

Table 4.6 WMA sample sites ("hot spot" sites) exceeding the TWQR for Irrigated Agriculture Water Use for the Irrigated Agriculture Water Quality Constituents

WMA Site	Sample Site	Constituent/s Exceeding Good Range	Extent of Exceedence	Location of Site
Luvuvhu and Letaba WMA				
94	B9H003Q01	pH	Purple	Shingwidzi River At Kanniedood Dam/ Kruger National Park
Crocodile (West) and Marico WMA				
11	A2H033Q01	pH	Purple	Nouklip Eye At Hartbeeshoek
26	A2H094Q01	pH	Purple	Bospoort Dam On Hex River: Down Stream Weir
39	A2R012Q01	pH	Purple	Klipvoor Dam On Pienaars River: Near Dam Wall
41	A2R016Q01	pH	Purple	Leeukraal Dam On Apies River: Near Dam Wall
Olifants WMA				
95	B1H002Q01	EC	Yellow	Spook Spruit At Elandspruit
96	B1H004Q01	pH; EC	Red; yellow	Klip Spruit At Zaaihoek
104	B1H019Q01	EC	Yellow	Noupoort Spruit At Naauwpoort
105	B1H020Q01	EC	Yellow	Koring Spruit At Vaalkranz
125	B3H021Q01	EC	Yellow	Elands River At Scherp Arabie
132	B4H011Q01	pH	Purple	Steelpoort River At Alverton
145	B7H009Q01	pH	Purple	Olifants River At Finale/Liverpool
147	B7H015Q01	pH	Purple	Olifants River At Mamba/Kruger National Park
148	B7H019Q01	EC; Cl	Yellow; yellow	Ga-Selati River At Loole/Foskor
Usutu to Mhlatuze WMA				
669	W3H008Q01	pH	Purple	Mkuze River At Doornhoek
671	W3H012Q01	EC; Cl	Yellow; red	Mzinene River At Cloete
673	W3H015Q01	EC; Cl	Yellow; yellow	Hluhluwe River At Valsbaai/St Lucia Inflow
675	W3H023Q01	EC	Yellow	Nkongolwana River At Veelsgeluk/ Kongolana (Cp5)
686	W3R002Q01	SAR; pH; EC; Cl	Purple; purple; purple	Lake St Lucia At Lister's Point
688	W4H006Q01	pH	Purple	Phongolo River At M'Hlati
Thukela WMA				
611	V1H009Q01	pH	Purple	Bloukrans River At Frere
638	V6H003Q01	pH	Purple	Wasbank River At Kuikvlei
642	V6H011Q01	pH	Purple	Wasbank River At Uithoek
643	V6H013Q01	pH	Purple	Wasbank River At Wasbank
644	V6H016Q01	pH	Purple	Mkomazana River At Wasbank
645	V6H017Q01	pH	Purple	Blinkwater River At Lynwood
646	V6H018Q01	pH	Purple	Tholeni River At Vaalkop
647	V6H019Q01	pH	Purple	Wasbank River At Vaalkop
648	V6H020Q01	pH	Purple	Wasbank River At Asynkraal
Upper Vaal WMA				
162	C2H004Q01	EC	Yellow	Suikerbosrand River At Uitvlugt (Rw S2)
163	C2H005Q01	EC	Yellow	Riet Spruit At Kaal Plaats (Rw Rv2)
166	C2H013Q01	EC	Yellow	Upper Turffontein Eye At Turffontein
173	C2H069Q01	EC	Yellow	Moorivierloop (River) At Blaaubank
179	C2H132Q01	EC	Yellow	Riet Spruit At Tamboekiesfontein
180	C2H133Q01	EC	Yellow	Blesbok Spruit At Heidelberg
181	C2H134Q01	EC	Yellow	Cowles Dam Outflow At Springs
182	C2H135Q01	EC	Yellow	Natal Spruit At Rietfontein
183	C2H136Q01	EC	Yellow	Riet Spruit At Waterval

