

Risk Considerations for various Open Water Swim Venues

Planning for an Open Water Swim (OWS) needs to consider ongoing pollution following stormwater discharge and history of the venue? The primary concern is consequences from pollution coming from the River Torrens (Torrens) but also from the Patawolonga and Sturt Creek and from the Barcoo outlet and various drains along the coast.

River Torrens

When the Jetty to Jetty commenced a little over 100 years ago the River Torrens did not discharge out to the sea at Henley Beach rather it flooded over the area behind the dune system between West Beach and Tennyson. Some of the flood water flowed through what is now the West Lakes basin and then out the Port River while some of the water flooded across the area now occupied by the Adelaide airport and into the Patawolonga. I imagine the sea between the Henley and Grange jetties was a pristine swimming venue.

In the period 1935 to 1939 the “break out” creek was created from the River Torrens at Fulham, the old river filled in and a discharge through the dunes at Henley Beach was created. This allowed the western suburbs to be drained and settled. Further in 1971 a flood mitigation dam was constructed on the upper reaches for the River Torrens at Kangaroo Creek to minimise flooding throughout the suburbs. Also the River Torrens was straightened and widened from the foot hills to the start of the break out creek to minimise flooding over its banks. While flooding particularly in Adelaide's western suburbs was reduced it meant that for the majority of the time the flow in the river was very low allowing pollutants to build up.

In addition the Torrens Lake in the city has very low flow, due to the Kangaroo Creek dam storing water and this together with urban pollution result in toxic algae blooms growing in the warmer months. Periodically “environmental flows” are released from the Kangaroo Creek dam (typically January to March) to flush out the algae - all of which end up as stormwater discharge at Henley Beach.

Today the suburbs surrounding the River Torrens have filled in - market gardens and factories have been replaced with housing. When there is heavy rain across the city the storm water first flushes the streets and drains and this flows into the Torrens. At about the time storm water flow from the street eases, the flood water from the upper reaches of the River Torrens flows through the city cleansing the Torrens Lake and indeed the whole river by flushing it into the sea at Henley Beach. Storm water flows from the River Torrens may last up to 10 days and it takes approximately a week for the plume of polluted stormwater from the River Torrens to dissipate in the ocean because of the high pollutant load in the stormwater. The pollution from the River Torrens is discharged directly on the Henley OWS course and a little over one kilometre south of the Jetty to Jetty course.

Sturt Creek, Patawolonga and Barcoo outlet

The River Sturt collects storm water from across the south-western suburbs. It was originally a tortuous creek that frequently over flowed its banks flooding the Marion area. The area that was flooded was originally market gardens but from the 1950's the area was subdivided for housing. In the early 1970's the Sturt River was straightened and lined with concrete as a result of property damage caused by flooding. This overcame the flooding problem but the concrete lined drain provided efficient transport of pollutants to the Patawolonga. In addition when the Adelaide airport was built in the 1950's drains around the airport collected stormwater from the south western suburbs from Burnside to Unley (including Waterfall Gully and the City of Adelaide). In the 1990's the Patawolonga was so polluted that a direct drain to the sea had to be created - this is known as the Barcoo outlet. The Patawolonga now fills from the southern end and, along with storm water from the Sturt River and suburbs south and east of the airport, discharges it into the ocean some 300 metres from the beach at Glenelg North. During large inflows the flow of the Patawolonga is

reversed to prevent flooding in Glenelg North and stormwater is allowed to discharge through the southern lock gates.

The design of the Barcoo outlet causes discharge of storm water every 12 hours on the falling tide and while significantly less storm water flows from the River Sturt than the River Torrens it is still a source of pollutants just 1.5 kilometres south of the OWS Championship venue and 4.5 kilometres south of Henley Beach jetty.

While there has not been the need to cancel the OWS Championship, the water is frequently cloudy indicating dispersed stormwater pollutants. However the Proclamation Day swim was recently cancelled due to stormwater discharge from the southern lock.

Onkaparinga River

The Onkaparinga River is one of the least polluted rivers flowing from the Adelaide Hills. It flows through mainly rural catchments and has no significant pollution load in its discharge. The sewage settlement ponds that existed approximately 2 kilometres from the river mouth were demolished in 2015. The Onkaparinga does carry a sediment load in storm flows which may cause turbidity but poses little health risk.

