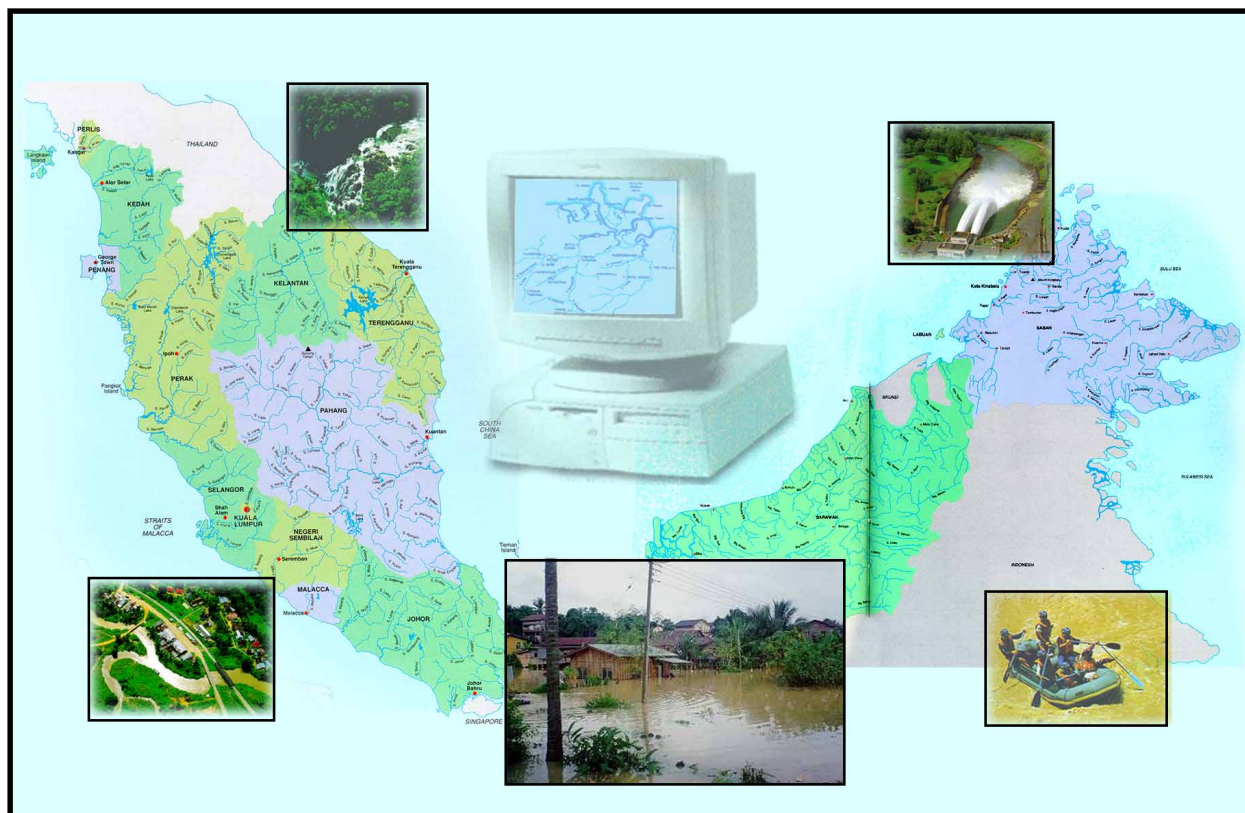




JABATAN PENGAIRAN DAN SALIRAN MALAYSIA

## NATIONAL REGISTER OF RIVER BASINS



### FINAL REPORT

### Volume 2.5

### Updating of Condition of Flooding in Malaysia

### State Report for Johor

Submitted by :



**KTA Tenaga** sdn bhd  
CONSULTING ENGINEERS \* JURUTERA PERUNDING

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## **NATIONAL REGISTER OF RIVER BASINS**

- Vol. 1 : Register of River Basins
- Vol. 2 : Updating of Condition of Flooding in Malaysia - Main Report
- Vol. 2.1 : State Report for Perlis, Kedah & Pulau Pinang
- Vol. 2.2 : State Report for Perak
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- Vol. 2.4 : State Report for Negeri Sembilan & Melaka
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**NATIONAL REGISTER OF RIVER BASINS**  
**UPDATING OF CONDITION OF FLOODING IN MALAYSIA**

**VOLUME 2.5: STATE REPORT FOR JOHOR**

*Final Report*

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## **1.0 SUMMARY OF FLOOD EVENTS BY RIVERS IN AN RBMU**

The number of flood events that occur in a river within an RBMU in Johor, for each year between 1980 and 2001, is shown in the following Table. The tables give the dates of the flood events that occur in each river within the RBMU.

Table 1: Summary of Flood Events (1980 – 2001) for Johor

## **2.0 INFORMATION ON EACH REPORTED FLOOD EVENTS**

The information on each reported flood event that occurs in Johor from 1980 to 2000, have been extracted and organised in a table under the river where it occurs. The list of tables are as follows:

1. Table 2(a): RBMU 21, Muar
2. Table 2(b): RBMU 22, Batu Pahat
3. Table 2(c): RBMU 23, South West Johor Rivers
4. Table 2(d): RBMU 24, Johor
5. Table 2(e): RBMU 25, Sedili Besar
6. Table 2(f): RBMU 26, Mersing
7. Table 2(g): RBMU 27, Endau

The following information are presented in the tables which are grouped by RBMU in the state.

- (a) Date of flood event
- (b) Location of flood event
- (c) Area, Depth, Duration of flood event
- (d) Level at flood warning station, where pertinent
- (e) Rainfall or Flood Discharge ARI, where available
- (f) Number of family and people evacuated
- (g) Number of deaths
- (h) Reported flood damages, where available
- (i) Length of roads and railways flooded
- (j) Flood maps, where available
- (k) Pertinent Remarks



### **3.0 FLOOD AREA STATISTICS AND AAD BY RBMU**

The flood area statistics and annual average damage for the RBMUs in Johor, are given in the following tables:

1. Table 3(a): Flood Area Statistics and AAD for RBMU 21, Muar
2. Table 3(b): Flood Area Statistics and AAD for RBMU 22, Batu Pahat
3. Table 3(c): Flood Area Statistics and AAD for RBMU 23, South West Johor Rivers
4. Table 3(d): Flood Area Statistics and AAD for RBMU 24, Johor
5. Table 3(e): Flood Area Statistics and AAD for RBMU 25, Sedili Besar
6. Table 3(f): Flood Area Statistics and AAD for RBMU 26, Mersing
7. Table 3(g): Flood Area Statistics and AAD for RBMU 27, Endau

The AAD reported in this study is in year 2000 prices while the AAD quoted from JICA's 1982 study is in 1980 prices.

### **4.0 FLOOD AREA STATISTICS AND AAD FOR STATE**

The flood area statistics and annual average damage for Johor, are given in the following table:

1. Table 4: Flood Area Statistics and AAD for Johor

The AAD reported in this study is in year 2000 prices while the AAD quoted from JICA's 1982 study is in 1980 prices.

### **5.0 FLOOD MAP DRAWINGS**

The list of updated flood maps and their related drawing numbers that have been produced for the RBMU in Johor, is given in Table 5. A set of the drawings in A3 size is given in this report. Digital copies of the flood maps are also available in the CD-ROM attached.