WMA Site	Sample Site	Constituent/s Exceeding Good Range	Extent of Exceedence	Location of Site
187	C2H146Q01	EC	Yellow	Blesbok Spruit At Dagafontein – 2Km D/Stream N17
189	C2H149Q01	EC	Yellow	Blesbok Spruit At Nigel East – R51 Bridge (B8)
190	C2H153Q01	EC	Yellow	Wonderfontein Spruit At Randfontein Azaadville Bridge
191	C2H154Q01	EC	Yellow	Wonderfontein Spruit At Bridge On The Doornkop
193	C2H161Q01	EC	Yellow	Wonderfontein Spruit On Gravel Road Bridge
200	C2H234Q01	EC	Yellow	Suikerbosrant River At Badfontein
201	C2R001Q01	pH	Purple	Boskop Dam On Mooi River: Near Dam Wall
202	C2R003Q01	pH	Purple	Klerkskraal Dam On Mooi River: Near Dam Wall
203	C2R004Q01	pH	Purple	Potchefstroom Dam On Mooi River: Near Dam Wall
Middle Vaal WMA				
230	C2H073Q01	EC	Yellow	Skoon Spruit At Goedgenoeg/Orkney Bridge
231	C2H139Q01	EC	Yellow	Koekemoer Spruit At Buffelsfontein
232	C2R002Q01	pH	Purple	Johan Nesser Dam On Skoon Spruit: Near Dam Wall
234	C4H016Q01	EC; Cl	Yellow; yellow	Sand River At Bloudrif
235	C4H017Q01	EC; Cl	Yellow; yellow	Sand River At Doring River/Bloudrif
244	C7R001Q01	pH	Purple	Koppies Dam On Renoster River: Near Dam Wall
Mvoti to Umzimkulu WMA				
600	U6H005Q01	SAR; EC	Red; yellow	Sterk Spruit At Zigzag/Claire's Est/ Shongweni Dam-
Mzimvubu to Keiskamma WMA				
510	R2H009Q01	pH	Purple	Ngqokweni River At Sheshegu 5/ Mgqokweni 19
512	R2H015Q01	pH; EC; Cl	Purple; yellow; yellow	Yellowwoods River At Fort Murray Outspan
513	R2H016Q01	SAR; pH; EC; Cl	Red; purple; red; red	Zwelitsha Spruit At Malakalaka
522	S1R001Q01	pH	Purple	Xonxa Dam On White Kei River: Near Dam Wall
525	S3H004Q01	pH	Purple	Black Kei River At Cathcarts Gift/ Endwell
526	S3H005Q01	pH	Purple	Oskraal River At Whittlesea
527	S3H006Q01	pH	Purple	Klaas Smits River At Weltevreden/ Queenstown
539	S7H004Q01	pH	Purple	Great Kei River At Area 8 Sprigs B/ Transkei Border
Upper Orange WMA				
261	D1H001Q01	pH	Purple	Wonderboom/Storb. Spruit At Diepkloof/Burgersdorp
Lower Orange WMA				
283	D5H017Q01	SAR; EC; Cl	Red; purple; purple	Renoster River At Leeuwenkuil
284	D5H021Q01	SAR; pH; EC; Cl	Red; purple; red; red	Sak River At De Kruis/Williston
285	D5R001Q01	pH	Purple	Rooiberg Dam On Hartbees River: Near Dam Wall
Fish to Tsitsikamma WMA				
444	K8H001Q01	pH	Red	Kruis River At Farm 508 Pineview
445	K8H002Q01	pH	Red	Elands River At Kwaai Brand Forest Reserve/Witelsbos
449	L3R001Q01	EC	Yellow	Beervlei Dam At Windheudel
450	L6H001Q01	SAR; pH; EC; Cl	Red; purple; purple; purple	Heuningklip River At Campherspoort
452	L7H007Q01	SAR; EC; Cl	Purple; purple; purple	Groot River At Sandpoort
453	L8H001Q01	pH	Red	Wabooms River At Diepkloof
459	M1H012Q01	EC; Cl	Yellow; red	Swartkops River At Uitenhage/Nivens Bridge
461	N1H013Q01	SAR; EC; Cl	Red; red; purple	Mackiesputs Eye At Graaf-Reinet/ Van Reyneveldspas
462	N1R001Q01	SAR; EC; Cl	Red; red; purple	Van Reyneveldspas Dam On Sundays River
463	N2H007Q01	pH; EC; Cl	Purple; red; purple	Sundays River At De Draay
464	N2H009Q01	pH; EC	Purple; yellow	Volkers River At Volkersrivier
465	N2R001Q01	pH	Purple	Darlington Dam On Sundays River At Dwaas

