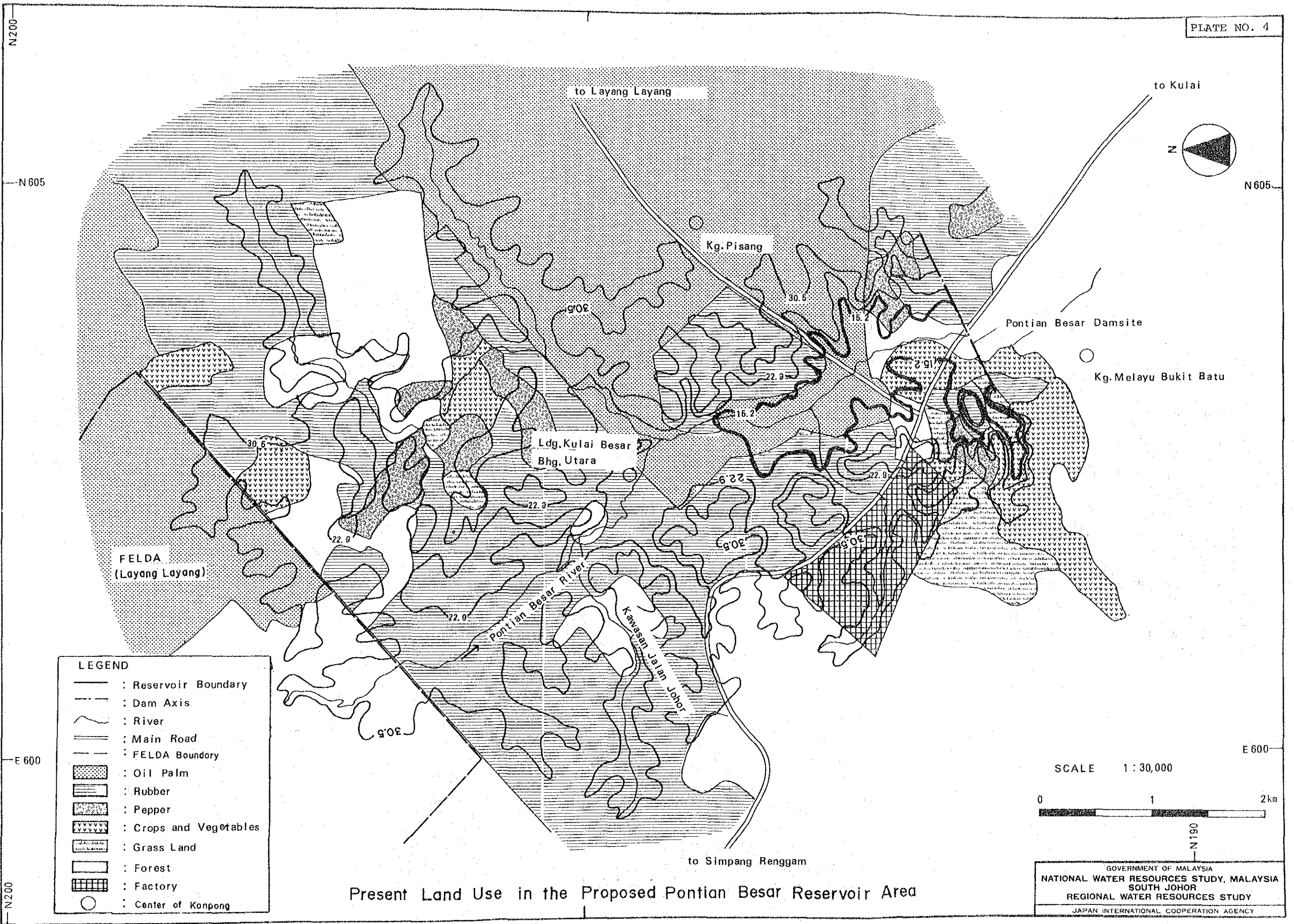
Note: Elevation is shown in feet.

SCALE



General Layout of Benut, Pontian Besar and Upper Pengli Dams

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Present Land Use in the Proposed Pontian Besar Reservoir Area

