Malaysia
ENVIRONMENTAL QUALITY REPORT
2011

Jabatan Alam Sekitar
Kementerian Sumber Asli dan Alam Sekitar

Department of Environment
Ministry of Natural Resources and Environment

RIVER WATER QUALITY

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RIVER WATER QUALITY MONITORING

The Department of Environment (DOE) continued with the river water quality monitoring programme in 2011 to detect changes in river water quality. Water samples were collected at regular intervals from designated stations for *in-situ* and laboratory analysis to determine its physico-chemical and biological characteristics. The Water Quality Index (WQI) was used as a basis for assessment of a watercourse in relation to pollution load categorization and designation of classes of beneficial uses as stipulated in the National Water Quality Standards for Malaysia (NWQS) **(ANNEX)**. The WQI was derived using Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Ammoniacal Nitrogen (NH_3-N), Suspended Solids (SS) and pH.

In 2011, river water quality was assessed based on a total of 4,249 samples taken from 464 rivers, using 812 manual stations (MWQM) and 10 continuous water quality monitoring stations (CWQM) for the purpose of early detection of pollution influx. For the period of January to December 2011, no distinctive incidence of pollution flux was observed.

RIVER WATER QUALITY STATUS

Out of 464 rivers monitored, a total of 275 (59.3%) were found to be clean, 150 (32.3%) slightly polluted and 39 (8.4%) polluted **(Figure 2.1) (Tables 2.1, 2.2 and 2.3)**.

As in previous years, the major pollutants detected were Biochemical Oxygen Demand (BOD), Ammoniacal Nitrogen (NH_3-N) and Suspended Solids (SS). High BOD can be attributed to untreated or partially treated sewage and discharges from agro-based industries and manufacturing industries. The main sources of NH_3-N were livestock farming and domestic sewage, while the sources for SS were mainly due to earthworks and land clearing activities.

Table 2.4 shows that out of 39 polluted rivers, 22 rivers were categorized as Class III, 16 rivers as Class IV and one river as Class V.

In terms of BOD, 24 rivers were categorized as Class V and 15 rivers as Class IV.

In terms of NH_3-N, 23 rivers were categorized as Class V, 8 rivers as Class IV, 6 rivers as Class III and 2 rivers as Class II.

In terms of SS, 18 rivers were categorized as Class III, 11 rivers as Class II, 8 rivers as Class I and one river was categorized as Class IV and Class V, respectively.

CONTINUOUS WATER QUALITY MONITORING

The dissolved oxygen is an indicator of BOD strength exerted by organic pollutants. In terms of dissolved oxygen level, 98% of the data recorded at Sg. Perak were within the Class II of the National Water Quality Standard of Malaysia (NWQS), followed by Sg. Rajang (57%), Sg. Melaka (29%) and Sg. Linggi (13%). Meanwhile, less than 10% of the data recorded at Sg. Sarawak, Sg. Labu, Sg. Skudai, Sg. Selangor and Sg. Putat were within the Class II of the National Water Quality Standard of Malaysia (NWQS). Sg. Jinjang had the worst DO values with only 0.8% of the data within the Class II of the National Water Quality Standard of Malaysia (NWQS) **(Figure 2.2)**.

The ammonium is an ionized form of ammonia. The measurement of ammonium can indicate the potential to form ammonia or ammoniacal nitrogen pollutants in rivers due to pH changes. Ammonium levels at all rivers except Sg. Perak and Sg. Rajang were found to have exceeded the Class II of the National Water Quality Standard of Malaysia (NWQS) **(Figure 2.3)**.

Turbidity is used as an indicator of suspended solids in a river. All turbidity data at Sg. Melaka exceeds the Class II of the National Water Quality Standard of Malaysia (NWQS) of 50 NTU value. Meanwhile, 72% of turbidity data for Sg. Putat were within the Class II of the National Water Quality Standard of Malaysia (NWQS), followed by Sg. Jinjang (60%), Sg. Labu (53%), Sg. Perak

(53%), Sg. Selangor (20%) and Sg. Rajang (15%) **(Figure 2.4)**. Based on continuous monitoring stations, Sg Rajang and Sg Selangor were found to be the worst in terms of turbidity.

TREND IN RIVER WATER POLLUTION

The river water quality in terms of Water Quality Classification Index had shown a slight improvement in 2011. The percentage of clean rivers had increased from 51% (2010) to 59% in 2011. The percentage of polluted river had decreased from 13% in 2010 to 8% in 2011. These trends are shown in **Figure 2.1**.

In terms of BOD sub-index, the number of clean rivers had significantly decreased from 104 (2010) to 44 (2011) **(Figure 2.6)**. For AN sub-index, the number of clean rivers had increased from 147 (2010) to 174 (2011) **(Figure 2.7)**. As for SS sub-index, the number of clean rivers had slightly decreased from 334 (2010) to 293 (2011) **(Figure 2.8)**.

Heavy metals were analysed for Mercury (Hg), Arsenic (As), Cadmium (Cd), Chromium (Cr), Plumbum (Pb), and Zinc (Zn). All Pb and Zn data were within the Class IIB limits of the National Water Quality Standard of Malaysia (NWQS). Meanwhile, 99.98% of the data for Cd were within the Class IIB limits of the National Water Quality Standard of Malaysia (NWQS) followed by Cr (99.95%), As (99.93%) and Hg (99.43%).

Crystal clear water

Table 2.1 Malaysia: Water Quality Status of Clean Rivers, 2011

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI 2010	WQI 2011	RIVER (2011) CLASS	RIVER (2011) CATEGORY
PERLIS	PERLIS	PELARIT	1	92	91	II	C
		WANG KELIAN	1	93	91	II	C
		JERNIH	1	88	90	II	C
		NGULANG	1	74	85	II	C
		JARUM	1	81	83	II	C
KEDAH	ULU MELAKA	PETANG	1	93	95	I	C
		ULU MELAKA	1	82	82	II	C
	MERBOK	TUPAH	1	84	95	I	C
		TOK PAWANG	1	91	90	II	C
	KEDAH	JANING	1	94	94	I	C
		PEDU	1	86	87	II	C
		TEKAI	1	85	86	II	C
		PDG TERAP	3	81	82	II	C
	KISAP	KISAP	1	92	92	II	C
KEDAH/ P.PINANG	MUDA	PEGANG	1	87	95	I	C
		KETIL	2	91	94	I	C
		CHEPIR	1	90	92	II	C
		MUDA	4	89	92	II	C
		KARANGAN	1	84	90	II	C
		SEDIM	1	88	90	II	C
P.PINANG	JAWI	JUNJONG	1	94	91	II	C
	PINANG	AIR TERJUN	1	94	87	II	C
	KLUANG	ARA	2	80	87	II	C
	PERAI	KULIM	2	81	82	II	C
P.PINANG/ PERAK	KERIAN	KECHIL	1	88	90	II	C
		KERIAN	4	82	82	II	C
PERAK	PERAK	CHEPOR	1	92	95	I	C
		KINJANG	1	94	91	II	C
		PELUS	2	83	91	II	C
		KLAH	1	91	90	II	C
		CHENDERIANG	1	91	88	II	C
		SUNGKAI	2	82	88	II	C
		PERAK	8	87	87	II	C
		KAMPAR	2	87	86	II	C
		KANGSAR	1	84	86	II	C
		RAIA	2	87	86	II	C
		BIDOR	3	84	85	II	C
		BATANG PADANG	3	81	84	II	C
		KUANG	1	85	84	II	C