Table 1 : Summary of Flood Events (1980 – 2001) for Johor



TABLE 1 : SUMMARY OF FLOOD EVENTS (1980 - 2001) BY RIVERS (SHEET 1 OF 3)

STATE : JOHOR

Year of Flood	RBMU	No. of Flood Events	River	Date of Flood Event
1980	Muar	1	Sg. Muar	late November
1981	South West Johor	1	Sg. Skudai	mid December
	Johor	1	Sg. Johor	mid December
	Sedili Besar	1	Sg. Sedili Besar	mid December
	Endau	1	Sg. Endau	mid December
	Muar	2	Sg. Muar	mid December
1982	Muar	2	Sg. Segamat	mid to late December
			Sg. Pagoh	mid December
			Sg. Batu Pahat	mid December
	Batu Pahat	1	Sg. Batu Pahat	mid December
	South West Johor	1	Sg. Tebrau	late December
1983	Johor	1	Sg. Johor	late December
	Endau	1	Sg. Kahang	late December
	Muar	1	Sg. Muar	late December
1984	South West Johor	1	Sg. Tebrau	late December
	Johor	1	Sg. Johor	late December
	Muar	1	Sg. Pagoh	December
1985	Mersing	1	Sg. Mersing	early January
	Muar	4	Sg. Muar	mid to late March
1986	Muar	4	Sg. Segamat	mid March
			Sg. Labis	early March
			Sg. Juasseh	early January
			Sg. Batu Pahat	March
	Batu Pahat	1	Sg. Chaah/ Lenik	mid March
			Sg. Bekok	March
			Sg. Simpang Kiri	March
			Sg. Sembrong	March
	South West Johor	1	Sg. Tebrau	March
			Sg. Skudai	March
	Johor	2	Sg. Johor	early January
	Sedili Besar	1	Sg. Johor	March
			Sg. Sedili Besar	early January
	Endau	1	Sg. Endau	March
1987	Muar	2	Sg. Muar	mid January
			Sg. Muar	mid December
			Sg. Segamat	mid January
			Sg. Segamat	mid December
			Sg. Labis	mid January
			Sg. Labis	mid December
			Sg. Pagoh	mid January
			Sg. Juasseh	14/1/87
	Batu Pahat	1	Sg. Chaah/ Lenik	mid January
			Sg. Bekok	mid January
			Sg. Simpang Kiri	mid January
			Sg. Sembrong	mid January
	South West Johor	2	Sg. Tebrau	early January
			Sg. Skudai	early January
			Sg. Benut	mid January
	Johor	2	Sg. Johor	mid January
			Sg. Tiram	12/1/87
	Sedili Besar	1	Sg. Serai	12/10/87
			Sg. Sedili Besar	mid January
	Mersing	1	Sg. Mersing	mid December
	Endau	2	Sg. Endau	mid January
			Sg. Endau	December
1988	Muar	2	Sg. Muar	November
			Sg. Labis	early December

TABLE 1 : SUMMARY OF FLOOD EVENTS (1980 - 2001) BY RIVERS (SHEET 2 OF 3)

STATE : JOHOR

Year of Flood	RBMU	No. of Flood Events	River	Date of Flood Event
1989	Muar	1	Sg. Muar	early December
			Sg. Segamat	early December
			Sg. Juasseh	early December
	Batu Pahat	1	Sg. Chaah/ Lenik	early December
			Sg. Sembrong	early December
	South West Johor	1	Sg. Tebrau	early December
			Sg. Skudai	early December
	Johor	1	Sg. Johor	early December
			Sg. Tiram	early December
1990	Muar	5	Sg. Sedili Besar	early December
			Sg. Sedili Besar	early December
			Sg. Kahang	mid December
			Sg. Muar	mid to late Dec
			Sg. Segamat	17/12/90
			Sg. Segamat	18/12/90
	Batu Pahat	2	Sg. Segamat	20/12/90
			Sg. Segamat	24/12/90
			Sg. Juasseh	18/12/90
			Sg. Batu Pahat	17 to 18/12/1990
			Sg. Bekok	24/12/90
			Sg. Simpang Kiri	24/12/90
	Johor	1	Sg. Sembrong	24/12/90
			Sg. Johor	18 to 20/12/90
	Endau	2	Sg. Endau	17 to 18/12/1990
			Sg. Kahang	17/12/90
			Sg. Kahang	20/12/90
1991	Muar	1	Sg. Muar	late December
			Sg. Segamat	December
			Sg. Labis	December
	Batu Pahat	1	Sg. Batu Pahat	December
			Sg. Chaah/ Lenik	December
			Sg. Bekok	late December
			Sg. Simpang Kiri	late December
			Sg. Sembrong	late December
	South West Johor	1	Sg. Tebrau	late December
			Sg. Skudai	late December
			Sg. Benut	late December
			Sg. Pontian Kecil/ Pontian Besar	late December
			Sg. Plentong	late December
			Sg. Masai	late December
	Johor	1	Sg. Tiram	late December
1991	Endau	1	Sg. Endau	late December
			Sg. Kahang	late December
			Sg. Meranti	late December
			Sg. Mengkibol	late December
1992	Muar	1	Sg. Muar	December
			Sg. Segamat	December
			Sg. Labis	December
	Batu Pahat	1	Sg. Chaah/ Lenik	December
			Sg. Bekok	late December
			Sg. Sembrong	December
	South West Johor	1	Sg. Tebrau	December
			Sg. Benut	December
			Sg. Plentong	December
			Sg. Masai	December
	Johor	1	Sg. Tiram	December



TABLE 1 : SUMMARY OF FLOOD EVENTS (1980 - 2001) BY RIVERS (SHEET 3 OF 3)

STATE : JOHOR

Year of Flood	RBMU	No. of Flood Events	River	Date of Flood Event
1992	Johor	1	Sg. Serai	December
	Endau		Sg. Kahang	December
			Sg. Mengkibol	December
1993	Muar	1	Sg. Muar	15 to 24/11/93
	Endau	1	Sg. Kahang	24 to 27/12/93
1994	Muar	1	Sg. Muar	mid November
			Sg. Segamat	November
	Batu Pahat	1	Sg. Chaah/ Lenik	November
	South West Johor	1	Sg. Tebrau	November
			Sg. Skudai	November
			Sg. Benut	November
	Johor	1	Sg. Johor	November
	Sedili Besar	1	Sg. Sedili Besar	November
1995	Muar	1	Sg. Muar	late December
	Mersing	1	Sg. Mersing	late December
1996	Johor	1	Sg. Johor	1/2/96
1997	Muar	1	Sg. Muar	mid December
			Sg. Segamat	mid December
1998	Johor	1	Sg. Johor	29 to 31/12/98
	Sedili Besar	1	Sg. Sedili Besar	30 to 31/12/98
	Mersing	1	Sg. Mersing	29/12/98
			Sg. Jemaluang	29/12/98
			Sg. Endau	29 to 31/12/98
	Endau	1	Sg. Kahang	29 to 31/12/98
			Sg. Anak Endau	late December
1999	Sedili Besar	1	Sg. Sedili Besar	2/1/99
	Endau	2	Sg. Endau	early January
			Sg. Anak Endau	23 to 25/12/99
2000	Johor	1	Sg. Johor	March
2001	Muar	1	Sg. Muar	late December
	Batu Pahat South West Johor	2	Sg. Sembrong	18/1/01
			Sg. Tebrau	27/12/01
			Sg. Skudai	15/1/01
			Sg. Skudai	27 to 29/12/01
			Sg. Benut	15 to 18/1/01
			Sg. Benut	27 to 29/12/01
			Sg. Pontian Kecil/ Pontian Besar	27 to 29/12/01
			Sg. Plentong	15/1/01
			Sg. Plentong	27 to 29/12/01
			Sg. Masai	15/1/01
			Sg. Masai	27/12/01
	Johor	2	Sg. Johor	27 to 29/12/01
			Sg. Tiram	27 to 29/12/01
			Sg. Sayong	15 to 18/1/01
	Mersing	2	Sg. Mersing	15 to 18/1/01
			Sg. Mersing	27 to 29/12/01
			Sg. Jemaluang	15 to 18/01/01
	Endau	1	Sg. Endau	15 to 18/01/01
			Sg. Kahang	15 to 18/01/01