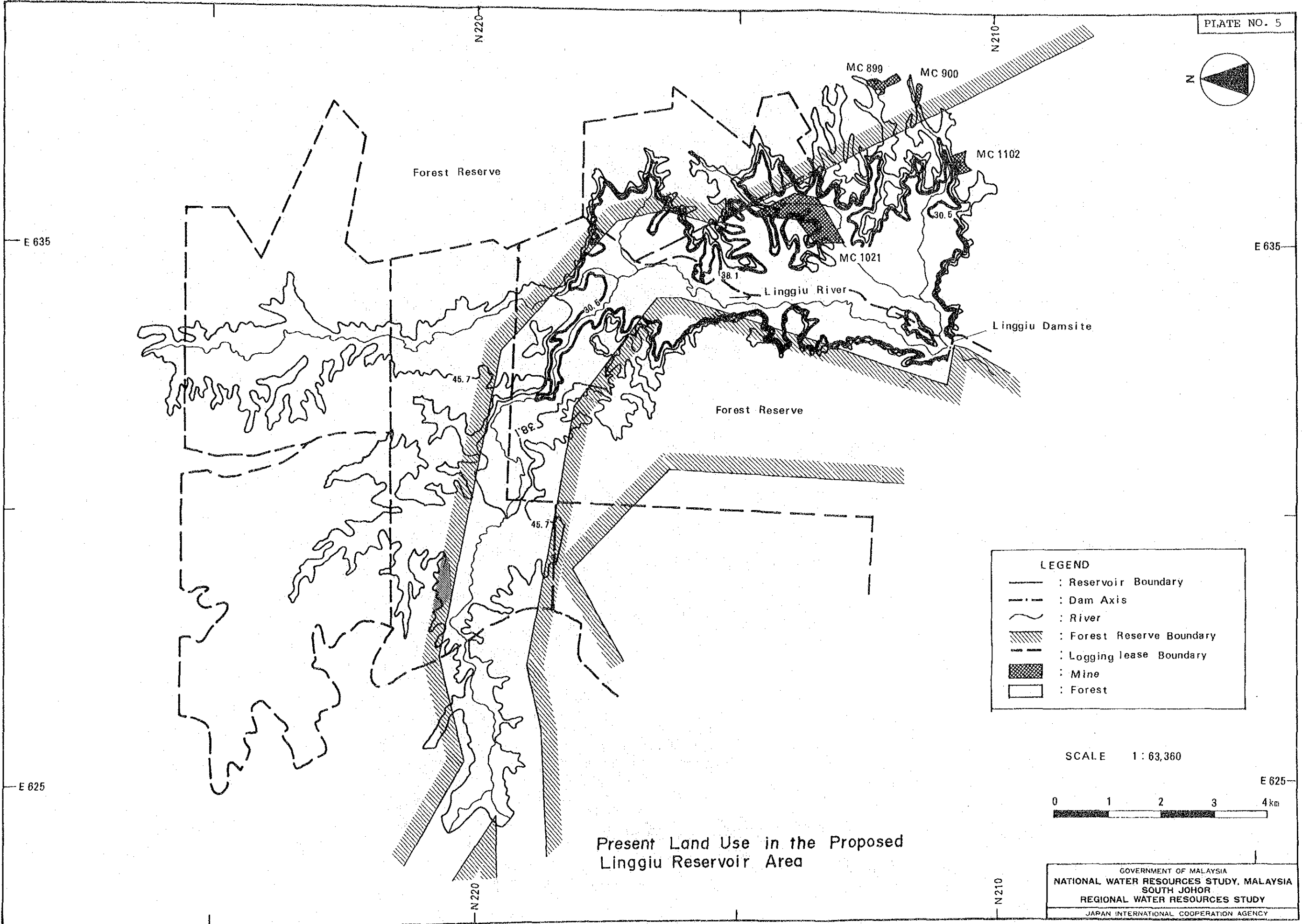
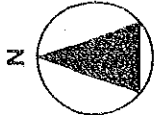
- LEGEND**
- : Reservoir Boundary
  - - - : Dam Axis
  - ~ : River
  - == : Main Road
  - - - : FELDA Boundary
  - [Diagonal lines] : Oil Palm
  - [Horizontal lines] : Rubber
  - [Vertical lines] : Pepper
  - [Cross-hatch] : Crops and Vegetables
  - [Dotted pattern] : Grass Land
  - [Blank] : Forest
  - [Grid pattern] : Factory
  - : Center of Konpong

SCALE 1 : 30,000

0 1 2 km

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Forest Reserve

MC 899

MC 900

MC 1102

MC 1021

30.5

38.1

Linggiu River

Linggiu Damsite

Forest Reserve

46.7

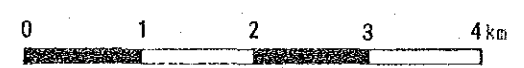
88.5

46.7

LEGEND

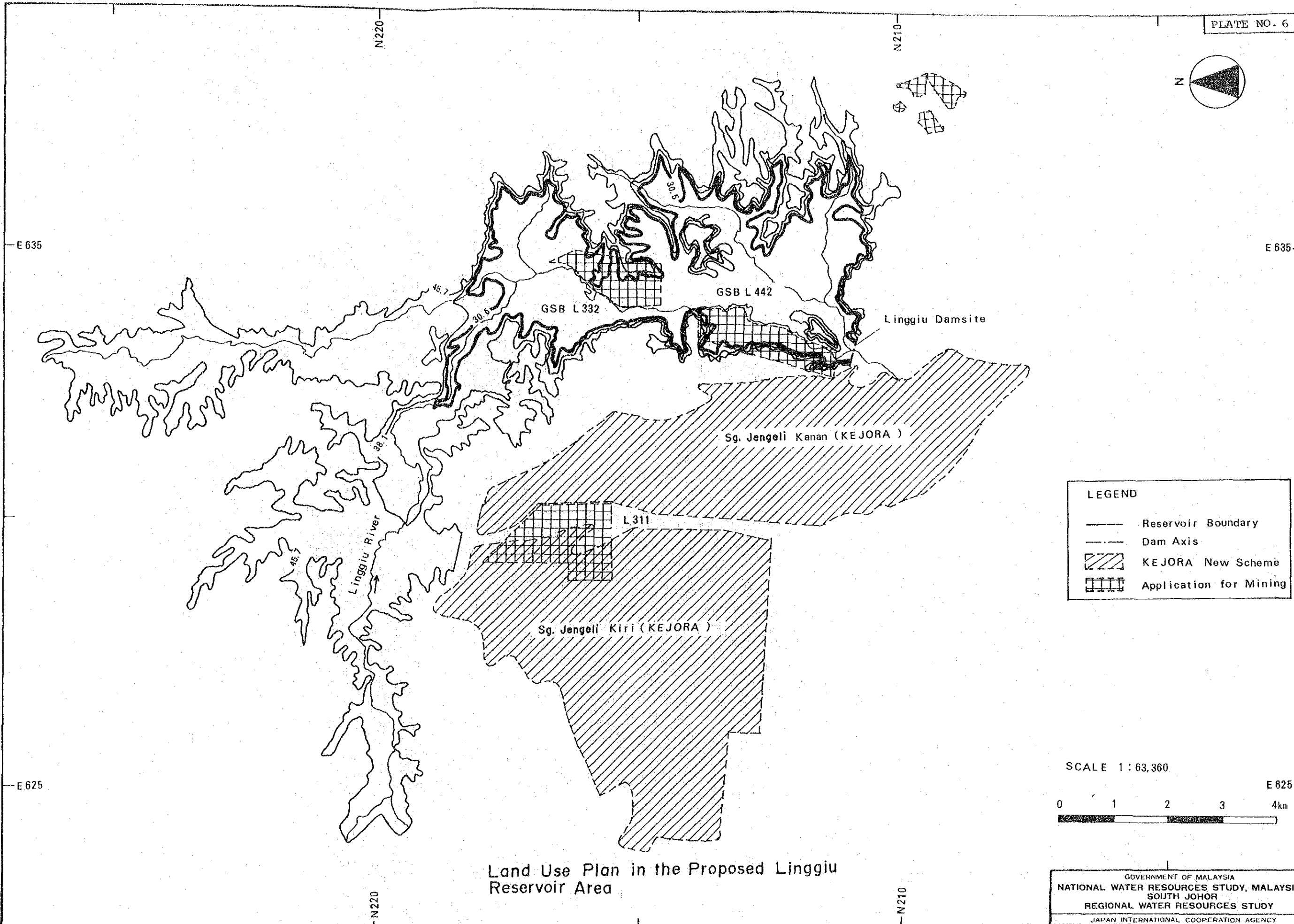
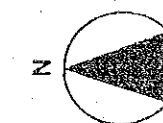
- : Reservoir Boundary
- - - : Dam Axis
- ~ : River
- ▨ : Forest Reserve Boundary
- - - : Logging lease Boundary
- ▩ : Mine
- : Forest

