Attachment 1
to
Item 4.5.1

Macquarie Park – Aquatic Safety Assessment

Date of meeting: 11 July 2023
Location: Council Chambers
Time: 6:30 p.m.

Aquatic Safety Assessment

Hawkesbury City Council
Macquarie Park

ROYAL LIFE SAVING
NSW | ACT | TAS

AQUATIC RISK SERVICES

Royal Life Saving works with the Australian aquatics industry to improve industry safety and risk management standards.

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PUBLISHING INFORMATION

Published by: Royal Life Saving NSW
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DOCUMENT CONTROL

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	Name, Title	Date
Prepared by	Nicholas Au, Aquatic Risk Services Manager Royal Life Saving NSW | ACT | TAS	February 2023

VERSION CONTROL

Title	Version Number	Amendment Summary	Date
Aquatic Safety Assessment for Macquarie Park	V1.0	**Original**	24th February 2023

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Foreword

Royal Life Saving Society – Australia (RLSSA) is a specialist service provider in the field of aquatic risk management. Since its inception in 1894, RLSSA has worked to harness the strengths of the communities we work with to reduce drowning and aquatic related injuries in, on and around water.

Throughout Australia, inland water environments continue to experience a dramatic increase in patronage, climate change, and the rise in temperature throughout the summer periods have driven people to seek out aquatic locations. The global push for responsible use of natural resources and environments have also led to an increase in natural inland recreational locations.

These contributing factors highlight the need for a greater understanding of inland water environments. The flat, still surface of an inland waterway can give a false sense of security and often hide features and conditions such as currents, undertows, or submerged objects, making them potentially dangerous. Conditions in our inland water environments can change unexpectedly, and this can lead to severe consequences for the unprepared. Therefore, the formulation and implementation of risk management policies are essential to maintaining an efficient and safe aquatic environment for the community.

Through the Aquatic Risk Services Team, Royal Life Saving NSW (RLSNSW) can assess inland water environments such as lakes, rivers, and dams, proposed or currently utilised by the community, for recreational activities and assist in developing risk management strategies. In doing so, RLSNSW aims to mitigate potential loss and provide recommendations to ensure public safety in, on, and around inland waterways.

Disclaimer

The RLSNSW Aquatic Safety Assessment aims to provide clear advice regarding good practice for water safety and is based upon existing standards and risk management principles. Treatment options included in this report are guiding recommendations only and represent the opinion of RLSNSW in relation to water safety at Macquarie Park.

Hawkesbury City Council should determine what additional risk mitigation strategies may be required for Macquarie Park. Hawkesbury City Council should also evaluate the recommendations made within this report and determine their appropriateness and feasibility based on their own assessment of risk. RLSNSW accepts no duty of care or liability to the land managers or any other third party for any loss suffered in relation to the use of this report.

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Contents

Executive Summary

This report identifies, analyses, and evaluates the current risks associated with recreational swimming and other aquatic activities at Macquarie Park.

Many of the site's visitors may be unaware of hazards specific to the aquatic environment. By allowing RLSNSW to undertake this risk assessment and treatment plan, Hawkesbury City Council is taking a proactive approach to determining appropriate risk mitigation actions to help prevent foreseeable loss of life and injury to visitors recreating at Macquarie Park.

This report contains recommendations specific to current standards and best practice regarding risk management and signage pertinent to the characteristics and designed applicative use of Macquarie Park.

Activities/Facilities

Macquarie Park sits on the northern bank of the Hawkesbury River, opposite Howe Park. The park is divided into two distinct sections: a formal picnic ground with grassy spaces, picnic tables, a children's playground, sheltered picnic areas with barbecues and public restrooms, and a restaurant and kiosk that is privately leased. The second section features a more natural bushland setting, with a sandy beach that wraps around much of the shoreline and is popular for swimming, kayaking and canoeing. Additionally, there is a large, open grassy area to the north of the park that is utilised for casual sport and special events.

Hazards/Risks

The river under assessment has several consistent hazards due to the area's geography and high-energy nature, these are outlined in detail in the Risk Register *(pg.35).* Based on the risk assessments, the following hazards have been rated with the greatest inherent risk for Macquarie Park:

- Shallow water/deep water
- Sudden changes in depth
- Marine life
- Collison/impact between swimmers and watercraft
- Vegetation
- Changing weather conditions
- Water temperature
- Water quality/condition
- UV exposure
- Visitation numbers / overcrowding / exceeding capacity
- Foreshore/steep banks
- Risk-taking behaviour
- Alcohol and drug consumption
- Lack of swimming ability/water safety knowledge
- Inadequate parental supervision
- Child safety
- Unsupervised use/swimming or recreating alone
- User demographics
- CALD visitors
- Unstructured activities

It has been identified that the hazards listed above pose a risk to the following types of recreational users:

- Children
- Young Males (15-29 years)
- People aged 18-44 years
- Older People (55+ Years)
- CALD groups
- Tourists
- Bystanders/walkers
- Swimmers
- Inexperienced swimmers
- Non/weak swimmers wading through the water
- Watercraft users

Summary of Key Recommendations

- Establishment of a Public Water Safety Management Plan
- Establishment of an Emergency Response Plan
- Emergency Response Systems and Equipment
- Designated Swimming Area
- Installation of Public Amenities
- Targeted Public Awareness and Education Strategy
- Water Quality
- Provision of Publicly Accessible Rescue Equipment
- Provision of Supervision
- Systems of Safety Signage

Introduction and Scope

Recreational activities such as swimming, is a popular pastime in Australia. With the rise of warmer weather over past summers due to global climate change, more Australians are seeking out water environments to escape the heat. Inland waterways used for swimming and recreation, such as rivers, provide users with the opportunity to experience an array of physical and social benefits. However, enjoying inland waterways has risks and the need to maximise user safety in and around inland waterways is of the utmost importance.

In 2021/22 river locations were ranked as the top location for drowning in Australia and accounted for 34% of overall drownings. Of the 114 drowning deaths that occurred in river locations, 15% of drownings involved swimming and recreation, 10% involved boating and 12% involved an unintentional fall into water. By reducing the probability of aquatic recreation injury and unintentional fatal drownings, the Hawkesbury City Council is taking a proactive approach to maintaining a safe and efficient aquatic environment at Macquarie Park.

This Aquatic Safety Assessment has been prepared following a series of on-site risk assessments at Macquarie Park. Site visits were conducted on:

- Friday, the 3rd of February 2023 between 12pm- 3:30pm
- Saturday, the 4th of February 2023 between 10:30am – 3:00pm.
- Thursday, the 16th of February 2023 between 10:15am – 12:30pm.

The site visits were undertaken by RLSNSW with the aim to gain a better understanding of the environment, visitation demographics and numbers, as well as the activities conducted at Macquarie Park.

This assessment identifies hazards and the associated risks of the river under assessment, including but not limited to signage, car parks, access tracks, service provision, geographical and geological hazards, user groups, conflicting activities and usage. The report also identifies facilities and activities that encourage people to visit the location.

RLSNSW assessed the following in detail:

- Access locations, classifying these as formal or informal access tracks and recommending treatment options.
- Signage that should be implemented in conjunction with an audit of any current signage.
- Hazards, potential risks, risk groups, risk scores and treatment options.
- Public rescue equipment that should be implemented, in conjunction with an audit of any current public rescue equipment.
- Facilities and points of interest that may attract members of the public to the aquatic location.

The Treatment Plan has been compiled by Nicholas Au, Royal Life Saving Society NSW - Aquatic Risk Services. The report provides treatment recommendations to improve risk and safety management in line with current risk management best practice and signage standards.

Risk treatments are guiding recommendations only and represent the opinion of RLSNSW in relation to water safety at Macquarie Park. Recommendations reflect the observations on the date/s of inspection only. Hawkesbury City Council should observe the recommendations made by RLSNSW over an extended period to ensure a complete understanding of the aquatic environment at Macquarie Park and the activities undertaken. Hawkesbury City Council should determine which Risk Treatments are implemented to create a safer recreational water environment in consultation with key stakeholders.

The geographical scope of this assessment extended approximately: **583 metres along the reserve foreshore**.

(Figure 1 on page 10 provides an overview of the assessment area.)

Stakeholder Interviews

Consultation took place with the following stakeholders to ensure transparency in the reporting process and as a mean to obtain local knowledge and background on the inspected area:

- Sean Perry, Hawkesbury City Council
- Christopher Amit, Hawkesbury City Council
- Conrad Webb, Hawkesbury City Council

- David Catt, Hawkesbury City Council
- Chief Inspector Peter Jenkins, Hawkesbury Police Command

Situational Analysis

A situational analysis was conducted to develop a broader understanding of Macquarie Park and the swimming area. The analysis aimed to collect data on how the river and reserve are used, the intended purpose of site, previous and proposed developments, and previous incident history at the site. The situational analysis and risk register are limited to observations and information made available to RLSNSW at the time of the assessment.

River and Reserve Identification

Hawkesbury River

The Hawkesbury River estuary marks the northern boundary of the Greater Sydney Metropolitan region and the southern boundary of the Central Coast region of New South Wales. The river is the second largest coastal catchment in the state, starts where the Grose and Nepean Rivers join at Yarramundi and flows more than 100 kilometres before entering the ocean via Broken Bay and Pittwater.

The upper section of the Hawkesbury River flows through the Hawkesbury Local Government Area, from Wisemans Ferry to Yarramundi, a total length of around 76km.

The area around the upper river boasts a unique landscape. From the junction of the Grose River to Lower Portland, the riverbed is comprised of sand. In the vicinity of Windsor, the river takes on a meandering form with expansive floodplains. There are also numerous lagoons and floodplain wetlands, such as Pitt Town Lagoon and Long Neck Lagoon, which serve as vital habitats for birds and are listed on the National Estate registry. Downstream from Windsor to Sackville the river is broad and deep, with flat, cleared and cultivated banks.

The Hawkesbury River has a rich and diverse history dating back to the indigenous peoples who lived in the area for thousands of years before European settlement. The Darug people were the traditional custodians of the Hawkesbury River and used the river for fishing, transportation and cultural activities.

After European settlement in the late 18th century, the Hawkesbury River became an important resource for the growing colony. The river was used for agriculture, fishing and transportation, and it played a key role in the development of the region. Over time, the Hawkesbury River has faced a number of challenges, including water pollution, flood damage and declining water quality but efforts have been made to preserve and improve the health of the river.

Today, the Hawkesbury River remains an important resource for the communities which it encompasses and is a popular destination for recreational activities such as boating, kayaking, fishing and swimming.

Macquarie Park

Macquarie Park is a 24-hectare park located in Windsor, New South Wales, on the northern bank of the Hawkesbury River. The park is accessible by crossing the Windsor Bridge and turning left at the roundabout on Wilberforce Road. It offers ample parking, toilets, a cafe, a sandy beach along 1.4 km of riverbank, a children's playground and picnic facilities. The park was once a privately owned picnic area but was purchased by the Colo Shire Council in 1955 for public recreational use.

The park has a rich history dating back to 1795, when Richard Turner was granted 30 acres of land along the Hawkesbury River. However, he failed to fulfil the requirements of the grant and the land was taken from him. It was later bequeathed to an orphan school by Lieutenant Braithwaite, but the proceeds were secured by solicitors for over 100 years. In 1930, Torrens Title was granted to Captain Edmund Lawrence Braithwaite. The advent of the motor car and the opening of the Windsor Bridge in 1874 made the site a popular picnic spot. A local farmer, Frank Woods, leased the land and established the Macquarie Beach Picnic Ground, which was very popular until the land was sold to Matthew Johnston in 1930. Johnston constructed Macquarie Park House which was later destroyed by floods and a fire.

In the 1960s, the land was leased from Colo Council and a caravan park was developed, which served the district for over 10 years. During the 1970s, the park was closed due to flood damage to the banks, but Hawkesbury Shire Council took over the management of the area in the 1980s and refurbished the park house for use as a restaurant. After a fire in 1993, the house was fully refurbished and now serves as a popular seafood restaurant on the first floor and a cafe on the ground floor.

Today, Macquarie Park has become a well-liked spot among both residents and visitors, who take advantage of its natural reserve for various leisure activities like barbecuing, picnicking, and engaging in water sports like kayaking and fishing. The section of the river's western banks within Macquarie Park, referred to as "Windsor Beach," remains a favoured spot for recreational swimming. It is worth noting that Google Maps has now incorporated the unofficial name "Windsor Beach" into its keyword search function, making it easy for commuters to find the location.

Although a popular destination for recreational swimming, it must be noted that Hawkesbury City Council does not promote or encourage the provision of recreational swimming at Macquarie Park.

