



## APPENDIX B16-A WATER QUALITY MONITORING RESULTS FROM DAWSON RIVER BASELINE SURVEYS

## Water quality monitoring results from Dawson River baseline surveys

### Summary of baseline survey data with application of water quality objectives (WQOs) exceedances

Tables 1 to 15 summarise the application of water quality objectives (WQOs) for protection of ecosystem (95%, moderately disturbed) for each water type (Upper Dawson, Lower Dawson, and lakes and reservoirs) and for drinking water supply from the Dawson River guidelines (DERM 2011) and Australian water quality guidelines (ANZECC 2000) for the Dawson River baseline surveys (frc 2008; Ecowise 2008a,b; ALS 2012, GHD 2012; frc 2013). Only water quality parameters with exceedances of WQO's are shown. All surveys were conducted during dry season baseflow conditions except for February 2012 (ALS 2012) which occurred during high flows and is highlighted in yellow. Data for metals is for total concentrations and the trigger values are not corrected for hardness (ANZECC 2000). The sites are placed in order (left to right) from upstream to downstream. Raw data from frc (2008) and Ecowise (2008a 2008b) are provided below.

### Summary of baseline survey data with application of water quality objectives (WQOs)

#### Key to Tables

Table 1 Key to Tables

Upper Dawson WQOs	Lower Dawson WQOs	Lakes and reservoirs WQOs
Within WQOs	Exceedance or outside of WQOs	No data recorded
*Denotes sampling undertaken at high flow		

**Table 2 Application of Water Quality Objectives - EC ( $\mu\text{s}/\text{cm}$ )**

EC ( $\mu\text{s}/\text{cm}$ )	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red				Red	Red	Red	Green	Red	Red
AUG 12	Green	Green	Green				Green	Green	Green	Green	Green	Red
FEB 12*	Red	Red	Red				Green	Green	Green	Green	Green	Red
OCT 08		Red	Red	Green	Red	Green	Red	Green				
JUNE 08		Green	Green	Red	Red	Red	Red	Green				
DEC 07		Green	Red									
NOV 07*			Green			Green						

**Table 3 Application of Water Quality Objectives - Dissolved oxygen (% sat)**

Dissolved oxygen (% sat)	WS02	WS03 N1	WS04 N2	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red			Green	Red	Red	Green	Red	Red
AUG 12	Green	Red	Red			Red	Green	Red	Red	Red	Red
FEB 12*	Red	Red	Red			Red	Green	Red	Red	Red	Red
OCT 08											
JUNE 08											
NOV 07*			Red		Red						

**Table 4 Application of Water Quality Objectives - Susp. Solids**

Susp. Solids	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red					Red		Red		Red
AUG 12	Green	Green	Green					Red		Red		Green
FEB 12*	Red	Red	Red					Red		Red		Red
OCT 08		Red	Red	Red				Red				
JUNE 08		Green	Green	Green				Red				

**Table 5 Application of Water Quality Objectives - Turbidity (NTU)**

Turbidity (NTU)	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Green	Green	Green				Red	Green	Red	Red	Red	Green
AUG 12	Red	Green	Green					Red	Red	Red	Red	Green
FEB 12*	Red	Red	Red				Red	Red	Red	Green	Red	Red
OCT 08		Red	Red	Red	Red	Red	Red	Red				
JUNE 08		Green	Green	Green	Green	Red	Green	Green				
DEC 07		Red	Red									
NOV 07*			Red			Red						

**Table 6 Application of Water Quality Objectives - Sulphate**

Sulphate	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red					Green		Green		Green
AUG 12	Red	Red	Red					Green		Green		Red
FEB 12*	Green	Red	Red					Green		Green		
OCT 08												
JUNE 08												

