

INVESTIGATION INTO SUITABLE SWIMMING SITES ON THE COOKS RIVER

Background

In November 2009, the Cooks River Valley Association (CRVA) sought advice from the NSW Minister for Health regarding recreational water quality issues in the Cooks River. In response, NSW Health convened a meeting of stakeholders in June 2010 to discuss these issues including the possibility of investigating sites suitable for swimming. At this meeting Beachwatch agreed to investigate the recreational water quality at a number of potential swimming sites using the National Health and Medical Research Councils Guidelines for Managing Risks in Recreational Waters, in particular Chapter 5 – Microbial Water Quality.

All six sites investigated by Beachwatch in September 2010 had a sanitary inspection category of high due to potential impacts from sewage overflows, local stormwater inputs and upstream river discharge. Microbial water quality was generally poor, with enterococci levels unsuitable for swimming at all but one site (Waterworth Park).

NSW Health convened another stakeholder meeting in July 2013. At this meeting Beachwatch agreed to conduct further water sampling at selected sites in the Cooks River to investigate the suitability of sites for primary contact recreation.

Proposed swimming sites

Three potential swimming sites were sampled: Waterworth Park (Plate 1), Kendrick Park (Plate 2) and Cahill Park (Plate 3), along the Cooks River (Figure 1). These sites were selected from the eight sites previously sampled in 2010, due to the ease of access (Table 1).