WMA Site	Sample Site	Constituent/s Exceeding Good Range	Extent of Exceedence	Location of Site
466	N3H002Q01	EC; Cl	Yellow; yellow	Voël River At Rietvley
467	N4H001Q01	pH; EC	Purple; yellow	Sundays River At Korhaanspoort/ Couransdrift
468	N4H003Q01	SAR; pH; EC; Cl	Red; purple; red; purple	Sundays River At Addo Drift East/ Addo Bridge
469	N4H005Q01	SAR; EC; Cl	Purple; purple; purple	Coerney River At Selborne/Carlton
470	P1H003Q01	SAR; pH; EC; Cl	Red; purple; red; purple	Boesmans River At Donkerhoek/ Alicedale
471	P1R003Q01	SAR; pH; EC; Cl	Red; purple; red; purple	Nuwejaars Dam On Nuwejaars Spruit At Nuwejaars Drift West
472	P3H001Q01	SAR; EC; Cl	Red; purple; purple	Kariega River At Smithfield/Lower Waterford
475	P4H001Q01	SAR; EC; Cl	Red; red; purple	Kowie River At Bathurst/Wolfscrag
480	Q2H002Q01	pH; EC	Purple; yellow	Great Fish River At Zoutpansdrift
481	Q3H004Q01	pH; EC	Purple; yellow	Pauls River At Coutzenburg
483	Q4H013Q01	SAR; pH; EC; Cl	Red; purple; red; red	Tarka River At Bridge Farm/Tarka Bridge (New Weir)
485	Q5H005Q01	SAR; pH; EC; Cl	Red; purple; red; red	Great Fish River At Van Stadens Dam/Mortimer Weir
486	Q6H003Q01	pH; EC	Purple; yellow	Baviaans River At Botmangat/De Klerkdal
487	Q7H003Q01	pH; EC	Purple; yellow	Great Fish River At Leeuwe Drift
488	Q7H005Q01	pH; EC; Cl	Purple; yellow; yellow	Great Fish River Atsout Vleij/Sheldon
489	Q8H008Q01	pH; EC	Purple; yellow	Little Fish River At Doornkraal
490	Q8H010Q01	pH; EC	Purple; yellow	Little Fish River At Grootvlakte
491	Q8H011Q01	pH; EC; Cl	Purple; yellow; yellow	Little Fish River At Rietfontein/Junction Drift
492	Q8R001Q01	pH	Purple	De Mist Kraal Dam On Little Fish River
493	Q9H001Q01	SAR;	Purple; yellow; yellow	Great Fish River At Fort Brown Peninsula
495	Q9H012Q01	pH; EC; Cl	Purple; yellow; yellow	Great Fish River At Brandtlegte/ Piggot's Bridge
496	Q9H017Q01	pH	Purple	Blinkwater River At Blinkwater
497	Q9H018Q01	SAR;	Purple; yellow; yellow	Great Fish River At Matomela's Reserve/Outspan
Gouritz WMA				
374	H8H003Q01	pH	Red	Duiwenhoks Dam On Duiwenhoks River: Down Stream Weir
375	H9H002Q01	pH	Red	Vet River At The Camp
376	H9H004Q01	pH	Red	Kruis River At Aan De Kruisrivier/Swq 3-44
378	H9H006Q01	pH	Red	Canal From Goukoul River At Groote Bosch
379	H9H010Q01	pH	Red	Korinte-Vet Dam On Korinte River: Down Stream Weir
380	H9R001Q01	pH	Red	Korinte-Vet Dam On Korinte River: Near Dam Wall
383	J1H017Q01	SAR; EC; Cl	Red; red; purple	Sand River At Buffelsfontein/Van Wyksdorp
384	J1H019Q01	SAR; EC; Cl	Red; purple; purple	Groot River At Buffelsfontein/Van Wyksdorp
388	J1R002Q01	pH; EC; Cl	Purple; yellow; red	Bellair Dam On Brak River: Near Dam Wall
390	J1R004Q01	EC; Cl	Yellow; red	Miertjeskraal Dam On Brand River: Near Dam Wall
391	J2H005Q01	EC; Cl	Yellow; yellow	Huis River At Zoar
401	J3H011Q01	SAR; EC; Cl	Purple; purple; purple	Olifants River At Warm Water
411	J3R002Q01	EC; Cl	Yellow; yellow	Stompdrif Dam On Olifants River: Near Dam Wall
416	K1H017Q01	EC; Cl	Yellow; yellow	Hartebeeskuil Dam On Hartenbos River: Down Stream
417	K1H021Q01	EC; Cl	Yellow; red	Hartenbos River At Hartenbosch
418	K1R001Q01	EC; Cl	Yellow; yellow	Hartebeeskuil Dam On Hartenbos River: Near Dam Wall
423	K3H001Q01	pH	Red	Kaaimans River At Upper Barbiere Kraal
426	K3H004Q01	pH	Red	Malgas River At Blanco
427	K3H005Q01	pH	Red	Touws River At Farm 162/Geo.F.12-8
430	K3R002Q01	pH	Red	Garden Route Dam On Swart River: Near Dam Wall