**Table 7 Application of Water Quality Objectives - Total N**

Total N	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Green	Green	Green				Red	Red	Red	Red	Red	Red
AUG 12	Red	Red	Green				Red	Red	Red	Red	Red	Green
FEB 12*	Red	Red	Red				Red	Red	Red	Red	Red	Red
OCT 08		Red	Red	Red	Red	Red	Red	Red				
JUNE 08		Green	Green	Green	Red	Red	Red	Green				

**Table 8 Application of Water Quality Objectives - Nitrite + Nitrate**

Nitrite + Nitrate	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Green	Green	Green				Green	Red	Green	Green	Red	Green
AUG 12	Red	Red	Red				Red	Red	Red	Red	Red	Green
FEB 12*	Green	Red	Red				Red	Red	Red	Red	Red	Red
OCT 08		Red	Red	Green	Green	Green	Green	Red				
JUNE 08		Red	Green	Green	Green	Red	Green	Green				

**Table 9 Application of Water Quality Objectives - Ammonia**

Ammonia	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red				Red	Red	Red	Red	Red	Red
AUG 12	Red	Red	Red				Red	Red	Red	Red	Red	Red
FEB 12*	Red	Red	Red				Red	Red	Red	Red	Red	Red
OCT 08		n/a	n/a	n/a	n/a	n/a	n/a	n/a				
JUNE 08		Red	Green	Green	Green	Red	Red	Green				

**Table 10 Application of Water Quality Objectives - Total Phosphorus**

Total Phos	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Green	Red	Red				Red	Red	Red	Red	Red	Red
AUG 12	Red	Red	Red				Red	Red	Red	Red	Red	Red
FEB 12*	Red	Red	Red				Red	Red	Red	Red	Red	Red
OCT 08		Red	Red	Red	Red	Red	Red	Red				
JUNE 08		Green	Green	Green	Red	Red	Red	Red				

**Table 11 Application of Water Quality Objectives – Reactive Phosphorus**

Reactive Phos	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red				Red	Red	Red	Red	Red	Red
AUG 12	Green	Red	Red				Red	Red	Red	Red	Red	Red
FEB 12*	Red	Red	Red				Red	Red	Red	Red	Red	Red
OCT 08		Red	Red	Red	Red	Red	Red	Red				
JUNE 08		Green	Green	Green	Red	Red	Red	Red				

**Table 12 Application of Water Quality Objectives - Chromium**

Chromium	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Green	Green	Green				Red	Green	Green	Green	Green	Green
AUG 12	Green	Green	Red				Red	Red	Red	Red	Red	Green
FEB 12*	Red	Red	Red				Red	Red	Red	Red	Red	Red
OCT 08		Green	Red	Green	Green	Red	Green	Green				
JUNE 08		Green	Green	Green	Green	Red	Green	Green				

**Table 13 Application of Water Quality Objectives - Copper**

Copper	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red	White	White	White	Red	Red	Green	Green	Green	Green
AUG 12	Green	Red	Red	White	White	White	Red	Red	Red	Red	Red	Red
FEB 12*	Red	Red	Red	White	White	White	Red	Red	Red	Red	Red	Red
OCT 08	White	Red	Red	Red	Red	Red	Red	Red	White	White	White	White
JUNE 08	White	Green	Red	Green	Red	Red	Red	Green	White	White	White	White

**Table 14 Application of Water Quality Objectives - Zinc**

Zinc	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Green	Green	Green	White	White	White	Green	Green	Green	Green	Green	Green
AUG 12	Green	Green	Red	White	White	White	Red	Red	Red	Red	Red	Green
FEB 12*	Red	Red	Red	White	White	White	Red	Red	Red	Red	Red	Red
OCT 08	White	Green	Red	Red	Green	Red	Green	Green	White	White	White	White
JUNE 08	White	Red	Red	Red	Green	Green	Red	Green	White	White	White	White