Table 2.1 Malaysia: Water Quality Status of Clean Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
	SEPETANG	JANA	1	94	93	I	C
		TRONG	1	93	92	II	C
		LIMAU	1	93	88	II	C
		BATU TEGOH	3	88	87	II	C
		TEMERLOH	2	90	87	II	C
	KURAU	ARA	2	93	91	II	C
	RAJA HITAM	NYIOR	1	94	91	II	C
	BRUAS	ROTAN	1	91	90	II	C
		DANDANG	1	90	89	II	C
		BRUAS	3	84	83	II	C
PERAK/ SELANGOR	BERNAM	INKI	1	93	95	I	C
		TROLAK	1	90	92	II	C
		BERNAM	4	86	88	II	C
		SLIM	2	86	88	II	C
SELANGOR	SELANGOR	KERLING	1	91	94	I	C
		BATANG KALI	1	92	91	II	C
		KANCHING	1	92	90	II	C
		SERENDAH	1	88	90	II	C
		SELANGOR	4	82	83	II	C
	LANGAT	LUI	1	94	90	II	C
		SEMENYIH	1	75	88	II	C
		CHUAU	2	89	87	II	C
		JIJAN	1	85	87	II	C
SELANGOR/ WPKL	KLANG	SEMELAH	1	84	90	II	C
		GOMBAK	3	80	84	II	C
N.SEMBILAN	LINGGI	BATANG PENAR	1	92	93	I	C
		PEDAS	1	81	88	II	C
		REMBAU	2	86	88	II	C
		CHEMBONG	1	82	87	II	C
		SIPUT	1	83	85	II	C
		KEPAYONG	1	78	84	II	C
		KUNDUR BESAR	1	87	84	II	C
MELAKA	MELAKA	TAMPIN	1	95	95	I	C
		KEMUNTING	1	84	89	II	C
		KERU	1	84	89	II	C
		BTG.MELAKA	2	78	87	II	C
		DURIAN TUNGGAL	1	82	81	II	C
	KESANG	CHOHONG	2	80	90	II	C
	DUYONG	GAPAM	1	86	87	II	C

Table 2.1 Malaysia: Water Quality Status of Clean Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
JOHOR/ N.SEMBILAN	MUAR	AIR PANAS	1	93	91	II	C
		JUASSEH	1	90	89	II	C
		GEMENCHEH	1	81	85	II	C
		MEDA	1	83	83	II	C
		LABIS	1	73	81	II	C
JOHOR	BATU PAHAT	BANTANG	1	94	92	II	C
		CHAAH	1	90	90	II	C
		MEREK	1	81	90	II	C
		LENIK	1	86	88	II	C
	ENDAU	JASIN	1	93	92	II	C
		SELAI	1	92	92	II	C
		TAMOK	1	91	88	II	C
		ENDAU	3	89	87	II	C
		KAHANG	1	84	87	II	C
		MAMAI	1	79	87	II	C
		SINGOL	1	77	84	II	C
		PALOH	1	85	81	II	C
	JOHOR	LAYANG	1	90	92	II	C
		PELEPAH	2	94	91	II	C
		PENGGELI	2	86	91	II	C
		PANTI	1	83	90	II	C
		LAYAU KIRI	1	88	88	II	C
		TELOR	1	87	88	II	C
		LINGGIU	1	84	87	II	C
		REMIS	1	84	87	II	C
		SEMANGAR	1	87	87	II	C
		TEMOH	1	90	87	II	C
		ANAK SG. SAYONG	1	74	86	II	C
		SAYONG	4	83	86	II	C
		BUKIT BESAR	1	86	85	II	C
		BELITONG	1	83	84	II	C
		JOHOR	4	83	84	II	C
		PAPAN	1	82	84	II	C
		SEBOL	1	79	84	II	C
		SELUYUT	1	78	84	II	C
		SANTI	1	77	81	II	C
		TIRAM	4	79	81	II	C
	BENUT	PARIT HJ. YASSIN	1	85	90	II	C
	PALOI	PALOI	1	82	87	II	C
	MERSING	MERSING	2	84	81	II	C

Table 2.1 Malaysia: Water Quality Status of Clean Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
PAHANG	PAHANG	BURUNG	1	91	96	I	C
		TERANUM	1	92	95	I	C
		TERLA	1	90	94	I	C
		BERTAM	1	87	92	II	C
		HABU	1	87	92	II	C
		KELAU	1	93	91	II	C
		RINGLET	1	84	91	II	C
		TRINGKAP	1	86	91	II	C
		BENUS	2	91	90	II	C
		BERKAPOR	1	90	90	II	C
		LENGGOK	1	94	90	II	C
		T. PAYA BUNGOR	1	86	90	II	C
		TELOM	2	85	90	II	C
		TEMBELING	1	94	90	II	C
		TERAS	1	90	90	II	C
		LIPIS	3	90	89	II	C
		MARAN	1	84	89	II	C
		PERTING	1	93	89	II	C
		TAHAN	1	94	89	II	C
		TERIS	3	NA	89	II	C
		KERTAM	1	90	88	II	C
		LEPAR	3	88	88	II	C
		TANGLIR	1	89	88	II	C
		BENTONG	1	88	87	II	C
		TASIK CHINI	1	85	87	II	C
		JEMPOL	2	89	86	II	C
		LUIT	1	90	86	II	C
		TEKAL	1	83	86	II	C
		JELAI	2	84	85	II	C
		PAHANG	8	87	85	II	C
		TEKAM	2	87	85	II	C
		TRIANG	2	84	83	II	C
		KOYAN	1	85	82	II	C
		CHINI	1	79	81	II	C
		SEMANTAN	3	85	81	II	C
	ROMPIN	PUKIN	1	90	93	I	C
	KUANTAN	KENAU	1	92	90	II	C
		KUANTAN	5	89	88	II	C
		PANDAN	1	92	88	II	C
		BELAT	1	84	85	II	C
		TALAM	1	69	85	II	C
		CHARU	1	90	84	II	C