SCALE 1 : 63,360



Present Land Use in the Proposed Linggiu Reservoir Area

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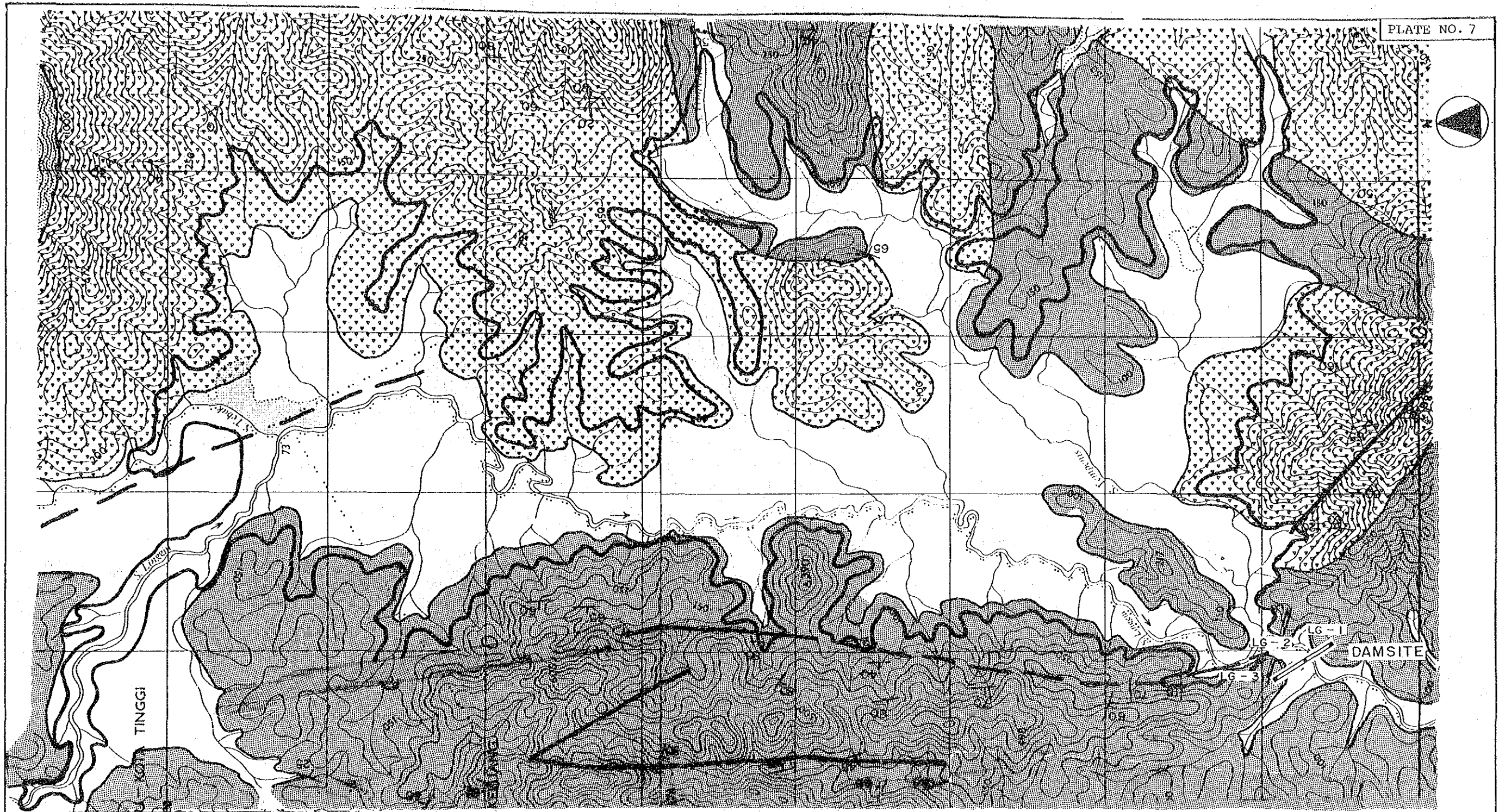


**LEGEND**

- Reservoir Boundary
- - - Dam Axis
- ▨ KEJORA New Scheme
- ▤ Application for Mining

SCALE 1 : 63,360

Land Use Plan in the Proposed Linggiu Reservoir Area



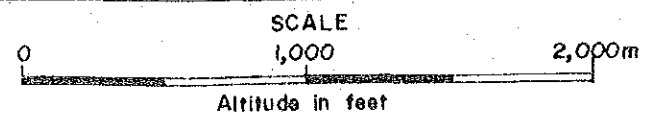
LEGEND

GEOLOGIC AGE	FORMATION	SYMBOL	DESCRIPTION & LITHOLOGY
RECENT	ALLUVIUM		River and swamp alluvium. Mainly sand, silt and clay.
LOWER CRETACEOUS	TEBAK FORMATION		Massive cross-bedded sandstone with intercalations of mudstone and grits.
UPPER PERMIAN	SEDILI VOLCANIC FORMATION		Acidic to intermediate pyroclastics and lava.
	LINGGIU FORMATION		Sandstone, siltstone, conglomerate, shale, tuff and lava