**Table 15 Application of Water Quality Objectives - Cadmium**

Cadmium	WS02	WS03 N1	WS04 N2	N13	N3	N4	WS05 N5	WS06 N6	WS07 N7	WS08 N8	WS09 N9	WS10 N10
NOV 12	Red	Red	Red	White	White	White	Green	Red	Red	Red	Red	Red
AUG 12	Green	Green	Green	White	White	White	Green	Green	Green	Green	Green	Green
FEB 12*	Green	Green	Green	White	White	White	Green	Green	Green	Green	Green	Green
OCT 08	White	Green	Green	Red	Green	Green	Green	Red	White	White	White	White
JUNE 08	White	Green	Green	Green	Green	Green	Green	Green	White	White	White	White

**Baseline sampling for November and December 2007, (FRC, 2008)**

	Site	Dawson R.			
		N1 (high flow)	N2 (base flow)	N2 (high flow)	N4 (base flow)
<b>Water quality indicators</b>	<b>Units</b>	<b>Dawson R.</b>	<b>Dawson R.</b>	<b>Dawson R.</b>	<b>Dawson R.</b>
Electrical Conductivity @ 25°C*	µS/cm	111.5	442	96.9	198
Dissolved Oxygen*	mg/L	-	2.7	-	1.9
Dissolved Oxygen	% sat	-	31.4	-	22.7
Turbidity	NTU	1232	600	1100	600
pH	-	6.6	6.83	6.01	6.41

'red value' indicates value exceeds water quality objective; '-' indicates value was not recorded; '\*' indicates water quality objective not available for the indicator



**Post wet season sampling  
(June 2008, Ecowise 2008)**

Water quality indicators	Units	Site						
		N1 Dawson R.	N2 Dawson R.	N3 Dawson R.	N4 Dawson R.	N5 Dawson R.	N6 Dawson R.	N13 Bentley Ck
Electrical Conductivity @ 25°C*	µS/cm	327	381	368	243	251	178	407
Total Dissolved Solids (est.)	mg/L	212	248	239	158	163	116	264
Suspended Solids (SS)*	mg/L	13	17	11	12	5	12	9
Turbidity*	NTU	18.0	13.0	4.3	110	5.2	22.0	4.0
Total Hardness as CaCO <sub>3</sub> *	mg/L	82	102	106	65	72	7	111
Hydroxide Alkalinity as CaCO <sub>3</sub>	mg/L	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO <sub>3</sub>	mg/L	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO <sub>3</sub>	mg/L	103	125	124	83	82	66	134
Total Alkalinity as CaCO <sub>3</sub>	mg/L	103	125	124	83	82	66	134
Ammonia as N*	mg/L	0.028	<0.010	<0.010	0.013	0.033	0.015	<0.010
Nitrite as N	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate as N	mg/L	0.086	<0.010	<0.010	0.170	<0.010	<0.010	<0.010
Nitrite + Nitrate as N*	mg/L	0.086	<0.010	<0.010	0.170	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen as N	mg/L	0.4	0.3	1.0	1.0	0.8	<0.1	0.2
Total Nitrogen as N*	mg/L	0.5	0.3	1.0	1.1	0.8	<0.1	0.2
Total Phosphorus as P*	mg/L	0.03	0.05	0.02	0.12	0.05	0.09	0.03
Reactive Phosphorus - Filtered*	mg/L	0.011	<0.010	<0.010	0.018	<0.010	0.036	<0.010
<b>Major ions</b>								
Calcium	mg/L	22	27	29	18	20	3	30
Magnesium	mg/L	7	8	8	4	5	<1	9
<b>Total metals</b>								
Aluminium*	mg/L	0.17	0.51	0.23	3.87	0.32	0.76	0.17
Antimony	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic*	mg/L	<0.001	0.001	0.001	0.003	0.002	0.001	0.001
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	0.089	0.107	0.101	0.108	0.072	0.024	0.109
Bismuth	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium* <sup>h</sup>	mg/L	0.0003	0.0003	0.0002	0.0004	0.0004	<0.0001	<0.0001
Cerium	mg/L	0.001	0.001	<0.001	0.006	<0.001	0.001	<0.001
Caesium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001