Plate1: Waterworth Park



Plate 2: Cahill Park

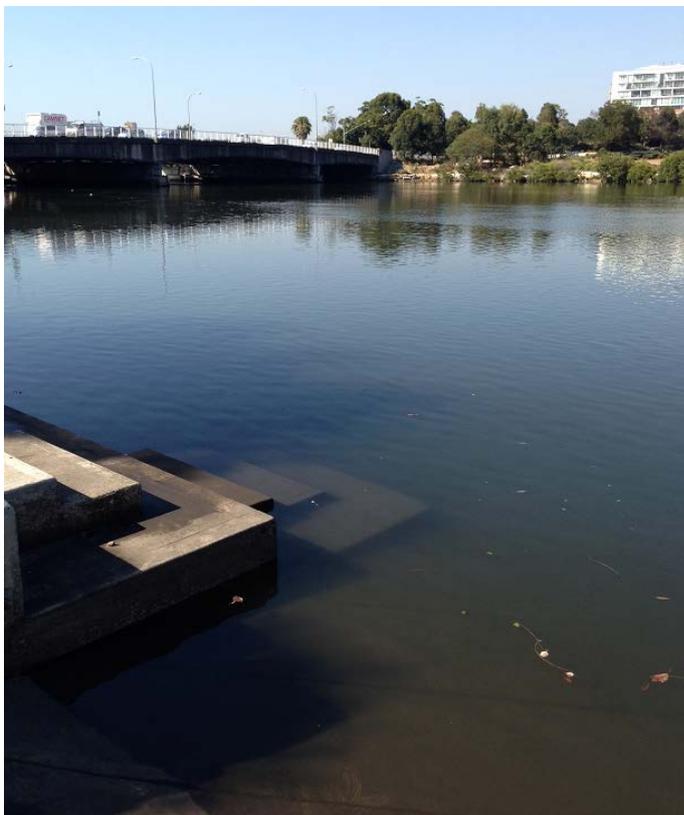


Plate 3: Kendrick Park

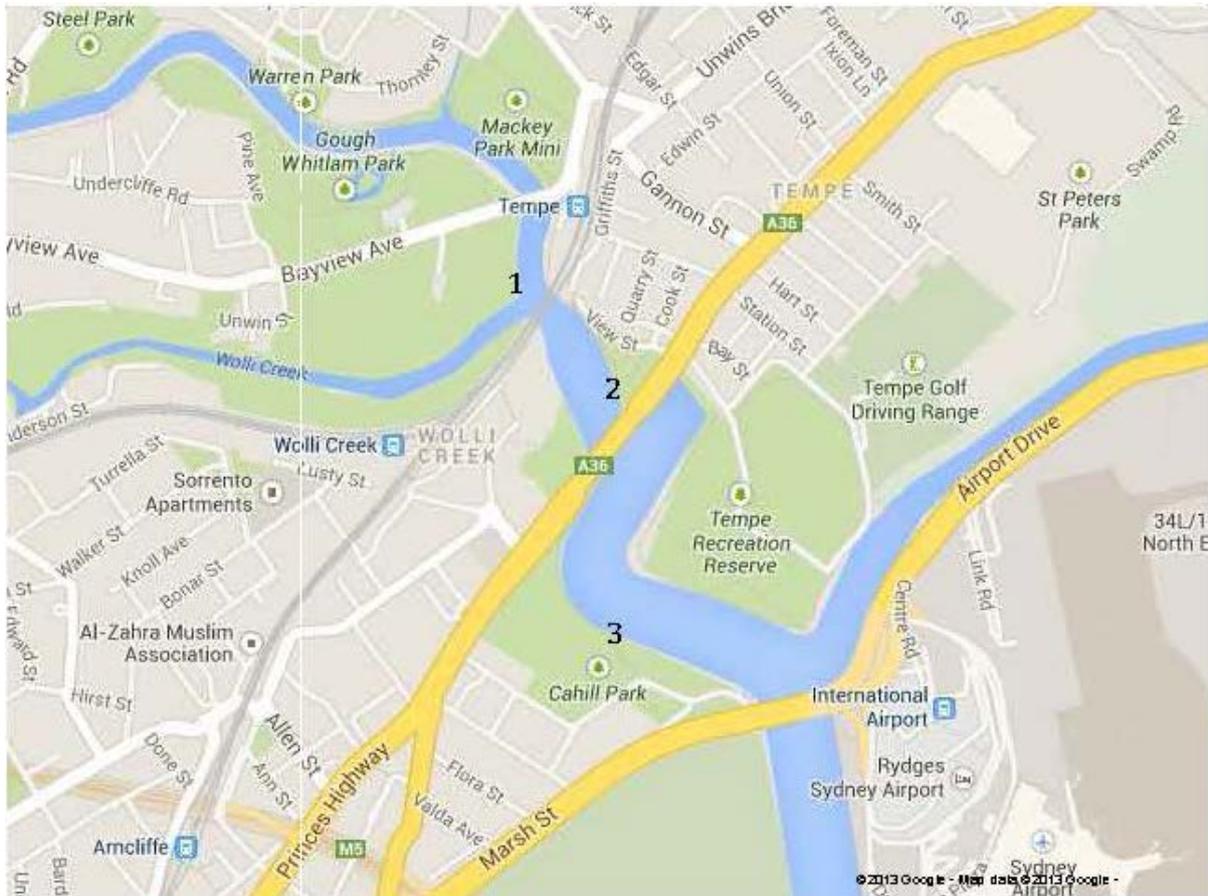


Figure 1: Location of sampling sites

Table 1: Location and accessibility of proposed swimming locations

Site	Location	Access	Facilities
1. Waterworth Park, Tempe	At the junction of Wollongong Creek and Cooks River; entry off Bayview Avenue	Open access to water but mud, rocks, slime and oysters present	No toilets in close proximity to the site
2. Kendrick Park, Marrickville	Immediately upstream of Princes Highway; entry off View Street	Good access via canoe ramp and steps	Toilets close to the site
3. Cahill Park	Entry off Gertrude St, Wollongong Creek	Narrow rocky beach with good access from park but oysters present	Toilets available in Cahill Park

Water sampling

The National Health and Medical Research Council's 2008 guidelines require microbial water quality to be assessed using the bacterial indicator enterococci. Enterococci are present in the intestines of all warm-blooded animal and when found in waterways can indicate the

To provide a snap shot of water quality, the sites were sampled on two occasions (7 and 22 November 2013) following wet and dry weather conditions. No rainfall had fallen in the 13 days prior to November 7. Heavy rainfall had fallen in the week previous to November 22. Two samples were collected from each site on each occasion. Sample 1 was collected as per normal aseptic sampling procedures and Sample 2 was collected after the sediment had been disturbed. Enterococci (and associated pathogens) generally survive for longer periods in fresh waters than marine waters, and longer still in muddy sediment where they are better protected from ultraviolet radiation and have access to nutrients. The second sample was collected to assess the contribution of enterococci from disturbed sediment, which is likely to occur when people enter the water.

Microbial water quality results

Extensive water quality sampling for enterococci was not conducted by Beachwatch as part of this study. The enterococci (cfu/100ml) results presented in Table 2 provide a snap shot of water quality at the proposed swimming sites in wet and dry weather conditions.

Table 2: Microbial water quality at potential swimming sites in wet and dry weather conditions.

