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# PARRAMATTA RIVER

Swim Site Activation Framework

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## 1.0 Introduction



## 1.1 Parramatta River Catchment Group Mission

The Parramatta River is one of Australia's most significant waterways. The river traverses eight different local councils and has a catchment area of 257 km<sup>2</sup> spanning eleven local councils.

The catchment is predominantly urban, having been developed for residential, commercial, industrial and infrastructure land uses. The region is also undergoing urban consolidation and re-development. Urbanisation has resulted in high levels of pollution and threatened biodiversity. Pressures on the river will increase with population growth in the area set to accelerate over the coming years.

The Parramatta River Catchment Group (PRCG) was formed to provide a coordinated approach to improving the health of the river. The PRCG supports projects that seek to improve the health of the catchment. In 2014, PRCG launched Our Living River with the aim of making the river swimmable by 2025.

## 1.2 Masterplan

This report contributes to the development of the Parramatta River Masterplan, which includes a number of supporting studies. The objectives of the Masterplan are to:

- Improve the health of the river
- Provide tangible benefits to the local community
- Strategically tackle issues of sewer and stormwater pollution
- Provide the best cost-benefit for the community

These objectives will be delivered in two stages: research and analysis, followed by stakeholder engagement.

The role of the Masterplan is to achieve the mission of making Parramatta River swimmable again by 2025. Swim site activation is an integral part of the first stage of the development of the Masterplan. This study contributes to this by providing a framework for activation of different potential swim sites along the river.

## 1.3 Project Scope

The report provides a framework to understand the potential for activating sites along the river and the options for activation of particular sites on the river. Understanding the potential for activation requires an understanding of various criteria including safety, technical constraints, adjacent urban form and governance solutions. The framework develops the important activation criteria and orders them into a simple model that can then be applied to assess and compare different sites along the river.

The report explores the potential for swimming and where swimming is not feasible, other river site activation options that maximise engagement with the river.

This report also uses the framework to assess the identified swim sites along the river and to explore ideas for three case study sites for potential activation. The activation options for each case study respond to the particular site characteristics and opportunities, and its physical location on the river.

Visualisations of each of the three sites will help to capture the imagination of the community and garner support for the project and the Masterplan as a whole.

Thus, the key deliverables for this project are:

- The Swim Site Activation Framework
- Analysis and assessment of 12 potential sites using the Activation Framework and development of activation options for three case study sites
- Visualisation of options for activation at the three case study sites

## 1.4 Project Approach

The Activation Framework is a multi-step approach developed to assess the potential for activation of a swim site. The three key steps are:

- Feasibility assessment
- Site vulnerability assessment
- Site desirability assessment

Together these steps represent the key criteria which impact on the potential for activation and the ideal type of activation of a particular river site. They enable a simple semi-quantitative assessment to assist in prioritising potential swim sites.

The approach also allows for scenario modelling for potential sites. For example, the framework can be used to see how investing in infrastructure can change its desirability score.

The framework allows for a robust and transparent assessment of a site and is designed to be graphical in nature and to be easily understood by the broader community.

## 1.5 How To Use This Framework

The site activation framework provides guidance on the potential for activation and the type of activation that can be achieved at a particular site.

A site is assessed using three sets of criteria:

- **Feasibility criteria** to initially determine the physical viability of in-river or land-based activation. These are outlined in detail in Section 2.1.
- **Vulnerability criteria** to determine the relative risks of a site to various safety and community acceptance factors. These are outlined in detail in Section 2.2.
- **Desirability criteria** to determine the likelihood that a site will be active and have good visitation rates, impacting on the overall success of a river site's activation. These criteria are outlined in detail in Section 2.3.

The following provides an overview of how the criteria are applied to assess a potential swim site.

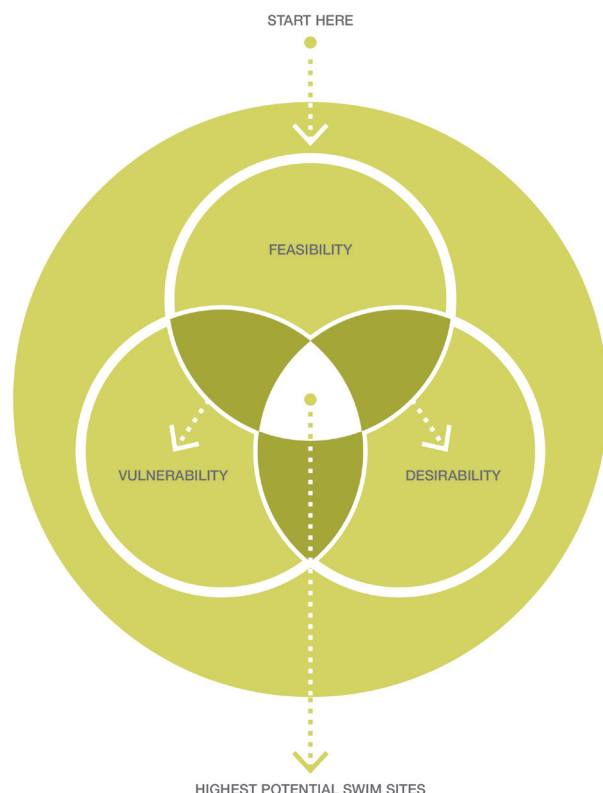


Diagram 1: Site Activation Framework Process

### Step 1 - Feasibility Assessment

The first step determines the physical potential for in-river activation and the types of activation suitable for a site using the feasibility criteria. The criteria helps to identify situations where activation of the river is difficult or excluded (for example, due to maritime exclusion, or sensitive flora and fauna).

If the site is deemed suitable for in-river activation, this will be further analysed for particular activities such as swimming and recreational boating ("splash contact"). For example, if the site is unsuitable for swimming, the site should also be assessed for whether it can be used for in-river activities such as watercraft use or splash contact.

In some cases where swimming is a desired site activity, it may be necessary to consider a treated river 'pool' or similar for in-river recreation.

If the site is deemed unsuitable for in-river activation due to the feasibility criteria, it may still be suitable for land-based activation (such as picnicking, fishing, boardwalk, river bank parklands), as well as land-based swimming or land-based splash contact activities.

Feasibility assessment criteria are discussed further in section 2.1.

### Step 2 - Vulnerability Assessment

The second step is to assess the site according to the vulnerability criteria. The vulnerability of a site may influence the potential activation and the type of activation opportunities initially identified in Step 1. The vulnerability criteria assesses the relative risks from a safety and community acceptance point of view.

The higher the vulnerability of a site, the greater the management measures required to mitigate its risks. Where management measures are not adequate or satisfactory for its vulnerability, the Feasibility Assessment classification of a site may need to be reconsidered (e.g. from an in-river swimming site to an in-river splash contact site or a treated water river swim site).