Chromium* <sup>h</sup>	mg/L	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt	mg/L	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Copper* <sup>h</sup>	mg/L	0.001	0.002	0.002	0.004	0.002	<0.001	0.001
Dysprosium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Erbium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Europium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Gadolinium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Gallium	mg/L	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Hafnium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Holmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Indium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lanthanum	mg/L	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Lead* <sup>h</sup>	mg/L	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Lithium	mg/L	0.004	0.004	0.002	0.003	0.001	0.008	0.002
Lutetium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese*	mg/L	0.021	0.025	0.052	0.041	0.172	0.037	0.046
Molybdenum	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Neodymium	mg/L	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Nickel* <sup>h</sup>	mg/L	<0.001	0.001	0.001	0.003	0.002	<0.001	0.001
Praseodymium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Rubidium	mg/L	0.002	0.002	0.002	0.006	0.002	0.005	0.002
Samarium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium*	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver*	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	mg/L	0.358	0.439	0.457	0.317	0.315	0.050	0.502
Tellurium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Terbium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thulium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tin	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	mg/L	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Uranium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ytterbium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Yttrium	mg/L	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Zinc* <sup>h</sup>	mg/L	<0.005	0.006	0.071	0.015	<0.005	0.032	<0.005
Zirconium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron*	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	mg/L	0.36	0.45	0.22	3.63	0.61	1.01	0.17
Mercury*	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Ammonia as N	mg/L	0.028	<0.010	<0.010	0.013	0.033	0.015	<0.010
<b>Organochlorine Pesticides</b>								
alpha-BHC	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
beta-BHC	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
gamma-BHC	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
delta-BHC	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Heptachlor	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Aldrin	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Heptachlor epoxide	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
trans-Chlordane	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
alpha-Endosulfan	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
cis-Chlordane	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Dieldrin	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
4,4'-DDE	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Endrin	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
beta-Endosulfan	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
4,4'-DDD	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Endrin aldehyde	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Endosulfan sulphate	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
4,4'-DDT	µg/L	<2	<2	<2	<2	<2	<2	<2
Endrin ketone	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Methoxychlor	µg/L	<2	<2	<2	<2	<2	<2	<2
<b>Organophosphorus Pesticides</b>								
Dichlorvos	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Demeton-S-methyl	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Monocrotophos	µg/L	<2	<2	<2	<2	<2	<2	<2
Dimethoate	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Diazinon	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5



Chlorpyrifos-methyl	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Parathion-methyl	µg/L	<2	<2	<2	<2	<2	<2	<2
Malathion	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Fenthion	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Chlorpyrifos	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Parathion	µg/L	<2	<2	<2	<2	<2	<2	<2
Pirimphos-ethyl	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Chlorfenvinphos	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Bromophos-ethyl	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Fenamiphos	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Prothiofos	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Ethion	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Carbophenothion	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
Azinphos Methyl	µg/L	<0.6	<0.6	<0.6	<0.5	<0.6	<0.5	<0.5
<b>Phenoxyacetic Acid Herbicides</b>								
4-Chlorophenoxy acetic acid	µg/L	<10	<10	<10	<10	<10	<10	<10
2,4-DB	µg/L	<10	<10	<10	<10	<10	<10	<10
Dicamba	µg/L	<10	<10	<10	<10	<10	<10	<10
Mecoprop	µg/L	<10	<10	<10	<10	<10	<10	<10
MCPA	µg/L	<10	<10	<10	<10	<10	<10	<10
2,4-DP	µg/L	<10	<10	<10	<10	<10	<10	<10
2,4-D	µg/L	<10	<10	<10	<10	<10	<10	<10
Triclopyr	µg/L	<10	<10	<10	<10	<10	<10	<10
2,4,5-TP (Silvex)	µg/L	<10	<10	<10	<10	<10	<10	<10
2,4,5-T	µg/L	<10	<10	<10	<10	<10	<10	<10
MCPB	µg/L	<10	<10	<10	<10	<10	<10	<10
Picloram	µg/L	<10	<10	<10	<10	<10	<10	<10
Clopyralid	µg/L	<10	<10	<10	<10	<10	<10	<10
Fluroxypyr	µg/L	<10	<10	<10	<10	<10	<10	<10
2,6-D	µg/L	<10	<10	<10	<10	<10	<10	<10
2,4,6-T	µg/L	<10	<10	<10	<10	<10	<10	<10
<b>Glyphosate and AMPA</b>								
Glyphosate	µg/L	<10	<10	<10	<10	<10	<10	<10
AMPA	µg/L	<10	<10	<10	<10	<10	<10	<10