SITE	Dry weather		Wet weather	
	Unstirred sediment	Stirred sediment	Unstirred sediment	Stirred sediment
Waterworth Park	27	26	140	200
Kendrick Park	23	20	210	130
Cahill Park	6	8	330	840

While water quality is inherently variable, these data indicate that poor water quality can occur after rainfall with enterococci results exceeding the safe swimming limit of 40cfu/100ml at all three sites. The higher results found with stirred sediments from Waterworth Park and Cahill Park indicate there are likely to be significant levels of enterococci (and any associated pathogens) living within the sediment at these locations. As the sediments would be stirred up by swimmers entering the sites, the results with stirred sediments may more closely represent the water quality experienced by swimmers, particularly those who remain near the shoreline such as small children.

Other site suitability considerations

In addition to microbial water quality, there are a number of other hazards and risks that need to be identified, including physical hazards, dangerous aquatic organisms and chemical hazards.

From the site visits it was apparent that physical hazards may pose a significant risk. Poor water clarity, submerged objects, oysters and strong currents, particularly after periods of heavy rain, were observed. After the rainfall lots of litter, including nappies, plastic bags and bottles, was seen floating on the river and washed up on the shoreline (Plate 4). The risk of swimmers being struck by boats must also be considered with regular boating activity taking place in the section of river near Cahill Park.



Plate 4: Litter on shoreline at Cahill Park

Dangerous aquatic organisms include bull sharks which can thrive in both saltwater and freshwater and can travel far up rivers. They are probably responsible for the majority of near-shore shark attacks, including many attacks attributed to other species. The bull shark is known for its aggressive nature, predilection for warm shallow water, and presence in brackish and freshwater systems including estuaries and rivers, and is likely to be found in the Cooks River.

Given the level of past industrial activity in the catchment, chemical hazards, in particular levels of metals, are likely to be an issue. Extensive sampling of the water and sediment would be required to quantify the risk to human health.

Conclusion

Apart from the microbial hazards investigated in this report, a number of other issues would need to be carefully considered by a local council before promoting a site for swimming, including:

- provision of safe access to water (to prevent slips, trips and falls)
- presence of debris in the water such as logs, oysters and glass
- strong water currents in the lower reaches and potentially in all areas of the river following heavy rainfall
- dangerous aquatic organisms such as bull sharks
- availability of facilities for swimmers and ongoing maintenance costs
- potential risks from chemical hazards in the water and in the sediment such as heavy metals and organics.



COOKS RIVER

Weather Sunny / Overcast : (Fine) / Wet

Date 7 November 2013

Officer Cris Hickey / Meredith Gampy

AM High Tide 1:55 PM at 11:43 AM

Location	Sample*	Time	Drain/Lagoon flow*	Temperature (°C)	Conductivity	No. of swimmer	Surface scum	Leaf litter	Litter	Marine debris	Bluebottles	Weed	Turbidity*	Comments
44. Waterworth Park	1	8:00	-	20.7	49.7	0	some	nil	nil	nil	nil	nil	clear	Esky _____ °C
	2	8:01	-	"	"	"	"	"	"	"	"	"	"	
45. Kendrick Park	1	8:43	-	20.4	51.5	0	film	some	some	nil	nil	nil	low	mercury film on top of water Esky _____ °C
	2	8:44	-	"	"	"	"	"	"	"	"	"	"	
46. Cahill Park	1	9:05	-	20.6	49.9	0	some	some	some	nil	nil	nil	moderate	Esky _____ °C
	2	9:06	-	"	"	"	"	"	"	"	"	"	"	

27

26

23

20

6

2

* sample 1 = unstirred
sample 2 = stirred

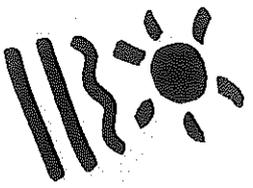
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Check in

#1 Time _____ Spoke to _____

#2 Time _____ Spoke to _____



COOKS RIVER

Weather Sunny/Overcast : Fine/Wet

Date

22 November 2013

Officer

Alb + SL

AM High Tide

1.6m @ 11.46 am

Location	Sample*	Time	Drain/Lagoon flow*	Temperature (°C)	Conductivity	No. of swimmer	Surface scum Foam	Leaf litter	Litter	Marine debris	Bluebottles	Weed	Turbidity*	Comments
44. Watworth Park	1	10.33		20.8	44.4	0			✓				M	Esky _____ °C
	2	10.33		20.8	44.4	0			✓				M	
45. Kendrick Park	1	10.20		21.0	44.8	0		✓	✓				M	Esky _____ °C
	2	10.20		21.0	44.8	0		✓	✓				M	
46. Cahill Park	1	10.51		21.0	33.6	0		✓	✓				M	Esky _____ °C
	2	10.51		21.0	33.6	0								

* sample 1 = unstirred
sample 2 = stirred

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#1 Time _____ Spoke to _____
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