1. Table 2 (a) : RBMU 21, Muar
2. Table 2 (b) : RBMU 22, Batu Pahat
3. Table 2 (c) : RBMU 23, South West Johor Rivers
4. Table 2 (d) : RBMU 24, Johor
5. Table 2 (e) : RBMU 25, Sedili Besar
6. Table 2 (f) : RBMU 26, Mersing
7. Table 2 (g) : RBMU 27, Endau



**Table 2(a): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 21: MUAR, STATE: JOHOR** (SHEET 1/6)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Segamat	1982 mid-end December	Southern area of Daerah Segamat				47.4m at Sg Juaseh			1694		10,000	-Jln Labis-Jln Yong Peng 0.6 m 1 day	Y	
	1986 mid March	Mukim Labis -Kg Sawah Bahru		2.74	8	11.37m at Bandar Segamat			483		55,400		Y	
		Mukim Segamat -Paya Gubah		4.75	10				1866					
		Mukim Gemereh -Kawasan Pechah (& 3 other kpgs.)		3.81	13				218					
				1.98-2.74	4-7							-Jln Temenggong		
	1987 mid January	Mukim Labis	280	1-1.5	5-6	9.91m at Bandar Segamat			792				Y	
		Mukim Segamat	548	0.6-2.4	9-10									
		Mukim Gemereh	309	0.3-2.1	7-11									
		Mukim Pagoh	226	1.2-1.5	7-11									
	1987 mid December	Mukim Segamat -Kg Tengah	40	1.7	7						10,000	-Jln GSA Jadi 2 km -Jln Segamat-Pagoh- Bkt Kepong 1km	Y	
		Mukim Gemereh	141	0.5-1.7	5-7									
		Mukim Pagoh	624	1.7	5									
		5 other kampungs	20-114	0.8-1.9	3-10									
	1989 early December	-Kg Jabi/ Paya -Kg Sermin/ Paya Kg Tengah/ -Kg Gubah		1.3 1 1	4 5 5	9.63m at Bandar Segamat  47.56m at Sg Juaseh			51			-Jln ke GSA Jadi 0.8 m 7 days	Y	
	17/12/90	-Kg Cabang -Kg Tengah				9.46 m at Bandar Segamat		1 1	9 5				N	
	18/12/90	-Kg Cabang -Kg Tengah				10.46 m at Bandar Segamat 6.58 m at Kuala		1 1	9 5					

**Table 2(a): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 21: MUAR, STATE: JOHOR** (SHEET 2/6)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Segamat	20/12/90	Daerah Segamat - Kg Sawah Baru - Kg Paya Dalam  - Kg Pagah 2 - 2 other kampungs				9.27 m at Bandar Segamat 8.57 m at Kuala			43 34  84 68					
	24/12/90					6.67 m at Berdar							N	
	1991 December	Low lying areas of Daerah Segamat							1313		119,520		N	
	1992 December	Low lying areas of Daerah Segamat				11.62m at Bandar Segamat 7.09m at Buloh Kasap			2730				Y	
	1994 November	Low lying areas of Daerah Segamat				10.55m at Sg Segamat Bandar 6.89m at Sg Segamat Kuantan			470		173,666	-Jalan Labis - Sawah Butang 0.35 km 1.2 m 3 days -Jalan Segamat- Tengku Tiga at Batu 1, 6, GSA Jabi 2.05 km 1-1.5 m 3 days -Jln Segamat- J.Bharu at 11.5 0.15km 0.75 m 1 day	Y	
	1997 mid December	Mukim Labis Mukim Segamat Mukim Gemereh				10.17m at Bandar Segamat	55mm (15/12), 100mm (16/12) at Ladang Segamat		86 179 93		1,100		N	
Sg Muar	1980 late November	Upper catchment		0.7-1.2	4-8	9.02m at Buloh Kasap							Y	
	1982 mid December	Daerah Muar -Kaw. Durian Chondong -Kaw. Sungai Tui -Bt. Kepong		1-1.5	7	2.83m at Bkt. Kepong		2	16				Y	



**Table 2(a): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 21: MUAR, STATE: JOHOR** (SHEET 3/6)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Muar	1984 end December	Daerah Muar		1	3	9.24 at Buloh Kasap						-Jln Segamat - Kg Lubuk Lanjut -Jln Kg Jawa -Tanah Merah	Y	
	1986 mid-end	Mukim Pagoh -Kg. Tekom -Kg limau manis		5.23 4.92	22 19	10.57m at Buloh Kasap	262mm on 8/3/86 at Ldg Chuah Moh San, Segamat		245		171,100	-Jln Pagoh - Codan 3.2km -Jln Pagoh Bt 3.5 2.4km -Jln Bt Anam/ Spang Loi Bt 8 1.6km	Y	
		Mukim Gemereh -Kg Alai-Tasek (7 other kpgs.)		4.19 2.24-4.65	21 12-22				2097					
		Mukim Pagoh  Kg Jln Labis Batu 38	397	0.4-3.0 0.9	9-13 8	9.11m at Buloh Kasap  3.72m at Bkt. Kepong	93.5mm on 11/1/87 at Ldg Melville, Labis		990			-Jln Bkt Kepong-Kg. Bkt. Berdar 1.1km 0.8 m 8 days -Jln Simpang Kg Raja/ Pagoh 1.12km 0.5 m 8 days	Y	
	1988 November	Mukim Gemereh -Kg Alai/ Paya Tasek  Mukim Pagoh  Mukim Buloh Kasap (3 other kpgs.)		1.2 1.2 0.6-1.5 0.8-1.2	12 1.4 10-14 5-12				26 72 144 5-13			-Jln Pekan Jabi-Sermin 0.8km 1.22 m 2 days -Jln Pekan Jabi-GSA Jabi 0.8 m 0.76 m 2 days -Jln Spang Loi- Batu 10 Tombong 0.46km 3.2 m 12 days -Jln Batu Anam - Batu 8.5 Spang Loi 0.3km 2.13 m 12 days	Y	
	1989 early December	-Kg Sedeng, Pagoh -Kg Codan, Pagoh		1.3 1.3	4 5	8.63m at Buloh Kasap 108mm on 1/12/89 at Ldg Bkt Serampang			119			-Jln Segamat-Pagoh-Bkt. Kepung 0.8km 0.5 m 6 days	Y	