Vulnerability assessment criteria are discussed further in section 2.2.

### Step 3 - Assessing Desirability

After assessing a site's range of potential activation options (Step 1) along with its vulnerability (Step 2), the framework is used to determine the desirability of each site. Although a site may be feasible for activation it may have low desirability due to a number of factors related to its context, infrastructure and attractiveness to users.

The desirability assessment gives a relative score for each site, which can be used to compare across sites and to assist in determining priority sites. The higher the desirability score at the site, the higher the likelihood of success of activation.

It should be noted that a site's potential desirability can be improved through providing infrastructure or other site improvements. Based on this, the criteria can be used to assess investment scenarios and their potential impact on the activation of a site.

The potential desirability of a site can also be summarised for current and future activation through categorisation of sites into a local, district or regional swim site. Sites with one or a combination of limited adjacent land area, limited foreshore area, high ecological sensitivity, significant heritage constraints, and lack of suitable public and private transport access are more likely to be suitable for local swim sites. Sites which have generally large adjacent land areas, long foreshore areas, low ecological sensitivity, minimal heritage constraints, good suitable public and private transport access are likely to be suitable for regional swim sites.

Desirability criteria are discussed further in section 2.3.







## 2.0 Swim Site Activation Framework



## 2.1 Feasibility

The feasibility criteria are used to assist in determining what type of river site activation options are possible at different sites along the river. The feasibility assessment is used as a starting point to provide an initial 'quick screen' of what types of activities are feasible at various locations for further assessment in the vulnerability and desirability assessments.

### Ecological Restrictions

The presence of flora and fauna may restrict access to the water in certain locations along the river. This might be due to sensitivity to human physical disturbance or use of chemicals (such as sunscreens, insect repellent or watercraft by-products).

### Boat Traffic

Boat traffic such as Rivercats and ferries that traverse the river from Circular Quay to Parramatta are a major constraint to in-river activity. For example, restrictions apply west of Silverwater Bridge up to the Charles St Weir due to the narrow width of the channel and priority given to the Rivercat service. Ferry traffic has the potential to increase over time with redevelopment along the river, especially along narrow stretches of the river such as at Camellia and Rydalmere.

Boating infrastructure also needs to be considered. Areas around ferry terminals and boat ramps are generally unsafe for river-based activities such as swimming. Private jetties and pontoons may limit a site's potential for foreshore activation.

Key points to consider are:

- Personal waterfront exclusion zones;
- Maritime restricted zones;
- Routes of ferries and Rivercats;
- The location of terminals and boating infrastructure;
- Private moorings and jetties;
- Recreational boating, particularly organised sporting activities.

### Water Quality

Water quality affects whether a site is suitable for primary or secondary contact.

The water quality of the river varies along its length, from the freshwater tributaries of Toongabbie Creek and Darling Mills Creek through to Sydney Harbour. The Parramatta River is a highly urbanised catchment, so water pollution is a significant factor for activation options at a site, particularly for swimming and primary contact.

The relationship of a site to point source pollution needs to be considered; including from major sewer overflows, especially those off trunk sewer mains, as well as point source pollution from industrial discharge, including dry weather spills.

Water quality in the feasibility phase assesses whether the water quality meets the national guidelines for primary contact for recreational water, particularly for microbial water quality. In many cases there is insufficient information to assess the water quality and water quality monitoring will be required.

Initial monitoring will provide an indication of water quality but to adequately assess the water quality requirements, monitoring over a longer period (e.g. a year or more) will be required. An initial high level estimate is being made through the Parramatta River Masterplan Water Quality Modelling project, which is also being undertaken as part of Stage 1 of the Masterplan.

### Bathymetry

Bathymetry is the study of the bed of the river, including topography and water depth. In the case of the Parramatta River, this varies widely and is an important consideration when assessing a site.

In some cases the depth of water in the river will be too shallow to permit or accommodate some in-river based activities including swimming and watercraft use.

Ideally, for these activities the bed of the river should be deeper than 1.5m to reduce contact of swimmers and watercraft with the bed of the river. This depth reduces the likelihood of disturbing potential contaminated sediment. An example of where bathymetry limits opportunities for swimming is Ermington Bay where at very low tides the river bed across the whole of the bay is exposed.

Where depth limits activities, alternate options can be explored for in-river activity such as splash play.

### Publicly-Available Land

For a site to be feasible, there needs to be publicly-available land adjacent to the site for access, land-based activities and infrastructure such as amenities and change rooms. A site without any adjacent public land to the river is generally considered unfeasible.

Where swimming is not feasible, foreshore activation could be an alternative for a site; for example, foreshore boardwalks to provide connectivity.