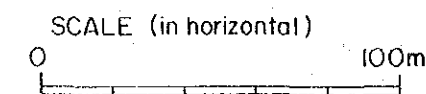
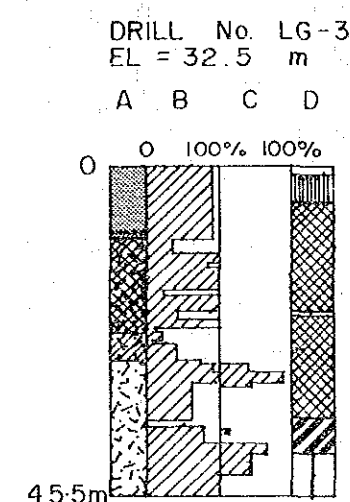
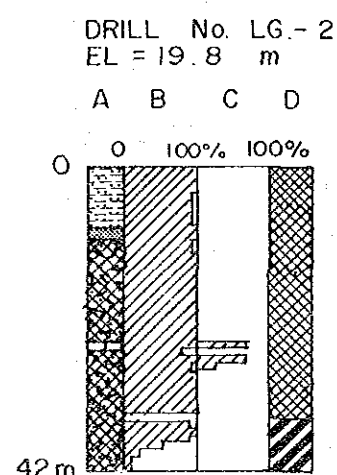
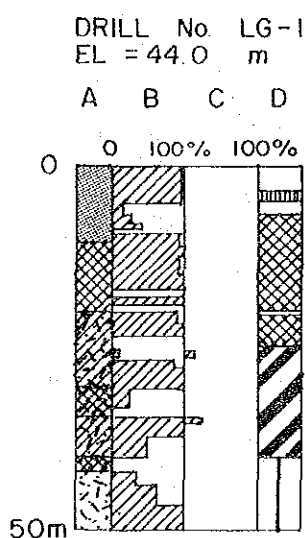
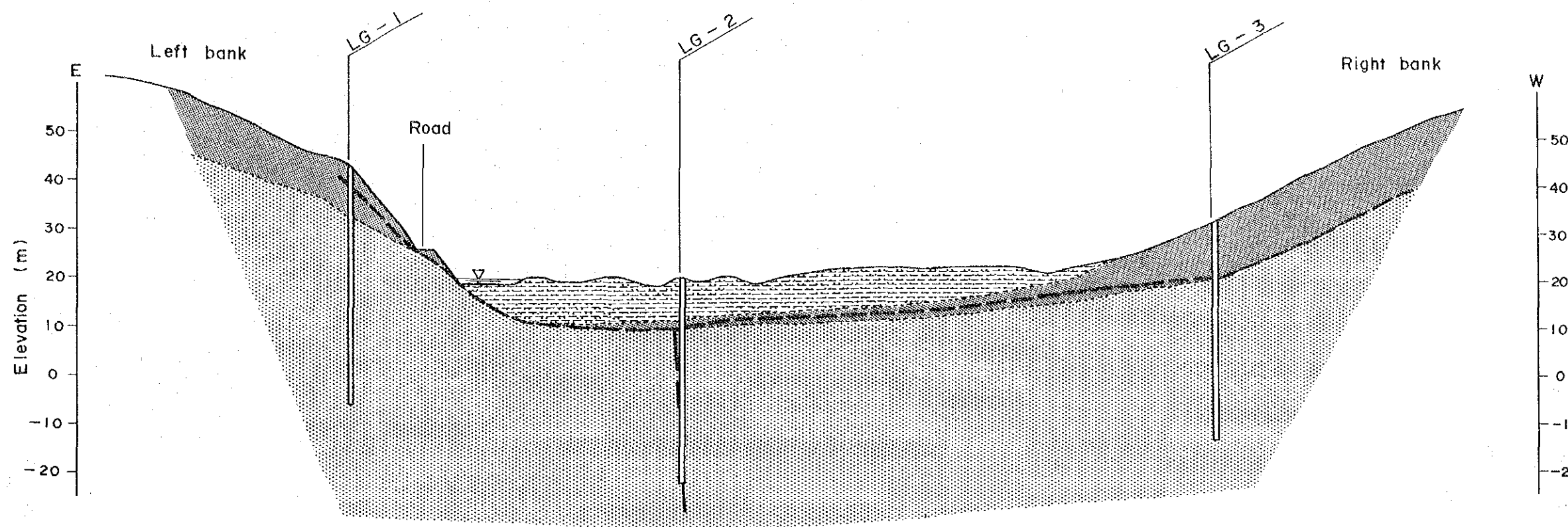
	Boundary of Formation		Inferred		Drilling Hole
	Fault		Strike and dip of Bedding		Strike and dip of Joint
	Vertical Joint				Reservoir Area

Geological Map of the Proposed Linggi Reservoir Area



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**LEGEND**

A: Geology from the surface investigation and drilling

- Alluvial deposits (sand, silt)
  - Top soil and residual soil
  - Tuffaceous sandstone
  - Rhyolite and Rhyolitic tuff
- } LINGGIU FORMATION

- Heavy weathered or fractured zone (B to CL in rock-grade classification)
- Moderately weathered or fractured zone (CL in rock-grade classification)
- Fault fractured
- Geologic boundary
- Excavation line for Earth fill type dam

B: Core Recovery (%)

C: Rock Quality Designation (%)