Table 2.1 Malaysia: Water Quality Status of Clean Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
	MERCHONG	MERCHONG	1	87	90	II	C
	ROMPIN	KERATONG	2	79	88	II	C
		PONTIAN	1	86	85	II	C
		AUR	1	89	84	II	C
	ANAK ENDAU	ANAK ENDAU	2	85	84	II	C
	BEBAR	MERBA	1	85	84	II	C
TERENGGANU	TERENGGANU	BERANG	1	91	92	II	C
		PUEH	1	84	89	II	C
		TERENGGANU	3	85	85	II	C
		TELEMONG	1	89	81	II	C
	KERTIH	KERTIH	1	86	92	II	C
	BESUT	BESUT	2	89	91	II	C
	CHUKAI	IBOK	1	82	91	II	C
		BUNGKUS	1	73	81	II	C
	DUNGUN	DUNGUN	4	91	90	II	C
	PAKA	RASAU	1	77	88	II	C
		PAKA	1	84	87	II	C
	SETIU	SETIU	2	92	88	II	C
	KEMAMAN	CHERUL	1	86	87	II	C
		KEMAMAN	2	88	86	II	C
	KLUANG	KLUANG	1	86	81	II	C
	MARANG	MARANG	1	78	81	II	C
KELANTAN	KELANTAN	KERILLA	1	92	94	I	C
		TUANG	1	92	94	I	C
		PERGAU	6	92	93	I	C
		BER	1	89	91	II	C
		BETIS	1	91	90	II	C
		GALAS	5	89	89	II	C
		NAL	2	91	89	II	C
		BEROK	3	85	88	II	C
		LEBIR	3	89	86	II	C
		NENGGIRI	3	86	86	II	C
		BELATOP	2	82	85	II	C
		KELANTAN	3	85	85	II	C
		SOKOR	1	85	85	II	C
		RELAI	1	86	83	II	C
	GOLOK	LANAS	1	93	86	II	C
		GOLOK	5	88	85	II	C
	KEMASIN	SEMERAK	2	88	85	II	C
	PENGKALAN CHEPA	KELADI	1	79	83	II	C

Table 2.1 Malaysia: Water Quality Status of Clean Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
SARAWAK	MIRI	PADANG LIKU	1	89	91	II	C
	LUPAR	AI	2	90	90	II	C
		SEKERANG	1	91	88	II	C
		SETERAP	1	81	81	II	C
		UNDUP	1	85	84	II	C
	LIMBANG	LIMBANG	5	85	89	II	C
	RAJANG	KANOWIT	1	85	87	II	C
		BINATANG	1	85	86	II	C
		BALOI	1	80	81	II	C
		JULAU	1	85	85	II	C
	TRUSAN	TRUSAN	1	88	86	II	C
	LAWAS	LAWAS	3	88	84	II	C
	SIMILAJAU	SIMILAJAU	2	81	82	II	C
	NIAH	SEKALOH	1	76	81	II	C
	SEMUNSAM	SEMUNSAM	1	75	81	II	C
SABAH	SUGUT	BONGKUD	1	94	95	I	C
		LOHAN	1	91	95	I	C
		SUGUT	3	92	90	II	C
		MERALI	1	94	93	I	C
	PADAS	BUNSIT	1	90	95	I	C
		LIAWAN	1	91	94	I	C
		TANDULU	1	91	94	I	C
		PANGATAN	1	81	90	II	C
		PEGALAN	3	83	88	II	C
		PADAS	3	81	85	II	C
	BINGKONGAN	BANDAU	1	92	94	I	C
		BINGKONGAN	2	92	94	I	C
		MENGGARIS	2	92	93	I	C
		TANDEK	1	86	90	II	C
	KEDAMAIAN	TEMPASUK	2	94	94	I	C
		WARIU	1	94	94	I	C
		KEDAMAIAN	1	94	93	I	C
	APAS	APAS	1	90	92	II	C
	LABOK	KINIPIR	2	92	92	II	C
		MALIAU	1	92	92	II	C
		LIWAGU	2	91	90	II	C
		TUNGUD	1	87	87	II	C
		LABOK	1	90	84	II	C
	LAKUTAN	LAKUTAN	1	89	92	II	C
	MOYOG	MOYOG	4	91	92	II	C
	SAPI	SUALONG	1	85	92	II	C
		SAPI	3	81	89	II	C

Table 2.1 Malaysia: Water Quality Status of Clean Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
	PAPAR	PAPAR	3	88	91	II	C
	TAWAU	TAWAU	4	82	91	II	C
	KALUMPANG	KALUMPANG	3	87	90	II	C
	MENGGA-LONG	MENGGALONG	2	85	90	II	C
	LIKAS	MENGGATAL	2	91	90	II	C
		INANAM	3	84	85	II	C
	SILABUKAN	SILABUKAN	2	84	90	II	C
	TUARAN	TUARAN	2	89	90	II	C
		SONG SAI	1	90	88	II	C
		DAMIT	2	88	85	II	C
	UMAS-UMAS	UMAS-UMAS	1	81	90	II	C
	KINABATA-NGAN	MENANGGUL	1	81	89	II	C
		KARAMUAK	1	90	88	II	C
		KINABATANGAN	3	83	87	II	C
		KOYAH	1	82	87	II	C
	MEROTAI	MEROTAI	3	85	89	II	C
	BALUNG	BALUNG	1	88	88	II	C
	BRANTIAN	BRANTIAN	1	85	88	II	C
	LINGKUNGAN	BUKAU	1	87	88	II	C
		LINGKUNGAN	1	91	87	II	C
	SEGAMA	SEGAMA	3	86	88	II	C
	TINGKAYU	TINGKAYU	2	80	88	II	C
	KIMANIS	KIMANIS	1	84	87	II	C
	SEGALIUD	SEGALIUD	2	82	87	II	C
	TENGHILAN	TENGHILAN	1	91	87	II	C
	TUNGKU	TUNGKU	2	89	87	II	C
	BENGKOKA	BENGKOKA	2	85	86	II	C
	KALABAKAN	KALABAKAN	3	81	86	II	C
	MEMBAKUT	MEMBAKUT	1	88	86	II	C
	MOUNAD	MOUNAD	2	82	86	II	C
	BONGAWAN	BONGAWAN	1	84	85	II	C
	PAITAN	PAITAN	1	83	85	II	C
	TELIPOK	TELIPOK	2	82	85	II	C