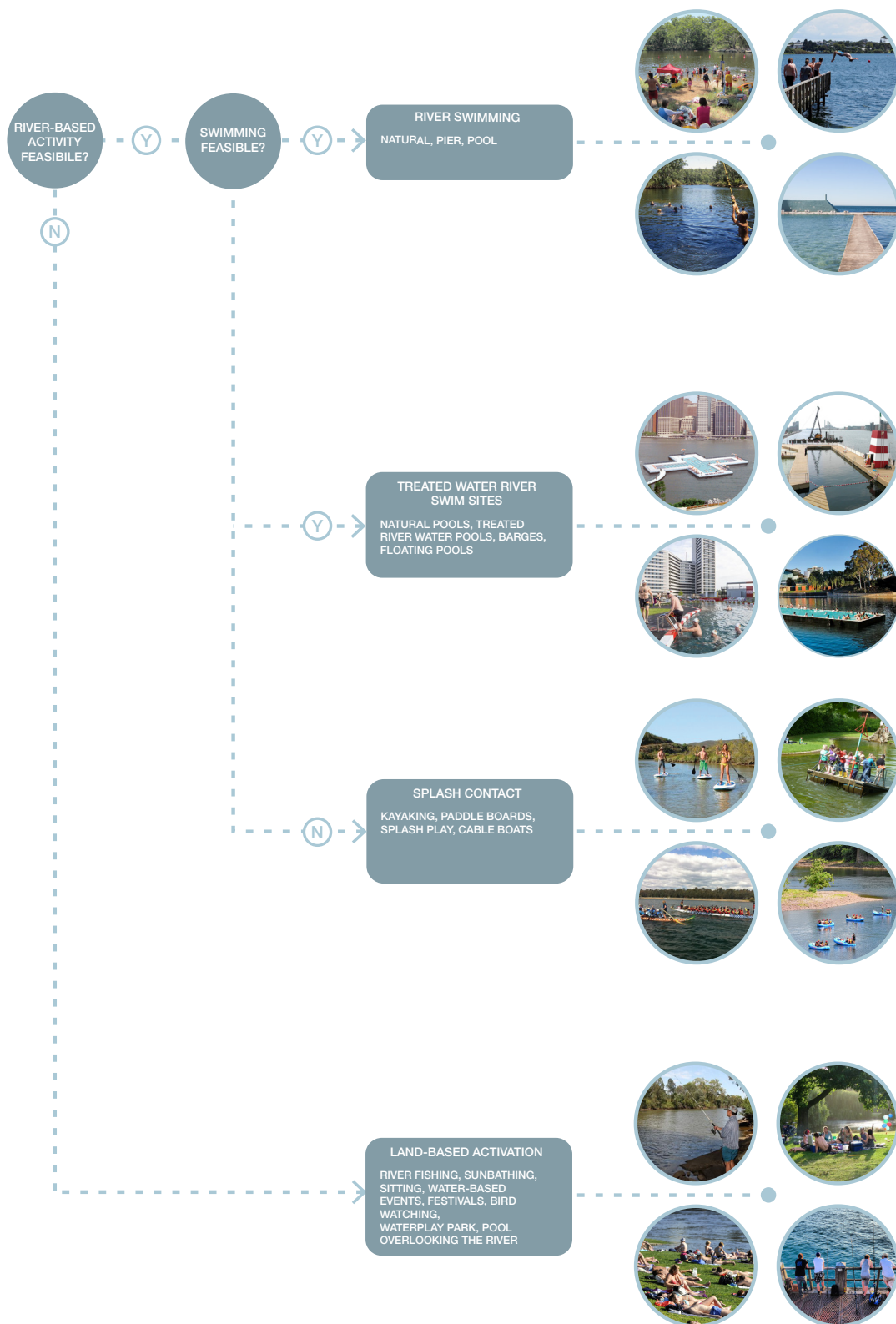


DIAGRAM 2: FEASIBILITY ASSESSMENT FLOWCHART

The Parramatta River fronts a wide range of adjacent land uses including industrial, commercial and residential. It is important to consider adjacent land ownership when looking at sites for potential suitability for activation for in-river activities. For example, at present there are large-scale industrial sites at Rydalmere and Camellia which limit the sites' use by the public. Due to redevelopment occurring in some cases, these may only be a temporary constraint (e.g. Camellia is currently in the process of rezoning).

Along Parramatta River there are also significant sections of the river where the adjacent land is adjoining residential development, particularly in the downstream section of the river. Activation sites generally require publicly accessible land to be a feasible site for in-river based activities and land-based activities.
















## Swim Site Scale



As part of the Feasibility assessment, a judgement is to be made as to the geographical reach and importance of the swim site. Factors to be considered can include the geographical catchment of visitors expected, historical, social or cultural significance attached to a particular location, its attractiveness, ease of access and/or capacity to host certain numbers of visitors, amongst other things. For the assessment, the three available categories are Local, District or Regional. Typically, local sites would attract visitors from the local area only and have capacity for fewer visitors while regional sites will attract visitors from a wide area and have capacity for significantly more visitors.

## FEASIBILITY ASSESSMENT - BLANK TEMPLATE

An initial feasibility assessment has been undertaken for 'Site X' based on information and knowledge of the site at present. While full water quality data is not available for 'Site X', initial water quality monitoring conducted by X showed .... 'Site X' is currently considered feasible for [swimming/splash contact/land-based activation].

'Site X' is considered a **Local/District/Regional** site due to ...

	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic	  		
Water Quality	  		
Bathymetry	  		
Publicly-Available Land	  		
Ecological Restrictions	  		

**KEY:**  Low Feasibility  
 Medium Feasibility  
 High Feasibility

## 2.2 Vulnerability

Vulnerability criteria are used to assess the risk at a site considering its proposed activation. The higher the vulnerability, the more risk management measures will be needed to ensure the site has an acceptable level of safety as well as general acceptance by the community. A 'traffic light system' represents high, medium and low levels of risk based on assessment of the criteria.

The criteria are broadly based on the National Health and Medical Research Council "Guidelines for Managing Risks in Recreational Waters". These guidelines contain a comprehensive summary of criteria which impact on recreational use of waters and adopt a risk-based approach to managing safety in water-based activity recreation. Some of the criteria in these guidelines are not relevant (e.g. risks associated with beaches such as rips) or generally apply to all sights (e.g. sun, water temperature, etc).

### Water Quality

<b>Potential Problems</b>	<p>Water quality needs to be assessed during both the feasibility stage and vulnerability stage. During the feasibility stage an assessment is made of pathogens against relevant guidelines and standards. During the vulnerability stage, water quality is assessed against a broader range of indicators as well as various temporal changes that may occur at a site.</p> <p>A site initially identified as suitable for activity such as swimming may still be vulnerable to temporal changes in water quality, such as during wet weather.</p> <p>The adjacent and upstream catchment and its various land uses (such as industrial development) have a potential to impact on water quality. These land uses can cause point source pollution and dry weather discharges which may not be immediately detected through water quality sampling. For example, sites which have sewer overflows or industrial land uses in close proximity to the site would result in a higher vulnerability for water quality due to the potential local impacts of sewer overflow or industrial discharges. Algal blooms can also impact on water-based recreation activities. Toxins in algae can cause skin irritation and, if ingested, illness.</p>
<b>Response</b>	<p>Water quality monitoring implemented, with warnings similar to the State Government's Beachwatch program</p> <p>Education of users through signage or other means at the site; e.g. warning not to swim after rain or in signs of algal blooms</p> <p>Water treatment using natural or physical treatment measures</p>

### Precedent



Floating Wetlands  
Aqua Biofilter, Lake Taihu

Lake Taihu Aqua Biofilter is a floating wetland used to treat wastewater. The system is composed of reed islands that are interspersed with Canna lilies, a popular crop for animal feed. The project has restored healthy biological activity to the lake while also providing a new local industry.

### River Sediment Quality

<b>Potential Problems</b>	<p>Fine silt and mud are a potential cause of poor water quality. Contaminated river bed sediments have the potential to be re-suspended into the water column during in-river activities. These sediments can potentially then be ingested or come into contact with users, causing illness, skin irritation, infections, etc.</p>
<b>Response</b>	<p>Location of site structures in deep water to avoid contact with the river bed</p>

## Water Clarity

### Potential Problems

The clarity of the water at a site will have an impact upon the vulnerability to both users' safety (e.g. risks of injury from submerged objects) and perceptions of the site (affecting its overall appeal and community acceptance). There is also an association of turbid water with poor quality water. Water clarity is affected by oil and grease contamination, debris and other visual pollutants. Water clarity is highly dependent on the local characteristics of a site, such as proximity to commercial areas and road runoff, which can cause poor water clarity.

### Response

Education of users about turbidity, through signage or other means at the site  
Water treatment using natural or physical treatment measures  
Management measures (e.g. rubbish removal etc.)