Image 1. *Macquarie Park, Windsor*

Land/Water Manager and other Key Stakeholders

Hawkesbury City Council is a local government area located in the Greater Western Sydney region of New South Wales, Australia. The council is the largest local government area by landmass in metropolitan Sydney, covering an area of 2,793km2. It was established in 1989 and encompasses the suburbs of the Hawkesbury region including Richmond, Windsor, and parts of Kurrajong.

Hawkesbury City Council is responsible for providing services and facilities to the local community, including waste management, road maintenance, planning and development, community services, and recreation facilities. The council also works to maintain and improve the local area through environmental conservation, community engagement, and economic development.

Macquarie Park is one of many reserves managed by the council and is made up of both Crown and Council land. The council oversees Macquarie Park, including the lease of Macquarie House, which operates as a restaurant and café, known as the Macquarie Park Boathouse Café and Restaurant. The restaurant is open seven days a week, with different hours of operation between Monday and Friday, Friday and Saturday, and Sunday. On weekdays, it is open from 11am to 3pm, on Friday and Saturday evenings it operates from 5pm to 8pm, on Sundays it is open from 11am to 4pm.

Council staff attend the site daily, ensuring facilities are maintained and cleaned. The council has an Asset Management Plan for all assets and a Plan of Management for the park, which is currently being updated.

Windsor Canoe Club is a recreational club based out of Macquarie Park and is dedicated to promoting the sport of canoeing and kayaking. The club was founded in 1997 by a team of keen paddlers and has a long history of providing opportunities for people of all ages to participate in the sport. The club offers a variety of training programs including paddling lessons, safety courses, and fitness classes.

In addition to recreational activities, the Windsor Canoe Club is also active in competitive paddling and regularly hosts races and regattas. The club has a strong tradition of producing successful athletes and has helped to develop some of the country's top paddlers.

The club's facilities located at Macquarie Park include storage sheds, and a clubhouse which is leased from Hawkesbury City Council. The club utilise the watercraft launch facility at Macquarie Park.

Hawkesbury Police Area Command (HLAC) is situated in the North Western Metropolitan Region and within the Hawkesbury City local government area. The command shares borders with several Local Area Commands including Penrith, Quakers Hill, The Hills, Brisbane Waters, Chifley, Mudgee, Hunter Valley, and Lower Hunter. The HLAC encompasses an estimated 49 townships that are spread over a large area.

During the summer months, the large number of people engaging in recreational activities on the river attracts incidents of stealing, anti-social behaviour, assaults, and malicious damage to property. Boating accidents resulting in serious injury and death have also occurred. The volume of river users during this period requires police to utilise the Waterways Authority and the Police Launch for high-profile patrolling and attendance.

Population, Tourism, and Visitation

Population, tourism, and site usage data is an important consideration when evaluating and predicting visitation trends. Increased visitation to the reserve and river under assessment relates to an increase in the probability of an event occurring and should be considered when determining suitable risk treatment options.

Hawkesbury City Council has developed a Destination Management Plan as part of its Business Recovery Plan in response to the recent impact on the Hawkesbury LGA from fires, floods, and the COVID-19 Pandemic. The plan aims to help the Hawkesbury area recover and build resilience in the visitor economy sector. Although the plan does not specifically address visitation data for Macquarie Park, it does identify the Hawkesbury River as a draw card to the region.

Visitation analytics relevant to the site under assessment are not only useful for estimating future planning, environmental conservation, and commercial revenue, but they can also assist with public safety and education. Collecting and analysing visitation data such as;

visitor demographics (international/domestic tourist, locals, etc); reason for the visit; activities undertaken; frequency of visit/s; and average time spent at/on the river, may help identify appropriate risk treatment strategies to improve visitor safety in, on, and around the water.

The following tables give a snapshot of the population growth, domestic and international overnight visitors, domestic day-trippers within the Hawkesbury LGA and hospitality venues within a 5km radius Macquarie Park.

Population 2021

People	Hawkesbury	New South Wales	Australia
Male	33,461	3,984,166	12,545,154
Female	33,755	4,087,995	12,877,635

Table 1 – Population/People (Census 2021), Australian Bureau of Statistics

Age

People	Hawkesbury	New South Wales
0-4 years	4152	468,056
5-9 years	4,238	500,810
10-14 years	4,459	501,135
15-19 years	4,391	457,896
20-24 years	4,245	496,185
25-35 years	8,837	1,142,024
35-44 years	7,913	1,103,169
45-54 years	9,179	1,016,942
55-64 years	8,649	961,783
65-74 years	6,363	788,727
75+ years	4,774	635,414

Table 2 – Age, All People (Census 2021), Australian Bureau of Statistics

School Attendants

Type of educational institution attending	Hawkesbury	New South Wales
Preschool	1,562	167,196
Primary	5,662	651,375
Secondary	4,440	512,195

Table 3 – Type of educational institution attending, All People (Census 2021), Australian Bureau of Statistics

Country of Birth (Top Responses)

Country	Hawkesbury	New South Wales
Australia	55,330	5,277,497
England	2,174	231,385
New Zealand	804	118,527
India	2,105	208,962
Malta	490	13,491
Philippines	343	106,930

Table 4 – Country of Birth (Top Responses), All People (Census 2021), Australian Bureau of Statistics

Language Used at Home (top responses other than English)

Language	Hawkesbury	New South Wales
Maltese	572	10,377
Punjabi	339	53,460
Italian	285	64,039
Arabic	259	227,243
Cantonese	235	148,943

***Table 5** – Language used at home, top responses (other than English), All People (Census 2021), Australian Bureau of Statistics*

Visitor Nights by Reason for Trip

Purpose	Domestic overnight visitors' trips – by purpose	International overnight visitors' trips – by purpose
Visiting Friends/Relatives	963,403	293,815
Holiday	1,039,392	255,207
Business	306,136	N/A

***Table 6** – Domestic nights in Hawkesbury by reason for trip (total trips 2014/15 to 2019/20), Hawkesbury City Council – Destination Management Plan 2022-2024*

Domestic Day Trips to Hawkesbury City

Year	Domestic Day Trips
2015/16	936,839
2016/17	760,762
2017/18	861,051
2018/19	935,424
2019/20	794,137

***Table 7** – Domestic day trips to Hawkesbury 2015/16 to 2019/20, Hawkesbury City Council – Destination Management Plan 2022-2024*

Hospitality Establishments within a 5km Radius of Macquarie Park

Restaurants	Cafes/Takeaways	Pubs/Bars	Hotel/Motels (Excluding Airbnb's)
10	24	10	7

***Table 8** – Hospitality establishments within a 5km radius of Macquarie Park, Google Maps.*

Visitor trends to the Hawkesbury River

In 2022, the Royal Life Saving Society Australia conducted a mapping project of key aquatic locations across Australia to learn what locations people are visiting, the distance people travel and how long they stay there, to better understand visitation and exposure trends and where we could be targeting education and prevention strategies.

The Hawkesbury River was one of three key locations across Sydney that were monitored for exposure and visitation.

Visitor Type	Locals and Commuters
Home LGA	Parramatta Hills Shire

	Blacktown
Average Age	25-44 years
Time of day visiting	Between 12-6pm
Average hours spent at location	1.7 hours
Activities around water	Swimming

***Table 9** – Location and Visitation, RLSSA – Western Sydney Drowning Report 2011-2021*

By reviewing the Hawkesbury's Census data, combined with research conducted by Royal Life Saving on drowning, Hawkesbury City Council may be able to profile match high risk user groups, which will assist the Council in developing future drowning prevention and water safety strategies.

Cultural Diversity

The culturally diverse population of Western Sydney, which encompasses a large and densely populated region featuring waterways such as rivers, lakes, creeks, streams and swimming pools, is largely youthful. Given the growing population, it is crucial to employ a variety of approaches to enhance water safety knowledge and skills, and to ensure that the residents have access to secure environments for swimming and water safety activities.

Based on the 2021 Census data, the Hawkesbury Region has a diverse cultural population across the LGA. People may come from countries or families where their interaction around water has largely been for work or everyday life, household activities or religious ceremonies and not for leisure, as is the norm in Australia.

Additionally, there may be a gap in understanding of swimming and water safety skills and knowledge between children born and growing up in Australia and their parents who may have had less exposure and opportunities to engage with aquatic locations and activities since moving to Australia.

Research has reported that adult migrants know the importance of swimming and water safety lessons for their children. However, many adults do not prioritise swimming for themselves, especially if they are already paying for their children to be attending lessons.

It is therefore important Hawkesbury City Council raise awareness and knowledge of water safety education for all communities and ensure that everyone can access and understand safety messages.

Facility Visitation Rate – Calculation

The Facility Visitation Rate (FVR) is a quantitative assessment system adopted by Royal Life Saving NSW to determine the most appropriate signage schedule for a facility (venue or location). The FVR system was developed for Local Government by State-Wide Mutual as 'Best Practice' for Signage as Remote Supervision (2007).

The FVR is calculated using data collected during the assessment process and includes site population use and frequency of use. Since the FVR calculation is used to determine aquatic recreational warning signage requirements, the figures used are those of the peak period of river usage.

The following information is used to calculate the FVR:

1. Stakeholder observation, consultation, and feedback
2. Historical statistical data
3. Observational data collected during the site assessment; (observational data should be collected during peak summer period).

The Facility Visitation Rate is calculated using the following formula:

Facility Visitation Rate = (Development x Population) + Frequency

Development* = the level of facilities and infrastructure that exist within or about the facility.

Population = the average number of people that use the facility at any point in time**.**

Frequency = the number of times that the facility is used by patrons**.**

Using this formula, an FVR rating of 20-26 was devised for the assessed site.

Name of Site	FVR
Macquarie Park	**23**

*Note: *Development ratings were calculated with reference to appendix B on page (pg.49).*

FVR	General Sign Description	Location
2-3	No sign required	
4-6	The sign should contain: • The name of the facility • A general warning message • All Council regulations that apply to the facility should appear on the sign as prohibition pictograms • Any information symbols relevant to the facility NB. Given the low rating of or absence of risk the sign does not require the depiction of warning symbols.	A sign should appear in a prominent position within the facility.
7-10	The sign should contain: • The name of the facility • A general warning message • All Council regulations that apply to the facility should appear on the sign as prohibition pictograms • Any information symbols relevant to the facility • All potential hazards identified within the facility that have a risk rating of HIGH should appear on the sign as warning symbols. If no HIGH's, then the top hazard should appear.	A sign should appear at all entrances to the facility provided by Council.

11-15	The sign should contain: • The name of the facility • A general warning message • All Council regulations that apply to the facility should appear on the sign as prohibition pictograms • Any information symbols relevant to the facility • All potential hazards identified within the facility that have a risk rating of HIGH should appear on the sign as warning symbols. If no HIGH's, then the top two hazards should appear.	A sign should appear at all entrances to the facility provided by Council.
16-20	The sign should contain: • The name of the facility • A general warning message • All Council regulations that apply to the facility should appear on the sign as prohibition pictograms • Any information symbols relevant to the facility • All potential hazards identified within the facility that have a risk rating of HIGH should appear on the sign as warning symbols. If no HIGH's then the top three hazards should appear.	A sign should appear at all entrances provided by Council to the facility. Consideration should be given to placing signs in other areas of high use.
20-26	The sign should contain: • The name of the facility • A general warning message • All Council regulations that apply to the facility should appear on the sign as prohibition pictograms • Any information symbols relevant to the facility • All potential hazards identified within the facility that have a risk rating of HIGH should appear on the sign as warning symbols. If no HIGH's, then the top four hazards should appear.	A sign should appear at all entrances provided by Council to the facility. Consideration should be given to placing signs in other areas of high use.
27-30	Council should consider full time supervision whilst the facility is occupied, as well as the display of warning symbols. The level of risk is such that the installation of a sign alone warning people of the hazards would not be the most appropriate risk reduction technique. A combination of both supervision and signage is the most appropriate approach. Whatever level of supervision Council elects, the supervisory body must be experienced and trained for the activity.	In addition to supervision consideration should be given to placing signs at the entrance and in other highly visible areas within the facility.

Current and Proposed Developments

Macquarie Park has undergone numerous improvements aimed at enhancing the communities experience and connection with nature. Key upgrades include:

Road Improvements: In 2020, road upgrades were completed including the construction of a roundabout at the Freemans Reach Rd/Wilberforce Rd intersection and the widening of the Macquarie Park entrance. These enhancements have improved connectivity and access to Macquarie Park for drivers, cyclists, and pedestrians.

Park Upgrades: The council has made several improvements to Macquarie Park, including an upgrade of playground with shade structures, picnic tables, and a BBQ area near the play area in 2010-2012. In 2016, a fixed non-powered boat launching facility with a ramp was built as part of the NSW Boating Now program, improving access to the Hawkesbury River. The council has also recently carried out modifications and maintenance of the roads and parking around the park.

