

## 4.2 Domestic Use

### 4.2.1 “Health” constituents

The first two of the Guideline Compliance Pie Diagram maps (Map 5 and Map 6) relate to the following constituents: NO<sub>3</sub>+NO<sub>2</sub>; NH<sub>4</sub>; pH; TDS and F. The median water quality at almost all of the sample sites is within the *Very Good* and *Good* water quality ranges for domestic (drinking) water use (DWAf, 1996a and DWAf, DOH and WRC, 1998) when compared to the ranges in Table 3.2, however, at isolated sites median concentrations exceed the *Very Good* and *Good* ranges. The sites in Table 3.6 are included in Map 5.

Table 3.2 (earlier in the document) lists the applicable water quality guideline classifications. Table 4.1 contains a list of sample sites for which certain of the constituents had median concentrations exceeding the *Good* range for domestic (drinking) use (DWAf, DOH and WRC, 1998).

Table 4.1 Sample sites exceeding the *Very Good* and *Good* range for domestic water use for the Domestic Health Water Quality Constituents

Sample Site	Constituent/s Exceeding Good Range	Extent of Exceedence	Location of Site
Olifants WMA			
B3H021Q01	F	Yellow	Elands River at Scherp Arabie
Upper Vaal WMA			
C2H004Q01	TDS	Yellow	Suikerbosrand River at Uitvlugt
Lower Orange WMA			
D5H021Q01	TDS	Red	Sak River at De Kruis/Williston
Fish to Tsitsikamma WMA			
L6H001Q01	TDS	Red	Heuningklip River at Campherspoort
N1H013Q01	TDS	Purple	Mackiesputs Eye at Graaf-Reinet/Van Reyneveldspas
N2H007Q01	TDS	Yellow	Sundays River at De Draay
N4H003Q01	TDS	Red	Sundays River at Addo Drift East/Addo Bridge
P1H003Q01	TDS	Red	Boesmans River at Donkerhoek/Alicedale
P3H001Q01	TDS	Red	Kariega River at Smithfield/Lower Waterford
P4H001Q01	TDS	Yellow	Kowie River at Bathurst/Wolfscrag
Q4H013Q01	F; TDS	Red; yellow	Tarka River at Bridge Farm/Tarka Bridge (New Weir)
Q8H011Q01	TDS	Yellow	Little Fish River at Rietfontein/Junction Drift
Q9H001Q01	TDS	Yellow	Great Fish River at Fort Brown Peninsula
Q9H018Q01	TDS	Yellow	Great Fish River at Matomela's Reserve/ Outspan
Gouritz WMA			
J1H019Q01	TDS	Purple	Groot River at Buffelsfontein/Van Wyksdorp
J3H011Q01	TDS	Purple	Olifants River at Warm Water
K2H004Q01	TDS	Purple	Great Brak River at Vishoek
K4R002Q01	TDS	Purple	Swart Vlei at Ronde Valley/Hoogekraal

It would appear that Fluoride (F) and Total Dissolved Salts (TDS) are, from a domestic use point of view, the major concerns at certain of the sampling sites (refer to the guideline values in Table 3.2 and Table 4.1 and Map 5 that indicates water quality fitness-for-use for Domestic Use: “Health” and the sites with elevated levels).

### Fluoride (F)

On the Elands River at Scherp Arabie (Olifants Water Management Area) and especially at the Tarka River at Bridge Farm/Tarka Bridge (Fish to Tsitsikamma WMA), fluoride levels are elevated. The fluoride levels could result in tooth staining at both sites and also health effects (including skeletal damage) at the latter site (refer to Table 3.2 for the possible effects). Fluorosis is the term given to the disease condition where there is malformation of either the teeth (dental fluorosis) and/or the bony skeleton (skeletal fluorosis), due to chronic exposure to elevated fluoride intake.

### **Total Dissolved Salts (TDS)**

The TDS levels were elevated at many of the sites in Table 4.1 and can be considered to be Poor or Not Acceptable in terms of human health at the Sak River at De Kruis/Williston (Lower Orange WMA), Heuningklip River at Campherspoort, Sundays River at Addo Drift East, Boesmans River at Donkerhoek/Alicedale, Kariega River at Smithfield (all in the Fish to Tsitsikamma WMA), and especially in the Gouritz WMA where it was *Not Acceptable* at the Groot River at Buffelsfontein, Olifants River at Warm Water, Great Brak River at Vishoek and Swart Vlei at Ronde Valley. The health effects range from salt overload in sensitive groups to an increasing risk of dehydration (refer to Table 3.2). It should be noted that the main effect, however, is aesthetic (the water has a salty taste and does not slake thirst at high concentrations).

***Link to land cover***

Refer to Table 3.5 and Map 1 and the location of the sites above for an explanation.

The elevated fluoride levels evident at the two sites is most probably due to natural geology since the land cover at the Elands River at Scherp Arabie is cultivated land and forest and at the Tarka River at Bridge Farm it is shrub, grass and cultivated land.

The elevated TDS levels would also appear to be a result of natural geology in most cases, with the possible exception of those sites near to where there is cultivated land and/or plantations (Sundays River at Addo Drift East, Boesmans River at Donkerhoek – both in the Fish to Tstitsikamma WMA, Olifants River at Warm Water and Swart Vlei at Ronde Valley – both in the Gouritz WMA) that may be fertilised and thereby contribute to the salt load. It is likely that the Swart Vlei at Ronde Valley site is strongly influenced by seawater intrusion.

Map 5 Water quality fitness for use from a Domestic Use “Health” perspective reported at the national assessment sample sites