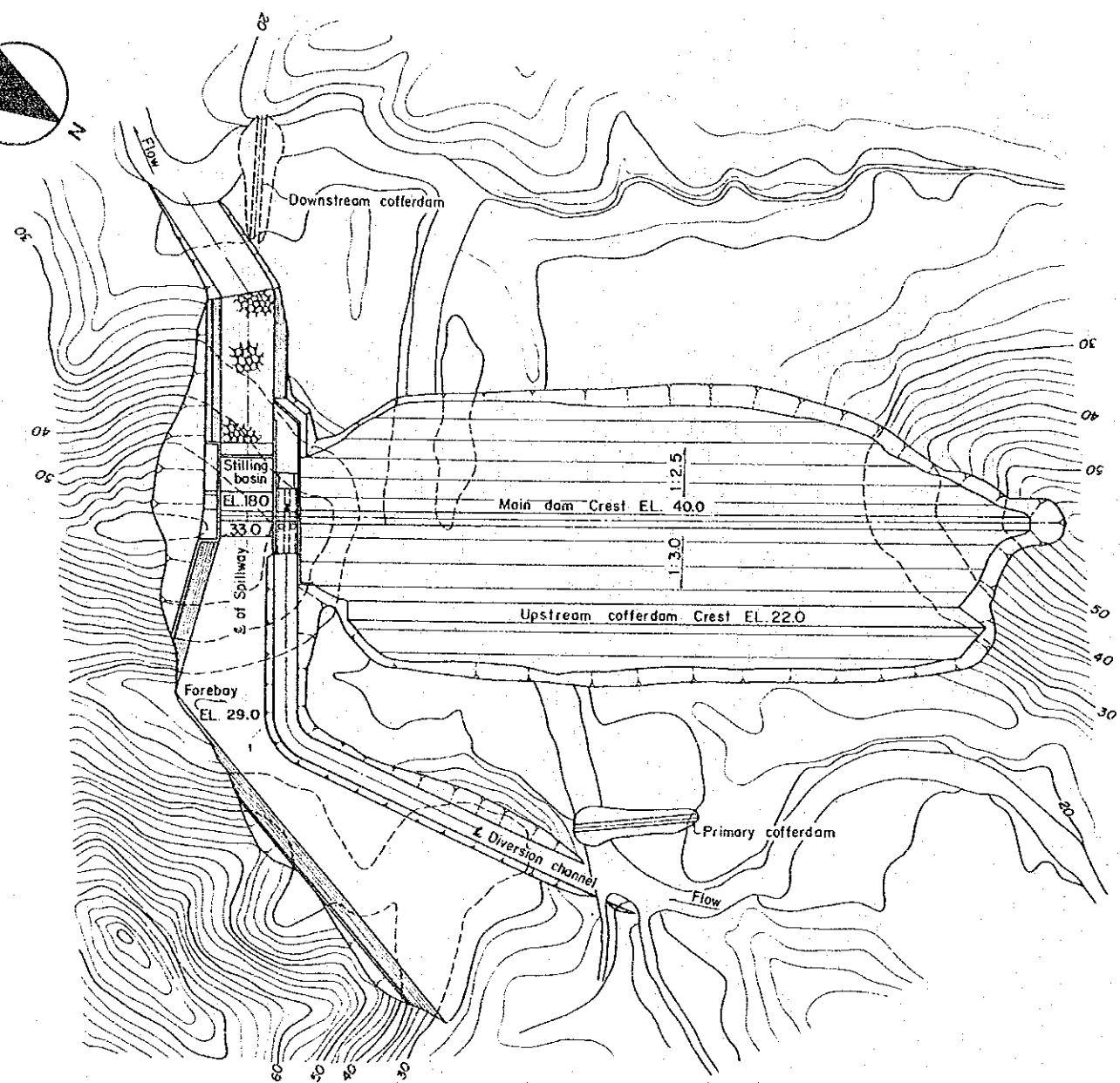
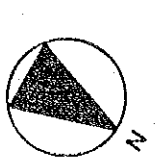
D: Permeability in Lugeon Unit (Lu)

- $Lu \leq 5$
- $5 < Lu \leq 20$
- $20 < Lu \leq 40$
- $40 < Lu \leq 100$
- $100 < Lu$

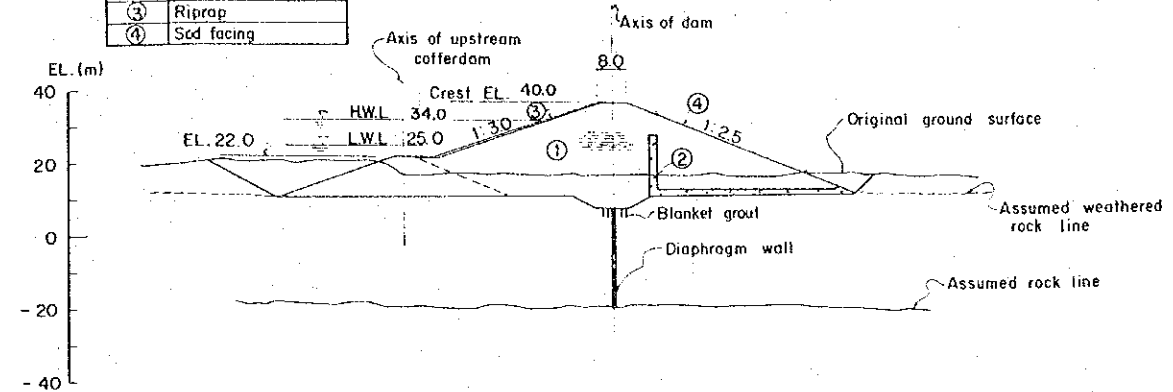
(Detailed geological interpretation will need after new drillings)

**Geologic Profile of the Proposed Linggiu Damsite**

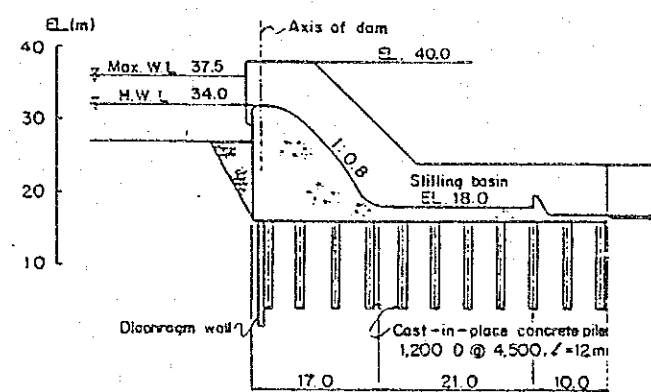
Zone	Material
①	Earthfill material
②	Interceptor drain
③	Riprap
④	Sod facing