Specific information associated with future development plans for Macquarie Park was not made available to RLSNSW during the situational analysis.

Any existing and future development plans should consider the impact of increased visitation, usage and public safety around the aquatic environment. Possible treatment options such as water safety advocacy campaigns, communication equipment, adequate changing and showering amenities, and water safety signage should be considered part of the planning process.

Incident History

Over the past five years, there have been 481 drowning deaths in New South Wales waterways, with a high number of these deaths occurring within inland environments (rivers/creeks).

The 2021/2022 Royal Life Saving National Drowning Report recorded one hundred and twenty-five (125) drowning deaths in New South Wales. Out of the one hundred and twenty-five (125) recorded drownings:

- 83% of those who drowned in New South Wales were males
- 47% occurred in inland waterways (rivers, creeks, and lakes)
- 21% of the drownings occurred during swimming and recreation, while 8% were due to the person/s falling into the water
- 44% of drownings occurred in summer.

Drowning deaths occur every year in rivers around the state, including the Hawkesbury. A total of eleven (11) water-related deaths have occurred on the Hawkesbury River between 2019 - 2023. Data was provided by Hawkesbury City Council and Hawkesbury Police Area Command during the assessment process. Of the 11 water-related deaths:

- Males accounted for all eleven (11) incidents

- 80% of the victims were not residing in the Hawkesbury LGA
- The average age was 26-51 years
- Risk taking behaviour contributed to 80% of the incidents
- 72% of incidents occurred in summer
- Three (3) of the water-related deaths occurred at Macquarie Park.

According to previous research conducted by the Royal Life Saving Society Australia (RLSSA), the Hawkesbury River is the country's fifth most dangerous river due to the number of aquatic related incidents/drownings which have occurred year after year.

A recent study conducted by RLSSA into unintentional fatal drowning of Western Sydney residents identified the Hawkesbury in the top ten Local Government Areas where Western Sydney residents drowned between 2011 – 2021. The study further identified, out of the 196 people who drowned over the 10-year analysis, 29% of drowning deaths among Western Sydney residents occurred at an inland waterway location. Of those, the highest number occurred at the Hawkesbury River, followed by the Parramatta and Georges Rivers.

A further breakdown of the inland waterway drownings identified:

- Males accounted for 86% of the drowning deaths
- 32% were aged between 25-34%
- 23%were aged 55 years and over
- 45% were born overseas
- 32% were swimming and recreating prior to submersion
- 16% were boating
- 13% were unintentional falls into the water
- 48% recorded alcohol (50% recorded BAC $\geq$0.05%)

Past incident history is not always indicative of future incident prediction. However, a review and assessment of incident data may identify environmental trends which may encourage/discourage recreational activities; impact hazard/risk perception and risk-taking behaviour; identify higher-risk conditions for types of localities and specific 'Black Spot' locations; and provide a quantifiable measure of the effectiveness of the current and proposed safety systems for Macquarie Park.

Flood History

Due to its proximity to the Hawkesbury River and its tributaries, the Hawkesbury Local Government Area (LGA) has experienced significant flood events throughout its history.

The Warragamba Dam is located in a narrow gorge on the lower section of the Warragamba River, 3.3 kilometres upstream from where it joins the Nepean River near Wallacia. The catchment area upstream of the Warragamba Dam contributes around 80% of the total catchment to Penrith and 70% to Windsor, making it a significant factor in the valley's flooding. The dam plays a crucial role in flood management as it can hold back inflows during floods when its storage level is low. However, during large rainfall events, the dam

can quickly fill and overflow if the storage level is near capacity, and it cannot hold back the inflows. The most significant floods in the area's history have occurred during wet periods when the dam's storage level is near capacity. The following provides a snapshot of the significant floods that have affected the region:

1867 Flood: This was one of the earliest recorded floods in the Hawkesbury region.

1879 Flood: Another significant flood that affected the Hawkesbury region, causing extensive damage to buildings, roads, and farmland.

1895 Flood: This flood was one of the most severe in the region's history, with floodwaters reaching a height of 19.7 meters at Windsor. The flood caused widespread damage to buildings, crops, and infrastructure.

1961 Flood: This flood was caused by a tropical cyclone that moved south from Queensland, resulting in heavy rainfall in the Hawkesbury region. The floodwaters inundated many homes and businesses, causing significant damage.

1986 Flood: This flood was caused by an intense low-pressure system that brought heavy rainfall to the Hawkesbury region. The floodwaters reached a height of 15.1 meters at Windsor, causing extensive damage to homes, businesses, and infrastructure.

1990 Flood: This flood was caused by heavy rainfall and resulted in floodwaters reaching a height of 15 meters at Windsor. The flood caused significant damage to homes, businesses, and infrastructure.

2021 Flood: In March 2021, the Hawkesbury region experienced significant flooding caused by heavy rainfall from ex-tropical cyclone Owen. The floodwaters reached a height of 12.9 meters at Windsor, causing widespread damage to homes, businesses, and infrastructure.

2022 Flood (March): The Hawkesbury River basin was once again hit by a significant flood event, marking the second time in twelve months. However, the flood peak was lower than that of March 2021. Based on the "River Flood Levels" data of the Bureau of Meteorology, the recording station at Windsor PWD reported that the flood peak was slightly below the major flood level of 12.2 metres, measuring 11.99 metres.

2022 Flood (July 5th): Represented the worst day of flooding in the Hawkesbury in 44 years. This flood exceeded 13.93m, beating both the March 2021 and 2022 floods. Major flooding occurred along the Hawkesbury River at North Richmond and Windsor, with river levels peaking at 14.19 metres and 13.93 metres, respectively. The flooding left a significant path of destruction to businesses, homes and infrastructure.

Specific information relating to flood levels and damage sustained at Macquarie Park was not made available to Royal Life Saving NSW during the situational analysis.

Considering the Hawkesbury region's vulnerability to flooding, any proposed upgrades to the park and foreshore must consider future flood events from both a safety and financial perspective.

Existing Safety Controls and Education Campaigns

Safety measures such as signage, public rescue, communication equipment, and community engagement are essential to the success of water safety management. The following information provides a summary of existing safety controls and education campaigns implemented by Hawkesbury City Council.

Signage System

Hawkesbury City Council has installed a water safety signage system at Macquarie Park. The aim of the signage is to impart site-specific information to the public and to help individuals make informed decisions regarding recreation in the park.

Hawkesbury City Council do not promote Macquarie Park as swimming area. The water safety signage identifies the hazards, associated risks and information needs of potential and actual patrons visiting the sites. The signs were developed based on a risk management approach in 2013.

During the situational analysis it was unclear whether Hawkesbury City Council includes water safety signs in the public facility management program for regular inspections and maintenance.

A summary of existing safety signage at Macquarie Park has been provided in the table following:

AQUATIC RISK SERVICES

Royal Life Saving works with the Australian aquatics industry to improve industry safety and risk management standards.

ROYAL LIFE SAVING
NSW | ACT | TAS

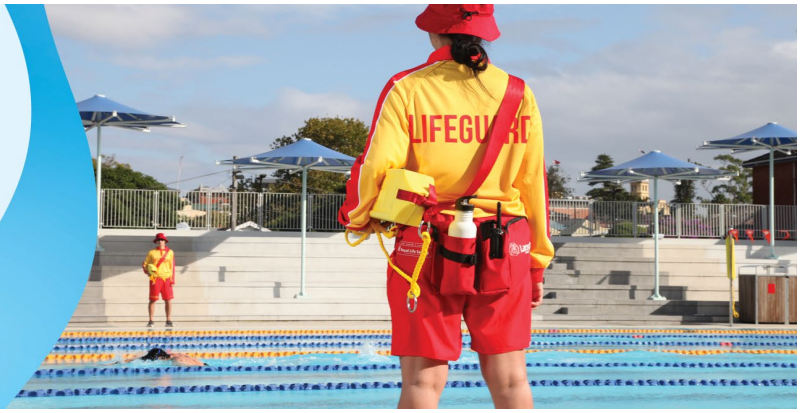
Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 33602032 **Longitude:** 150.821259 **Location Description:** Positioned at the main entrance into Macquarie Park off Wilberforce Rd **Siting Information:** Above 1500mm clear visibility **Sign information** **Emergency Identification Number or Address**: Nil **Hazards**: Beware of Shallow Water and Submerged Objects When Diving and Swimming; Beware of Sudden Drop-Off; Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; Unsupervised children have drowned at this location; In case of emergency call 000. **Additional Symbols/ Information:** Warning message which outlines; Use of this facility may be hazardous. Please observe these signs for your safety.

Additional Comments

The current signs displayed around Macquarie Park are ambiguous and users may interpret the signs differently based on their comprehension and understanding. The large yellow caution sign communicates that users must beware of shallow water and submerged objects when diving and swimming. However, the site information sign communicates the prohibition of diving into water. Therefore, the sign provides contradictory information and may mislead visitors.

The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Additionally, the site information sign should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.

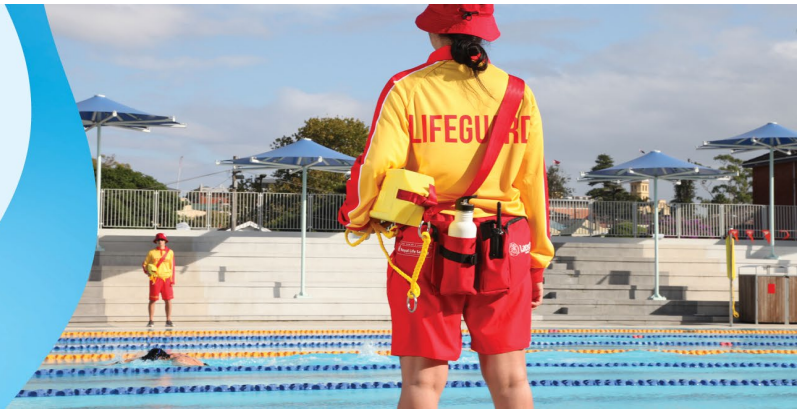


Macquarie Park	Sign Information
	**Sign Type:** Individual Caution/Hazard **Latitude:** 33.60292 **Longitude:** 150.82075 **Location Description:** Located in the scrub area, between the water's edge and the children's park. **Siting Information:** Above 1500mm, obstructed by bush/trees. **Sign Information** **Emergency Identification Number or Address**: NIL **Hazards**: Caution Deep Holes and Shifting Sands. **Regulations:** N/A **Additional Symbols/ Information:** Unsupervised Children have drowned in this river at this location.

Additional Comments
The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 33603005 **Longitude:** 150.820608 **Location Description:** Access path between reserve and riverbank. **Siting Information:** Above 1500mm obstructed by bush/trees. **Sign Information** **Emergency Identification Number or Address**: Nil **Hazards**: Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; In case of emergency call 000. **Additional Symbols/ Information:** Warning message which outlines; Use of this facility may be hazardous. Please observe these signs for your safety.

Additional Comments
Site information sign should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.



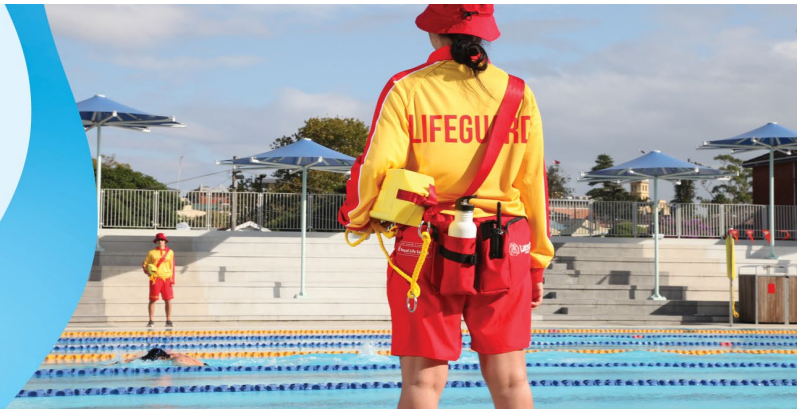
Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 33603155 **Longitude:** 150.819844 **Location Description:** Access path between reserve and riverbank. **Siting Information:** Above 1500mm clear visibility. **Sign Information** **Emergency Identification Number or Address**: Nil **Hazards**: Beware of Shallow Water and Submerged Objects When Diving and Swimming; Beware of Sudden Drop-Off; Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; Unsupervised children have drowned at this location; In case of emergency call 000.

Additional Comments

The current signs displayed around Macquarie Park are ambiguous and users may interpret the signs differently based on their comprehension and understanding. The large yellow caution sign communicates that users must beware of shallow water and submerged objects when diving and swimming. However, the site information sign communicates the prohibition of diving into water. Therefore, the sign provides contradictory information and may mislead visitors.