West Lakes

West Lakes was created from a low lying salt flat and swampy area that originally extended from the upper reaches of the Port River to the River Torrens flood plain at Henley Beach.

Swamp reclamation commenced in 1970. A man made lake, six metres deep along the rowing course was created. A pipe was built to carry sea water one way from the Gulf St Vincent into the lake with discharge into the Port River at Bower Road across a weir, set at mean sea level. The time lag between high tide in Gulf St Vincent and the upper reaches of the Port River allows a continuous flushing of sea water through the lake. The lake was first filled in 1974. The lake was originally designed to receive storm water run off from the surrounding areas. In 1985, it was recommended that signs be posted warning residents of the dangers of swimming in polluted lake water. It was found that storm water runoff from adjacent golf courses and new housing subdivisions was putting a high nutrient load in the water causing algae blooms, decreasing dissolved oxygen in the water and polluting the lake. Storm water runoff pollution has since been significantly reduced with low nitrate and phosphate fertilisers on golf courses and through treating and recycling storm water runoff.

The Port River Sewage Treatment works built in 1935 on the north eastern end of the lake discharged treated water into the Port River north of the Bower Road weir while sludge was dried and buried on site. With the construction of West Lakes in 1977 the sludge was excavated and disposed of as fertiliser filler. The sewage treatment works was closed in 2004 with all waste water now being pumped to Bolivar.

Under normal tides the lakes entire volume changes every three days. Around low tide the volume of water flowing through the lakes will be lower resulting in the lake and with high temperatures the lake may become more saline than the incoming sea water. In extreme case low flow may result in a reduction in dissolved oxygen that may cause distress (and death) to marine life but is generally not harmful to humans.

Other Drains

There are other locations where storm water is collected local drains that then flush pollutant onto OWS courses. The size of the drain catchment determines the volume of stormwater discharge on any course. Drains that are of concern for current OWS courses include Edwards Street Brighton, Young Street, Brighton, Pier Street, Glenelg and, Broadway, Glenelg.

Rainfall patterns

Historic rainfall records show that the highest intensity rainfall in Adelaide occurs between November and March due to tropical lows developing from remnants of cyclones across northern Australia. The high intensity rainfall flow through out the River Torrens, Sturt River and Onkaparinga Rivers results in short duration (2 to 3 days) but high volume stormwater flows. The rainfall patterns allow pollutants and rubbish to accumulate over Spring only to be flushed with stormwater from summer storms.

Conclusion

There is a risk of serious illness or death due to the pollutants which can carry bacteria, viruses and pathogens in stormwater onto some OWS courses.

Masters Swimming South Australia and affiliated Clubs need to assess the risks with continuing with the historic swims at their current venues given the pollution potential at these locations outlined above. In the past five years the Jetty to Jetty has water quality was doubtful on at least two occasions while the events that have been cancelled due to pollution on the course were the Charles Sturt Challenge (2014) the Brighton Jetty Classic (2012), Pink Swim (2016) and Proclamation Classic (2016) .

Similarly the venue for the OWS Championship may be relocated given the potential for pollution from the Barcoo outlet while the venue for Seacliff and Pub to Pub swims may on occasion be need to be modified as the courses are occasionally subject to pollution from the Edwards and Young Street drain.

Alternative venues where water may be safer for OWS include Somerton Beach to Glenelg South; Semaphore Jetty to Larges Jetty (approximately 1.7km), West Lakes and southern patrolled beaches such as Moana or even further away on Yorks Peninsula. Like all Open Water Swim venues, they are still subject to a 3 day clearing period after stormwater discharge but offer a far less polluted venue for open water swims due to the limited storm water discharge near these venues.

Finally OWS venues have been selected in the past because of historic association and because of relationships built up with Surf Life Saving Clubs. It is not easy to make changes under these circumstances but the overriding consideration is the safety of swimmers and risk to Masters Swimming from sickness or death due to stormwater pollution of OWS courses.

Written by John Middleton for consideration of Masters Swimming South Australia.
Reviewed with addition of commentary on West Lakes - January 2018