**Table 2(a): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 21: MUAR, STATE: JOHOR** (SHEET 4/6)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Muar	17/12/90	Low lying areas				7.79m at Buloh Kasap							N	
	18/12/90	Low lying areas				8.50m at Buloh Kasap								
	20/12/90	Low lying areas				8.75m at Buloh Kasap								
	24/12/90	Low lying areas				9.16m at Buloh Kasap								
	1991 end December	8 kampungs	1225	0.7-1.5	7-14	47.88 at Kg Air Panas 10.17 at Bdr Segamat 9.80m at Buloh Kasap			1282		98,920	-Jln Kepong-Labis at km 24 1.2 km 0.6 m 14 days -Jln Kg Bukit Bandar 1.5km 1 m 14 days -Jln Segamat-Pagoh-Bkt. Kepong at Batu 0.5, 1, 2, 3 and Kg Codan 2.75 km 0.8-1.3 m 8-35 days -Jln Buloh Kuang-Mesudut Lama 0.6-1.5 m 14-30 days	N	
	1992 December	Daerah Bkt Kepong 4 kampungs	57.4	0.9-1.5	10	4.32m at Bkt Kepong			473			-Jln Bkt Kepong-Labis at Bt.24 1.2km 0.45 m 10 days -Jln Kg Bkt Bandar 1.5km 0.9 m 10 days -Kg Sungai Berai 0.14km 0.45 m 10 days	Y	
		Daerah Lenga -Kg Lenga	20.8	1.2	10	2.59m at Lenga								
	15/11/93 to 24/22/93	Segamat district	1444	0.5-4.3	10	17-80m at Kg Awat, Sg Muar 9.66m at Buloh Kasap			266				Y	

**Table 2(a): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 21: MUAR, STATE: JOHOR (SHEET 5/6)**

[illegible]

**Table 2(a): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 21: MUAR, STATE: JOHOR** (SHEET 6/6)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Labis	1991 December										19,350		N	
	1992 December	Low lying areas							69				Y	
Sg Pagoh	1982 mid December	-Kg Simpang		0.5	7	2.86m at Jambatan Jln Pagoh						-Jln Simpang Kg Raja (1km from Pagoh) 1-2 m 7 days	N	
	1985 December	-Kg Sri Makmur -Pekan Pagoh -Kg Selancar		0.8 0.5 0.6	8 5 7				57				Y	
	1987 mid January	-Kg Selancar		0.7	10	3.38m at Jambatan Bt 17							Y	
Sg Juasseh	1986 early January	-Kg Sawah Baru		0.3	2	47.33m at Kg Air Panas			14				Y	
	14/1/87	-Kg Tuan Seh		1.3	6								Y	
	1989 early December	-Kg Tuan Seh		0.9	3								Y	
	18/12/90	Low lying areas				47.35m at Pekan Air Panas							N	



**Table 2(b): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 22: BATU PAHAT, STATE: JOHOR (SHEET 1/4)**

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Chaah/ Sg Lenik	1986 mid March	Mukim Chaah -Tanah Pemulihan Banjir -Kg Lenin		1.52	4				170				Y	
				1.45	4									
		Mukim Labis -Kg Usaha Jaya -Kg Sg Keras		1.07	2			55						
				0.61	2									
	1987 mid January	Mukim Chaah	223	0.5-1.2	7	15.79m at Jambatan Chaah						-Pekan Chaah at Km 138-139 0.4 km 0.8 m 2 days	Y	
		Mukim Labis	65	0.5-0.6	4	13.96m off Bandar Chaah								
	1989 early December	-Kg Sg Lenik		0.8	4								Y	
1991 December	Low lying areas						64		37,150			N		
1992 December	Low lying areas		0.25-1.5	1.2		17.34mm at Chaah  14.32mm Lenek		315				-Jln Segamat-Yong Peng at Km 13.7-13.9, Km 165 and Km 183 4.1 km 0.25-1.5 m 1.2 days  -Jln Labis- Segamat 0.95 km 1.7-1.8 m 3 days	Y	
	1994 November	Low lying areas										-Jln Segamat- Johor Bahru 0.2 km 0.75 m 1 day	Y	
Sg Bekok	1986 March	-Kg Pt Hamil -Kg Pt Temehel -Kg Paya (Yong Peng) (& 4 other kpgs.)		1.3 1.2 1.2 1.2	35 35 35 35			322	1868		400	-Jln Yong Peng-Labis 0.4 km 0.9 m 2 days -Jln Yong Peng-Labis at km 122-123 0.12 km 0.6 m 2 days	Y	

**Table 2(b): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 22: BATU PAHAT, STATE: JOHOR** (SHEET 2/4)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Bekok	1987 mid January	-Sg Temehel -Kg Ulu Lama		1	21	3.29m at Yong Peng 7.13m at Bt 77, Jln Yong Peng-Labis			1807				Y	
	24/12/90	Low lying areas				5.86 m at Bt 77 2.75 m at Jamb. Yong Peng							N	
	1991 end December	16 kampungs	815	0.55-1	11-30	19.2m at Empangan Bekok 7.24m at Bt 77, Jln Johor-Segamat  3.35m at Jambatan Yong Peng			1118		26,870		N	
	1992 end Dec	Low lying areas				6.39m at Bt 77, Jln Yong Peng-Segamat  2.65m at Yong Peng			130				Y	
Sg Simpang Kiri	1986 March	-Kg Pt Lamam -Kg Kangkar -Merlimau -Kg Melayu Kg Melayu		2.05 2.05 1.64	35 35 35			311	1948		67,500	-Jln Pt Jalil 2 km 0.4 m 14 days  -Jln Yong Peng-Muar at km 136-138.5 2.5 km 0.2 m 2 days  -Jln Parit Pasir, Sri Medan-Parit Pasir 1.61km	Y	
	1987 mid January	-Kg Kolam Air		1.5 1.2	21 15	3.23m at Pt Pasir 3.26m at Sri Medan			3051	4	312,000	-Jln Werija, Sri Medan 3 km 1.2 m 15 days	Y	

**Table 2(b): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 22: BATU PAHAT, STATE: JOHOR** (SHEET 3/4)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Simpang Kiri												-Jln Pt Pasir 2km		
	24/12/90	Sri Medan				2.45 m at Sri Medan 2.65 m at Pt Pasir			45				N	
	1991 end December	3 kampungs		0.5	9	2.23m at Sri Medan 2.43m at Pt Pasir			34		3,600		N	
Sg Sembrong	1986 March	-Kg Pt Khalid -Kg Pt Jatuh		0.7	15			10	141		32,800	-Jln Air Hitam-Kluang at km 96 0.02 km 0.3 m 2 days	Y	
	1987 mid January	Low lying areas		1	14	3.93m Empangan sembrong  2.59m at Pt Raja			37				Y	
	1989 early December	-Kg Palembang		1.2	5				72		150,000		Y	
	24/12/90					1.69 m at Pt Raja							N	
	1991 end December	3 kampungs	1.5	0.2-1.0	8	2.58m at Pt/ Air Pt Raja			868		20,000		N	
	1992 December	Low lying areas				3.49m at Brizay bridge  2.56m at Pt Raja			396				Y	
	18/1/01	Low lying areas										-Jalan Mersing 24.2 m	N	
Sg Batu Pahat	1982 mid December	Daerah Batu Pahat - Sri Medan - Pt Sulong				7.13m at Bt 77, Sg Bekok			3478		63,000		Y	

**Table 2(b): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 22: BATU PAHAT, STATE: JOHOR** (SHEET 4/4)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Batu Pahat		- Pt Yaani - Yong Peng - Assam Bubok				4.0m at Brizay Bridge, Sg Sembrong  3.6m at Sri Medan, Sg Simpang Kiri								
	1986	Low lying areas				138.5mm at Ladang Johor, Labis (8/3/86)							Y	
	17/12/90	Daerah Labis - Kg Sawah Batu - Kg Lembah Bakti - Kg Paya Merah - 9 other kampungs						9 10 12 144	43 55 52 690			Jln Kluang-Kahang at Bt. 4 26.00 m	N	
	18/12/90	-Kg Sawah Baru -Kg Lembah Bakti -Kg Paya Merah (& 5 other kpgs.)						9 10 12 65	43 55 52 282					
	1991 December	Low lying areas									7665		N	