The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Additionally, the site information sign should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.



Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 3360346 **Longitude:** 150.81915 **Location Description:** Access path between reserve and riverbank. **Siting Information:** Above 1500mm clear visibility. **Sign Information** **Emergency Identification Number or Address**: Nil **Hazards**: Beware of Shallow Water and Submerged Objects When Diving and Swimming; Beware of Sudden Drop-Off; Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; Unsupervised children have drowned at this location; In case of emergency call 000.

Additional Comments

The current signs displayed around Macquarie Park are ambiguous and users may interpret the signs differently based on their comprehension and understanding. The large yellow caution sign communicates that users must beware of shallow water and submerged objects when diving and swimming. However, the site information sign communicates the prohibition of diving into water. Therefore, the sign provides contradictory information and may mislead visitors.

The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Additionally, the site information sign should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.

AQUATIC RISK SERVICES

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ROYAL LIFE SAVING
NSW | ACT | TAS

Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 33.60369 **Longitude:** 150.81880 **Location Description:** Access path between reserve and riverbank. **Siting Information:** Above 1500mm clear visibility. **Sign Information** **Emergency Identification Number or Address**: Nil **Hazards**: Beware of Shallow Water and Submerged Objects When Diving and Swimming; Beware of Sudden Drop-Off; Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; Unsupervised children have drowned at this location; In case of emergency call 000.

Additional Comments

The current signs displayed around Macquarie Park are ambiguous and users may interpret the signs differently based on their comprehension and understanding. The large yellow caution sign communicates that users must beware of shallow water and submerged objects when diving and swimming. However, the site information sign communicates the prohibition of diving into water. Therefore, the sign provides contradictory information and may mislead visitors.

The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Additionally, the site information signs should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.

Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 33.60367 **Longitude:** 150.81857 **Location Description:** At the top of the stairs leading down to the Canoe Launch Area. **Siting Information:** Above 1500mm clear visibility. **Sign Information** **Emergency Identification Number or Address**: Nil **Hazards**: Beware of Shallow Water and Submerged Objects When Diving and Swimming; Beware of Sudden Drop-Off; Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; Unsupervised children have drowned at this location; In case of emergency call 000.

Additional Comments

The current signs displayed around Macquarie Park are ambiguous and users may interpret the signs differently based on their comprehension and understanding. The large yellow caution sign communicates that users must beware of shallow water and submerged objects when diving and swimming. However, the site information sign communicates the prohibition of diving into water. Therefore, the sign provides contradictory information and may mislead visitors.

The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Additionally, the site information signs should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.

Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 33.60543 **Longitude:** 150.81545 **Location Description:** Car Park **Siting Information:** Above 1500mm clear visibility. **Sign Information** **Emergency Identification Number or Address**: Nil **Hazards**: Beware of Shallow Water and Submerged Objects When Diving and Swimming; Beware of Sudden Drop-Off; Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; Unsupervised children have drowned at this location; In case of emergency call 000.

Additional Comments

The current signs displayed around Macquarie Park are ambiguous and users may interpret the signs differently based on their comprehension and understanding. The large yellow caution sign communicates that users must beware of shallow water and submerged objects when diving and swimming. However, the site information sign communicates the prohibition of diving into water. Therefore, the sign provides contradictory information and may mislead visitors.

The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Additionally, the site information signs should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.

Macquarie Park	Sign Information
	**Sign Type:** Public Access **Latitude:** 33.60398 **Longitude:** 150.81742 **Location Description:** Western end of reserve. **Siting Information:** Above 1500mm clear visibility. **Sign Information** **Emergency Identification Number or Address**: Nil **Hazards**: Beware of Shallow Water and Submerged Objects When Diving and Swimming; Beware of Sudden Drop-Off; Submerged Obstacles, Strong Currents, Shallow Water, Sudden Drop, Boating Area, Deep Water, No Lifesaving Service, Falling Branches. **Regulations:** No Diving into Water, No Jumping into Water, No Swimming in Floods or Heavy Rain. **Information:** Keep children under active supervision at all times in or around the water; Unsupervised children have drowned at this location; In case of emergency call 000.

Additional Comments

The current signs displayed around Macquarie Park are ambiguous and users may interpret the signs differently based on their comprehension and understanding. The large yellow caution sign communicates that users must beware of shallow water and submerged objects when diving and swimming. However, the site information sign communicates the prohibition of diving into water. Therefore, the sign provides contradictory information and may mislead visitors.

The warning symbols displayed on the yellow caution sign are outdated and do not reflect the Australian Standards 2416:2010 Water Safety Signs and Beach Safety Flags.

Additionally, the site information signs should be enlarged to ensure it is both visible and legible at the intended maximum viewing distance.

Emergency Equipment

In October 2021 Hawkesbury City Council partnered with Royal Life Saving NSW to install two (2) Public Rescue Stations at Macquarie Park, with the aim of providing visiting public and user groups with immediate access to general emergency equipment. The equipment consists of a Life-Ring, with attached rope and housing. One has been installed near the canoe/kayak launching area and one further upstream on the western riverbank.

Information provided by the Hawkesbury Police Area Command during the situational analysis, confirmed that the rescue equipment was deployed during recent aquatic related incidents at Macquarie Park.

Hawkesbury City Council undertake regular inspection of the equipment throughout the year and replace resources when necessary. It should be noted that public rescue equipment is reactive, and not a proactive measure. Public rescue equipment can give visitors to the site a false sense of safety and should be seen as one element of an overall treatment strategy.

The following table provides a summary of existing rescue equipment at Macquarie Park.

Equipment Image – Macquarie Park	Equipment Type
	**Latitude:**33.603838 **Longitude:** 150.818853 **Equipment Description**: Life-ring and housing. **Siting Information:** Adjacent to the canoe/kayak launch facility. **Additional Information:** User instructions are located on the inside of the equipment housing, behind the life-ring.

Equipment Image – Macquarie Park	Equipment Type
	**Equipment Type** **Latitude:**33.60406 **Longitude:** 150.81766 **Equipment Description**: Life-ring and housing. **Siting Information:** Located greater than 10 metres from the water's edge. **Additional Information:** User instructions are located on the inside of the equipment housing, behind the life-ring.

Hazard Identification and Risk Assessment

A river is characterised as a natural stream of significant water flowing in a definite course or channel/s across the land into the sea or lake. The morphology of a river often relates to factors such as environmental conditions and processes like erodibility, which gives each river its own characteristics.

Rivers often appear gentle and peaceful and give a false sense of security. Currents, undertows, and submerged objects can often go unnoticed when observed from the water's edge. The shape of the river and its length can usually indicate the type of hazards that may be present. For example, winds often pick up greater speed over open water areas than in enclosed bays and surrounding protected areas. Currents caused by wind and varying water temperatures can produce unpredictable results in the behaviour of water movement throughout different sections of a river. As water moves through the channels and into inlets such as bays or coves, the currents generally slow, causing sediments and materials carried by the river to settle, creating turbidly.

River width and gradient play a dominant role in the velocity of water. Commonly narrow river channels allow a faster flow of water. Higher gradients lead to dominance in erosion, particularly of the river bottom. As the gradient decreases, erosion occurs laterally, forming meanders. The erosion of the riverbanks gives each shoreline its characteristics. The more the riverbanks erode, the more the river is affected by input from the surrounding land. Eroding riverbanks can cause dislodged rocks, falling trees and branch debris to enter the river, which can harm the unsuspected bather.

These generalised characteristics are a simple snapshot of the overall complex nature and evolving composition of rivers. From this summary of generic characteristics of rivers, hazards that become apparent are:

- Currents
- Variable water depths
- Variable water temperatures
- Unstable (eroding) riverbanks and foreshores
- Turbidity
- Submerged objects and obstacles
- Uneven surfaces
- Water quality
- Size of River
- Isolation
- Dangerous marine life

In order to localise generic waterway hazards reflective of the river under assessment, site inspections of Macquarie Park were conducted on the 3rd, 4th and 16th of February 2023 by the RLSNSW. The purpose of the site inspections was to see if the general waterway characteristics outlined above applied to the assessable site and to what extent. Furthermore, the site inspection provided an opportunity to observe additional localised hazards not characterised by the generic waterway description above.

During each site inspection, hazards were identified within the area inspected and assessed in terms of their individual risk to public safety using the risk assessment matrix, Table 1 below. The risk ratings were based on agreed levels of likelihood and consequence for each safety hazard and environmental impact.

Based on the assessment of risk to public safety at Macquarie Park, Hawkesbury City Council should focus on the *Moderate* and *High,* risk ratings, which are deemed significant.

A hierarchy of controls has been developed to minimise these risks. These include:

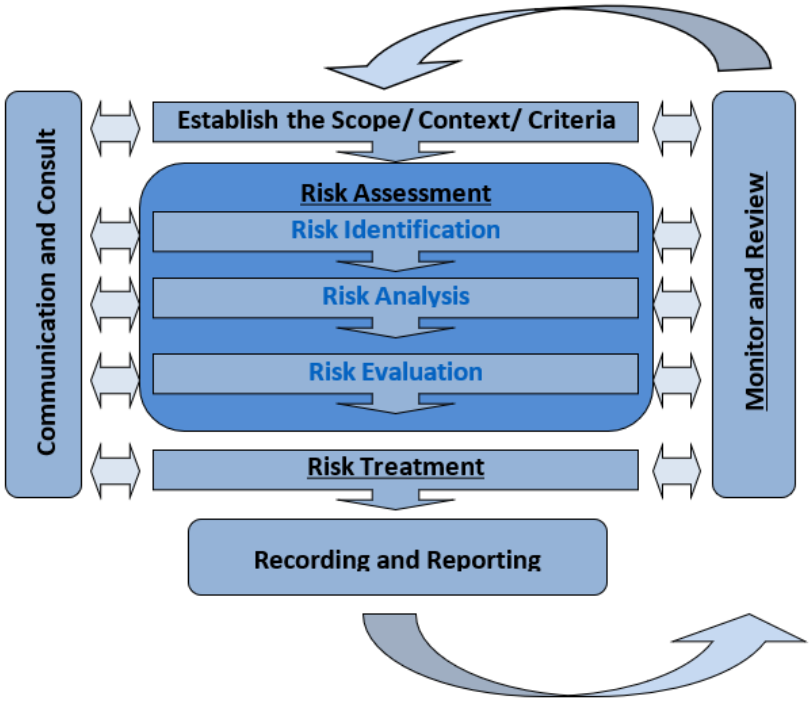
Elimination	The most effective control measure involves eliminating the hazard and associated risk. By designing in or designing out certain features, hazards may be eliminated.
	If this is not practicable, then
Substitute the Hazard	Replace a hazardous process or material with a less hazardous one to reduce the risk (create a path or bridge).
	If this is not practicable, then
Isolate the Hazard	Separate the hazard from people, for example, by designing the waterfront layout so that sufficient barriers are in place to prevent unintentional entry into the waterway.
	If this is not practicable, then
Engineering Controls	Use engineering control measures to minimise the risk, for example, including adequate lighting around waterfronts and/or reducing the gradient of waterfronts.
	If this is not practicable, then
Administrative Controls	If engineering controls cannot reduce the risk sufficiently, administrative controls such as warning signs or exclusion zones where a hazardous activity is carried out should be used.
	If this is not practicable, then
Personal Protective Equipment	For example, PFDs, wetsuits and/or other equipment. PPE is the least effective control measure as it relies on the worker's / user's behaviour and therefore requires thorough training and a high level of supervision to be effective.

		Consequences				
		Insignificant (1) No injuries / minimal financial loss	**Minor (2)** First aid treatment / medium financial loss	**Moderate (3)** Medical treatment / high financial loss	**Major (4)** Hospitable / large financial loss	**Catastrophic (5)** Death / massive financial loss
Likelihood	**Almost Certain (5)** Often occurs / once a week	Moderate (5)	High (10)	High (15)	Catastrophic (20)	Catastrophic (25)
	Likely (4) Could easily happen / once a month	Moderate (4)	Moderate (8)	High (12)	Catastrophic (16)	Catastrophic (20)
	Possible (3) Could happen or known it to happen / once a year	Low (3)	Moderate (6)	Moderate (9)	High (12)	High (15)
	Unlikely (2) Hasn't happened yet but could / once every 10 years	Low (2)	Moderate (4)	Moderate (6)	Moderate (8)	High (10)
	Rare (1) Conceivable but only on extreme circumstances / once in 100 years	Low (1)	Low (2)	Low (3)	Moderate (4)	Moderate (5)

***Table 1** – Risk Assessment Matrix*

The risk framework and descriptors used in this report are based on Royal Life Saving's Risk Management Framework and draw on the application of the following Australian-New Zealand and International Standards:

- AS ISO 31000:2018 Risk Management – Guidelines.