Table 2.2 Malaysia: Water Quality Status of Slightly Polluted Rivers, 2011

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
PERLIS	PERLIS	PERLIS	1	69	66	III	SP
KEDAH	KEDAH	PENDANG	1	76	80	II	SP
	MERBOK	MERBOK	1	69	74	III	SP
		BONGKOK	1	64	71	III	SP
		PETANI	1	56	65	III	SP
KEDAH/ P.PINANG	MUDA	JERUNG	1	66	72	III	SP
P.PINANG	JAWI	MACHANG BUBOK	1	79	77	II	SP
	PERAI	KELADI	1	76	75	III	SP
		JARAK	3	67	65	III	SP
	BAYAN LEPAS	TIRAM	2	74	75	III	SP
		BAYAN LEPAS	1	60	62	III	SP
	JURU	KILANG UBI	4	65	71	III	SP
		PASIR	1	51	63	III	SP
	KLUANG	RELAU	1	65	68	III	SP
P.PINANG/ PERAK	KERIAN	SELAMA	2	72	72	III	SP
PERAK	KURAU	KURAU	4	79	79	II	SP
	PERAK	KINTA	6	78	77	II	SP
		NYAMOK	1	61	74	III	SP
		KEPAYANG	2	72	71	III	SP
		SELUANG	1	64	69	III	SP
		KERDAH	1	56	68	III	SP
		PARI	1	72	68	III	SP
		SEROKAI	1	70	66	III	SP
		PINJI	2	65	64	III	SP
		TUMBOH	1	71	64	III	SP
	SEPETANG	SEPETANG	2	71	72	III	SP
	RAJA HITAM	MANJONG	2	80	70	III	SP
	WANGI	DERALIK	1	55	68	III	SP
		WANGI	1	69	63	III	SP
SELANGOR	TENGI	TENGI	3	72	77	II	SP
	LANGAT	LANGAT	7	72	75	III	SP
		PAJAM	1	75	74	III	SP
		ANAK CHUAU	1	78	72	III	SP
		BATANG NILAI	1	57	65	III	SP
	SEPANG	SEPANG	2	75	73	III	SP
	SELANGOR	SEMBAH	1	74	72	III	SP
SELANGOR/ WPKL	KLANG	BATU	3	74	77	II	SP
		KLANG	6	61	61	III	SP
N.SEMBILAN	LINGGI	LINGGI	5	73	76	III	SP
		SIMIN	1	75	75	III	SP

Table 2.2 Malaysia: Water Quality Status of Slightly Polluted Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
MELAKA	KESANG	KESANG	3	71	80	II	SP
	MELAKA	MELAKA	5	73	78	II	SP
		REMBIA	1	61	67	III	SP
	DUYONG	DUYONG	3	70	72	III	SP
	SERI MELAKA	SERI MELAKA	1	62	62	III	SP
JOHOR/ N.SEMBILAN	MUAR	MUAR	8	80	80	II	SP
		SEGAMAT	1	80	78	II	SP
JOHOR	BATU PAHAT	BEKOK	5	77	80	II	SP
		BERLIAN	1	74	75	III	SP
		MERPO	1	77	70	III	SP
		SEMBERONG	2	63	68	III	SP
		SIMPANG KIRI	3	63	67	III	SP
		SIMPANG KANAN	2	56	64	III	SP
		BATU PAHAT	1	54	60	III	SP
	SEDILI BESAR	DOHOL	1	81	80	II	SP
		AMBAT	1	84	79	II	SP
		PASIR PANJANG	1	64	77	II	SP
		TEMUBOR KANAN	1	84	77	II	SP
		SEDILI BESAR	5	79	78	II	SP
	SEDILI KECIL	SEDILI KECIL	2	79	80	II	SP
		ANAK SEDILI KECIL	1	75	78	II	SP
		BAHAN	2	74	74	III	SP
	ENDAU	SEMBERONG	5	81	80	II	SP
		LENGGOR	1	83	77	II	SP
		MENGKIBOL	3	69	75	III	SP
		PAMOL	1	65	73	III	SP
		JEBONG	1	65	65	III	SP
		MELATAI	1	60	65	III	SP
	JEMALUANG	JEMALUANG	2	80	78	II	SP
	JOHOR	CHEMANGAR	1	78	77	II	SP
		LEBAM	1	71	70	III	SP
		SEMENCHU	1	67	64	III	SP
	PULAI	PULAI	2	80	74	III	SP
	BENUT	ULU BENUT	1	74	74	III	SP
	PONTIAN KECIL	PONTIAN KECIL	2	73	70	III	SP
	BENUT	BENUT	4	72	69	III	SP
	SKUDAI	SKUDAI	9	68	68	III	SP
		MELANA	2	71	66	III	SP
	PONTIAN BESAR	AIR HITAM	1	68	67	III	SP
		PONTIAN BESAR	5	63	61	III	SP

Table 2.2 Malaysia: Water Quality Status of Slightly Polluted Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
	TEBRAU	SEBULUNG	1	56	65	III	SP
		PLENTONG	1	50	61	III	SP
	KIM-KIM	KIM-KIM	2	73	64	III	SP
PAHANG	PAHANG	JENGKA	2	80	80	II	SP
		TELANG	1	81	80	II	SP
		KUNDANG	1	76	77	II	SP
		TASIK BERA	1	82	76	III	SP
		BERA	2	78	75	III	SP
		MENTIGA	1	80	74	III	SP
		SERTING	2	68	73	III	SP
	KUANTAN	RIAU	1	76	80	II	SP
	ROMPIN	ROMPIN	4	82	80	II	SP
	CHERATING	CHERATING	1	78	76	III	SP
	BALOK	PANJANG	1	74	75	III	SP
		BALOK	2	67	66	III	SP
	BEBAR	SERAI	2	71	71	III	SP
		BEBAR	1	69	65	III	SP
	TONGGOK	TONGGOK	1	68	69	III	SP
TERENGGANU	SETIU	CHALOK	2	81	80	II	SP
	CHUKAI	CHUKAI	1	70	79	II	SP
		RUANG	1	64	71	III	SP
	IBAI	IBAI	3	76	77	II	SP
	TERENGGANU	NERUS	1	86	77	II	SP
	MERANG	MERANG	1	75	69	III	SP
	MERCHANG	MERCHANG	1	74	69	III	SP
	KEMAMAN	RANSAN	1	52	60	III	SP
KELANTAN	PENGKALAN DATU	PENGKALAN DATU	3	80	79	II	SP
	KEMASIN	KEMASIN	2	74	72	III	SP
	PENGKALAN CHEPA	PENGKALAN CHEPA	2	74	71	III	SP
		RAJA GALI	1	76	68	III	SP
		ALOR B	1	62	61	III	SP
SARAWAK	LUPAR	LUPAR	3	77	80	II	SP
	NIAH	NIAH	2	84	80	II	SP
	SARAWAK	SARAWAK KANAN	1	77	80	II	SP
		SARAWAK	6	80	79	II	SP
		SAMARAHAN	2	76	77	II	SP
		SARAWAK KIRI	1	81	77	II	SP
		SEMADANG	1	89	77	II	SP
		KUAP	1	73	75	III	SP

Table 2.2 Malaysia : Water Quality Status of Slightly Polluted Rivers, 2011 (continued)