**Table 2(c): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 23: SOUTH WEST JOHOR RIVERS** (SHEET 1/4)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Tebrau	1983 end December	Daerah Johor Bahru - Kg Kangkar - Kg Maju Jaya - Kg Pertanian - Skudai		1.2	2				615			-Jln Johor Bahru-Mersing at Bt 43-45 1-17 m 4-5 days	Y	
	1984 end December	-Kg Pertanian -Kg Maju Jaya							108				Y	
	1986 March	-Kg Maju Jaya		1.3	1				30				Y	
	1987 early January	-Kg Maju Jaya -Kg Kangkar Tebrau		1.3 1.3	7 2	8.11m at Kg Maju Jaya			163			-Jln Johor Bahru-Kota Tinggi at km 10.8 0.08 km 0.6 m 7 days	Y	
	1989 early December	Low lying areas				7.62m at Kg Maju Jaya						-Jln Johor Bahru-Kota Tinggi at km 9.6 0.02 km 0.6 m 7 days	Y	
	1991 end December	3 kampungs	24	1-1.5	3	8.17m at Kg Maju Jaya			651				N	
	1992 December	Low lying areas				7.77m at Kg Maju Jaya			77				Y	
	1994 November	-Kg Maju Jaya	50		1	8.25m at Kg Maju Jaya			66				Y	
	27/12/01	-Kg Paya Kenangan -Kg Kangkar Tebrau											N	
Sg Skudai	1981 mid December	-Riverine villages		0.9-1.2	2-3	14.78m at Kg Jaya Sepakat 7.83m at Kg Maju Jaya			381				Y	
	1986 March	-Kg Pertanian -Kg Tan Yoke Fang		1.3	15				61				Y	
	1987 early	-Kg Pertanian		0.6	9	16.76m at Kg Perhentian							Y	

**Table 2(c): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 23: SOUTH WEST JOHOR RIVERS** (SHEET 2/4)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Skudai	January					20.06m at Kg Tan Yoke Fang								
	1989 early December	Low lying areas										-Jln Johor Bahru-Mersing 0.03 km 0.6 m 3 days	Y	
	1991 end December	7 kampungs		0.5-1.0	3	21.12m at Kg Tan Yoke Fang  16.98m at Kg Pertarusan			582				N	
	1994 November	-Kg Tan Yoke Fang	30		1	21.12m at Kg Tan Yoke Fang			177				Y	
	15/1/01  27/12/01  27/12/01 to 29/12/01	-Kg Tan Yoke Fang -Kg Pertanian -Kg Jaya Sepakat  -Kg Pertanian -Kg Tan Yoke Fong -Kg Jaya Sepakat -Kg Indah Jaya -Kg Laut Bt.10/ Poh Chi Ling -Bandar Senai -Batu 12, Kulai -Sedenak  Daerah Skudai -18 kampung		0.5-1	1	          18.89 m at Kg. Separa 21.90 m at Kg. Tan Yoke Fong (27/12/01)		50	          3184				N	
Sg Benut	1987 mid January	-Kg Haji Nor -Spg Renggam -Kg Cholero -Kg Bt 6 Spg Renggam -Kg Pt Hj Hisham -Kg Sg Limau		1	4-5	7.04m at JKR Pump House			287		6,500		Y	
	1991 end December	5 kampungs		0.5-1.6	1-2				157				N	

**Table 2(c): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 23: SOUTH WEST JOHOR RIVERS** (SHEET 3/4)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Benut	1992 December	Low lying areas							53				Y	
	1994 November	-Pt Abd Rahman 8/113A -Pt Hassan 8/111A -Pt Luboh Sipen 8/110A -Kg Kolam Air -Pt Haji Hashim -Kg Perak -Sg Limau		3.15  0.92-1.22	3  3				278				Y	
	15/1/01 to 18/1/01	-Kg Kolam Air -Kg Pt Hj Hashim -Kg Pt Hj Salam -Kg Paya Palembang							50 22 60 120				N	
	27/12/01	Daerah Kluang -Taman Harmoni -Taman Rekamas -Taman Suria -Kg Pt. Cholero -Kg Pt. Salam -Kg Pt. Hj Hashim -Kg Sehari -Kg Sri Linau -Kg Kolam Air											N	
	27/12/01	Daerah Pontian -Pt. Betak -Kg Lama -Pt. Madirono -Pt. Makwasang												
	27/12/01 to 29/12/01	Low lying areas				1.76 m at Pt. Hj. Md Salleh 3.30 m at Pt. Hj. Ariff 2.10 m at CDI								
Sg Pontian Kecil / Sg Pontian Besar	1991 end December	-4 kampungs		0.5	2-4								N	
	27/12/01 to 29/12/01	Daerah Pontian -23 kampungs				8.45 m at Kg. Sawah 1.82 m at Pt. Pasir 3.7 m at Pt. Selangor 4.68 m at Sg. Air Merah 3.14 m at Kayu Ara Pasang			1723				N	

**Table 2(c): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 23: SOUTH WEST JOHOR RIVERS (SHEET 4/4)**

[illegible]



**Table 2(d): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 24: JOHOR, STATE: JOHOR** (SHEET 1/3)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Johor	1981 mid December	-Low lying areas of Kota Tinggi -Felda Air Tawar		0.41		9.69m at Kg Rantau Panjang			884		32,290		Y	
	1983 end December	Dearah Kota Tinggi - Kg sayang - Kg Gambit		1.2	2				191				Y	
	1984 end December	-Low lying areas of Kota Tinggi		0.3-0.6		8.38m at Kg Rantau Panjang  2.19m at Kota Tinggi			35				Y	
	1986 early January	-Kg Jaya Diri -Kg Semanggar		0.3 0.6	2 8				19			-Jln Kota Tinggi-Mersing at Bt 0.5 0.7 m 1 day -Jln Kota Tinggi-Mersing at Bt 10.5 0.5 m 1 day	Y	
	1986 March	-Kg Semanggar		1	1				65				Y	
	1987 mid January	-Kg Tengah Renggam -Kg Baru Renggam -Kg Paya Layang	12 12 15	1 1 1.5	3 3 4	40.17m at Bdr Renggam 18.78m at Jln Felda Inas 2.59m at Bdr Kota Tinggi	216.2 mm at Ldg Guntang Telok Sangat (12/1/87)		808		66,300	-Jln Kota Tinggi-Mersing at km 1, 2, 5, 6, 8 0.4km 0.3-1.4 m	Y	
	1989 early December	-Kg Rantau Panjang -Kg Semanggar Dalam		2.1 1.5	5 5	21.2m at Felda Tenggera  16.24m at Felda Inas	280.5mm at Ldg Telok Sangat (30/11/89)		1006		147, 600		Y	
	17/12/90  18/12/90  20/12/90	Low lying areas of Kota Tinggi   Daerah Kota Tinggi -Kg Semanggar Dalam				8.36 m at Rantau Panjang  9.24 m at Rantau Panjang  8.98 m at Kg Rantau Panjang							N	