It may be necessary for Hawkesbury City Council to translate these ratings to their own risk management framework in order to align assessed risks with their existing enterprise risk management framework.

Risk Assessment – Macquarie Park

RISK REGISTER SUMMARY

A risk register is a table summarising the identified risk. It includes information on the location, why it has been identified as a risk, what current measures/controls (treatments) are in place to lessen the risk and an overall hazard rating. The risk register summary provides a snapshot of identified risks specific to Macquarie Park.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Site Management										
Is swimming promoted at the site by the Land/Water Manager (e.g., Council)?			✓	Contradictory information – signage located onsite indicates hazards to users when swimming. However, Hawkesbury Council do not formally promote the site for recreational swimming. The ambiguous messaging may cause visitors to interpret the signs differently based on their understanding and comprehension, leading to aquatic related incidents/injuries.	Possible (3)	Catastrophic (5)	**High 15**	Weak and Non-Swimmers Inexperienced Swimmers Children Specific User Groups Users with underlining medical conditions or disabilities Tourists CALD User Groups Young Males aged 15 to 29 years of age People aged 18 to 44 years of age	Water Safety Signage System Public Rescue Equipment	1. The Council, in its role as Land Manager, decides whether recreational swimming is allowed at Macquarie Park or if it is prohibited. 2. If prohibited, introduce signage specifically warning against swimming. 3. Review and update the safety signage system at Macquarie Park to ensure consistent messaging.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Has a designated swimming area/enclosure been identified		✓		Visitors/bathers can access the Hawkesbury River from various points along the Macquarie Park Foreshore, this may lead to bathers; - Unintentionally entering deep water resulting in drowning. - Swimmers may be tempted to swim out further than their skill level would normally allow, placing them at greater risk of drowning due to the length and width of the river. - Strong currents may lead to weak swimmers being swept downstream or pulled under the water, leading to swimmer fatigue and drowning or near drowning.	Possible (3)	Catastrophic (5)	**High 15**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Swimmers Event patrons/visitors Non/Weak swimmers wading through the water Watercraft users CALD Groups	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Implement a regular program for checking and removing transitory hazards, mainly if Macquarie Park is a recognised swimming location. 4. Investigate the feasibility of a supervision system. 5. Review and update safety signage system at Macquarie Park. 6. Develop a Public Water Safety Management Plan for Macquarie Park. 7. Development of a Public Emergency Management/Response Plan Macquarie Park. 8. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is water quality data easily available and accessible for the site?		✓		Health effects of contact with water pollution particularly after rainfall, flooding. Water clarity can be a hazard, and is closely associated with water quality, shallow water, and submerged objects. Water clarity may not pose a significant risk by itself, but it may impede search and rescue, as well as hide submerged objects and shallow water.	Possible (3)	Major (4)	**High 12**	All Water Users	Water Safety Signage System	1. Prohibit/warn against swimming. 2. Implement regular monitoring and testing of water quality at Macquarie Park and along the Hawkesbury River to help minimise the risk of waterborne illness. 3. Develop a Public Water Safety Management Plan for Macquarie Park. 4. Develop and implement a means of communicating with users about the suitability of water conditions. 5. Development of a Public Emergency Management/Response Plan for Macquarie Park which includes management plans for water quality. 6. Investigate adequate measures for closure of the reserve following water pollution notification. 7. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is there a system in place for the management of group hire or event use of the location?	✓			Council's park booking system can be accessed via the council website. Minimal terms and conditions sighted at the time of assessment. In addition the scope of the booking is limited to the park and facilities, including canoe launch. Group gatherings in proximity to water, may lead to children/weak swimmers unintentionally/intentionally entering the river which may lead to aquatic related incidents. Crowding during community events, heatwaves, or public holidays such as Australia Day may increase exposure or the likelihood of exposure to hazards for people visiting Macquarie Park. A popular location that is inundated with crowds of people, can become a hazard to safety and may lead to higher risk of injury illness, accidental immersion and/or weak/non swimmers entering water out of their depths.	Possible (3)	Catastrophic (5)	High 15	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Swimmers Event patrons/visitors Non/Weak swimmers wading through the water Watercraft users CALD Groups	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming within the hirer agreement. 2. Booking system to include water safety messaging. 3. Visitation management and utilisation of ratios for organised activities at Macquarie Park. 4. Investigate the feasibility of a supervision system during planned events and large group gatherings. 5. Review and update safety signage system at Macquarie Park, noting the importance of visual and multilingual information. 6. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community. 7. Develop a Public Water Safety Management Plan Macquarie Park, factoring in events and crowd control. 8. Development of a Public Emergency Management/Response Plan for Macquarie Park which includes emergency action plans for large groups and events. 9. Hirer provided with a copy of an emergency action plan for the park. 10. Investigate the feasibility of emergency help points, including communication system.
Has a safety management plan been developed for the park/reserve?		✓		Difficultly in raising the alarm, finding and accessing the site which may leading to personal injury/death.	Possible (3)	Catastrophic (5)	**High 15**	All Park Visitors	Water Safety Signage System Public Rescue Equipment	1. Develop a Public Water Safety Management Plan Macquarie Park 2. Development of a Public Emergency Management/Response Plan for Macquarie Park. 3. Investigate the feasibility of emergency help points, including communication system.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is a lifesaving service provided at the proposed location?		✓		Public partaking in water-based activities alone/unsupervised and outside of peak times may lead to aquatic-related injuries resulting in drowning. Bystanders attempting to provide assistance, putting themselves and the casualty at risk of personal injury/drowning.	Likely (4)	Catastrophic (5)	**Catastrophic 20**	Weak and Non-Swimmers Inexperienced & Experienced Swimmers Children Users with underlining medical conditions or disabilities Tourists CALD User Groups Young Males aged 15 to 29 years of age People aged 18 to 44 years of age Older People 55+ years of age Users affected by drugs or alcohol	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming. 2. Develop a supervision strategy for Macquarie Park, which considers the deployment of a lifeguarding service.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Has Council promoted water safety awareness and education programs to local members of the community and user groups?		✓		The presence of children and adults of all ages with varying levels of swimming experience/water familiarity may lead to aquatic related injuries. CALD communities can be at higher risk of misinterpreting or misunderstanding risk due to English being a second language (ESL); lack of proficient swimming abilities; variety of understanding with general water safety. CALD groups and tourists unfamiliar with the environment and general water safety. Risk taking behaviour - Person over-estimates their swimming ability. Underestimation of hazards and lack of familiarity with the environment. Risk taking behaviour - Person partaking in water-based activities alone and outside of peak times may lead to aquatic related injuries/drowning. Education and awareness programs for residents and visitors (tourists) alike, have been shown to be effective in controlling risks at aquatic recreation waterways.	Likely (4)	Catastrophic (5)	**Catastrophic 20**	All Park Visitors	Water Safety Signage System Public Rescue Equipment	1. Recommend Public education and safety awareness programs outlining known and likely to occur hazards be developed in consultation with RLS and other key agencies/ organisations. 2. Targeted RLS / Council Water Safety campaigns to promote safe behaviour around water within the local community. 3. Develop a standardised and coordinated drowning prevention campaign and toolkit that can be accessed across the community. 4. Investigate the feasibility of a supervision system during peak periods. 5. Implement a signage strategy that is culturally and linguistically appropriate. 6. Investigate the feasibility of emergency help points, including communication system. 7. Develop a Public Water Safety Management Plan for Macquarie Park in consultation with community/CALD groups and leaders. 8. Develop an Emergency Management/ Response Plan for Macquarie Park. 9. Develop a standardised and coordinated drowning prevention campaign and toolkit that can be accessed across the community. 10. Promote adult swimming and water safety programs at the local pools. 11. Council consider investing in subsidised swimming lessons for CALD and at-risk community groups. 12. Disseminate safety information through community groups and tourism operators. 13. Implement water safety messaging across Macquarie Park and other popular river locations within the Hawkesbury LGA. 14. Council include water safety messaging across council website and park booking systems.
Access										