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
		TABUAN	1	68	75	III	SP
		MAONG KIRI	1	67	69	III	SP
		SEMENGGOH	1	70	68	III	SP
	TATAU	TATAU	1	80	80	II	SP
	BALINGIAN	BALINGIAN	2	75	79	II	SP
	SUAI	SUAI	1	71	79	II	SP
	SIBUTI	KEJAPIL	1	81	78	II	SP
		SIBUTI	2	77	76	III	SP
		KABULOH	2	61	62	III	SP
	BARAM	TUTUH	1	73	77	II	SP
		BARAM	4	77	73	III	SP
	KAYAN	KAYAN	3	72	76	III	SP
	SARIBAS	LAYAR	2	82	76	III	SP
		SARIBAS	1	69	65	III	SP
	RAJANG	RAJANG	11	74	76	III	SP
		SARIKEI	2	78	74	III	SP
		MERADONG	1	71	71	III	SP
		SALIM	1	73	71	III	SP
	KERIAN	SEBLAK	1	78	76	III	SP
		KERIAN	2	77	74	III	SP
	KEMENA	SIBIU	1	76	76	III	SP
		KEMENA	3	80	75	III	SP
	MUKAH	MUKAH	4	73	73	III	SP
	SADONG	SADONG	4	76	73	III	SP
		KARANGAN	2	75	72	III	SP
	OYA	OYA	3	78	72	III	SP
	MIRI	MIRI	2	59	65	III	SP
		DALAM	1	53	64	III	SP
		LUTONG	1	63	64	III	SP
SABAH	LIKAS	LIKAS	2	76	75	III	SP
	SEMBULAN	SEMBULAN	2	72	62	III	SP

Table 2.3 Malaysia : Water Quality Status of Polluted Rivers, 2011

STATE	RIVER BASIN	RIVER	NO. OF STATIONS	WQI		RIVER (2011)	
				2010	2011	CLASS	CATEGORY
KEDAH	KEDAH	KEDAH	1	63	59	P	III
P.PINANG	PINANG	AIR ITAM	5	53	57	P	III
		PINANG	1	52	44	P	IV
		JELUTONG	1	34	43	P	IV
		DONDANG	1	43	42	P	IV
	PERAI	PERAI	2	59	55	P	III
		PERTAMA	1	55	50	P	IV
		KEREH	2	49	45	P	IV
	JURU	JURU	2	52	54	P	III
		RAMBAI	1	44	52	P	III
	JAWI	JAWI	1	52	42	P	IV
PERAK	RAJA HITAM	RAJA HITAM	2	61	53	P	III
SELANGOR	BULOH	BULOH	4	50	58	P	III
SELANGOR/ WPKL	KLANG	JINJANG	1	58	53	P	III
MELAKA	MERLIMAU	MERLIMAU	2	58	53	P	III
JOHOR/ N.SEMBILAN	MUAR	SARANG BUAYA	1	60	59	P	III
JOHOR	BATU PAHAT	AMRAN	1	71	59	P	III
	RAMBAH	RAMBAH	2	57	59	P	III
	KAW. PASIR GUDANG	LATOH	1	58	58	P	III
		MASAI	1	60	52	P	III
		PEREMBI	1	42	48	P	IV
		BULUH	1	39	33	P	IV
		TUKANG BATU	1	33	26	P	V
	TEBRAU	PANDAN	1	54	57	P	III
		TAMPOI	1	51	57	P	III
		TEBRAU	4	66	56	P	III
		BALA	1	51	51	P	IV
		SENGKUANG	1	39	42	P	IV
	PULAI	ULU CHOH	1	76	54	P	III
	SEGGET	SEGGET	5	51	53	P	III
	KEMPAS	KEMPAS	2	57	51	P	IV
	DANGA	DANGA	2	49	49	P	IV
	PONTIAN BESAR	AYER MERAH	1	36	47	P	IV
	BENUT	PINGGAN	1	57	47	P	IV
	SANGLANG	SANGLANG	1	54	47	P	IV
	AIR BALOI	AIR BALOI	3	46	41	P	IV
KELANTAN	PENGKALAN CHEPA	ALOR LINTAH	1	45	53	P	III
SARAWAK	SIBUTI	SATAP	1	61	59	P	III
	MIRI	ADONG	1	51	59	P	III

Table 2.4: Malaysia : The polluted rivers and classes based on BOD, AN and SS, 2011

STATE	RIVER BASIN	RIVER	2011		Classes based on		
			WQI	CLASS	BOD	AN	SS
KEDAH	KEDAH	KEDAH	59	III	IV	III	III
JOHOR/ N.SEMBILAN	MUAR	SARANG BUAYA	59	III	V	III	III
JOHOR	BATU PAHAT	AMRAN	59	III	V	IV	II
JOHOR	RAMBAH	RAMBAH	59	III	V	II	III
SARAWAK	MIRI	ADONG	59	III	V	III	I
SARAWAK	SIBUTI	SATAP	59	III	V	III	I
SELANGOR	BULOH	BULOH	58	III	IV	IV	III
JOHOR	KAW. PASIR GUDANG	LATOH	58	III	IV	IV	II
P.PINANG	PINANG	AIR ITAM	57	III	IV	IV	II
JOHOR	TEBRAU	PANDAN	57	III	IV	V	I
JOHOR	TEBRAU	TAMPOI	57	III	V	V	I
JOHOR	TEBRAU	TEBRAU	56	III	IV	V	III
P.PINANG	PERAI	PERAI	55	III	IV	IV	III
P.PINANG	JURU	JURU	54	III	IV	V	III
JOHOR	PULAI	ULU CHOH	54	III	V	V	III
JOHOR	SEGGET	SEGGET	53	III	IV	V	II
PERAK	RAJA HITAM	RAJA HITAM	53	III	V	IV	II
KELANTAN	PENGKALAN CHEPA	ALOR LINTAH	53	III	IV	V	I
SELANGOR/WPKL	KLANG	JINJANG	53	III	V	V	II
MELAKA	MERLIMAU	MERLIMAU	53	III	V	V	I
P.PINANG	JURU	RAMBAI	52	III	IV	V	III
JOHOR	KAW. PASIR GUDANG	MASAI	52	III	IV	V	III
JOHOR	KEMPAS	KEMPAS	51	IV	V	V	II
JOHOR	TEBRAU	BALA	51	IV	IV	V	II
P.PINANG	PERAI	PERTAMA	50	IV	IV	IV	II
JOHOR	DANGA	DANGA	49	IV	IV	V	III
JOHOR	KAW. PASIR GUDANG	PEREMBI	48	IV	V	V	III
JOHOR	PONTIAN BESAR	AYER MERAH	47	IV	V	IV	I
JOHOR	BENUT	PINGGAN	47	IV	V	III	V
JOHOR	SANGLANG	SANGLANG	47	IV	V	II	IV
P.PINANG	PERAI	KEREH	45	IV	V	V	III
P.PINANG	PINANG	PINANG	44	IV	V	V	II
P.PINANG	PINANG	JELUTONG	43	IV	V	V	II
P.PINANG	JAWI	JAWI	42	IV	V	V	III
P.PINANG	PINANG	DONDANG	42	IV	V	V	III
JOHOR	TEBRAU	SENGKUANG	42	IV	V	V	I
JOHOR	AIR BALOI	AIR BALOI	41	IV	V	III	III