### Precedent



Natural Filtration  
Kings Cross Pond Club, London

Kings Cross Pond Club is a 40-metre-long natural swimming pool. The pool purifies the water using a chemical free approach. Pools are divided into recreational swim zones and filtration zones. Floating and underwater plants oxygenate and cleanse the water.

## River Dynamics

### Potential Problems

The flow conditions of a river can present a hazard, particularly where there are high water velocities or deep waters. Water velocities have an impact on both watercraft and swimming safety as rivers can quickly convey people long distances in short times. The problem is compounded when people are conveyed to deeper water or towards hazards (e.g. watercraft). Large objects (e.g. logs) can also be conveyed, which can hit river users. For some users, fast flowing waters can induce feelings of panic. Rivers may look calm and shallow on the surface while masking the faster-flowing water underneath. Dynamics of river flows (such as water velocities) can change in relatively short time frames; this can present a hazard as there are no obvious signs that the conditions have changed to become more hazardous.

### Response

Education of users about velocities; for example, through signage or other means at the site warning not to swim when there may be high flows  
Use of water level indicators at the site to indicate safe ranges of water levels, which are correlated to velocities at the site - above certain water levels, entering the river is not recommended

### Precedent



Dangerous Current Hazard signs  
Royal Life Saving NSW

Hazard signs are deployed by Royal Life Saving NSW in order to protect swimmers from dangerous currents.



## River Bed Physical Hazards

**Potential Problems** Physical river bed hazards can be natural, such as large woody debris, bedrock on the base of the river or shore; or artificial, such as glass, needles or metal. Submerged objects, such as logs, rocks and discarded rubbish can be hit by swimmers or watercraft or can entrap them.

The vulnerability of a site to river bed hazards may not be immediately evident and may require a physical site assessment using diving or other techniques. Potential sources of hazards (e.g. old trees) should also be assessed.

In shallow water, sharp objects such as glass can present a danger.

**Response** Visual inspections can be undertaken from the surface, particularly in tidal areas during low tide, or after rain events. Inspections should target objects on, and protruding from, the river bed.

Particularly when establishing a swim site, more detailed underwater inspections, using divers, should be undertaken and any potential hazardous objects removed.

### Precedent



Hazard Dive  
Lake Parramatta, Sydney

Lake Parramatta is a swim site located two kilometres from Parramatta CBD, a highly urbanised area. A series of dives took place and potential hazards were cleared to ensure that the site is safe for swimming.

## River Bank and River Edge Characteristics

**Potential Problems** Some riverbed areas can contain soft sediment beds which can make access to the water less safe or enjoyable.

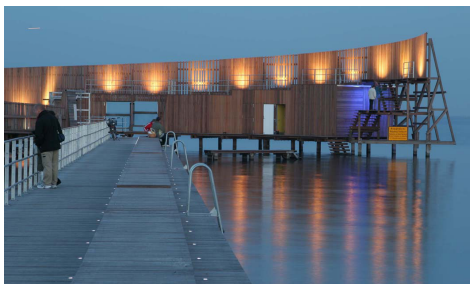
Soft sediments can also contain contaminants such as heavy metals which may cause a water quality risk if disturbed when entering the water.

At some sites access to the river's edge is restricted due to the river bank. For example, the river bank could have a steep, high drop to the water's edge. This both restricts access to the river and also makes emergency egress from the river more difficult. The river edge can also have hazards such as artificial walls with vertical surfaces, or rocky substrates with oysters.

**Response** For river edges with soft sediments along the edge, consider providing access to the river which avoids the soft sediments, such as building piers, wharfs or boardwalks structures, or providing access from the river bank using steps where access to deeper water is available.

Install appropriate warning signage.

### Precedent



Boardwalk  
Kastrup Søbad, Copenhagen

This project provides swimmers access to the water from an existing wharf. The curved boardwalk protects swimmers from the wind and includes changing rooms and showers. The aim of the project was to protect the existing coastline and provide access to the water.

## Heritage

**Potential Problems** Some areas along or adjacent to the river may have local, state or national heritage values which may potentially restrict development associated with recreation activities.

Some areas may also have heritage sight lines to or along the river from adjacent heritage buildings that need to be considered and may restrict development associated with recreation activities.

**Response** Consult with a qualified heritage consultant to determine acceptable uses adjacent to or nearby heritage sites and appropriate design responses.

### Precedent



Heritage  
Little Coogee, Sydney

Little Coogee is designed to retain the existing heritage condition. Additional infrastructure is to be avoided and any modification to the existing riverbank needs to be consistent with the heritage setting.

## Vulnerability Checklist

The vulnerability checklist assesses existing conditions at a site and can be used to gain an initial understanding of the vulnerability of a site.

Criteria	Test	Result	Method	Observation
<b>Water Quality</b>				
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Pass or Fail	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	
	Wet Weather Visual Check	Pass or Fail	Conduct a visual check of the area following more than 10mm of rainfall	
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Chart that plots water quality over time	Implement a monitoring program for water quality using samples collected over a period of 12 months	
<b>Water Clarity</b>				
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Pass or Fail	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	
	Wet Weather Visual Check	Pass or Fail	Conduct a visual check of the area following more than 10mm of rainfall - Is the water clarity desirable for swimming?	
	Water Turbidity Physical Content Test	Chart that plots turbidity over time	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	
<b>River Sediment Quality</b>				
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Pass or Fail	Conduct a site analysis to determine the embayment of the site and sediment type	
	Low Tide or Low Water Level Visual Check	Pass or Fail	Conduct a visual check of the area at low tide (if in a tidal part of the river) - Is there visual muddy sediment?	
	River Sediment Samples	Lab Assessment of River Sediment	Coordinate a physical content test of the river sediment by measuring samples around the site	
<b>River Dynamics</b>				
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Pass or Fail Aboriginal archaeological Due Diligence	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following a dry or low weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	
	Wet Weather Velocity Check	Pass or Fail	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	
<b>River Bed Physical Hazards</b>				
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Pass or Fail	Conduct a visual check of the area at low tide (if in a tidal part of the river) - Are there any physical hazards protruding from the water or riverbed?	
	Dive Study	Map or chart of physical hazards	Coordinate a dive study of the river bed for physical hazards	
<b>River Bank and River Edge Characteristics</b>				
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Pass or Fail	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	
<b>Heritage</b>				
Value, proximity and level of protection of heritage items	Research Heritage Items	Pass or Fail	Research World, National, State and local heritage sites and the Aboriginal Heritage Information Management System	
	Aboriginal archaeological Due Diligence		Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Pass or Fail	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	

## Vulnerability Case Study

'Site x' has been chosen as an illustrative site to demonstrate the use of the vulnerability checklist. An assessment of the site was undertaken using the checklist and the findings are as follows:

- The water quality appeared visually good in dry weather; however, the site appeared poor in wet weather. Water quality testing is recommended. An orange score has been given for vulnerability.
- The water is clear following both a dry and wet weather visual inspection, with no obvious issues with turbidity. Therefore, the site is considered to be of low water clarity vulnerability and has been given a green score.
- A visual check at low tide has revealed that there is fine silt and mud on the riverbank of the site. This is considered to be a high vulnerability and has been given a red score.
- A series of velocity checks revealed that there is an area of deep, slow moving water at the site. During wet weather, velocities increase significantly and this could potentially be a hazard. Hence, there is a vulnerability in inclement weather and this has been given an orange score.
- There are no obvious physical hazards following a visual inspection at low tide. A more detailed dive study is recommended to ensure that the site is free from debris. A large stormwater channel discharges upstream of the site presenting a risk of hazardous materials being deposited. The site has been given an orange score.
- A review of aerial photography has revealed that there is a significant mangrove habitat along 30% of the river edge. The vegetation can relatively easily be avoided. Hence, the site is considered to be low vulnerability and has been given a green score.
- Researching the site for heritage values has revealed that there are no issues with proximity to heritage items. Therefore, there is low vulnerability and the site has been given a green score.

Water Quality	  
Water Clarity	  
River Sediment Type and Quality	  
River Dynamics	  
River Bed Physical Hazards	  
River Bank and River Edge Characteristics	  
Heritage	  
Key:	<div>  High Vulnerability   Medium Vulnerability   Low Vulnerability </div> <div> <p>Results: There is only one high vulnerability issue. The site is considered to be low to medium vulnerability overall.</p> </div>

## 2.3 Desirability

The desirability of a swim site relates to a number of urban form elements which impact on overall appeal and how frequently people are likely to visit and spend time at a particular location. The more positive elements that a site has, the more desirable it is likely to be. For example, if the site has good access, amenities, and places to buy food and drinks, the more likely it is to be a desirable place.

The desirability criteria are shown diagrammatically in the figure on the following page and discussed in detail below.

### Access & Movement

Walking, cycling and public transport should be viable modes of transportation to the site. A site which has good existing access has an advantage compared to other sites. Key points to consider when evaluating and strategising 'Access and Movement' are:

- Public transport access
- Pedestrian and cycling access
- Parking

### Adjacent Open Space

Adjacent open space for land-based activities is important for creating vibrancy around the swim site activation. An area for relaxation and recreation at the water's edge is particularly important for parents watching their children in the water and for the safety of water users. These open spaces carry potential for additional activities and programs connected to the site.

Key points to consider when evaluating and strategising 'Adjacent Open Space' are:

- Safety
- Adjacent open space
- Open space network

### Natural Environment

The natural environment is a key desirability factor in activating a site. The natural environment contributes significantly to the amenity and aesthetics of a site and can be an asset to activation. Sites which have good riverbank conditions which invite people down to the water and have trees and shade facilities (e.g. shelters) have a higher desirability.

Sites with high biodiversity and/or significant adjacent vegetation communities may be less suitable in terms of the Vulnerability Assessment, but more valued in the Desirability Assessment as vegetation can improve the amenity, provide shade and activities such as walking. Some sites may be suitable for a limited range of activation opportunities (e.g. bird watching) but unsuitable for significant activation (e.g. provision of facilities, parking, transport infrastructure).

Sites subject to natural hazards such as significant and frequent over-bank flooding can be less desirable due to safety risks and damage to infrastructure.

Key points to consider when evaluating and strategising 'Natural Environment' are:

- Natural hazards
- Trees / Shade
- Riverbank type
- Vegetation

### Built Form and Aesthetics

The desirability of a site is related to the relationship of the site to adjacent development characteristics, including buildings and type of buildings. For example, desirability is improved by built form which provides a place to eat and sit, for amenities, change rooms, retail or events. The greater the provision of suitable built form components the higher likelihood that the site will be activated. This must be balanced by a consideration of character, proportion, scale and general aesthetic factors which complement the swim site. For example, sites with industrial buildings adjacent to the river typically have low desirability.

Key points to consider when evaluating and strategising 'Built Form and Aesthetics' are as follows;

- Site Character (including Aesthetic Considerations)
- Existing Facilities
- Proximity to a Town Centre
- Topography and Views

### Governance & Implementation

Good governance is an important factor in any project's ultimate delivery. Governance will require consideration of a range of existing planning controls including infrastructure and transport requirements (e.g. boating access), fisheries (e.g. removing mangroves), environmental protection (e.g. impacts on threatened species), Council open space and recreation strategies.

In the context of activating river sites, the complex interplay between land owners, local council areas, catchment managers and their objectives requires a good governance structure to ensure a mutually-beneficial outcome, with Camellia being a good example.

River site activation and its desirability are dependent on the availability of resources for the proposed implementation measures. Where funding has been identified (e.g. through new development or Council support), it is more likely to provide the necessary construction and ongoing operational and maintenance resourcing to maintain the site's desirability.

The overall economic and social vitality of a site relates to the health of the local economy. For example, local food and beverage retailers, transport providers, recreation providers (e.g. boat hire) and sporting clubs (e.g. rowing clubs) all contribute to the activation of a site.

Key points to consider when evaluating and strategising 'Governance and Implementation' are:

- Planning Controls
- Land Ownership
- Governance
- Funding

## Community Demand

Community support for a project can have a significant impact upon its success. Communities often have unique insights into the viability of their local area and local environments that may not be immediately evident to decision makers. Proper consideration of community views can result in garnering support as well as uncovering new possibilities for the activation of the swim site.

In the context of activating a site for increased river recreation activities, an identified community demand can be a powerful driver for the development of activating a site. Community demand can even mean that other Desirability Assessment criteria are less relevant or important by virtue of their desire to activate and take community ownership of the site in its current conditions.

There are also unique opportunities if and when re-development occurs to provide services for new residents who are part of the identity of the new development.

Key points to consider when evaluating and strategising 'Community Demand' are:

- Identified Community Demand
- Future Redevelopment
- Adjacent Land Use



Diagram 3: Desirability criteria



## Lake Parramatta: desirability assessment case

### study example

To assess the desirability of a site, a semi-quantitative framework is used, as shown on this spread. The framework allows different sites along the river to be assessed in a visual manner to allow for communication to a wide audience.

Lake Parramatta is used as an example with indicative scoring developed for the site. Some parameters at present are not known and have been left blank. An explanation

of why a particular score has been given for each site is provided. At present this is an initial high level assessment to show how the desirability criteria are used and the data can be further developed based on a more comprehensive site assessment. Existing data and information (e.g. GIS mapping, heritage mapping) can be used to further inform the desirability scoring criteria.