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is the site easily accessible? (Appropriate defined pathways and signage).		✓		The reserve is easily accessible however, the river foreshore, particularly the area unofficially known as 'Windsor Beach', is difficult to access due to steep banks/erosion and undefined access. Steep banks with a sudden edge pose a risk of accidental falls. Diving from the banks into the water may lead to major injuries/drowning.	Possible (3)	Catastrophic (5)	**High 15**	All Park Visitors		1. Installation of barriers. 2. Removal of any undefined pathways. 3. Prohibit/warn against swimming. 4. Improve access to the water's edge (engineering controls such as defined pathway/steps). 5. Investigate beach (river sand) nourishment. 6. Identify and implement a passive recreation area for designated swimming at Macquarie Park.
Are there clearly identified parking areas at the proposed location?	✓			Parking spaces are provided throughout Macquarie Park. Participants and family required to park away from the location, during peak times (summer, weekends, events) may lead to vehicle on person collision causing severe injury or death.	Unlikely (2)	Catastrophic (5)	**High 10**	All Park Visitors	Designated parking spaces provided	1. Consider additional parking spaces in any future planning for Macquarie Park
Is pedestrian access separated from vehicle access?		✓		No pedestrian pathway provided between toilet block and children's play park. This may lead to vehicle on vehicle or vehicle on person collision causing severe injury or death.	Unlikely (2)	Catastrophic (5)	**High 10**	All Park Visitors Children		1. Consider additional pedestrian pathways in any future planning at Macquarie Park. 2. Review and update speed limit signage at Macquarie Park. 3. Implement a signage system that encourages active parental supervision in areas where young children are recreating at Macquarie Park. 4. Consideration should be given to completely fencing off the playground to provide a secure sanctuary for children.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Can emergency services access the site easily?		✓		The reserve is easily accessible however, the river foreshore, particularly the area unofficially known as 'Windsor Beach,' is difficult to access due to steep banks/erosion and undefined access. Current access conditions may lead to prolonged response in an emergency.	Possible (3)	Catastrophic (5)	**High 15**	Water Users		1. Prohibit/warn against swimming. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Improve access to the water's edge (engineering controls such as defined pathway/steps). 4. Investigate beach (river sand) nourishment. 5. Develop a Public Water Safety Management Plan Macquarie Park. 6. Development of a Public Emergency Management/Response Plan for Macquarie Park. 7. Investigate the feasibility of emergency help points, including communication system.
Amenities										
Are appropriate restrooms and changing facilities within proximity of recreational water areas to allow for private dressing?		✓		Insufficient changing facilities provided at the park may lead to unnecessary exposure.	Possible (3)	Major (4)	**High 12**	Bathers Watercraft Users Children		1. Provide appropriate family change facilities in proximity to the canoe launch area and carpark. 2. Develop a Public Safety Management Plan for Macquarie Park. 3. Introduce an Enhanced Enforcement Program with Local Area Command (NSW Police) to respond to anti-social and inappropriate behaviour. 4. Development of a Public Emergency Management/Response Plan for Macquarie Park. 5. Investigate the feasibility of emergency help points, including rescue equipment and communication systems.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Are changing facilities fitted with appropriate wash facilities, (which include sinks with soap dispensers, and showers)?		✓		Inadequate changeroom/shower facilities may prevent bathers from removing any cyanobacterial or algal material following river usage.	Possible (3)	Major (4)	**High 12**	Bathers Watercraft Users		1. Provide appropriate family change and wash facilities in proximity to the canoe launch area and carpark. 2. Investigate the feasibility of outdoor showers and foot wash stations. 3. Implement regular monitoring and testing of water quality at Macquarie Park and along the Hawkesbury River to help minimise the risk of waterborne illness. 4. Develop a Public Water Safety Management Plan for Macquarie Park. 5. Develop and implement a means of communicating with users about the suitability of water conditions. 6. Development of a Public Emergency Management/Response Plan for Macquarie Park which includes management plans for water quality.
Is shade protection provided in proximity to the river foreshore /swimming area? (By way of shelters or existing tree canopies).		✓		Short-term overexposure to UV may lead to sunburn, dehydration and heatstroke. Prolonged UV exposure may lead to serious health issues.	Almost Certain (5)	Moderate (3)	**High 15**	All Users		1. Provide shade structures in proximity to the swimming enclosure. 2. Installation of SunSmart signage at Macquarie Park. 3. Develop a Public Water Safety Management Plan for Macquarie Park, with input from the Cancer Council. 4. Targeted campaigns to raise awareness of skin cancer prevention.
Is there access to adequate supply of drinking water (water fountain) in proximity to the designated swimming area to help avoid dehydration and heat-related illnesses?		✓		Short-term overexposure to UV may lead to sunburn, dehydration and heatstroke.	Almost Certain (5)	Moderate (3)	**High 15**	All Users		1. Provide a good-quality drinking water supply at various locations in Macquarie Park. 2. Installation of SunSmart signage at Macquarie Park. 3. Develop a Public Water Safety Management Plan for Macquarie Park. 4. Targeted campaigns to raise awareness of overexposure to UV.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Are there signs encouraging active parental supervision in and around child play areas and other amenities such as picnic areas and toilets?		✓		Lack of child supervision around waterways may lead a child to unintentionally enter the river. Unknown persons in the immediate vicinity of the children's play area/reserve attempting to engage with a child not known to them.	Possible (3)	Catastrophic (5)	**High 15**	Children (0-14 years)		1. Installation of Parental Supervision Signage/safety information at Macquarie Park, especially around the playground, BBQ/picnic areas, toilet block and river foreshore. 2. Investigate the feasibility of a supervision system during peak periods. 3. Develop a Public Safety Management Plan for Macquarie Park. 4. Provide appropriate family change facilities. 5. Introduce an Enhanced Enforcement Program with Local Area Command (NSW Police) to respond to anti-social and inappropriate behaviour. 6. Development of a Public Emergency Management/Response Plan for Macquarie Park. 7. Investigate the feasibility of emergency help points, including communication systems. 8. Develop a standardised and coordinated child safety campaign that can be accessed across the community.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Swimming Area										
Is the swimming area appropriately separated from watercraft activity (exclusion zones/signage)?		✓		Motorised and non-motorised watercraft may collide with a person in the water, submerged obstacle or another watercraft. The risk of a collision is increased in areas where watercraft are operating close to people who are swimming.	Possible (3)	Catastrophic (5)	**High 15**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Swimmers Non/Weak swimmers wading through the water CALD Groups Watercraft users	Water Safety Signage System Public Rescue Equipment	1. Separation of swimming and boating/watercraft may necessitate the need for prohibition and/or warning signage advising that swimming is not advised. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Develop a Public Water Safety Management Plan for Macquarie Park. 4. Development of a Public Emergency Management/Response Plan for Macquarie Park. 5. Discuss possibilities of an enhanced waterways enforcement program with local emergency services. 6. Investigate the feasibility of a supervision system. 7. Review and update safety signage system at Macquarie Park. 8. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community. 9. Investigate the feasibility of emergency help points, including communication system.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is the swimming area separated from storm water or other potential contamination sources?		✓		The Hawkesbury River is surrounded by agricultural land. The impacts of agriculture on the river can include Nutrient runoff causing algal blooms; Sedimentation (soil erosion) from agricultural land can cause sediment to enter the river which can cloud the water and reduce light penetration; Pesticides used in agricultural practices can enter the river causing contamination. Poor water quality, particularly after rain fall may affect swimmer's health leading to illness.	Possible (3)	Major (4)	**High 12**	All Water Users	Water Safety Signage System	1. Prohibit/warn against swimming. 2. Implement regular monitoring and testing of water quality at Macquarie Park and along the Hawkesbury River to help minimise the risk of waterborne illness. 3. Develop a Public Water Safety Management Plan for Macquarie Park. 4. Develop and implement a means of communicating with users about the suitability of water conditions. 5. Development of a Public Emergency Management/Response Plan for Macquarie Park which includes management plans for water quality. 6. Investigate adequate measures for closure of the reserve following water pollution notification. 7. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community.
Is the swimming area prone to flooding?	✓			Persons entering the river during/after flash flooding can expose swimmers to dangers including pathogens which can cause illness, hidden debris below the surface causing collision or entrapment injuries, and unpredictable currents that may lead to drowning.	Possible (3)	Catastrophic (5)	**High 15**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Swimmers Non/Weak swimmers wading through the water Watercraft users CaLD Groups	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming. 2. Develop and implement a means of communicating with users as to the suitability of water conditions. 3. Develop a Public Water Safety Management Plan for Macquarie Park. 4. Development of a Public Emergency Management/Response Plan for Macquarie Park. 5. Adequate measures for closure after heavy rainfall/flash flooding. 6. Installation of additional safety signage at Macquarie Park, noting the importance of visual and multilingual information. 7. Investigate the feasibility of emergency help points, including communication system.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is the river subject to variable depths (uneven riverbed)?	✓			Direct impact or collision with the riverbed when diving/jumping. Collison or impact with a submerged or partially submerged object when diving/jumping. Person or persons unable to support themselves in the water or recover from a fall. Non/weak swimmers unintentionally enter deep water. People will have less support to keep their heads above water which may increase the risk of drowning.	Possible (3)	Catastrophic (5)	**High 15**	Weak and Non-Swimmers Inexperienced Swimmers Children Specific User Groups Users with underlining medical conditions or disabilities Tourists CALD User Groups Young Males aged 15 to 29 years of age People aged 18 to 44 years of age Older People 55+ years of age Users affected by drugs or alcohol	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Undertake a Bathymetry Survey to map the underwater features of the river. 4. Investigate the feasibility of a supervision system. 5. Review and update safety signage system at Macquarie Park, noting the importance of visual and multilingual information. 6. Develop a Public Water Safety Management Plan for Macquarie Park. 7. Development of a Public Emergency Management/Response Plan for Macquarie Park. 8. Investigate the feasibility of emergency help points, including communication system. 9. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is there a gradual walkable gradient (beach entry) into the swimming area?		✓		A sudden change in water depth can lead to non/weak swimmers finding themselves suddenly in deep water. If an individual does not have the swimming ability to get safely back to shore and unexpectedly find themselves out of their depth, they are at higher risk of drowning. Sudden entry into water may lead to cold water shock.	Possible (3)	Catastrophic (5)	**High 15**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Physically Unfit Non/Weak swimmers CALD groups Inexperienced swimmers	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Investigate the feasibility of a supervision system. 4. Review and update safety signage system at Macquarie Park, noting the importance of visual and multilingual information. 5. Develop a Public Water Safety Management Plan for Macquarie Park. 6. Development of a Public Emergency Management/Response Plan for Macquarie Park. 7. Investigate the feasibility of emergency help points, including communication system. 8. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community. 9. Media campaigns targeting parents and carers to raise awareness and promote prevention strategies/active supervision in and around water.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Does the foreshore allow for unobstructed visibility to the allocated swimming area?		✓		Obstructions such as steep banks, vegetation and meander river banks can limit the ability of park users/public to have a direct line of sight to the water, minimising the chances of recognising a swimmer in distress.	Possible (3)	Catastrophic (5)	**High 15**	Children Young Males 15-29 years People aged 18-44 years Older People 55+ Years Physically Unfit Users with underlining medical conditions or disabilities Users affected by drugs or alcohol Non/Weak swimmers CALD groups Inexperienced swimmers	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Remove trees and shrubs from the foreshore frontage. 4. Consider a defined access point from carpark to waterfront. 5. Investigate the feasibility of a supervision system. 6. Investigate the feasibility of emergency help points, including communication system. 7. Develop a Public Water Safety Management Plan for Macquarie Park. 8. Develop an Emergency Management /Response Plan for Macquarie Park. 9. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community. 10. Media campaigns targeting parents and carers to raise awareness and promote prevention strategies/active supervision in and around water.
Are slopes/banks approaching the water no steeper than 1:5 vertical to horizontal?		✓		Steep banks with a sudden edge pose a risk of accidental falls.	Possible (3)	Moderate (3)	**Moderate 9**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Physically Unfit		1. Installation of barriers. 2. Removal of any undefined pathways. 3. Prohibit/warn against swimming. 4. Improve access to the water's edge (engineering controls such as defined pathway/steps). 5. Investigate beach (river sand) nourishment. 6. Identify and implement a passive recreation area for designated swimming at Macquarie Park.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Is the swimming area free of strong currents?		✓		Strong under currents may carry people away into potentially dangerous and unknown situations, leading to drowning.	Possible (3)	Catastrophic (5)	**High 15**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Physically Unfit Non/Weak swimmers CALD groups Inexperienced swimmers Watercraft users	Water Safety Signage System Public Rescue Equipment	1. Prohibit/warn against swimming. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Review and update safety signage system at Macquarie Park, noting the importance of visual and multilingual information. 4. Investigate the feasibility of a supervision system. 5. Investigate the feasibility of emergency help points, including communication system. 6. Develop a Public Water Safety Management Plan for Macquarie Park. 7. Develop an Emergency Management/ Response Plan for Macquarie Park. 8. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community. 9. Media campaigns targeting parents and carers to raise awareness and promote prevention strategies/active supervision in and around water.
Is the river prone to marine life?	✓			Bull sharks are known to inhabit sections of the Hawkesbury River system and may lead to shark attacks. The bull shark is commonly listed as being one of the top two species of sharks involved in attacks on humans.	Unlikely (2)	Catastrophic (5)	**High 10**	All river users		1. Investigate the possibility and feasibility to implement a netted swimming area at Macquarie Park. 2. Implement a signage system warning of marine life. 3. Undertake additional risk assessment in consultation with a Marine Biologist to determine further risk mitigation strategies. 4. Investigate the feasibility of emergency help points rescue stations, including communication system. 5. Develop a Public Water Safety Management Plan for Macquarie Park. 6. Develop an Emergency Management/Response Plan for Macquarie Park.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Emergency Equipment										
Is publicly accessible rescue equipment located in proximity to the swimming area? (At minimum life-ring/floatation device or throw rope).	✓			Two (2) x Life-rings located at the Canoe launch area and 'Windsor Beach' area. Delayed emergency response due to missing equipment, resulting in serious injury/death.	Possible (3)	Catastrophic (5)	**High 15**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Physically Unfit Non/Weak swimmers CALD groups Inexperienced swimmers Watercraft users	Water Safety Signage System Public Rescue Equipment Council Inspection/ Maintenance System	1. Prohibit/warn against swimming. 2. Investigate the feasibility of additional rescue equipment, including Automatic External Defibrillator (AED), emergency help points, including communication system. 3. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 4. Develop a Public Water Safety Management Plan for Macquarie Park. 5. Develop an Emergency Management/Response Plan for Macquarie Park. 6. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community.
Is there an emergency communication system in proximity to public areas? (Duress button or emergency telephone).		✓		Difficultly in raising the alarm, finding and accessing the site which may lead to personal injury/death.	Unlikely (2)	Catastrophic (5)	**High 10**	All Park and Water Users	Public Rescue Equipment Mobile Phone Coverage Proximity to Windsor CBD	1. Prohibit/warn against swimming. 2. Investigate the feasibility of additional rescue equipment, including Automatic External Defibrillator (AED), emergency help points, including communication system. 3. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 4. Develop a Public Water Safety Management Plan for Macquarie Park. 5. Develop an Emergency Management/Response Plan for Macquarie Park. 6. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community.

Hazard Identification				Risk Review					Controls	
Considerations	**Yes**	**No**	**TBC**	**Risk Description** *(What could go wrong)*	**Likelihood**	**Consequence**	**Risk Rating**	**Risk Groups**	**Existing Controls**	**Additional Strategies that may be Adopted to Control Risk**
Activity Related										
Is the reserve/public area an alcohol-free zone?		✓		Persons partaking in water-based activities while under the influence of drugs and/or alcohol can increase the risk of drowning by impairing judgement and reaction time, increasing risk-taking behaviour and reducing coordination. Medications can cause drowsiness, affect alertness, and impair reaction time. Illegal drugs can numb the senses, reduce inhibitions and distort the perception of risk.	Likely (4)	Catastrophic (5)	**Catastrophic 20**	Young Males (15-29 years) Older People (55+ Years)	Public Rescue Equipment	1. Restrictions prohibiting alcohol consumption at Macquarie Park. 2. Introduce an Enhanced Enforcement Program with Local Area Command (NSW Police) to respond to anti-social and dangerous behaviour (e.g., alcohol and drug use). 3. Develop a Public Water Safety Management Plan for Macquarie Park. 4. Development of a Public Emergency Management/Response Plan for Macquarie Park. 5. Targeted RLS / Council Water Safety campaigns and Inland Waterways programs to promote safe behaviour around water within the local community. 6. Installation of appropriate safety signage and active enforcement at Macquarie Park, noting the importance of visual and multilingual information. 7. Investigate the feasibility of emergency help points, including, communication system.
Are areas where fishing is approved appropriately signed?		✓		Macquarie Park is a popular fishing spot for locals. Injury to bather caused by fishing line/hook.	Possible (3)	Minor (2)	**Moderate 6**	Children Young Males (15-29 years) People aged 18-44 years Older People (55+ Years) Swimmers Non/Weak swimmers wading through the water		1. Prohibit/warn against swimming. 2. Identify and implement a passive recreation area for designated swimming at Macquarie Park. 3. Develop a Public Water Safety Management Plan for Macquarie Park. 4. Development of a Public Emergency Management/Response Plan for Macquarie Park Foreshore. 5. Prohibition of fishing in designated swimming area. 6. Review and update safety signage at Macquarie Park.