JOHOR	KAW. PASIR GUDANG	BULUH	33	IV	V	V	III
JOHOR	KAW. PASIR GUDANG	TUKANG BATU	26	V	V	V	III

	Class I
	Class II
	Class III
	Class IV
	Class V

In harmony with nature

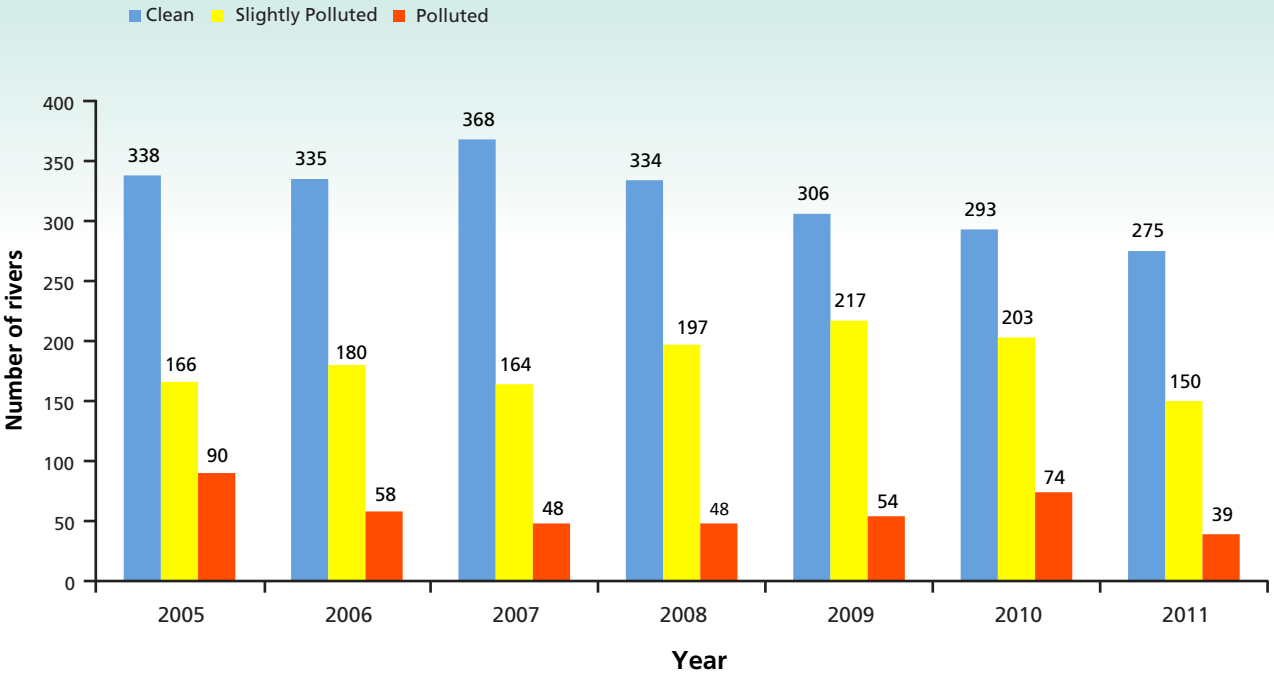

Figure 2.1 Malaysia : River Water Quality Trend (2005 - 2011)

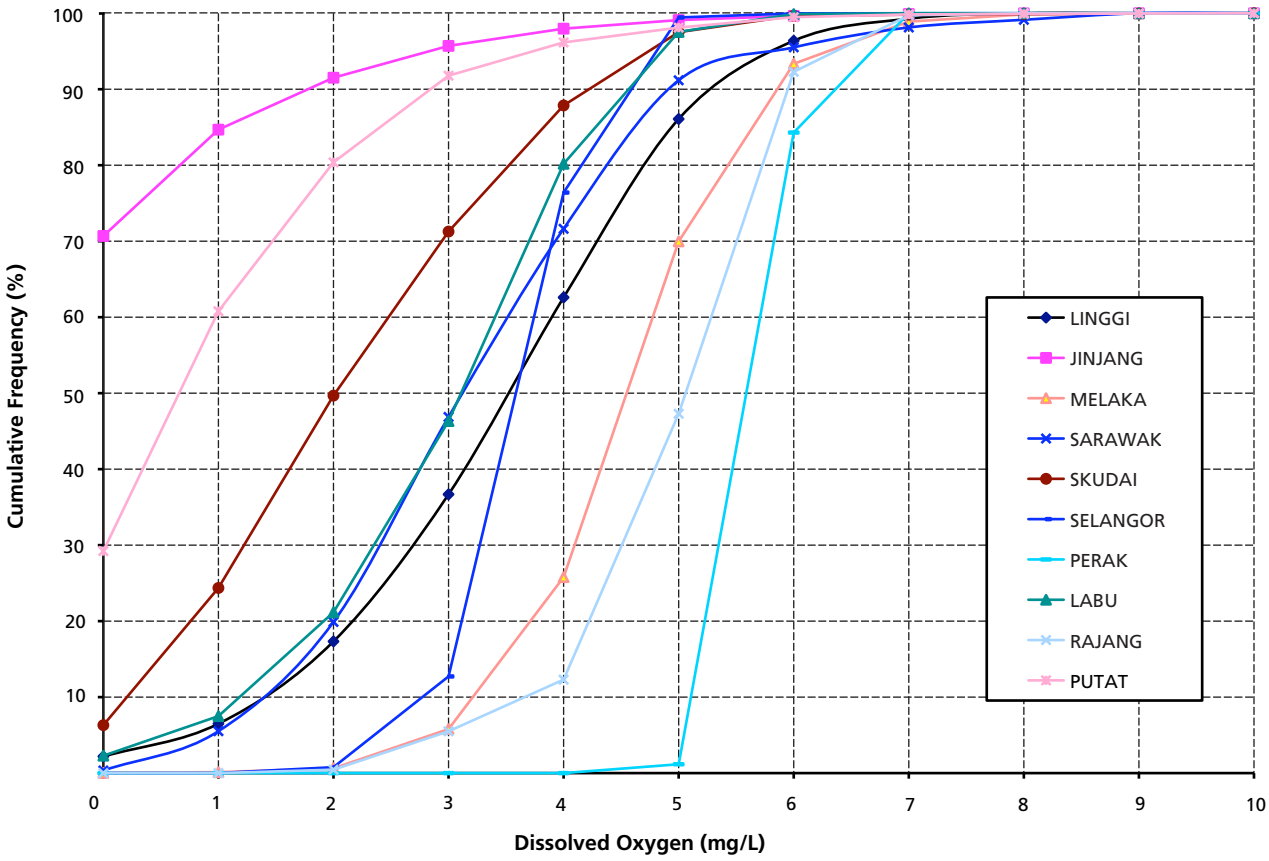

Figure 2.2 Comparison of Cumulative Frequency for 10 CWQM Stations - Dissolved Oxygen : 1st January - 31st December 2011