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 300m from location going to Parramatta every 30 mins at peak hour				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 0.5km of cycle path/boardwalk and the Hunts Creek walking trail				
<b>Parking</b>	10 carparking spots	20 carparking spots	50 carparking spots	100 carparking spots	200+ carparking spots
	Why? 68 carparking spots within a 100m radius of the site plus nearby street parking				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Poor visibility from the street, existing street lighting				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10000m <sup>2</sup>	10000-50000m <sup>2</sup>	50 000-100 000m <sup>2</sup>	more than 100000m <sup>2</sup>
	Why? 13500m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 1 existing park within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? A dive study was undertaken prior to pening for swimming and hazards were removed. A tree adjacent to the swim area has been taken down to manage safety.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 10500m <sup>2</sup> this is around 35% of the total site area				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank type
	Why? Rocky				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 70% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Natural setting				
Existing Facilities	No existing amenity	Public Toilet	Public toilet, shelters	Public toilet, shelters, play Equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as play equipment, shelters, public toilet, boat hire				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1km to nearest Town Centre (North Parramatta), 4km to Parramatta CBD				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - Flat terrain, pleasant views at the site				
Planning Controls					
	Why? Facilitated by Council				
Land Ownership					
	Why? Owned and activated by Parramatta Council				
Governance					
	Why? Council as lead agency working with other agencies; one land manager owns land and water; inexpensive to run – \$10,000/year				
Funding					
	Why? Ongoing investment by council; fully supported by council upgrades to amenities; additional government grants were also received.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 776 positive votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low; There are no current building sites.				
Adjacent land use	Heavy Industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential, commercial use and parkland surround the site, including the North Parramatta developments				

## Improving Desirability Scores

It should be noted that sites with lower desirability scores are not necessarily unsuitable for activation. The framework only provides a relative indication of current conditions. Sites with lower relative scores will require greater investment to activate the site, compared to other sites, such as through using the measures outlined below. If a site does not meet all of the desirability criteria it does not mean that it is without merit; it may simply require more investment to achieve a high level of activation at a site. It should be noted that high levels of activation may not always be desirable.

Thus, the desirability assessment is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	<ul style="list-style-type: none"> <li>– Provide greater access to the site by bus; this could be achieved with additional bus stops or more frequently timetabled trips</li> <li>– Better utilise existing services by providing shuttle buses to Ferry or Train Stations</li> </ul>
<b>Pedestrian &amp; Cycle Access</b>	<ul style="list-style-type: none"> <li>– Connect the site to nearby cycle paths or walkways</li> </ul>
<b>Parking</b>	<ul style="list-style-type: none"> <li>– Create additional carparking by better utilising on-street carparking or through the addition of a car park</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>– Increase the safety of a site by adding street lighting or by improving sightlines to enable greater visibility from the street</li> <li>– Undertake a CPTED (Crime Prevention Through Environmental Design) review of the site and implement action to increase passive surveillance and visibility of the site</li> </ul>
<b>Adjacent Open Space</b>	<ul style="list-style-type: none"> <li>– Consider purchasing adjacent properties</li> <li>– Consider placing planning controls on foreshore land at time of redevelopment</li> </ul>
<b>Natural Hazards</b>	<ul style="list-style-type: none"> <li>– Consider remediation projects</li> <li>– Consider warning signs (e.g. flood warning signs or systems)</li> <li>– Consider education campaign about hazards (e.g. swimming between flags)</li> </ul>
<b>Trees/Shade</b>	<ul style="list-style-type: none"> <li>– Increase the amount of planting on the site</li> <li>– Consider new shade structures</li> <li>– Consider new shelters and similar</li> </ul>
<b>Riverbank Type</b>	<ul style="list-style-type: none"> <li>– Consider steps or similar access to the water's edge</li> <li>– Consider requirement for wharves, jetties or similar to provide access</li> <li>– Consider locations which avoid sensitive vegetation along the river</li> </ul>
<b>Vegetation</b>	<ul style="list-style-type: none"> <li>– Look to alternative forms of activation and access which protect the shoreline such as boardwalks and jetties</li> <li>– Create clearly defined path entry points to avoid trampling of vegetation (e.g. similar to dune access points to the beach)</li> </ul>
<b>Site Character</b>	<ul style="list-style-type: none"> <li>– Improve a site's character through high quality design</li> <li>– Undertake a masterplan for the site to consider the site as a whole</li> </ul>
<b>Existing Facilities</b>	<ul style="list-style-type: none"> <li>– Increase the amount of existing facilities available to the public; including public toilets, shelters and play equipment</li> <li>– Foster small businesses which provide paddle boarding, dinghy or kayak hire</li> </ul>
<b>Proximity to Town Centre</b>	<ul style="list-style-type: none"> <li>– Provide small Kiosk or coffee cart services</li> <li>– Consider opportunities for rezoning adjacent land</li> </ul>
<b>Topography and Views</b>	<ul style="list-style-type: none"> <li>– Develop viewing platforms or boardwalk interventions which provide views beyond vegetation such as mangroves to surrounding areas</li> <li>– At steep sites consider ramps, benching and similar to improve usability</li> </ul>
<b>Planning Controls</b>	<ul style="list-style-type: none"> <li>– Encourage and enable the activation of the foreshore by planning controls in redevelopment zones</li> <li>– Include river activation as an acceptable use in Plans of Management and planning instruments</li> </ul>

<b>Land Ownership</b>	<ul style="list-style-type: none"> <li>– Purchase land from private landholders, where significant connectivity is provided</li> <li>– Consider boardwalks along the river in front of private properties</li> </ul>
<b>Governance</b>	<ul style="list-style-type: none"> <li>– Create a vision, then seek community and political support for the vision through awareness and education campaigns.</li> <li>– Demonstrate leadership through activities which activate at small, medium and large scales.</li> <li>– Engage proactively with and provide ongoing commitment to regional groups</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>– Seek State Government grants through the Metropolitan Greenspace program, various environmental programs such as estuary management grants, as well as similar Federal Government grants for recreation and environmental initiatives.</li> <li>– Funding can also be sought from new development through section 94 contributions and voluntary planning agreements as well as proactive engagement with regional scale development (e.g. Camellia)</li> </ul>
<b>Identified Community Demand</b>	<ul style="list-style-type: none"> <li>– Engage with the public and increase their awareness of the site through promotional campaigns</li> <li>– Hold events at the site to promote the recreation opportunities</li> <li>– Engage with community and school groups</li> </ul>
<b>Future Redevelopment</b>	<ul style="list-style-type: none"> <li>– If there is no planned redevelopment, consider projects which could potentially occur in the future, particularly in industrial areas</li> </ul>
<b>Adjacent Land use</b>	<ul style="list-style-type: none"> <li>– Consider rezoning of adjacent land</li> </ul>

## Desirability Scores – General notes

The objective of the desirability assessment is to assist in the assessment of both the potential and the ease of activation of a site:

- Low scores, typically 2.5 or less indicate that a site has few desirable features and is less likely to be able to activated successfully. These sites are generally best suited to local swim sites
- High scores, typically 3.5 or more indicate that a site has a number of desirable features and is likely to be able to activated successfully. These sites are generally best suited to regional swim sites
- Scores between 2.5 and 3.5 have a moderate number of desirability features and are likely to require investment in a range of infrastructure to create a successfully activated swim site. The majority of sites are in this category.