**Table 2(d): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 24: JOHOR, STATE: JOHOR** (SHEET 2/3)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Johor	24/12/90					5.91 m at Kg Rantau Panjang								
	1994 November	-Bandar Kota Tinggi		0.5-0.75	1.3								Y	
	1/2/96	-Bandar Kota Tinggi											N	
	31/12/98 to 29/12/98 to 31/12/98	-Kg Batu 25 -Kg Sg Teler		0.3-0.45 0.6-1.0	1 2				26				N	
	2000 March	-Bandar Ulu Tiram											N	
	27/12/01 to 29/12/01	-Kg Sg Tebrau -Kg Batu 25 -Kg Berangan  Daerah Simpang Renggam -9 kampungs Daerah Kota Tinggi -5 kampungs Daerah Johor Bahru -18 kampungs				8.59 m at Rantau Panjang (29/12/01) 2.46 m at Kota Tinggi (30/12/01)			400  141  4663				N	
Sg Tiram	12/1/87	-Kg Oren, Ulu Tiram -Kg Kangkar Tebrau		0.6	2	4.36m at Kg Kangkar  23.80m at Kg Oren			39		12,000		Y	
	1989 early December	Low lying areas									11,000		Y	
	1991 end December	-Kg Bt 20, Sg Tiram	4	0.5	1								N	
	1992 December	-Kg Oren, Ulu Tiram -Kg Baru Jaya, Ulu Tiram				23.1m at Kg Oren  20.88m at Bt 13, Jln J. Bahru-Kota Tinggi			25			-Jln Sg Tiram at Bt 20	Y	

**Table 2(d): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 24: JOHOR, STATE: JOHOR** (SHEET 3/3)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Tiram	15/1/01 to 18/1/01	-Kg Oren -Kg Sg Tiram -Bandar Tiram -Ladang Mados				21.80 m at Kg Oren	190 mm in Kota Tinggi						N	
	27/12/01 to 29/12/01					25.60 m at Kg. Oren (27/12/01)								
Sg Serai	12/10/87	-Kg Sentosa		1.3	4				93			-Jln Yong Peng-Paloh at km 7 0.05 km	Y	
	1992 December													
Sg Sayong	15/1/01 to 18/1/01	-Kg Murni Jaya -Layang-layang							39				N	





**Table 2(f): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 26: MERSING, STATE: JOHOR** (SHEET 1/1)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Mersing	1985 early January	-Several kampungs		0.6	2				284			-Jln Kluang-Mersing at km 48 Embankment Damaged	Y	
		-Tmn Sri Mersing -Rumah kos rendah -Mersing Kecil -Kg Air Merah		0.3-0.9	2	3.11m at Lot 3, Jln Mersing -Jemaluang			306					
	1987 mid December	-Several Kampungs										-Jln Mersing-Jemaluang at km 2 - km 3 0.9 m 2 days	Y	
	1995 end December	Daerah Mersing -Kg Sawah Dato					290mm at JPS Mersing (22/12/95)		335				N	
	29/12/98	Daerah Mersing -Kg Air Merah	15	0.2	1							-Jln Johor Bahru-Mersing (29-31/12/98) 0.3m	N	
	15/1/01 to 18/1/01	-Kg Sri Mersing -Tmn Sri Mersing -Kg Air Merah (& 17 other kpgs.)	300 50 50-150	0.6 1 0.6 0.5-1	1 1 1 1-2		350 mm (16-17/1/01)		1682			-Jln Endau 3.75 m -Jln Air Papan 2.4 m	Y	
	27/12/01 to 29/12/01	Daerah Mersing -2 kampungs							8				N	
Sg Jemaluang	29/12/98	Daerah Mersing -Kg Paya Peko -Kg Wak Salam -Kg Sri pantai	30	0.2-0.3	0.5								N	
	15/1/01 to 18/1/01	-Kg Paya Dato -Kg Wak Salam -Kg Sri Pantai	50 50	0.6 0.6 0.1-0.5	1 1				67				Y	

Table 2(g): FLOOD EVENTS FROM 1980 TO 2001

RBMU 27: ENDAU, STATE: JOHOR, PAHANG (SHEET 1/3)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Endau	1981 mid December	-Sawah Endau -Sawah Air Papan -Kg Semalai -Kg Semanyir (& 2 other kpgs.)	2200	0.5	3-4	8.35m at Sg Kahang 16.21m at Sg Lenggor			87		11,400	-Jln Kluang-Mersing at 11th 12th & 9th mile 0.9 m 3 days	Y	
	1986 March	Low lying areas						43	532			-Jln Kluang-Mersing at km 145-146 0.5 m 2 days	Y	
	1987 mid January	-Kg Bentong Luar & Dalam, Kluang -Kg Palembang/Kg.Melayu, Kluang -Kg S. C. Kluang -Kg Mengkibol Bt. 4	13	1	5	8.34m at Bt 26, Jln Kluang-Mersing			590		5,500	-Jln Kota Tinggi-Mersing at km 18, 32, 34, 42, 48 3.5 km 0.6-1.5 m 2-4 days	Y	
			12	1.5	6	26.76m at Bt 4, Jln Kluang-Mersing								
			25 10	1.5 1.5	9 7									
	1987 December	Low lying areas							199				N	
	17/12/90 18/12/90	-Kg Mengkibol			1	24.39 m at Bandar Kluang 24.3 m at Bandar Kluang		6	41				N	
								65	282					
	1991 end December	Low lying areas		0.5-1.0	2						186,500	-Jln Kluang-Mersing at Jambatan km 56, 20, 37, 81 and 87 2.1 km 0.5-1.0 m 2 days	N	
	29/12/98 to 31/12/98	Daerah Mersing -Kg Sg Padang -Kg Semanyir -Sawah Endau (& 2 other kpgs.)	10 10 132	0.3 1 0.5	2 2 3								N	
			20	0.5-1.5		2.94m at Sg Setajam		31	171			-Jln Pianggu-Kg Kasing -Jln Duku-Setajam		
	15/1/01 to 18/1/01	-Kg Mengkibol -Sawah Air Papan -Kg Air Papan -Kg teluk Buih	80 200	1.5 1	2 2	24.2m at Jln Mersing 1.91 m at Ulu Pintuair No. 1	24 mm in Kluang town		41				N	

**Table 2(g): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 27: ENDAU, STATE: JOHOR, PAHANG** (SHEET 2/3)

River	Date of Flood	Flood Location	Flood				Rainfall/ Flood Recurrence Interval (yrs)	Evacuees		Death	Damages Reported (RM)	Road / Railway Flooded (km)	Flood Maps (Y/N)	Remarks
			Area (ha)	Depth (m)	Duration (day)	Level at Flood Warning Station (m)		Family	People					
Sg Endau		Daerah Mersing - Kg Semanyir - Sawah Endau	15 500	0.5 0.6	1 1									
Sg Kahang	1983 end December	Daerah Kluang -Kg Bentong Luar -Kg Melayu -Kg Palembang Baru -Kg Bentong Dalam		1.2 1.2 1.6 1.2	2				694			-Jln Kluang-Mersing at km 32 (9-11/12) 0.76 m 2 days -Jln Kluang-Mersing at 43 km (9-11/12) 0.31 m	Y	
	1989 mid December	-Kg Contoh		1.5	6				152		71,200		Y	
	17/12/90  20/12/90	-Kg Contoh  Daerah Kluang -Kg Palembang -Kg Contoh				7.70 m at Jamb. Bt 26		18	95 192			-Jln Kluang Mersing	N	
	1991 end December	Low lying areas							184		4,000		N	
	1992 December	Low lying areas							205		303,950	-Jln Kluang-Mersing at km 17, 20, 29, 40 3.04km 0.2-1.0 m 1-6 days	Y	
	24/12/93 to 27/12/93	-Kg Contoh		1	4	8.29m at Bt 26, Jln Kluang-Mersing			89				Y	
	29/12/98 to 31/12/98	-Kg Contoh	60	1.5	3				63				N	
	15/1/01 to 18/1/01	-Kg Palembang Lama	70	1	2				60				N	
Sg Meranti	1991 end December	2 kampungs		0.5	2				203				N	