WMA Site	Sample Site	Constituent/s Exceeding Good Range	Extent of Exceedence	Location of Site
434	K3R006Q01	SAR; EC; Cl	Purple; purple; purple	Touws River Estuary At Wilderness
435	K4H001Q01	pH	Red	Hoekraal River At Eastbrook
436	K4H002Q01	pH	Red	Karataara River At Karataara Forest Reserve
438	K4R001Q01	SAR; pH; EC; Cl	Purple; purple; red; purple	Groen Vlei At Ruygte Valley
439	K4R002Q01	SAR; EC; Cl	Purple; purple; purple	Swart Vlei At Ronde Valley/ Hoogekraal
440	K5H002Q01	pH	Red	Knysna River At Milwood Forest Reserve
441	K5R001Q01	SAR; EC; Cl	Purple; purple; purple	Knysna Lagoon At Knysna
Olifants/Doorn WMA				
298	G3H001Q01	SAR; EC; Cl	Red; red; purple	Kruis River At Tweekuilen/Eendekuil
Breede WMA				
326	G4H006Q01	EC; Cl	Yellow; yellow	Klein River At Can Q5-8/ Wagenboomsdrift
330	G4R001Q01	pH	Red	Steenbras Dam On Steenbras River: Near Dam Wall
331	G4R002Q01	pH	Red	Eikenhof Dam On Palmiet River: Near Dam Wall
332	G4R003Q01	SAR; EC; Cl	Purple; purple; purple	Bot River Vlei On Bot River At Ysterklip/Hermanus
333	G4R004Q01	SAR; EC; Cl	Purple; purple; purple	Klein River Vlei On Klein Riv At Rocklands/Yacht
334	G5H008Q01	SAR; EC; Cl	Purple; purple; purple	Sout River At Kykoedy
337	H1H007Q01	pH	Red	Wit River At Drosterskloof
338	H1H009Q01	pH	Red	Holsloot River At Boontjiesrivier
341	H1H018Q01	pH	Red	Molenaars River At Hawequas Forest Reserve
342	H1H033Q01	pH	Red	Elands River At Hawequas Forest Reserve
347	H2H010Q01	EC; Cl	Red; red	Hex River At Worcester/Drie Riviere (Bridge)
350	H3H011Q01	SAR; EC; Cl	Red; red; purple	Kogmanskloof River At Goudmyn
352	H4H016Q01	EC; Cl	Yellow; yellow	Keisers River At Mc Gregor Commonage/Vrolykheid
354	H4H018Q01	SAR; EC; Cl	Red; purple; purple	Poesjenels River At La Chasseur
355	H4H019Q01	EC; Cl	Red; red	Vink River At De Gorree
356	H4H020Q01	EC; Cl	Red; purple	Nuy River At Doornrivier
360	H4R003Q01	pH	Red	Klipberg Dam On Konings River: Near Dam Wall
362	H5H004Q01	EC; Cl	Yellow; yellow	Bree River At Wolvendrift/Secunda
363	H5H005Q01	EC; Cl	Yellow; yellow	Bree River At Wagenboomsheuve/ Drew
364	H6H005Q01	pH	Red	Baviaans River At Genadendal Mission Station
369	H7H005Q01	pH	Red	Hermitage River At Swellendam Forest Reserve
371	H7H007Q01	pH	Red	Grootkloof River At Sparkenbosch
Berg WMA				
302	G1H009Q01	EC; Cl	Yellow; red	Brakkloof Spruit At Knolvlei Forest Reserve
303	G1H012Q01	pH	Red	Watervals River At Watervalsberge/ Lower Watervals
309	G1H024Q01	SAR; EC; Cl	Purple; purple; purple	Berg River At Kliphoeck
311	G1H034Q01	SAR; EC; Cl	Purple; purple; purple	Moorreesburg Spruit At Holle River
312	G1H035Q01	SAR; EC; Cl	Red; red; purple	Matjies River At Matjiesfontein
314	G1H039Q01	SAR; EC; Cl	Red; red; purple	Doring River At Grensplaas/Diepe Gat
315	G1H040Q01	EC; Cl	Yellow; red	Fish River At La Fonteine
317	G1H064Q01	PH	Purple; red	Banghoek River At Bosmanshoek (Compensation Water)
321	G2H012Q01	EC; Cl	Yellow; red	Diep River At Malmesbury

