

# Site 036 – Murray Anderson Creek, Ku-ring-gai Chase National Park

Freshwater (Reference) site  
Cowan Creek Catchment

## Monitoring Program Timelines

Program Name (site reference)	Sampling Period	Sampling Frequency
Long-term (036)	Jan 1995 – Sept 2017	Monthly
Ecohealth (MAND1)	Oct 2017 ongoing	Quarterly
Reference (MAND1)	Commence 2019/20	To be determined

## Key Findings and Recommendations

<b>Condition</b>	<p><b>Phys-chem:</b> pH, EC and DO consistently comply with REHVs. Long-term decreasing trend is evident for pH.</p> <p><b>Clarity:</b> Turbidity and TSS are low and consistently comply with REHVs.</p> <p><b>Nutrients:</b> Nutrient levels are low and consistently comply with REHVs.</p> <p><b>Bacteria:</b> Bacteria levels are low and consistently comply with REHVs.</p>
<b>Issues</b>	<ul style="list-style-type: none"> <li>– Long-term reference site due to undisturbed bushland catchment</li> </ul>
<b>Recommendations</b>	<ul style="list-style-type: none"> <li>– Ongoing monitoring for catchment health assessment via the Ecohealth program</li> <li>– Continued monitoring for local reference conditions</li> <li>– Further investigation of the influence of key SE Australian climate drivers on local reference conditions</li> <li>– Review of REHVs and suitability of long-term reference sites using targeted short-term reference site data</li> </ul>

## Site Photos



Murray Anderson Creek looking upstream during high flow



Murray Anderson Creek looking upstream during low flow

## Results of Data Analysis

**Table 1** Results of non-conformance calculations and *Kendall Tau* ( $p < 0.05$ ) trend analysis for Site 036

036	REHV	Long-term				2012-2017			
		n	Median	%NCs	Trend	n	Median	%NCs	Trend
Temp (°C)	NA	269	16.15	NA	NS	61	16.66	NA	NS
pH	4.8-7	270	5.78	10	↓	61	5.44	7	NS
DO (%sat)	75-118	249	99.90	5	↓	61	99.30	0	NS
EC (mS/cm)	0.32	269	0.19	0	NS	61	0.17	0	↓
Turbidity (NTU)	8	270	0.2	2	NS	61	0.3	2	↑
TSS (mg/L)	7	270	1	1	↓	60	1	0	NS
TP (mg/L)	0.01	271	0.003	3	↑	61	0.003	0	NS
TN (mg/L)	0.32	271	0.100	0	NS	61	0.090	0	NS
NH <sub>3</sub> -N (mg/L)	0.02	271	0.010	3	*	61	0.005	0	NS
NO <sub>x</sub> -N (mg/L)	0.05	271	0.010	0	*	61	0.005	0	NS
F.Cols (CFU/100ml)	150	271	6	6	↑	61	14	7	NS

REHV – Regional Environmental Health Value

n - Number of sampling events

%NCs - percent non-conformance based on REHVs

NA - No associated REHV or benchmark value

NS - trend not significant based on Kendall Tau analysis at  $p < 0.05$

↑ - significant increasing trend based on Kendall Tau at  $p < 0.05$

↓ - significant decreasing trend based on Kendall Tau at  $p < 0.05$

\* - trend analysis not appropriate due to change in laboratory detection limit

Median	%NCs
Within or below REHV	<25%
Equal to REHV	25% to 75%
Outside or above REHV	>75%
No associated REHV	Not Applicable

**Table 2** Descriptive statistics for variables measured at Site 036 from January 1995 to September 2017

Variable	Valid n	Mean	Median	Minimum	Maximum	20 <sup>th</sup> Percentile	80 <sup>th</sup> Percentile	Std Dev
Temp (°C)	269	15.86	16.15	6.50	27.15	11.51	20.07	4.155
pH	270	5.77	5.78	4.18	7.58	5.03	6.46	0.724
DO (mg/L)	266	9.94	10.00	4.40	17.55	8.95	11.07	1.482
DO (%sat)	249	98.80	99.90	50.90	200.00	93.81	103.60	11.326
EC (mS/cm)	269	0.16	0.19	0.00	0.40	0.10	0.20	0.060
EC (µS/cm)	112	150.49	157.00	55.00	206.00	121.00	179.00	33.601
Turbidity (NTU)	270	1.0	0.2	0.0	13.7	0.0	1.3	2.03
TSS (mg/L)	270	1	1	1	11	1	1	1.0
TP (mg/L)	271	0.005	0.003	0.001	0.203	0.001	0.006	0.0156
TN (mg/L)	271	0.108	0.100	0.025	0.900	0.060	0.140	0.0702
NH <sub>3</sub> -N (mg/L)	271	0.010	0.010	0.003	0.200	0.005	0.010	0.0161
NO <sub>x</sub> -N (mg/L)	271	0.009	0.010	0.001	0.206	0.005	0.010	0.0135
F.Cols (CFU/100ml)	271	50	6	0	2400	1	42	199.5
E.Coli (CFU/100ml)	19	25	11	1	95	1	62	30.5
Enterococci (CFU/100ml)	33	34	7	1	600	1	32	103.1

# Boxplots showing annual variability for each variable measured