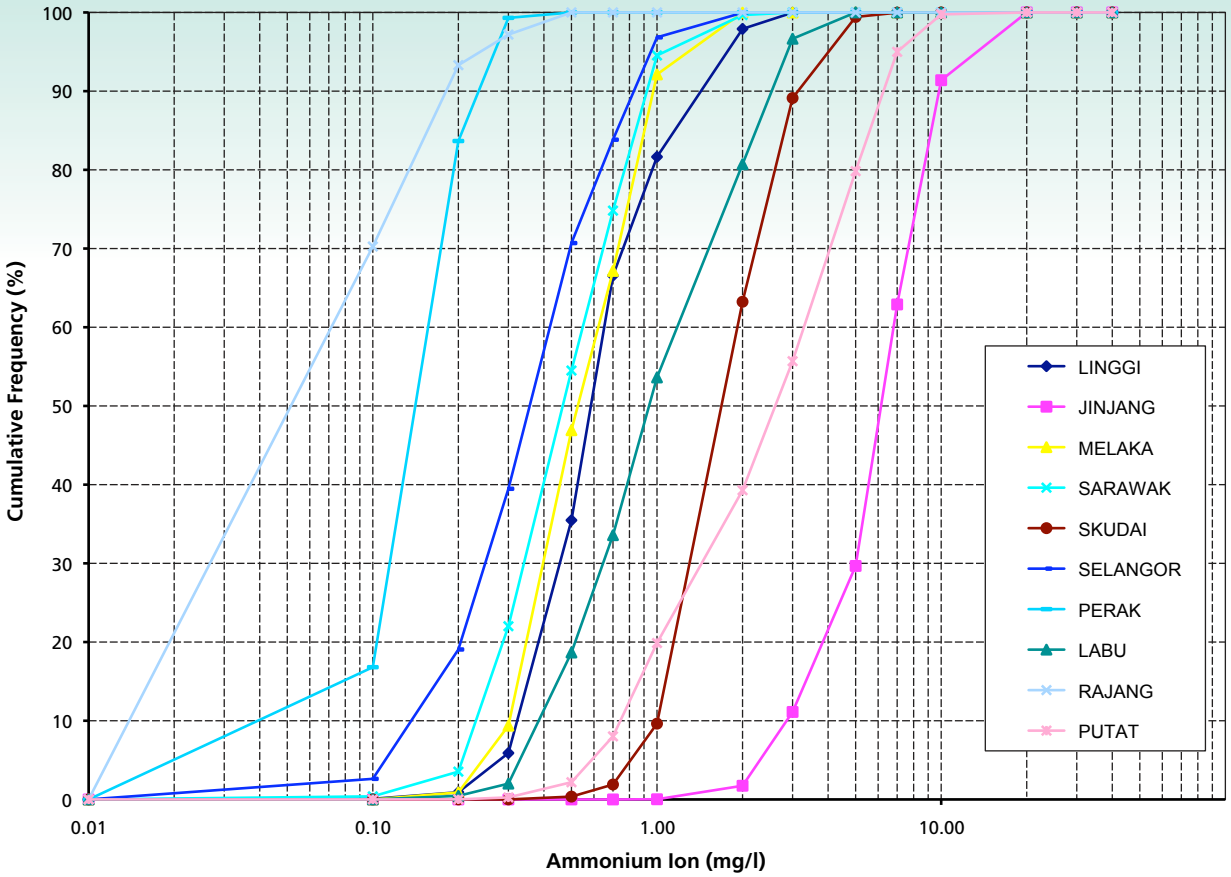

Figure 2.3 Comparison of Cumulative Frequency for 10 CWQM Stations - Ammonium Ion Concentration : 1st January - 31st December 2011

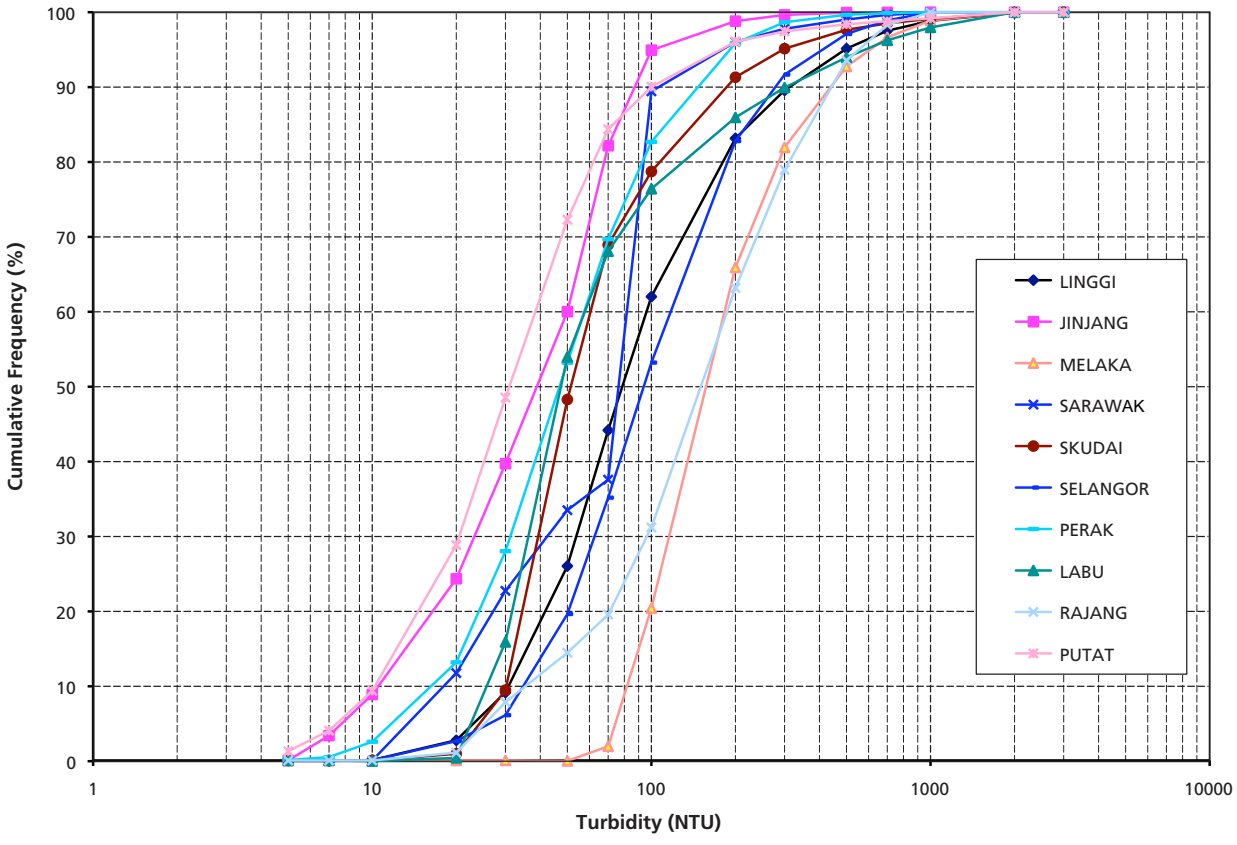

Figure 2.4. Comparison of Cumulative Frequency for 10 CWQM Stations - Turbidity : 1st January - 31st December 2011