4.4 Trophic Status

The trophic status of each of the previously mentioned impoundments is reflected in Table 4.7.

Table 4.7 The Trophic Status of Selected Impoundments (after van Ginkel *et al.*, 2001)

Water Management Area	Impoundment	Trophic Status
Luvuvhu and Letaba	Ebenezer Dam	Oligotrophic
	Magoebaskloof Dam	Oligotrophic to mesotrophic
	Tzaneen Dam	Oligotrophic
Crocodile (West) and Marico	Bon Accord Dam	Eutrophic to hypereutrophic
	Buffelspoort Dam	Not sampled
	Hartbeespoort Dam	Eutrophic to hypereutrophic
	Klipvoor Dam	Hypereutrophic
	Kosterrivier Dam	Eutrophic
	Lindleyspoort Dam	Eutrophic
	Rietvlei Dam	Hypereutrophic
	Roodekopjes Dam	Oligotrophic to mesotrophic
	Roodeplaat Dam	Hypereutrophic
	Vaalkop Dam	Mesotrophic to Eutrophic
Olifants	Bronkhorstspruit Dam	Oligotrophic
	Witbank Dam	Mesotrophic
	Middelburg Dam	Oligotrophic
	Loskop Dam	Mesotrophic
Usutu to Mhlatuze	Klipfontein Dam	Hypereutrophic to eutrophic
Upper, Middle and Lower Vaal	Allemanskraal Dam	Hypereutrophic
	Bloemhof Dam	Eutrophic to hypereutrophic
	Boskop Dam	Mesotrophic
	Erfenis Dam	Hypereutrophic
	Grootdraai Dam	Eutrophic
	Koppies Dam	Eutrophic
	Sterkfontein Dam	Mesotrophic
	Vaal Dam	Eutrophic to hypereutrophic
Mvoti to Umzimkulu	Albert Falls Dam	Mesotrophic to eutrophic
	Inanda Dam	Mesotrophic
	Midmar Dam	Mesotrophic
	Nagle Dam	Mesotrophic (towards Eutrophic)
	Hazelmere Dam	Mesotrophic (towards Eutrophic)
	Shongweni Dam	Hypereutrophic
Mzimvubu to Keiskamma	Bridledrift Dam	Eutrophic to hypereutrophic
	Laing Dam	Eutrophic to hypereutrophic
Upper and Lower Orange	Gariiep Dam	Eutrophic
	Cook's Lake	Hypereutrophic
	Disaneng Dam	Mesotrophic
	Lotlamoreng Dam	Hypereutrophic to eutrophic
	Setumo (Modimola) Dam	Eutrophic
Fish to Tsitsikamma	Bo-Lang Vlei	Eutrophic
	Groen Vlei	Mesotrophic
	Onder-Lang Vlei	Mesotrophic
	Ronde Vlei	Eutrophic
	Sedgefield Lagoon	Oligotrophic
	Swart Vlei	Oligotrophic
	Wilderness Lagoon	Mesotrophic
Berg	Misverstand Dam	Eutrophic to hypereutrophic
	Voël vlei Dam	Mesotrophic
	Wemmershoek Dam	Mesotrophic to Oligotrophic