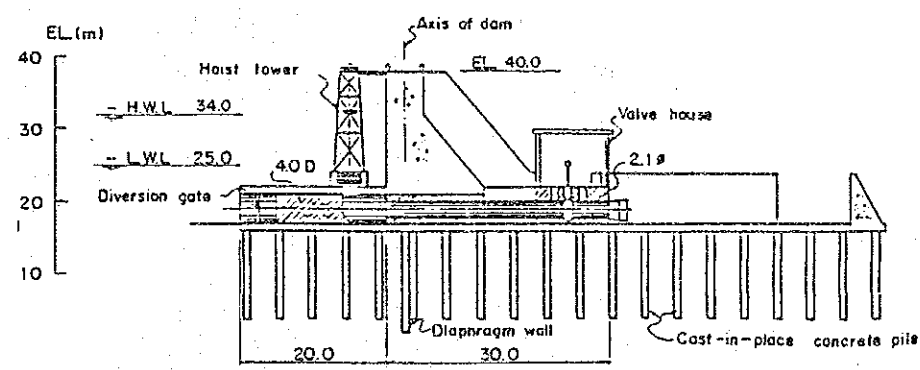
PLAN SCALE A



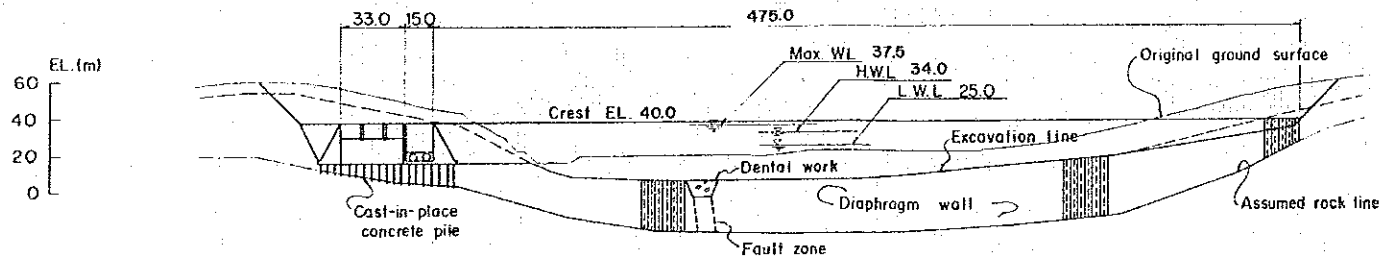
TYPICAL SECTION OF DAM SCALE B



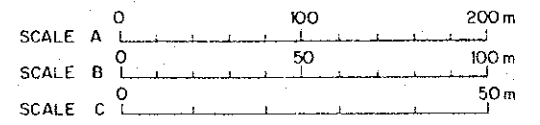
PROFILE OF SPILLWAY SCALE C



PROFILE OF DIVERSION AND RIVER OUTLET SCALE C



UPSTREAM ELEVATION OF DAM SCALE A



Linggiu Dam Scheme

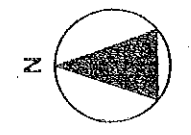
GOVERNMENT OF MALAYSIA  
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 SOUTH JOHOR  
 REGIONAL WATER RESOURCES STUDY  
 JAPAN INTERNATIONAL COOPERATION AGENCY

E 625











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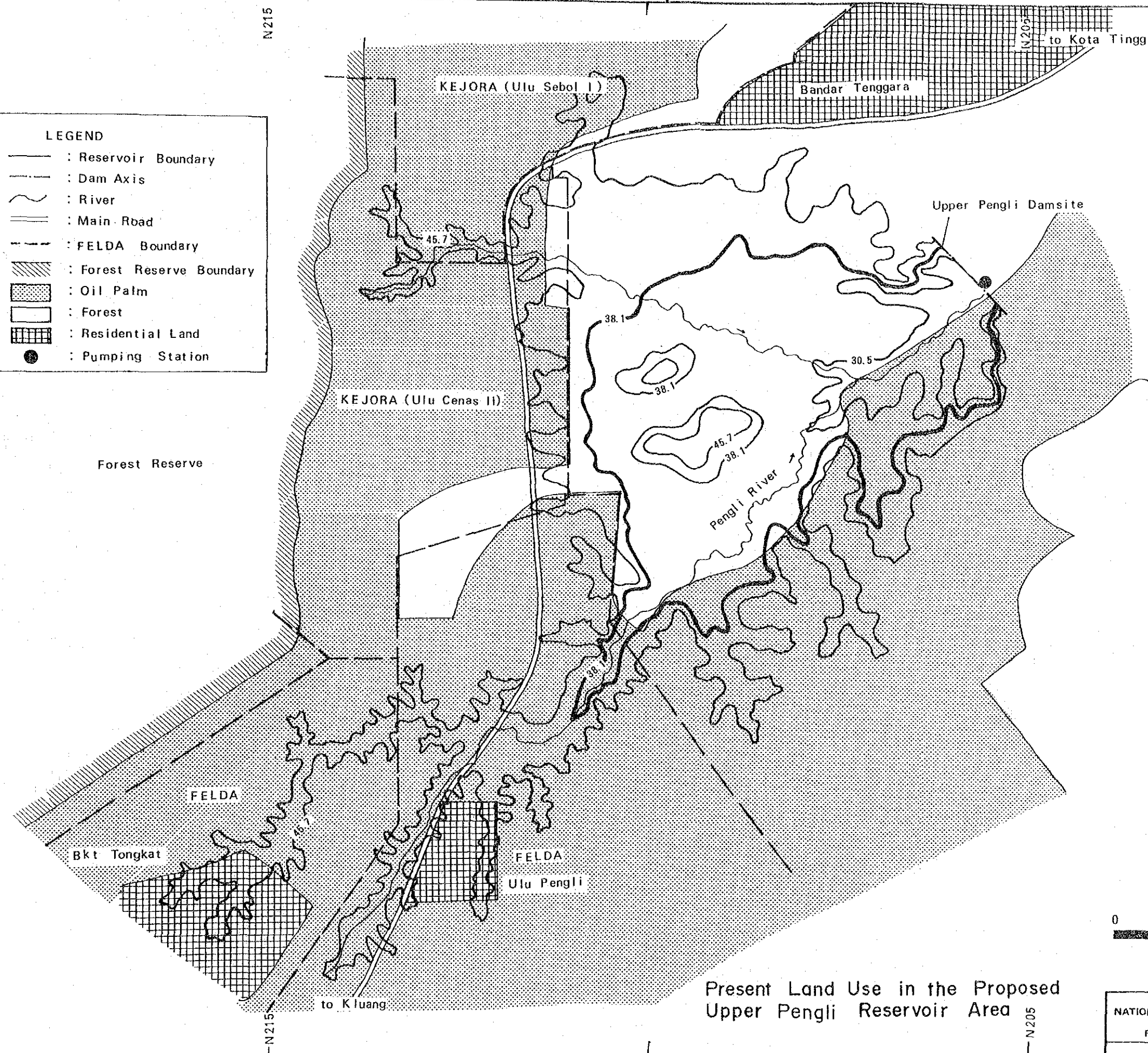
N 205

