

GROUNDWATER QUALITY

GROUNDWATER QUALITY MONITORING

Recognising the potential of groundwater as an important alternative source of water, the Department of Environment initiated the national groundwater monitoring programme in 1997. By 2004, 88 monitoring wells had been established at 48 sites in Peninsular Malaysia, 19 wells in Sarawak and 15 wells in Sabah (Table 5). The sites were selected and categorized according to the surrounding land use such as agricultural, urban/suburban, rural, industrial, solid waste landfills, golf courses, radioactive landfill, animal burial areas, municipal water supply and ex-mining (gold



Table 5 Malaysia: Distribution of Groundwater Monitoring Wells, 2004

Category	Number of Wells
Agricultural Areas	12
Urban/Suburban Areas	12
Industrial Sites	18
Landfills	27
Golf Courses	7
Radioactive Sites	1
Rural Areas	5
Ex-Mining Areas	3
Municipal Water Supply	11
Animal Burial	16
Aquaculture farms	9
Resorts	1
Total	122



Photo 12: Groundwater Monitoring (DOE Photo Library)

GROUNDWATER QUALITY STATUS

In 2004, 274 water samples were taken from the monitoring wells compared to 226 the previous year. The samples were analysed for volatile organic compounds (VOCs), pesticides, heavy



Photo 13: Sub-Urban Groundwater Monitoring Station (DOE Photo library)

Table 6 Malaysia: National Guidelines for Raw Drinking Water Quality (Benchmark for Groundwater) (Dec 2000)

PARAMETER	SYMBOL	BENCHMARK
SULPHATE	SO ₄	250 mg/l
HARDNESS	CaCO ₃	500 mg/l
NITRATE	NO ₃	10 mg/l
COLIFORM	-	Must not be detected in any 100ml sample
MANGANESE	Mn	0.1 mg/l
CHROMIUM	Cr	0.05 mg/l
ZINC	Zn	3 mg/l
ARSENIC	As	0.01 mg/l
SELENIUM	Se	0.01 mg/l
CHLORIDE	Cl	250 mg/l
PHENOLICS	-	0.002mg/l
TDS	-	1000mg/l
IRON	Fe	0.3mg/l
COPPER	Cu	1mg/l
LEAD (PLUMBUM)	Pb	0.01mg/l
CADMIUM	Cd	0.003mg/l
MERCURY	Hg	0.001mg/l

Source: Ministry of Health, Malaysia

metals, anions, bacteria, phenolic compounds, radioactivity (Gross Alpha and Beta), total hardness, total dissolved solids (TDS), pH, temperature, conductivity and dissolved oxygen. The groundwater quality status was determined using the National Guidelines for Raw Drinking Water Quality from the Ministry of Health (Revised Dec 2000) (Table 6) as the benchmark.

Iron (Fe) levels exceeding the benchmark were recorded in all samples (Figure 20). Between 23% and 100% of the samples taken from all sites showed high levels of iron. The sampling results also showed that between 10% and 100% of samples taken from all areas recorded

manganese (Mn) levels exceeding the benchmark. Between 3% and 56% of samples from all areas except in radioactive landfill, ex-mining areas, municipal water supply and urban / suburban areas were found to exceed the nitrate benchmark.

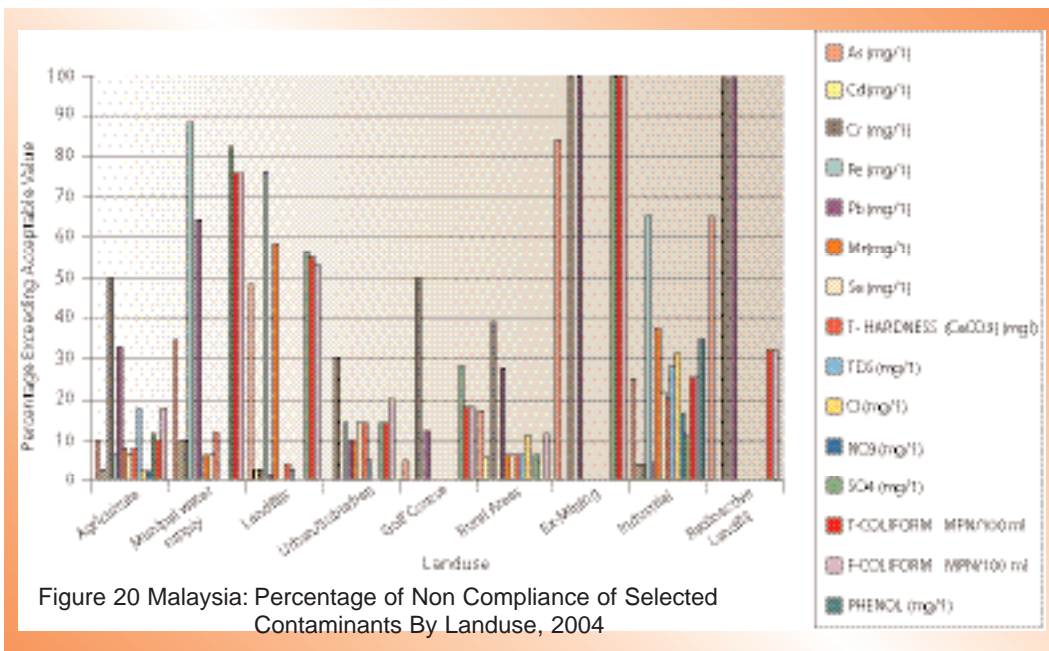
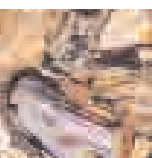
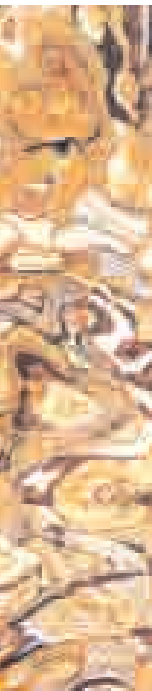


Figure 20 Malaysia: Percentage of Non Compliance of Selected Contaminants By Landuse, 2004







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