Principal Risk Treatments

There are a range of risk treatment options that can be considered for aquatic risk management. The following risk treatments have been developed to reduce the risk of public drownings and aquatic injuries when visiting and undertaking recreational activities at Macquarie Park. Hawkesbury City Council should endeavour to adopt the most appropriate risk treatments specific to their capabilities and consult with relevant stakeholders. The principal risk treatments addressing drowning prevention at Macquarie Park are as follows:

Establishment of a Public Water Safety Management Plan

A Water Safety Management Plan can provide clear guidance for the effective short and long-term management of public safety around waterways and the management of locations, including infrastructure and naturalised areas, ensuring appropriate public open space and recreational facilities are provided and maintained. Therefore, it is recommended that Hawkesbury City Council consider developing, implementing, and evaluating a water safety management plan for Macquarie Park and any other parks within the LGA that has water frontage.

The Management Plan should be developed through broad consultation with all relevant stakeholders. This may include relevant personnel from the local government authorities and regional agencies for the state government; emergency services representatives; community representatives and groups, including CALD groups; and local safety organisations.

The primary goal of the Public Water Safety Management Plan should be the preservation of life and the prevention of injury, including:

- The development of a framework for inspections/risk assessments to better understand environmental hazards;
- The identification of sites posing unacceptable risks to public safety with a specific focus on drowning safety; and;
- Supporting the allocation of resources to areas of greatest need to improve water safety within the community;
- Identify and align efforts of stakeholders, including those not yet engaged in the issue;
- Raise visitor and broader community awareness through strategic education and programs;
- The identification of public safety requirements for events that may be held at the reserves;
- Inform research agendas, including identifying gaps in data and interventions;
- Identify responsibilities for inspection and maintenance of infrastructure relevant to the safety of visitors to the reserve/river;

- Identify responsibilities for maintenance for inspection and maintenance of swimming areas;
- Develop criteria for acceptable bathing conditions and water monitoring;
- Identify operating times for the swimming area (seasonal/daily).

Continuous monitoring and review of the Water Safety Management Plan will ensure that new risks are detected and managed, and that action plans are implemented and effectively progressed. Review processes are often implemented as part of the regular management process cycle (and, if not, should be), supplemented by major reviews periodically (e.g., annual review).

Establishment of an Emergency Response Plan

It is a reasonable community expectation that an Emergency Response Plan is in place for public spaces. Risks will always be associated when interacting with the natural environment and inland waterways. At the same time, a reactive measure, such as a well-planned and rehearsed Emergency Response Plan, can significantly minimise the damage incurred if an incident should occur.

It is recommended that Hawkesbury City Council prepare an emergency response plan in conjunction with key stakeholders and local emergency services. The emergency plan should be based on a practical assessment of hazards associated with visitor numbers, activities undertaken at the reserves, the environment (river and surrounding reserve) and the possible consequences of an emergency occurring due to those hazards.

The emergency plan should be comprehensive and adaptable to the range of events and visitor numbers. The plan should apply to all potential emergencies that may require evacuation and emergency response to public accidents, including (but not limited to) medical, drowning, missing persons, fire, water contamination and severe weather.

The Emergency Response Plan should include:

- Details of the location, such as map, street names, GPS coordinates;
- The date when the plan was developed and approved for implementation and each subsequent review date;
- Emergency personnel names and phone numbers;
- Procedures for notifying the land manager, name, and contact details, plus roles and responsibilities;
- Emergency Coordinator for the location, roles and responsibilities;
- Emergency notification flow chart;
- Emergency assembly locations, access, and evacuation routes, if gated the names and contact details for all relevant personnel who have access;

- Emergency-related equipment such as communications (telephones, alarms etc.), rescue equipment, firefighting, etc;
- Emergency service contact details, which may include fire, police, ambulance, security, ranger/land manager, utilities such as water, communications, gas and electricity; and
- Emergency procedures, in particular procedures that establish timely and reliable recognition of emergency events and procedures for emergency notification and hierarchy;
- The Emergency Response Plan should be tested and periodically practised and the plan's existence should be communicated to all relevant stakeholders.

Emergency Response Systems and Equipment

The ability of members of the public to request assistance in an emergency is an important component of a drowning prevention strategy. Therefore, it is recommended that Hawkesbury City Council, in consultation with Key Stakeholders, consider technological solutions to address fatal and non-fatal drownings and other public incidents that may occur at Macquarie Park. Examples of Emergency Response Systems are:

Smart Technology – Which integrates CCTV, microphone capabilities and artificial intelligence. These systems allow for an immediate response (Emergency Service Engagement) during the initial stages of an incident, video surveillance of the water and surrounding area, and PA and siren functions. These systems can also capture visitation data, weather trends, etc.

Publicly Accessible Defibrillators and Monitoring Cabinets - Sudden cardiac arrest (SCA) strikes approximately 30,000 Australians annually. Unfortunately, fewer than 5% survive, often because help cannot reach them in time. Providing access to defibrillators in public areas can significantly enhance survival time.

Housing Publicly Accessible Defibrillators in monitored cabinets ensures the defibrillator is always secure and functional. Monitored cabinets have the ability to constantly monitor the functions of the AED as well as the air temperature surrounding the AED. Some cabinets also have surveillance and response-ability, alerting on the deployment of the AED.

Emergency Services Smart Phone Application – *"Emergency +"* is an application developed by emergency services, the federal government and industry partners. The application uses a mobile phone's GPS functionality so callers can provide emergency call-takers with their exact location information. *"Emergency+"* also includes SES and Police Assistance Line numbers as options, so non-emergency calls are made to the most appropriate number.

Geofencing –Geofencing is a location-based service which uses GPS, Wi-Fi, cellular data, etc, to trigger a pre-programmed action (such as mobile push notifications, trigger text

messages or alerts) when a mobile device or radio – frequency identification enters or exits a virtual boundary set up around a geographical location. It can be used in an emergency and to promote safety messages and other educational programs/information.

Designated Swimming Area

It is recommended that Hawkesbury City Council determine the most suitable location/area for recreational swimming to occur as part of the Hawkesbury City Council's Public Water Safety Management Plan.

As part of the review process, Hawkesbury City Council should consider the following options:

1) Discourage recreational swimming at Macquarie Park and promote recreational swimming at the local public swimming pools or develop a designated/allocated swimming location at a safer stretch of the Hawkesbury River.
2) Allocate a swimming area within Macquarie Park accompanied by a water safety signage strategy and relevant amenities (including rescue equipment and emergency communication strategy).

A designated swimming area allows for better hazard identification and control, providing an opportunity for safer water recreation. When determining the most appropriate location for recreational swimming, the following must be considered:

- **Council's appetite and risk tolerance** will help determine the number of swimming locations across the reserves and the amount of risk the Council is willing to accept.
- **Anticipated bather capacity** (number of bathers/visitors) will help establish appropriate size and infrastructure and ensure sufficient designated recreational space to prevent overcrowding and minimise impact on current park operations and infrastructure.
- **Car parking availability and/or access to public transport** - The designated swimming area should be easily accessible from car parks or other public transportation areas and should allow emergency services to get as close as possible to the water's edge, in the case of a major emergency. Defined access points to the swimming area should be introduced to ensure users enter and exit the area in a safe, controlled manner. Strategically placed public defined access signage should advise all risks relating to the designated swimming area, allowing users to make an informed decision before entering the water.
- **Water conditions** must also be taken into account when determining a designated swimming area, ensuring currents and water quality have minimal impact on bathers.
- **Boat traffic -** Clearly defined areas for swimming and boating will significantly reduce the likelihood of a collision between a swimmer and a boat and/or other small craft in the river. These areas should be reinforced with appropriate visible signage, viewable and legible from both in and out of the water.
- **Riverbank and edge characteristics** should allow for unobstructed visibility to the allocated swimming area. The foreshore should be a gradual gradient (beach entry)

into shallow water, providing safe access for young children and weak swimmers, allowing patrons to wade into their preferred depth. Removal of any sudden drop-offs, steep descents and potholes should be considered. The entry and river floor should be of a material that prevents slipping hazards and improves water clarity. The entry and egress point should be regularly maintained to prevent erosion.

- **Bathymetry** is an essential technique used to measure and map the depth and shape of underwater terrain or topography. It is commonly used to identify suitable swimming sites and ensure that the water depth and terrain is safe for swimming activities. If a designated swimming area is identified within Macquarie Park, considerations should be given to undertaking a Bathymetry Survey of the proposed area. The data collected during the survey can be used to help identify and remove hazards, determine the placement of buoys, markers, or other safety features to ensure that the water depth is safe for swimming. It is an essential tool for inland water management, safety, and planning.

Installation of Public Amenities

Public spaces should include a mix of amenities that attract people of all ages and genders. They should be designed to promote safety, security, and opportunities for socialising and connecting with nature. Therefore, Hawkesbury City Council should consider the feasibility of the following amenities:

- It is imperative that an adequate supply of drinking water (water fountain) is maintained near recreational water areas. Positive measures should also be taken to encourage people to drink water regularly to avoid dehydration and heat-related illnesses.
- The provision of shaded areas within proximity to recreational water areas can also dramatically reduce the incidence of heat stress.
- The provision of appropriate restrooms and changing facilities within proximity of recreational water areas to allow for private dressing and bathing. Sufficient wash facilities, which include sinks with soap dispensers and showers to meet the number of expected water users, should be introduced to allow bathers to remove any cyanobacterial or algal material.

Targeted Public Awareness and Education Strategy

Many visitors to Macquarie Park would not know that drowning is a significant problem in Australia (and worldwide). Public awareness and behaviour change are crucial if drowning prevention measures are to be accepted and successful. Therefore, it is recommended that Hawkesbury City Council develop and deliver public water safety education/awareness strategies to help change visitors' perceptions and increase awareness of aquatic recreation dangers in and around waterways.

Key factors pertaining to effective education and awareness strategies include:

- Consistency in safety messaging (elimination of confusing/unclear or disparate information).
- Consistency in the method of provision (ongoing information provided at regular locations/times).
- Longevity in the provision of information (ongoing, not a one-off).

The following are suggestions/examples of current strategies used around aquatic environments to assist in public awareness and behaviour change:

Education Programs – Can incorporate various aspects associated with aquatic and recreation activities and are a fundamental component of any drowning prevention strategy. Education programs should promote water safety (such as safety and preventative measures, rescue, and CPR information) across all life stages and should be tailored accordingly.

Advocacy of Swimming and Water Safety Programs at Local Pools to promote water familiarisation, safety, correct stroke technique and personal development within a safe environment. Classes can target a range of ages and swimming abilities. Particular focus should be given to encouraging older people to test and redevelop their skills in controlled environments.

Multisectoral Collaboration builds and strengthens partnerships with local schools, water safety bodies, media outlets, water management authorities, and tourism sectors to develop and implement water safety education strategies. While not all parties may have drowning prevention as their primary goal, their agendas and activities may nevertheless intersect and help reduce drowning deaths and promote safer aquatic environments.

Education Signage can provide visitor information about the site and key water safety information. Education signs should be positioned in areas that are subject to high public exposure however, they should not be placed in positions where they would compete with formal regulatory or hazardous warning signage.

Quick Response (QR) Codes may also be utilised around aquatic environments to provide location-based safety messaging. They also allow for embedding additional detailed information for visitors interested in knowing more without competing with other relevant information signage. The system works by scanning a smartphone over the QR Code. These codes can be linked to specific water-related safety information about a particular location, with the potential for multilingual messages.

CALD Community Education - Targeted water safety communication should be delivered to CALD communities. CALD communities can be at higher risk of misinterpreting or misunderstanding risk due to:

- Language and comprehension difficulties, including the ability the understand English warning signs;

- The inability to swim; and
- Different understanding of water safety, including when a body of water is considered dangerous.

Community groups may benefit from the delivery of a range of structured and/or informal education programs. These programs would ideally revolve around the acquisition of survival and self-rescue skills and skills which enable individuals to rescue others in the safest manner possible whilst minimising any personal risk.

Water Quality

Water quality is of prime importance and must be factored in when recreational swimming is permitted within the inland waterway. Ideally, water clarity should be clear enough for users to estimate the depth, see surface hazards easily, and detect any submerged objects. Water quality should also be at safe levels to ensure bathers health by reducing waterborne illness. Water quality can be compromised by a blue-green algal breakout, which may cause mild to severe health issues including injury or infections related to the ears, nose, skin, and other gastrointestinal issues.