E 625



**LEGEND**

-  : Reservoir Boundary
-  : Dam Axis
-  : River
-  : Main Road
-  : FELDA Boundary
-  : Forest Reserve Boundary
-  : Oil Palm
-  : Forest
-  : Residential Land
-  : Pumping Station



SCALE 1 : 50,000



Present Land Use in the Proposed Upper Pengli Reservoir Area

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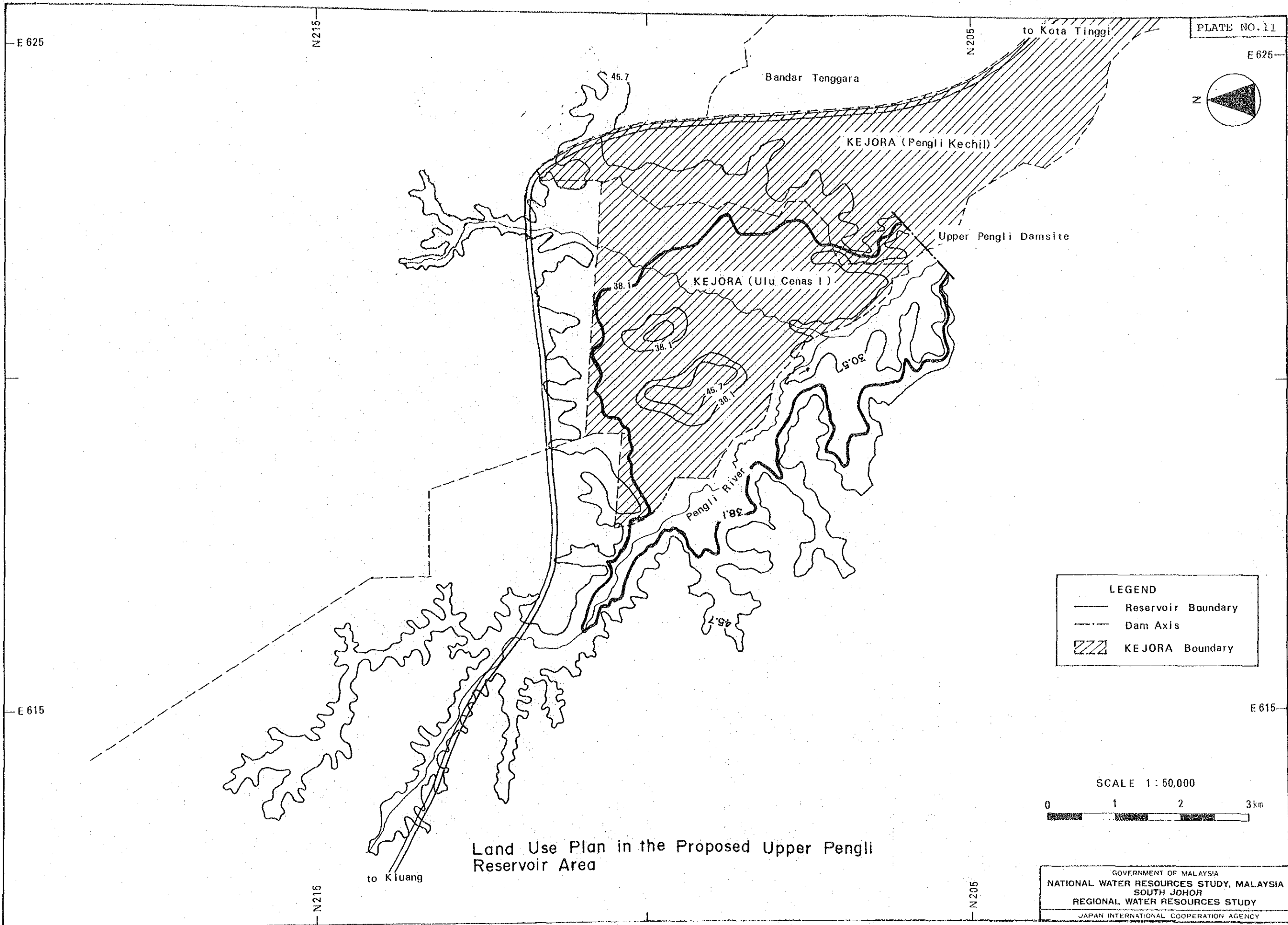
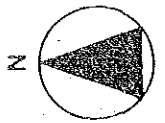
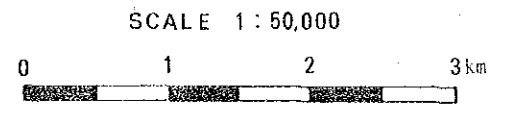