**Table 2(g): FLOOD EVENTS FROM 1980 TO 2001**  
**RBMU 27: ENDAU, STATE: JOHOR, PAHANG (SHEET 3/3)**

[illegible]



1. Table 3 (a) : Flood Area Statistics and AAD for RBMU 21, Muar
2. Table 3 (b) : Flood Area Statistics and AAD for RBMU 22, Batu Pahat
3. Table 3 (c) : Flood Area Statistics and AAD for RBMU 23, South West  
Johor Rivers
4. Table 3 (d) : Flood Area Statistics and AAD for RBMU 24, Johor
5. Table 3 (e) : Flood Area Statistics and AAD for RBMU 25, Sedili Besar
6. Table 3 (f) : Flood Area Statistics and AAD for RBMU 26, Mersing
7. Table 3 (g) : Flood Area Statistics and AAD for RBMU 27, Endau



**TABLE 3(a): Flood Area Statistics and Annual Average Damage organised by RBMU.**

**RBMU No. 21 ; Muar**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	8.21	2.00	9.49
Mix Horticulture	12.85	16.00	16.60
Paddy	3.00	33.00	3.99
Rubber	105.91	133.00	126.59
Oil Palm	57.76	8.00	69.67
Coconuts	0.15	0	0.15
Other Tree Crops	10.68	1.00	11.95
Forest	66.00	123.00	74.09
Mining	0.07	0	0.07
Swamp	34.28	35.00	38.21
Pasture / Grassland	0	2.00	0
Unused Land	10.00	0	10.89
<b>Total Flood area (km<sup>2</sup>)</b>	<b>308.91</b>	<b>353.00</b>	<b>361.70</b>
<b>No. of people affected</b>	<b>52846</b>	<b>76800</b>	<b>64750</b>
<b>Number of houses affected</b>			
Urban	5881		
Rural	5738		
Total	<b>11619</b>	<b>not reported</b>	
<b>Flood Event</b>	March 1986	1971	
<b>ARI</b>	15	15	
<b>AAD (RM mil)</b>	<b>18.05</b>	<b>3.66</b>	

**TABLE 3(b): Flood Area Statistics and Annual Average Damage organised by RBMU.**

**RBMU No. 22 ; Batu Pahat**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	1.54	4.00	9.34
Mix Horticulture	0.55	7.00	4.05
Paddy	0.00	6.00	0
Rubber	6.88	194.00	39.67
Oil Palm	57.24	22.00	98.50
Coconuts	0.00	22.00	0.57
Other Tree Crops	0.48	23.00	3.90
Forest	1.83	44.00	9.61
Mining	0.44	1.00	0.53
Swamp	14.27	107.00	33.51
Pasture / Grassland	0.00	0	0
Unused Land	3.60	0	8.84
<b>Total Flood area (km<sup>2</sup>)</b>	<b>86.83</b>	<b>430.00</b>	<b>208.52</b>
<b>No. of people affected</b>	<b>6008</b>	<b>29500</b>	<b>37939</b>
<b>Number of houses affected</b>			
Urban	1103		
Rural	246		
Total	<b>1349</b>	<b>not reported</b>	
<b>Flood Event</b>	Dec 92	1971	
<b>ARI</b>	5	15	
<b>AAD (RM mil)</b>	<b>3.92</b>	<b>2.72</b>	

**TABLE 3(c): Flood Area Statistics and Annual Average Damage organised by RBMU.**

**RBMU No. 23 ; South West Johor**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	9.81	6.00	11.69
Mix Horticulture	1.00	28.00	1.36
Paddy	0	12.00	0
Rubber	1.73	182.00	2.91
Oil Palm	4.47	10.00	5.88
Coconuts	0.02	120.00	0.05
Other Tree Crops	0.42	44.00	0.45
Forest	0.31	161.00	0.51
Mining	0	0	0.008
Swamp	0.45	138.00	0.93
Pasture / Grassland	0	12.00	0
Unused Land	0.95	0	1.23
<b>Total Flood area (km<sup>2</sup>)</b>	<b>19.16</b>	<b>713.00</b>	<b>25.02</b>
<b>No. of people affected</b>	<b>33019</b>	<b>110900</b>	<b>39701</b>
<b>Number of houses affected</b>			
Urban	7027		
Rural	447		
Total	<b>7474</b>	<b>not reported</b>	
<b>Flood Event</b>	Jan 1987	1969	
<b>ARI</b>	5	10	
<b>AAD (RM mil)</b>	<b>16.4</b>	<b>3.67</b>	



**TABLE 3(d): Flood Area Statistics and Annual Average Damage organised by RBMU.**

**RBMU No. 24 ; Johor**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	3.77	2.00	7.06
Mix Horticulture	7.33	3.00	8.53
Paddy	0.00	2.00	0
Rubber	14.70	24.00	20.19
Oil Palm	60.09	4.00	66.68
Coconuts	0.09	0	0.09
Other Tree Crops	3.75	2.00	4.79
Forest	10.46	41.00	13.68
Mining	4.91	5.00	6.51
Swamp	8.86	6.00	8.99
Pasture / Grassland	0.00	2.00	0
Unused Land	6.21	0	6.71
<b>Total Flood area (km<sup>2</sup>)</b>	<b>120.17</b>	<b>91.00</b>	<b>143.23</b>
<b>No. of people affected</b>	<b>27266</b>	<b>30500</b>	<b>40155</b>
<b>Number of houses affected</b>			
Urban	2701		
Rural	3273		
Total	<b>5974</b>	<b>not reported</b>	
<b>Flood Event</b>	Dec 1989	1969	
<b>ARI</b>	15	10	
<b>AAD (RM mil)</b>	<b>8.16</b>	<b>0.96</b>	

**TABLE 3(e): Flood Area Statistics and Annual Average Damage organised by RBMU.**

**RBMU No. 25 ; Sedili Besar**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	2.08	0	2.08
Mix Horticulture	7.27	1.00	7.27
Paddy	0.00	0	0.00
Rubber	4.59	2.00	4.59
Oil Palm	68.16	0	68.16
Coconuts	0.22	0	0.22
Other Tree Crops	1.67	0	1.67
Forest	68.70	41.00	68.70
Mining	3.60	0	3.60
Swamp	107.59	249.00	107.59
Pasture / Grassland	20	1.00	20.38
Unused Land	19.11	0	19.11
<b>Total Flood area (km<sup>2</sup>)</b>	<b>303.37</b>	<b>294.00</b>	<b>303.37</b>
<b>No. of people affected</b>	<b>21814</b>	<b>2000</b>	<b>21814</b>
<b>Number of houses affected</b>			
Urban	1490		
Rural	3246		
Total	<b>4736</b>	<b>not reported</b>	
<b>Flood Event</b>	1969	1969	
<b>ARI</b>	10	10	
<b>AAD (RM mil)</b>	<b>7.2</b>	<b>not reported</b>	