**Pre wet season sampling (October 2008)**

Water quality indicators	Units	Site						
		N1 Dawson R.	N2 Dawson R.	N3 Dawson R.	N4 Dawson R.	N5 Dawson R.	N6 Dawson R.	N13 Bentley Ck
Electrical Conductivity @ 25°C*	µS/cm	402	396	252	233	278	233	273
Total Dissolved Solids (est.)	mg/L	261	257	164	151	181	151	177
Suspended Solids (SS)*	mg/L	30	52	46	70	26	62	78
Turbidity*	NTU	50.0	75.0	55.0	120	45.0	120	70.0
Total Hardness as CaCO3*	mg/L	64	64	48	46	59	46	50
Hydroxide Alkalinity as CaCO3	mg/L	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	mg/L	144	155	93	89	100	87	97
Total Alkalinity as CaCO3	mg/L	144	155	93	89	100	87	97
Faecal coliforms	cfu/100 ml	30	130	60	70	50	50	40
Ammonia as N*	mg/L							
Nitrite as N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	0.07	0.09	<0.01	0.01	<0.01	0.11	<0.01
Nitrite + Nitrate as N*	mg/L	0.07	0.09	<0.01	0.01	<0.01	0.11	<0.01
Total Kjeldahl Nitrogen as N	mg/L	0.8	2.0	2.6	1.4	1.4	1.0	1.1
Total Nitrogen as N*	mg/L	0.9	2.1	2.6	1.4	1.4	1.1	1.1
Total Phosphorus as P*	mg/L	0.20	0.20	0.37	1.84	2.16	0.20	0.71
Reactive Phosphorus - Filtered*	mg/L	0.04	0.07	0.03	0.10	0.11	0.04	0.05
<b>Major ions</b>								
Calcium	mg/L	17	17	13	12	16	13	14
Magnesium	mg/L	5	5	4	3	4	3	4
<b>Total metals</b>								
Aluminium*	mg/L	2.52	3.41	0.46	5.75	0.57	1.64	3.00
Antimony	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic*	mg/L	0.001	0.002	0.001	0.001	0.002	0.002	0.002
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	0.097	0.118	0.080	0.100	0.081	0.091	0.096
Bismuth	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium* <sup>h</sup>	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cerium	mg/L	0.003	0.004	0.002	0.007	0.001	0.003	0.005
Caesium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium* <sup>h</sup>	mg/L	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001

Cobalt	mg/L	<0.001	0.001	<0.001	0.002	<0.001	0.001	0.002
Copper* <sup>h</sup>	mg/L	0.003	0.004	0.003	0.005	0.002	0.003	0.004
Dysprosium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Erbium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Europium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Gadolinium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Gallium	mg/L	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001
Hafnium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Holmium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Indium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lanthanum	mg/L	0.001	0.002	<0.001	0.003	<0.001	0.002	0.002
Lead* <sup>h</sup>	mg/L	0.001	0.002	<0.001	0.002	<0.001	0.001	0.002
Lithium	mg/L	0.006	0.007	0.002	0.004	0.002	0.003	0.004
Lutetium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese*	mg/L	0.042	0.067	0.073	0.116	0.092	0.085	0.129
Molybdenum	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Neodymium	mg/L	0.001	0.002	<0.001	0.003	<0.001	0.002	0.002
Nickel* <sup>h</sup>	mg/L	0.002	0.002	0.002	0.004	0.002	0.002	0.003
Praseodymium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Rubidium	mg/L	0.004	0.006	0.002	0.008	0.002	0.003	0.005
Samarium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium*	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Silver*	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	mg/L	0.328	0.324	0.264	0.250	0.304	0.253	0.275
Tellurium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Terbium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thulium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tin	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	mg/L	0.01	0.02	<0.01	0.02	<0.01	<0.01	0.01
Uranium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Ytterbium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Yttrium	mg/L	<0.001	0.001	<0.001	0.002	<0.001	0.001	0.001