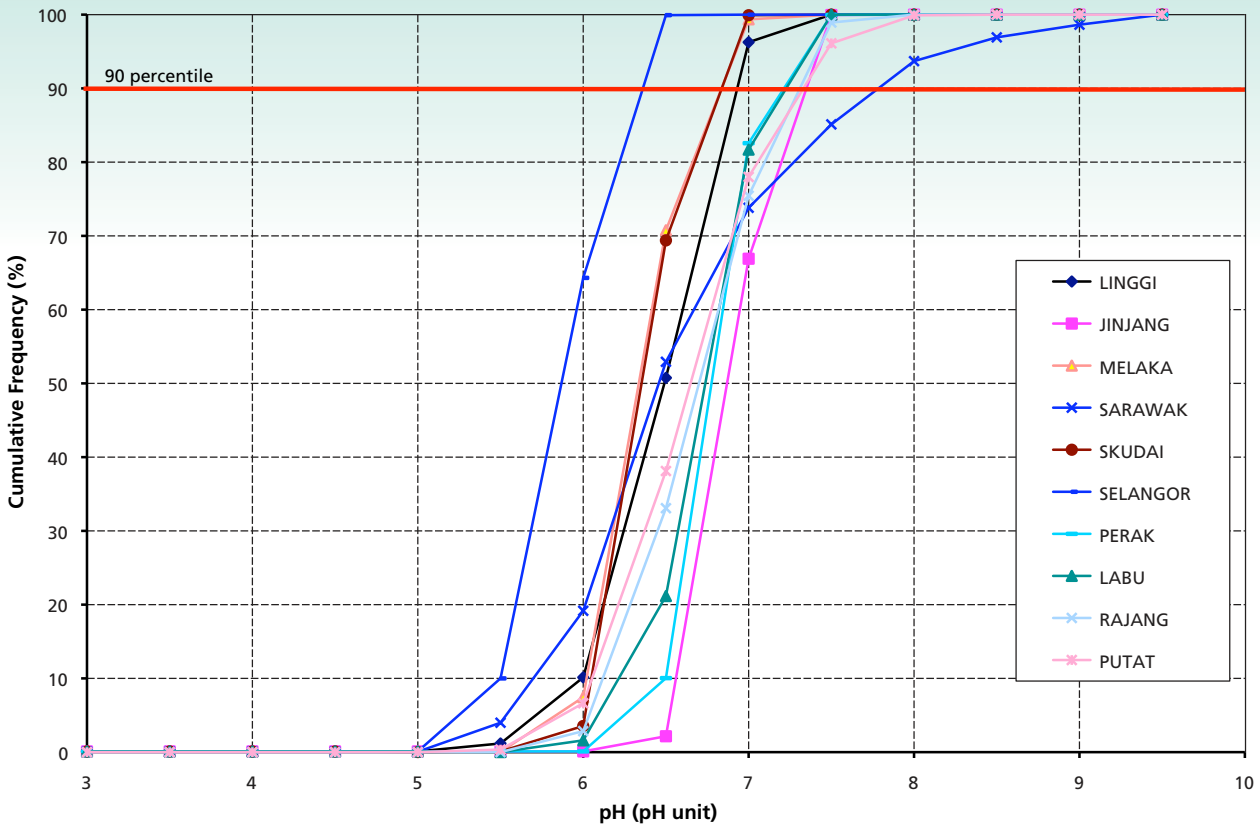

Figure 2.5. Comparison of Cumulative Frequency for 10 CWQM Stations - pH : 1st January - 31st December 2011

Figure 2.6 : River Water Quality Trend based on BOD sub-index (2005 - 2011)

Figure 2.7 :River Water Quality Trend based on AN sub-index (2005 - 2011)

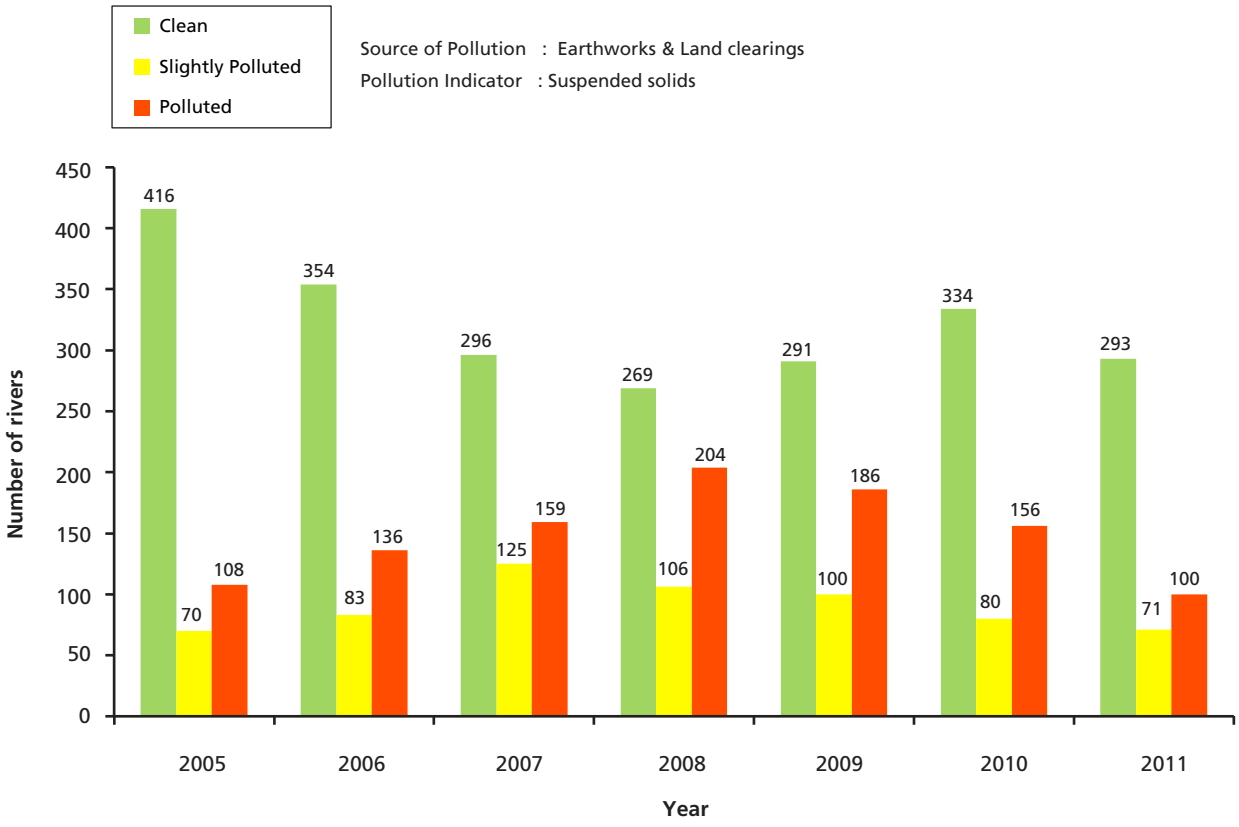

Figure 2.8 : River Water Quality Trend based on SS sub-index (2005 - 2011)