

Table 2-1: Summary of urban water quality management studies undertaken in South Africa

Reference	Study focus	Study location	Type of urban dev/landuse	Socio-economic status			Population density	Biophysical catchment characteristics					Runoff problems				
				Type & density of housing	Level of income	Level of service		Climate	Dominant hydrological process	Relief	Soil/ geology	Area	Other	Main pollutants monitored	Main pollutant sources	Causes of pollution	
Simpson (1986)	Urban runoff water quality	Pinetown, KZN	Commercial, light industrial & residential					coastal summer rainfall							SO4, Cl, NOx-N, P, Cd, Cu, Fe, Pb, Zn		
Stephenson & Green (1988)	Urban runoff water quality	Montgomery Park	Residential, few commercial & light industrial	Formal, low-density				inland summer rainfall	urban runoff	mountainous	highly impervious	67.2 ha			Cl, pH		
		Hillbrow	Residential & commercial	Formal, high-density	Low to high	High (water borne sewerage & stormwater)	12,500 (186 people/ha)								Ca, Mg, Na, K, Cl, pH, Alk, NO3, NH4, PO4, SO4, EC, TDS, COD, SS, TP, Fe, Pb, Cu, Cr, Turb.	Pollutants buildup, atmospheric fallout, vehicle emissions, roads, pavements, sewer surcharge, spills and illicit discharges, litter, etc	Littering, inappropriate use and abuse of services, overloaded sanitation systems, etc.
Klopers (1989)	Compared stormwater quality in Three Anchor Bay with Mitchell's Plain	Three Anchor Bay	Residential	low density middle class				Coastal winter rainfall region				152 ha			F-Coli, F-Strep, Coliph, Cd, Cu, Fe, Pb, Zn		
		Mitchell's Plain	Residential	medium density working class											1,375 ha	F-Coli, F-Strep, Coliph, Cd, Cu, Fe, Pb, Zn	
Wright (1991)	Urban runoff quality	Atlantis	Industrial town				70,000 people								K, Na, Ca, Mg, NH4-N, SO4, Cl, Alk, Nox-N, P, pH, DO, EC, TDS, Cd, Cu, Fe, Pb, Zn		
Wimberley (1992); Van Veelen & DWAF (1994a, b)	Assessed the effect of urban runoff on water quality of Jukskei river	Alexandra in Gauteng	Residential and commercial	High density, high to low cost formal housing, & low cost informal housing	Low to medium	Low	300,000 (612 p/ha)	Inland summer rainfall	Urban runoff	Between 12.5 to 3.3% slope	Granitic sands	490 ha			F-Coli, E-Coli, EC, pH, TKN, NH4-N, NO3-N, NO2-N, TP, PO4-P, COD, SS, TDS, SO4, Cl, Pb, Fe	greywater, solid waste, sewer/toilet overflows	inadequate service provision, low maintenance levels, illicit discharges and connections, over-crowding, littering, personal hygiene etc

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Silberbauer & Moolman (1991)	urbanisation & urban runoff water quality deterioration	Rietspruit in Gauteng															
Simpson & Coleman (1992)	Assess applicability of WITSKM TO Shembe catchment	Shembe near Durban	Residential & few commercial	High density, low cost informal housing								560 ha					
Mackey (1993, 1994a, b)	Impact of runoff from townships on lower Swartkops river	Swartkops, near Port Elizabeth	Residential, agricultural and industrial	Formal and informal. Low to high cost and density housing	Mixed						Soils are predominantly lithosols	1370 km ²			F Coliform, E-Coli, EC, pH, NH4-N, NO3-N, PO4-P, COD, TSS, TDS		
Van Ginkel et al., (1993)	Impact of runoff from townships on Buffalo river	Eastern Cape coast (Buffalo river catchment)	Irrigation (8.5 km ²); Urban-all types (9%); forestry & agriculture (75%)	All types	All levels	All levels	311,000 people (Average population density = 400/km ²)	Year-round rainfall region (summer rainfall being double that for winter)		Mountain zone, foothills zones and coastal areas	sandy loam derived from Beaufort sediments and clays from dolerite outcrops	1276 km ²			B, Ca, Cl, COD, DOC, EC, F, K, KN, Mg, Na, NH4, NO3+NO2, O2, pH, PO4, SI, SO4, SS, T, Alk, TDS, Temp, TP, Turb.	Urban runoffs, especially rural villages	Livestocks, inadequate sanitation and solid waste disposal facilities
Wright et al., (1992)	Impact of runoff from townships on receiving river	Khayelitsha	Residential	All types of urbanization. High density housing	Low income (under R4,000/ person/ annum)	Variable (nill in the shack areas and high in the formal areas)	320,000 (1990 census)	Low-intensity winter rainfall	Interflow and groundwater flow		Sand with high infiltration rate. Saturated sand thickness of 20 - 25 m.				F-Coli, F-Strep, Coliph, K, Na, Ca, Mg, NH4-N, SO4, Cl, Alk, Nox-N, P, pH, DO, EC, TDS, Cd, Cu, Fe, Pb, Zn	sewage overflow (serviced sites)	Litter, faecal, high pop density, poor living conditions, lack of envntal awareness, political unrest
Kelbe et al., (1992)	Hydrological response to urbanization	Ntuzo catchment, KZN	Rural settlemnts, forest, plantation, subsistence, sugar cane, mostly grass land , rocks	Informal housing. Low density	Low	None/low	low	High summer and low winter rainfall		10 - 20%	Glenrosa form (Robmore series)				pH, EC, turbidity, SS, PO4 NO3, NH4, DOC, COD, Cl		
Coleman (1992)	Hillbrow quality monitoring, and review of quality models	Hillbrow	Residential & commercial	Formal, high-density	Low to high	High (water borne sewerage & stormwater)	High	inland summer rainfall				67.2 ha					