Zinc* <sup>h</sup>	mg/L	0.006	0.009	<0.005	0.014	<0.005	<0.005	0.009
Zirconium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron*	mg/L	0.07	0.06	0.07	<0.05	<0.05	<0.05	0.08
Iron	mg/L	1.77	3.13	0.87	4.32	0.71	1.38	2.81
Mercury*	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<b>Organochlorine Pesticides</b>								
alpha-BHC	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
beta-BHC	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
gamma-BHC	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
delta-BHC	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Heptachlor	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Aldrin	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-Chlordane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-Chlordane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dieldrin	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4,4'-DDE	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Endrin	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4,4'-DDD	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Endrin aldehyde	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Endosulfan sulphate	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4,4'-DDT	µg/L	<2	<2	<2	<2	<2	<2	<2
Endrin ketone	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methoxychlor	µg/L	<2	<2	<2	<2	<2	<2	<2
<b>Organophosphorus Pesticides</b>								
Dichlorvos	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Monocrotophos	µg/L	<2	<2	<2	<2	<2	<2	<2
Dimethoate	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Parathion-methyl	µg/L	<2	<2	<2	<2	<2	<2	<2

Malathion	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenthion	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Parathion	µg/L	<2	<2	<2	<2	<2	<2	<2
Pirimphos-ethyl	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenamiphos	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Prothiofos	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbophenothion	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<b>Phenoxyacetic Acid Herbicides</b>								
4-Chlorophenoxy acetic acid	µg/L	<10	<10	<10	<10	<10	<10	<10
2.4-DB	µg/L	<10	<10	<10	<10	<10	<10	<10
Dicamba	µg/L	<10	<10	<10	<10	<10	<10	<10
Mecoprop	µg/L	<10	<10	<10	<10	<10	<10	<10
MCPA	µg/L	<10	<10	<10	<10	<10	<10	<10
2.4-DP	µg/L	<10	<10	<10	<10	<10	<10	<10
2.4-D	µg/L	<10	<10	<10	<10	<10	<10	<10
Triclopyr	µg/L	<10	<10	<10	<10	<10	<10	<10
2.4.5-TP (Silvex)	µg/L	<10	<10	<10	<10	<10	<10	<10
2.4.5-T	µg/L	<10	<10	<10	<10	<10	<10	<10
MCPB	µg/L	<10	<10	<10	<10	<10	<10	<10
Picloram	µg/L	<10	<10	<10	<10	<10	<10	<10
Clopyralid	µg/L	<10	<10	<10	<10	<10	<10	<10
Fluroxypyr	µg/L	<10	<10	<10	<10	<10	<10	<10
2.6-D	µg/L	<10	<10	<10	<10	<10	<10	<10
2.4.6-T	µg/L	<10	<10	<10	<10	<10	<10	<10
<b>Glyphosate and AMPA</b>								
Glyphosate	µg/L	<10	<10	<10	<10	<10	<10	<10
AMPA	µg/L	<10	<10	<10	<10	<10	<10	<10

\*' indicates WQO is available (DERM 2011, ANZECC 2000), 'h' indicates a hardness correction factor for trigger values of metal concentrations is available (ANZECC 200). 'red value' indicates value exceeds water quality objective