**TABLE 3(f): Flood Area Statistics and Annual Average Damage organised by RBMU.**

**RBMU No. 26 ; Mersing**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	3.46	0	3.46
Mix Horticulture	6.92	4.00	6.92
Paddy	1.34	1	1.34
Rubber	9.35	8.00	9.35
Oil Palm	23.89	0	23.89
Coconuts	1.40	9.00	1.40
Other Tree Crops	4.62	0	4.62
Forest	36.97	33.00	36.97
Mining	3.59	4.00	3.59
Swamp	49.51	61.00	49.51
Pasture / Grassland	0.00	2.00	0.00
Unused Land	5.79	0	5.79
<b>Total Flood area (km<sup>2</sup>)</b>	<b>146.84</b>	<b>122.00</b>	<b>146.84</b>
<b>No. of people affected</b>	<b>25429</b>	<b>18100</b>	<b>25429</b>
<b>Number of houses affected</b>			
Urban	2479		
Rural	3090		
Total	<b>5569</b>	<b>not reported</b>	
<b>Flood Event</b>	1971	1971	
<b>ARI</b>	21	10	
<b>AAD (RM mil)</b>	<b>3.33</b>	<b>0.42</b>	

**TABLE 3(g): Flood Area Statistics and Annual Average Damage organised by RBMU.**

**RBMU No. 27 ; Endau**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	4.28	3.00	8.30
Mix Horticulture	15.54	3.00	20.91
Paddy	21.43	7.00	27.60
Rubber	13.01	19.00	44.46
Oil Palm	161.35	7.00	270.88
Coconuts	1.29	0	2.76
Other Tree Crops	4.97	0	11.16
Forest	196.45	187.00	335.49
Mining	1.24	1.00	1.98
Swamp	331.68	528.00	422.49
Pasture / Grassland	0	1.00	0
Unused Land	24.20	0	32.00
<b>Total Flood area (km<sup>2</sup>)</b>	<b>775.44</b>	<b>756.00</b>	<b>1178.03</b>
<b>No. of people affected</b>	<b>39372</b>	<b>34400</b>	<b>60783</b>
<b>Number of houses affected</b>			
Urban	2988		
Rural	5580		
Total	<b>8568</b>	<b>not reported</b>	
<b>Flood Event</b>	1969	1969	
<b>ARI</b>	21	10	
<b>AAD (RM mil)</b>	<b>6.94</b>	<b>1.59</b>	



Table 4 : Flood Area Statistics and AAD for Johor



**TABLE 4 : FLOOD AREA STATISTICS AND ANNUAL AVERAGE DAMAGE FOR JOHOR.**

**State: Johor**

	<b>WORST FLOOD EVENT</b>		<b>FLOOD AFFECTED AREA</b>
	<b>2002 Study</b>	<b>1982 Study</b>	<b>2002 Study</b>
<b>Flood Area Statistic (km<sup>2</sup>)</b>			
Urban	33.15	17.00	51.42
Mix Horticulture	51.46	62.00	65.64
Paddy	25.77	61.00	32.93
Rubber	156.17	562.00	247.76
Oil Palm	432.96	51.00	603.66
Coconuts	3.17	151.00	5.24
Other Tree Crops	26.59	70.00	38.54
Forest	380.72	630.00	539.05
Mining	13.85	11.00	16.29
Swamp	546.64	1124.00	661.23
Pasture / Grassland	20.38	20.00	20.38
Unused Land	69.86	0.00	84.57
<b>Total Flood area (km<sup>2</sup>)</b>	<b>1760.72</b>	<b>2759.00</b>	<b>2366.71</b>
<b>No. of people affected</b>	<b>205754</b>	<b>302200</b>	<b>290570</b>
<b>AAD (RM mil)</b>	<b>64.0</b>	<b>13.02</b>	

## Flood Map Drawings



**Table 5: LIST OF DETAIL FLOOD MAPS**

State: JOHOR

ITEM	DRAWING TITLE	DRAWING NO.	SCALE (1 : X)	RBMU	
				No.	Name
1	Flood Map of Johor	T0036\J\JOHOR	1:400,000		
2	Sg Muar, Sg Segamat, Sg Jementah & Sg Palong, Johor	T0036\J\RBMU21\01	1:50,000	21	Muar
3	Sg Segamat, Sg Juaseh & Sg Kapeh, Johor	T0036\J\RBMU21\02	1:50,000	21	Muar
4	Sg Labis, Sg Tui, Sg Meda & Sg Lenga, Johor	T0036\J\RBMU21\03	1:50,000	21	Muar
5	Sg Muar, Johor	T0036\J\RBMU21\04	1:50,000	21	Muar
6	Sg Muar, Johor	T0036\J\RBMU21\05	1:50,000	21	Muar
7	Sg Simpang Kiri & Sg Bekok, Johor	T0036\J\RBMU22\01	1:50,000	22	Batu Pahat
8	Sg Bekok, Johor	T0036\J\RBMU22\02	1:50,000	22	Batu Pahat
9	Sg Simpang Kiri, Sg Simpang Kanan, Sg Batu Pahat & Sg Bekok, Johor	T0036\J\RBMU22\03	1:50,000	22	Batu Pahat
10	Sg Tebrau, Johor	T0036\J\RBMU23\01	1:50,000	23	South West Johor Rivers
11	Sg Pelentong & Sg Masai, Johor	T0036\J\RBMU23\02	1:50,000	23	South West Johor Rivers
12	Sg Sayong & Sg Pengeli, Johor	T0036\J\RBMU24\01	1:50,000	24	Johor
13	Sg Johor, Sg Semangor, Sg Sayong & Sg Lingga, Johor	T0036\J\RBMU24\02	1:50,000	24	Johor
14	Sg Johor, Sg Tiram & Sg Serai, Johor	T0036\J\RBMU24\03	1:50,000	24	Johor
15	Sg Sedili Besar, Sg Ulu Sedili Besar, Sg Meranti & Sg Ambat, Johor	T0036\J\RBMU25\01	1:50,000	25	Sedili Besar
16	Sg Sedili Besar, Sg Mupor, Sg Dohol & Sg Kayu, Johor	T0036\J\RBMU25\02	1:50,000	25	Sedili Besar
17	Sg Sedili Besar, Johor	T0036\J\RBMU25\03	1:50,000	25	Sedili Besar

State: JOHOR

ITEM	DRAWING TITLE	DRAWING NO.	SCALE (1 : X)	RBMU	
				No.	Name
18	Sg Tenglu Besar, Sg Mawar & Sg Teriang Besar, Johor	T0036\J\RBMU26\01	1:50,000	26	Mersing
19	Sg Mersing, Sg Mayang, Sg Jemaluang, Johor	T0036\J\RBMU26\02	1:50,000	26	Mersing
20	Sg Endau, Johor	T0036\J\RBMU27\01	1:50,000	27	Endau
21	Sg Endau, Johor	T0036\J\RBMU27\02	1:50,000	27	Endau
22	Sg Lenggong & Sg Tambang, Johor	T0036\J\RBMU27\03	1:50,000	27	Endau
23	Sg Sembrong, Sg Selai, Sg Jebong, Sg Kahang, Sg Madek, Sg Lenga & Sg Lenggong, Johor	T0036\J\RBMU27\04	1:50,000	27	Endau
24	Sg Sembrong, Sg Selai, Sg Sapuluh & Sg Kemidok, Johor	T0036\J\RBMU27\05	1:50,000	27	Endau
25	Sg Sembrong, Sg Paloh & Sg Mengkilob, Johor	T0036\J\RBMU27\06	1:50,000	27	Endau
26	Sg Kahang & Sg Madek, Johor	T0036\J\RBMU27\07	1:50,000	27	Endau
27	Sg Kahang & Sg Madek, Johor	T0036\J\RBMU27\08	1:50,000	27	Endau

**Note :**The drawing scale stated above are for flood maps in original A1 size drawings.