It is recommended that Hawkesbury City Council develop a communication process to ensure that visitors are made aware of the water conditions at Macquarie Park, especially after heavy rain, flood events or when there is known water pollution.

Provision of Publicly Accessible Rescue Equipment

Although it is preferred that incidents do not occur, it is unrealistic to expect that all incidents can be prevented. In order to minimise the potential of a fatality or permanent disability resulting from a drowning incident, the provision of additional rescue equipment in Macquarie Park should be considered.

Publicly Accessible Automated External Defibrillator (AED), which is accessible 24 hours per day, 7 days a week in all-weather environments.

Emergency Response System (ERS) which can be positioned in high use/risk areas. Once activated, link to a nominated contact/s such as local emergency services. For rescue equipment to be of use in the event of an incident its availability must be known. It must be identifiable and accessible and be within good working order. This may require the installation of appropriate storage in a prominent location and additional signage.

Personal Flotation Devices (PFDs) - Macquarie Park caters for various aquatic activities such as boating, kayaking, and canoeing. These activities may require the use of a lifejacket (PFD). A lifejacket is designed to help a person stay afloat in the water but cannot guarantee their safety and ultimate rescue. Lifejackets need to be the right type based on the activity requirements. PFDs are required to comply with manufacturing standards. For use on watercrafts, there are three types of PFD being;

- Lifejacket level 100+ (formerly known as Type 1)
- Lifejacket level 50 (formerly known as Type 2)
- Lifejacket level 50S (formerly known as Type 3)

It is recommended that lifejacket safety messages are considered when reviewing the current signage system for Macquarie Park. Localised signage should ideally reinforce the type of PFD required for the activity being facilitated within the managed waterway.

Provision of Supervision

Inland waterways are statistically one of Australia's most dangerous aquatic environments, with 114 deaths occurring in rivers in 2021/22. Therefore, it is important to consider supervision needs as part of the water safety management process for Macquarie Park. Various supervision systems can assist in minimising aquatic risk and should be considered for Macquarie Park:

- Full-time comprehensive lifesaving/lifeguard service
- Seasonal lifesaving/lifeguard service
- A flexible demand-based service (on a case-by-case basis, such as events, public holidays etc.)
- Surveillance cameras
- No supervision service, but the provision of safety signs and controlled access.

A parental supervision strategy should also form part of the overall treatment strategy for public safety. Children need to be actively supervised by a parent or guardian when in and around the water. Children under five should always be within arm's reach, and children under 14 should always be in sight. This message should be reinforced on localised signage in and around aquatic areas and in proximity to playgrounds, picnic and BBQ areas abutting waterways.

Systems of Safety Signage

A coordinated approach to signage with strategically placed signs and visible content is an essential part of aquatic risk management. Therefore, it is recommended that a review is undertaken on the current water safety signage system at Macquarie Park.

Determining the most appropriate signage around natural waterways is a detailed process that should include assessing the hazards and associated risks which need signage, then determining:

- The classification of sign to be used
- The location and size of the signs
- The mounting height
- The sign height and maximum viewing distance
- The text to support the sign
- The use of single or multiple message signs

- The lighting and illumination where the signage will be located
- The environment where the signage will be located
- The material, construction, and physical properties
- The fixing method of the signs.

The placement of water safety signage needs to be carefully considered allowing the public to make an informed decision when visiting Macquarie Park.

Water Safety Signage is a commonly used risk mitigation strategy around waterways. Appropriate signage should allow a person to make an informed decision before undertaking aquatic recreational activities at locations under the landowner's or operator's control.

Water Safety Signage commonly consists of four key components:

1. General Warning Message
2. Prohibition Symbols
3. Warning Symbols
4. Information symbols and messages

Standards Australia has developed guidelines for designing and applying Water Safety Signs and Beach Safety Flags 2416:2010. These signs have been well-researched and evaluated to show very high results in terms of recognition and recall.

The symbols used in this signage schedule are the most current and up to date. However, it is important to note that symbols and publications are reviewed and can be updated, this should be considered throughout the design phase.

General Warning Message
Warns users that hazards may exist at the location/facility and that patrons must take reasonable care for their safety. The general warning message should be within a red-coloured text box with white text. As a matter of practice, landowners and operators should include a general warning message on all signs installed at public recreational facilities.

Warning: Use of this facility may be hazardous.
Please take reasonable care for your safety.

Prohibition Symbols

Are safety signs which aim to prohibit behaviour likely to cause a risk to health or safety. All Council Regulations should appear as prohibition symbols. The symbols are depicted by a red circle on a white background, with a red diagonal slash across the prohibited activity or behaviour.

(Example - Prohibition symbol)

Warning Symbols

Are safety signs which indicate a potential hazard, obstacle or condition requiring special attention. The symbols are depicted in a yellow diamond/triangle with a black border and warn the public of the hazard displayed inside the geometric shape.

AS/NZS 2416.1:2010 Part 1, Part 2 and Part 3 Water Safety Signs and beach safety flags display warning symbols within a triangular shape, instead of the traditional diamond shape. Within AS/NZS 2416.1:2010 Part 1, Part 2 and Part 3 Water Safety Signs and beach safety flags the standards make specific reference to allow warning signs within Australia to be depicted with both. The triangle shape has been introduced as the Australian Standard is also now an International Standard and the triangle is more widely used in other parts of the world. Whatever option is chosen by the owner or operator, it is important to ensure that a consistent approach is taken in respect to the message to the public.

(Example - Prohibition symbol)

Information Symbols / Message
Any other comments or instructions that Council wishes to appear on the sign should appear either as information or safety messages.

Information should appear on the sign as a white image or words on a blue background.

Safety/Emergency information, such as exits, first aid etc., should appear on the sign as a white image or words on a green background.

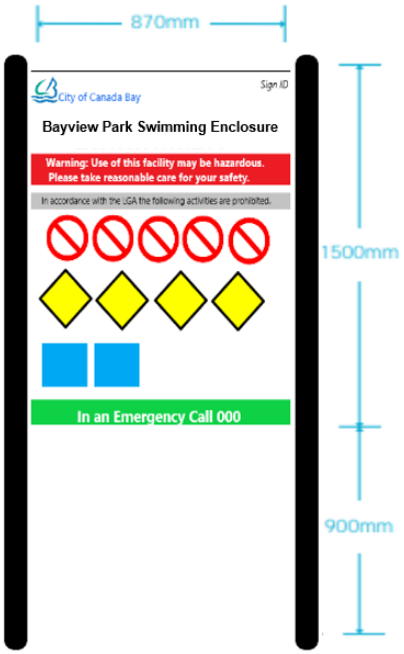
(Example - Information Symbol)

(Example - Emergency Symbol)

Supporting Text
The presentation of information is very important to how people understand and react to water safety signage. It is advisable to use supplementary text alongside symbols. This text should ensure the signs meaning can be clearly read and understood. The positioning of symbols on water safety signage should be given careful consideration as their positioning will also affect how successfully the sign is read and understood. The minimum height of symbols should take into account the needs of people with normal sight and people with visual impairments.

Mounting Height
The following principles should be applied to assist users of the facilities in predicting the location of successive signs, whether they are mounted on walls or posts.

a) Signs should be mounted as close as practicable to the observer's line of sight in the vertical plane. For a standing adult, this will be approximately 5° up or down from a point 1500 mm above ground level in front of the observer.
b) Signs that are freestanding or mounted overhead should be placed so that they are not a hazard and do not enter into the required space for a clear and accessible path.
c) Where practical, the space in front of the sign should be clear so that people without correction lenses or with visual impairments are able to approach the sign to reduce their viewing distance.



Asset Management

Hawkesbury City Council has a responsibility to ensure that all facilities and assets within its jurisdiction are easily identifiable. This includes a unique identifier for each sign structure that corresponds with the Council's assessment sheet to facilitate replacement or repair in the event of damage, vandalism or theft. It is important to note that this asset number is not a location or emergency number.

Managing water safety signs is an essential part of the Council's risk management approach and requires ongoing inspection and maintenance to ensure that signs remain effective in warning the public. Signs are often targets of mischief, vandalism or theft, and symbols may need to be updated to comply with relevant standards or to reflect changes in the nature of the facility.

To effectively manage signs, the Council should establish a management system that includes regular inspections and funding for repairs and replacements in an organised and cyclical manner. The Council may choose to incorporate sign management into its public facility management program or establish a separate sign maintenance program with dedicated personnel and resources. It is crucial that funding allocated to sign maintenance is clearly identified and used exclusively for this purpose, to prevent it from being diverted to other competing priorities.

Monitor and Review

Continuous monitoring and review of risks ensure new risks are detected and managed and that action plans are implemented and progressed effectively. Review processes are often implemented as part of the regular risk management process cycle (and if not, should be) supplemented by periodic major reviews (e.g., annual reviews).

Monitoring and reviewing activities link risk management to other management and administrative processes, e.g., capital works plans. This incorporated approach facilitates better risk management and continuous improvement. The primary input to this step is the watch list of the major risks that have been identified for risk treatment action (Risk Register). The outcomes of any review process should be in the form of revisions to the risk register and a list of new action items proposed for risk treatment or funding opportunities for already identified treatment options.

Appendix A - Industry Standards and References

The following references to codes, standards and guidelines are based on the latest available edition at the time of preparation of this safety report.

- **AS/NZS 2416.1:2010** Water safety signs and beach safety flags - Specifications for water safety signs used in workplaces and public areas (ISO 20712-1:2008, MOD)
- **AS/NZS 2416.2:2010** Water safety signs and beach safety flags - Specifications for beach safety flags - Colour, shape, meaning and performance (ISO 20712-2:2007, MOD)
- **AS/NZS 2416.3:2010** Water safety signs and beach safety flags - Guidance for use
- **AS 1319-1994** (R2018) Safety signs for the occupational environment
- **AS ISO 31000:2018** Risk management – Guidelines
- **AS 1657:2018** Fixed platforms, walkways, stairways, and ladders - Design, construction, and installation
- **AS 60601.2.4:2018** Medical electrical equipment - Particular requirements for the basic safety and essential performance of cardiac defibrillators (IEC 60601-2-4:2010 (ED. 3.0), MOD)
- **AS ISO 55001:2014** Asset management - Management systems - Requirements
- **AS 3745-2010** Planning for emergencies in facilities
- **AS 4586-2013** Slip resistance classification of new pedestrian surface materials
- **Australian Water Safety Strategy 2030,** Australian Water Safety Council (2021)
- **Guidelines for Water Safety in Urban Water Developments,** Royal Life Saving Society Australia. (2004)
- **National Drowning Research,** Royal Life Saving Australia
- **Building Code of Australia**
- **Guidelines for Safe Pool Operations**, Risk Management (Royal Life Saving Society of Australia)
- **Practice Note No.15** – Water Safety (2017, NSW Office of Local Government)
- **Guidelines for Managing Risks in Recreational Water** (2008, NHMRC)
- **Signs as Remote Supervision** (2014, Statewide Mutual)
- **Sign in Macquarie Park titled** “A brief History of Macquarie Park,” erected in 1996.
- https://www.hawkesbury.nsw.gov.au/
- **Hawkesbury-Nepean Valley Regional Flood Study 2019**, Infrastructure NSW, July 2019
- **Destination Management Plan 2022-2024**, Hawkesbury City Council
- https://www.abs.gov.au/

Appendix B

Facility Visitation Rating

Table 1 - Suggested development rating for reserves designed as a guide only.

Development Rating (D)	Type of Development at Location	Natural features
1	Virginal bush, cleared land, no infrastructure	No hazardous features
2	Cleared land, static infrastructure e.g., grass area with table and chairs, toilet area, lookout	Sloping ground, no natural water, walking track around Reserve
3	Cleared land with mobile infrastructure e.g., grass area with playground equipment, cycle way, market, leash free dog area	Reserve contains natural waterway that runs during wet weather, drops less than 1 metre
4	Council owned infrastructure with no artificial lighting e.g., golf course, football field, recreational ground, caravan park	Creeks, ponds, and ledges between 1 and 3 metres
5	Extensively developed infrastructure with artificial lighting e.g., sporting complex, artificially lit courts	Contains rivers, dams, and cliffs greater than 3 metres

Table 2 - Suggested population use rating for reserves and beaches.

Population Rating (P)	Population Use
1	Less than 5 people at a time
2	5 to 50 people at a time
3	50 to 100 people at a time
4	100 to 500 people at a time
5	Greater than 500 people at a time

Table 3 - Suggested frequency of use rating for reserves and beaches.

Frequency Rating (F)	Frequency of Use
1	Annual event or activity
2	Monthly event or activity
3	Weekly activity or event
4	Daily activity or event
5	In use for majority of day

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