PLATE NO. 11



**LEGEND**

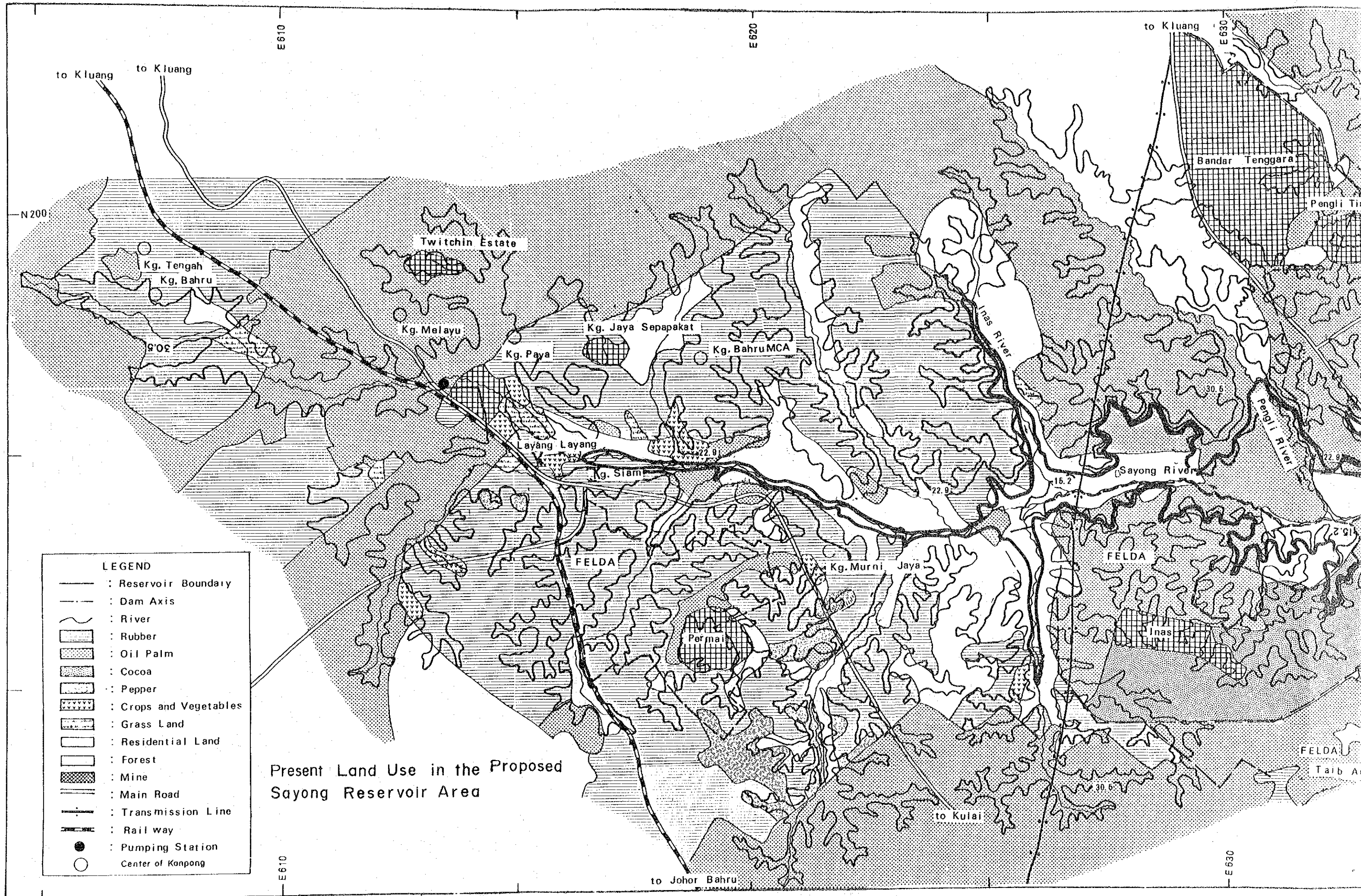
- Reservoir Boundary
- - - Dam Axis
- ▨▨▨ KEJORA Boundary



Land Use Plan in the Proposed Upper Pengli Reservoir Area

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- LEGEND**
- : Reservoir Boundary
  - : Dam Axis
  - ~ : River
  - [Diagonal lines /] : Rubber
  - [Diagonal lines \] : Oil Palm
  - [Cross-hatch] : Cocoa
  - [Vertical lines] : Pepper
  - [Horizontal lines] : Crops and Vegetables
  - [Dotted] : Grass Land
  - [Blank] : Residential Land
  - [Blank] : Forest
  - [Cross-hatch] : Mine
  - == : Main Road
  - +— : Transmission Line
  - +— : Rail way
  - : Pumping Station
  - : Center of Konpong

Present Land Use in the Proposed Sayong Reservoir Area

to Kluang to Kluang

to Kluang

N 200

E 610

E 620

E 630

Kg. Tengah  
Kg. Bahru

Twitchin Estate

Kg. Melayu

Kg. Jaya Sepakat

Kg. Bahru MCA

Kg. Paya

Layang Layang

Kg. Slam

Inas River

Sayong River

Pendi River

Bandar Tenggara

Pengli Tin

FELDA

Kg. Murni Jaya

FELDA

Inas

Permai

FELDA

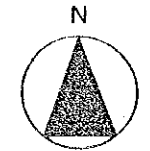
Taib An

to Kulai

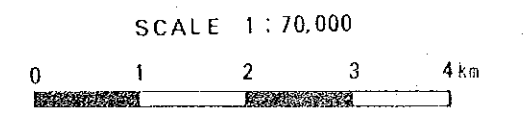
to Johor Bahru

E 610

E 630



in the Proposed Area



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