It is rather disturbing to note the number of impoundments listed in Table 4.7 that have a trophic status in the eutrophic to hypereutrophic classes. The list of impoundments that are classified by van Ginkel *et al.* (2001) as oligotrophic or mesotrophic is shorter: the Roodekopjes Dam; Bronkhorstspruit Dam, Witbank Dam; Middelburg Dam; Loskop Dam; Ebenezer Dam; Magoebaskloof Dam; Tzaneen Dam; Boskop Dam; Sterkfontein Dam; Disaneng Dam; Voël vlei Dam; Wemmershoek Dam; Groen Vlei; Onder-Land Vlei; Sedgefield Lagoon; Swart Vlei; Wilderness Lagoon; Inanda Dam and Midmar Dam.

The impoundments are ranked according to the greatest need to undertake eutrophication management (van Ginkel *et al.*, 2001) in Table 4.8.

Table 4.8 The priority ranking of selected impoundments throughout South Africa out of 49 impoundments included in the study of van Ginkel *et al.* (2001) indicating the relative need for eutrophication management

Water Management Area	Impoundment	Priority ranking
Crocodile (West) and Marico	Rietvlei Dam	1
Crocodile (West) and Marico	Klipvoor Dam	2
Upper and Lower Orange	Cooke's Lake	3
Crocodile (West) and Marico	Roodeplaat Dam	4
Crocodile (West) and Marico	Bon Accord Dam	5
Crocodile (West) and Marico	Hartbeespoort Dam	6
Upper, Middle and Lower Vaal	Erfenis Dam	7
Upper and Lower Orange	Lotlamoreng Dam	8
Upper, Middle and Lower Vaal	Bloemhof Dam	9
Mvoti to Umzimkulu	Shongweni Dam	10
Mzimvubu to Keiskamma	Bridledrift Dam	11
Upper, Middle and Lower Vaal	Koppies Dam	12
Mzimvubu to Keiskamma	Laing Dam	13
Berg	Misverstand Dam	14
Upper, Middle and Lower Vaal	Allemanskraal Dam	15
Upper and Lower Orange	Gariep Dam	16
Upper, Middle and Lower Vaal	Vaal Dam	17
Crocodile (West) and Marico	Kosterrivier Dam	18
Crocodile (West) and Marico	Lindleyspoort Dam	19
Upper and Lower Orange	Setumo Dam	20
Upper, Middle and Lower Vaal	Grootdraai Dam	21
Fish to Tsitsikamma	Bo-Lang Vlei	22
Usutu to Mhlathuze	Klipfontein Dam	23
Fish to Tsitsikamma	Ronde Vlei	24
Crocodile (West) and Marico	Vaalkop Dam	25
Mvoti to Umzimkulu	Inanda Dam	26
Olifants	Bronkhorstspruit Dam	27
Crocodile (West) and Marico	Roodekopjes Dam	28
Mvoti to Umzimkulu	Albert Falls Dam	29
Mvoti to Umzimkulu	Hazelmere Dam	30
Olifants	Witbank Dam	31
Mvoti to Umzimkulu	Nagle Dam	32
Olifants	Middelburg Dam	33
Fish to Tsitsikamma	Onder-Lang Vlei	34
Luvuvhu and Letaba	Magoebaskloof Dam	35
Mvoti to Umzimkulu	Midmar Dam	36
Upper, Middle and Lower Vaal	Sterkfontein Dam	37
Upper and Lower Orange	Disaneng Dam	38
Luvuvhu and Letaba	Tzaneen Dam	39
Berg	Voël Vlei	40
Olifants	Loskop Dam	41
Luvuvhu and Letaba	Ebenezer Dam	42
Upper, Middle and Lower Vaal	Boskop Dam	43
Fish to Tsitsikamma	Groen Vlei	44
Berg	Wemmershoek Dam	45
Fish to Tsitsikamma	Wilderness Lagoon	46
Fish to Tsitsikamma	Sedgefield Lagoon	47
Fish to Tsitsikamma	Swart Vlei	48
Crocodile (West) and Marico	Buffelspoort Dam (not sampled)	49

According to Table 4.8, the impoundments most in need of eutrophication management are situated in the Crocodile (West) Marico WMA, with five out of the top ten priority impoundments being situated in this WMA.