Proposed edits to *Australian Drinking Water Guidelines Version 4.0*– consequential edits related to revised ammonia, nickel, and chlorate fact sheets

Text in **red** are proposed edits to the existing text in the *Australian Drinking Water Guidelines* (the Guidelines).

Edit no.	Guidelines section	Page no.	Current text	Suggested edit	Comments
1.	Table 8.4	147	Nickel NHMRC Health-Based Guideline Value (mg/L) – 0.02	Nickel NHMRC Health-Based Guideline Value (mg/L) – **0.05** Revised text as per Table 8.4 below	Revise health-based guideline value and corresponding example doses by treatment chemical as per calculations in Table 8.4
2.	Table 9.5 Generic frequencies for monitoring non-microbial drinking water quality as supplied to the customer	176	See Table 9.5 below	Revised text as per Table 9.5 below	Inclusion of chlorate in table 9.5

Edit no.	Guidelines section	Page no.	Current text	Suggested edit	Comments
3.	Table 10.6 Guideline values for physical and chemical characteristics	210-225	See Table 10.6 below	Update Table 10.6 with new health-based/aesthetic guidance values and comments for nickel, and chlorate	Updated for new health-based guideline values.

Table 8.4 Recommended maximum impurity concentrations for selected drinking water treatment chemicals*

			IMPURITY Nickel (mg/L)
		NHMRC Health-Based Guideline Value (mg/L)	~~0.02~~ 0.05
Treatment Chemical	**Chemical Strength (%)**	**Example doses (mg/L)**	
Aluminium chlorohydrate	23	100 (as Al_2O_3)	~~4.6~~ 11.5
Aluminium sulfate (alum)	47	20 (as $Al_2(SO_4)_3$)	~~47~~ 117.5
Aluminium sulfate (alum)	47	60 (as $Al_2(SO_4)_3$)	~~15.7~~ 39.2
Aluminium sulfate (alum)	47	120 (as $Al_2(SO_4)_3$)	~~7.8~~ 19.6
Calcium hydroxide	99	30 (as $Ca(OH)_2$)	~~66~~ 165.0
Calcium hypochlorite	65	3 (as Cl_2)	~~433.3~~ 1,083.0
Calcium oxide	10	500 (as CaO)	~~0.4~~ 1.0
Chlorine	100	3 (as Cl_2)	
Copper sulfate	25.5	1 (as $CuSO_4.5H_2O$)	~~510~~ 1,275.0
Ferric chloride	42	120 (as $FeCl_3$)	~~7~~ 17.5
Ferric sulfate	20	100 (as $Fe_2(SO_4)_3$)	4 10.0
Hydrochloric acid	33	5 (as HCl)	~~132~~ 330.0
Hydrofluorosilicic acid	16	1.5 (as F)	
Hydroxylated ferric sulfate	12.5	100	~~2.5~~ 6.3
Polyaluminium chloride	10	100 (as Al_2O_3)	~~2.0~~ 5.0
Potassium permanganate	99	1 (as $KMnO_4$)	
Sodium fluoride	45	1.5 (as F)	
Sodium fluorosilicate	60	1.5 (as F)	
Sodium hydroxide	50	10 (as NaOH)	~~100~~ 250.0
Sodium hypochlorite	12	3 (as Cl_2)	~~80~~ 200.0
Sulfuric acid	98	5 (as $H2SO_4$)	

*NB. This excerpt from Table 8.4 illustrates the consequential updates if the nickel guideline value is increased from 0.02 mg/L to 0.05 mg/L.

Table 9.5 Generic frequencies for monitoring non-microbial drinking water quality as supplied to the consumer

	Frequency of sampling - Weekly	Frequency of sampling - Monthly	Frequency of sampling - Quarterly	Frequency of sampling - Annually+	Comments
Physical characteristics	pH Temperature Total dissolved solids[1]	Colour Turbidity Dissolved oxygen Hardness[2]		Taste and odour	[1] If reverse osmosis used, or there are known salinity issues, otherwise quarterly [2] If water is treated for hardness
Water treatment related chemicals (if used)	Fluoride[1] Aluminium[2] Chlorine Copper (seasonal)		Any related organic contaminants, e.g. acrylamide, carbon tetrachloride, epichlorohydrin		
Disinfection byproducts (DBPs)		Trihalomethanes (THMs)[1,2] Ammonia, nitrite, nitrate[2] Bromate, formaldehyde[3] Chlorite, chlorate[4]			[1] Where chlorine or chloramine are used. [2] Where chloramine is used. [3] Where ozone is used. [4] Where chlorine dioxide or ~~liquid chlorine~~ hypochlorite is used. If detected at elevated concentrations, close to, or above guideline values, additional related DBPs should also be analysed.

	Frequency of sampling - Weekly	Frequency of sampling - Monthly	Frequency of sampling - Quarterly	Frequency of sampling - Annually+	Comments
Inorganics	Iron Manganese		Arsenic, nitrate, fluoride, selenium, lead, mercury[1] Ammonia, cadmium, chromium, nickel, zinc, copper, hydrogen sulfide	Tin, silver beryllium, uranium, iodide, molybdenum, boron, barium	[1] Priority contaminants: quarterly sampling for groundwater sources, more frequent monitoring when detected at elevated concentrations; otherwise sampling reduced to annually, seasonally or event-related (e.g. storm events, reservoir turnover events).
Pesticides and organic toxicants		If detected or potential presence		If not detected	Monthly or quarterly sampling for pesticides/organic toxicants previously (or potentially) detected; seasonally annually, or event-related (e.g. storm events, spills) for other pesticides/organic toxicants.
Radiological				Radionuclides	New supplies should be assessed quarterly for one year, then every 2 years (groundwater) or 5 years (surface water). Increase frequency to quarterly if guideline screening levels exceeded.
Metals with potential for leaching				Bismuth, silicon, antimony, chromium, copper, nickel	Annual sampling, unless pipework material has been considered as part of the nominated sampling frequency.

Table 10.6 Guideline values for physical and chemical characteristics

Characteristic	Guideline values (mg/L unless otherwise specified)		Comments
	Health	Aesthetic	
Ammonia (as NH_3)	c	0.5	Presence may indicate sewage contamination and/or microbial activity. High levels may corrode copper pipes and fittings. Taste threshold for ammonium 35 mg/L. Odour threshold for ammonia 1.5 mg/L.
Chlorate	0.8 ~~c~~ e		Occurs in water as a degradation product of hypochlorite solution and as a by-product of chlorine dioxide disinfection. Action to reduce chlorate is encouraged, but must not compromise disinfection, as non-disinfected water poses significantly greater risk than chlorate. ~~By-product of chlorination. Insufficient data to set a health-based guideline value.~~
Chlorite	0.8		By-product of chlorine dioxide disinfection. Action to reduce chlorite is encouraged, but must not compromise disinfection, as non-disinfected water poses significantly greater risk than chlorite.
Nickel	~~0.02~~ 0.05		Concentrations usually very low; but up to 0.5 mg/L reported after prolonged contact of water with nickel-plated fittings.