The desirability assessments should also be undertaken with community consultation on both the desirability factors for each site as well as the overall community interest in activating a site for swimming and other recreation activities. Community demand for activating a site can be one of the most important factors in determining the suitability of a site.



## 3.0 Swimming Site Assessments



Twelve proposed swimming sites are assessed according to all three criteria of the Activation Framework introduced above.

This is followed by the four existing swimming sites in the Parramatta River. Three of the four existing swimming sites are monitored and reported by Beachwatch and one is monitored and reported by City of Parramatta. As these sites are already open for swimming, Feasibility and Vulnerability issues have already been managed, and are therefore not included in this report. Desirability assessment is included for the sake of comparison and with a view to future improvements .

# Little Coogee

Little Coogee is located in Parramatta Park on the Parramatta River foreshore. The site is in a freshwater section of the river. The site currently consists of a grassy bank sloping down towards the river bank. The area consists of scattered trees as well as a more continuous line of planting along the river bank itself. The site is owned and administered by the Parramatta Park Trust.

River is between two causeways that control and maintain water levels. altered from natural setting. Eastern bank is a constructed sea wall and deepest section of the river (outside of meander so fastest flow). Western banks has some sections of constructed wall and other natural edges.

A site assessment has identified the following at Little Coogee:

- The reserve is heritage listed, having non-Aboriginal heritage values at World, National State and Local levels based on its Vice-Regal and People's Park cultural values and Aboriginal heritage values at State and Local levels due to its location near the Pleistocene sand lens, and has significant heritage constraints.
- Old Government House and the Domain (Parramatta Park) is of World, National, State and Local heritage significance and has significant statutory constraints and obligations.
- Little Coogee sits within the World Heritage boundary. The Trust has indicated that any structures or other facilities located at Little Coogee are subject to the heritage constraints of the site.
- The water at the time of visit was very shallow on the western bank, limiting opportunities for swimming and immersion.
- There was a large sediment bar at the time of visiting which allowed access down to the river and water edge.

- There is a flying fox colony upstream which needs to be considered both in terms of potential impacts on the colony as well as impacts of the flying fox colony on the water quality of the river
- The site is well activated with existing amenities and café (currently under repair) as well as the main loop path in Parramatta Park and nearby adjacent attractions including the Dairy and the Paddocks playground
- There is, however, limited existing parking and limited opportunity for expansion of parking due to the heritage landscape constraints.
- The river in this location consists of natural banks and natural bed
- The site has a pleasant natural riverbank character, with views up and down the river.

Specific opportunities at this site range from greater activation and promotion of the site as a land based riverbank picnic spot to a more water based recreation spot including potential for splash contact and potentially swimming subject to water quality considerations. Any additional activation of the site would need to consider the impact on heritage at the site and other constraints.

A strategy for Little Coogee could be to promote the site as a riverbank recreation opportunity and this would naturally encourage splash contact as people engage with the rivers edge through exploration of natural areas.
















During the site visit the visible water quality was reasonably good. It is recommended to undertake screening water quality monitoring (and exposure pathway analysis for chemicals and pathogens) at the site during dry weather to understand the water quality. Depending on the outcomes of this, further investigations into the viability of swimming at the site could be considered.




## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Little Coogee based on information and knowledge of the site at present. While full water quality data is not available for Little Coogee, initial water quality monitoring conducted by City of Parramatta showed that Little Coogee is comparative to water quality in the CBD, albeit slightly better. Little Coogee is currently considered feasible for land-based activation and is likely to be suitable for splash contact activation. Water quality monitoring is recommended to understand potential for swim based activation, but based on information available at present it is considered unlikely to be feasible for swimming. A treated water river swimming site is considered feasible at the site based on the available land and previous studies which have investigated this along the river foreshore.

Little Coogee is considered a **Regional** site due to its location within Parramatta Park and the wide range of available facilities.

























	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic	  	NA	
Water Quality	  	WQ unknown at present	Undertake WQ Monitoring
Bathymetry	  	Depth may limit swimming	Survey river to confirm best locations
Publicly-Available Land	  	Large areas of land available. Restrained by heritage.	Heritage study to assess any proposed changes at the site
Ecological Restrictions	  	Grey Headed Flying Fox colony	Ecological impact assessment

**KEY:**  Low Feasibility  
 Medium Feasibility  
 High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The assessment is based on an initial preliminary dry weather site inspection. Note that currently there is no wet weather site visit, sediment monitoring, bathymetry data or dive study for this site. There has been some initial water quality monitoring conducted by City of Parramatta showing that Little Coogee is comparative to water quality in the CBD, albeit slightly better.

### Vulnerability Summary

<b>KEY:</b>  High Vulnerability  Medium Vulnerability  Low Vulnerability	Water Quality	  
	Water Clarity	  
	River Sediment Quality	  
	River Dynamics	  
	River Bed Physical Hazards	  
	River Bank and River Edge Characteristics	  
	Heritage	  
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.		

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Immediately adjacent are parklands and the Parramatta Stadium
	Site Analysis		There are no major stormwater outlets at this location
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Moderate turbidity. Visible to about 0.2m from the surface and visible oily film on the surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-

River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No embayments Fine muddy sediments Causeways maintaining water level, limiting flow in no/low rainfall periods
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	-
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Note no lab assessment of sediments undertaken at Little Coogee
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities in dry weather on the inside of the meander bend.
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Likely to be high velocities in wet weather due to nature of channel and relatively large upstream catchment area
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Logs, rubbish, dumped materials, etc
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	Eastern bank is a constructed sea wall with steep drop-off to deep water. Western banks has some sections of constructed wall and other natural edges. A small sediment bar was present allowing access. Access to the water is typical of a natural riverbank, with a short drop at the top of bank Scattered trees growing along the river edge.
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	State heritage item which restricts future facilities. Consider need to strengthen its importance
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	Any activation will need to consider visual impacts to the site

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 300m from location going to Epping or Parramatta Station every 10 mins at peak hour				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 3km of cycle path/boardwalk				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 40 carparking spots within a 100m radius of the site, although use is at capacity due to surrounding land use				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Good leave in, existing street lighting, minimal passive surveillance at night				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50,000-100,000m <sup>2</sup>	more than 100,000 m <sup>2</sup>
	Why? 60,000 m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing parks within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 3 existing parks within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? Main river trunk suffers from flooding issues. Grey Headed Flying Fox camp is nearby. Woody debris likely, including from floods.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 2200m <sup>2</sup> (around 25% of the total site area)				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Mixed sand + fine sediment, reasonable access to the water				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 50% of edges are surrounded by vegetation/mangroves				



Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Natural setting with parkland views in a protected area of the river				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as picnic tables and cafe and close proximity to playground				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1.5km to Westmead or Parramatta				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - Flat terrain				
Planning Controls					
	Why? Heritage Act approvals required.				
Land Ownership					
	Why? Government-owned				
Governance					
	Why? Parramatta Park Act - Trust Board and Minister for Environment ( <a href="http://www.parrapark.com.au/about-us/board-and-executive/">www.parrapark.com.au/about-us/board-and-executive/</a> )				
Funding					
	Why? Additional works and services above normal Park operations may require Capital Funding and additional recurrent funding sources				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 450 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? Within Westmead redevelopment precinct and Parramatta CBD				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Parklands, North Parramatta (PNUT), Stadium, Parramatta Light Rail				

## Parramatta CBD

The Parramatta River foreshore reserve runs along the river's edge adjacent to Parramatta CBD. The site currently contains a main foreshore path on both sides of the river, turf and scattered trees, and a sea-wall dropping down steeply into the Parramatta River. The river is freshwater in this location and water in this section of the river is regulated by two weirs, one upstream of the site and one downstream of the site.

A site assessment has identified the following at the river foreshore in the Parramatta CBD:

- The reserve is likely to undergo significant transformation in the short, medium and long term with the continuing development of Parramatta CBD
- The site is scheduled for a number of significant upgrades including the potential for a new Powerhouse Museum facility as well as an upgrade to Riverside Theatre along the river's edge
- Parramatta CBD and the surrounding areas are undergoing significant re-development and there will be increasing demands placed on the open space for passive recreation.
- The site is well activated with existing facilities, events and programs and will be increasingly activated in the future by development along the waterfront
- The river in this location consists of a concrete base sloping down to a natural central river bed
- The site has a range of significant festivals and events including Loy Krathong Festival, NSW Paddlefest and Burramatta Festival
- The river in this section is currently being used for recreational boating including weekly canoe polo events
- The access to the water edge is currently difficult outside of the boat ramps
- Fill behind the wall needs to be considered

A wide range of potential opportunities have been identified at the site in previous studies including the Parramatta City River Strategy, Design Parramatta and City River Swim – Strategies for Parramatta River. These studies should be referred to for more detail on proposed activation opportunities.

A strategy for Parramatta CBD could be to strategically support the implementation of existing strategies which focus on the riverfront activation and work closely with future riverfront reserve upgrades and related projects.



FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Parramatta CBD based on information and knowledge of the site at present (water quality data is available for the site). The CBD is currently considered feasible for land based activation and splash contact activation and both are presently occurring at the site. Water quality monitoring undertaken to date by the City of Parramatta indicates that the site is currently not feasible for swimming. A swim site is considered desirable in the Parramatta CBD and a treated water swim site is considered feasible at the site based on the available land and previous studies which have investigated this along the river foreshore.

Parramatta CBD is considered a **Regional** site due to its location within the Parramatta CBD and its current role in hosting major events.

	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic	<div><div></div><div></div><div></div></div>	NA	
Water Quality	<div><div></div><div></div><div></div></div>	Poor WQ	Implement Masterplan
Bathymetry	<div><div></div><div></div><div></div></div>	Depth may limit swimming	Survey river to confirm best locations
Publicly-available Land	<div><div></div><div></div><div></div></div>	Land available	
Ecological Restrictions	<div><div></div><div></div><div></div></div>	Limited ecological constraints	

KEY: 

Low Feasibility

Medium Feasibility

High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection, bathymetry study and significant water quality monitoring. Note that currently there is no wet weather site visit, sediment monitoring or dive study for this site.

### Vulnerability Summary

**KEY:**

- High Vulnerability
- Medium Vulnerability
- Low Vulnerability

Water Quality	<span style="color: green;">○</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
Water Clarity	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
River Sediment Quality	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
River Dynamics	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
River Bed Physical Hazards	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
River Bank and River Edge Characteristics	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
Heritage		<span style="color: yellow;">●</span>	<span style="color: red;">○</span>

Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Central Business District area drains to the river Stormwater outlets are located within the section from the CBD
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests	Implement a monitoring program for water quality using samples collected over a period of 12 months	Monitoring by the City of Parramatta shows the water quality does not meet the guidelines for pathogen levels
	Bacteriological Content Test		
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Moderate turbidity. Visible to about 0.2m from the surface and visible oily film on the surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-

River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No embayment, however flushing is controlled by the weirs in this section of the river Muddy fine sediments
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	-
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Note no lab assessment of sediments undertaken at Parramatta CBD
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities in dry weather.
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Likely to be high velocities in wet weather due to nature of the large upstream channel
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Nothing identified on site, but likely to be hazards such as sharps, dumped material
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	No beach or other accessible water edge; sea wall restricts access to the river; no vegetation along the river.
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	State heritage item which restricts future facilities. Consider need to strengthen its importance
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	Potential for impacts and needs to be further assessed

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

Public Transport Access	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 100m from location going to Parramatta Station every 10 mins at peak hour, ferry + train in close proximity				
Pedestrian & Cycle Access	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 3km of cycle path/boardwalk				
Parking	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 200 carparking spots within a 100m radius of the site				
Safety	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Good visibility from the street, no existing street lighting, good surveillance from adjacent land use				
Adjacent open space	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50,000-100,000m <sup>2</sup>	more than 100,000 m <sup>2</sup>
	Why? 40,000 m <sup>2</sup> of open space surrounding the site				
Open Space Network	0 existing parks within 500m radius	1 existing parks within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 4 existing parks within a 500m <sup>2</sup> radius				
Natural Hazards					
	Why? Not assessed but likely				
Trees/shade	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 3200m <sup>2</sup> (around 15% of the total site area)				
Riverbank type	Muddy riverbank type				Sandy riverbank Type
	Why? Undesirable - Muddy and poor access due to steep, vertical banks, good access to top of bank				
Vegetation	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? No edges are surrounded by vegetation/mangroves				



Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Urban area with parklands adjacent and increasing investment in reserve				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Various facilities and opportunities exist				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? Less than 0.5km to Parramatta Town Centre				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - Flat terrain				
Planning Controls					
	Why? Not yet assessed				
Land Ownership					
	Why? Not yet assessed				
Governance					
	Why? Not yet assessed				
Funding					
	Why? Not yet assessed				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 478 positive votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The CBD is undergoing significant re-development				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential, commercial, retail and parklands with major events as well				

# MacArthur Street Bridge

Queens Wharf Reserve at Macarthur Street, Parramatta is a narrow reserve on the southern side of the Parramatta River, immediately downstream of the Parramatta CBD. The site contains turf and scattered trees and a relatively high sea wall dropping down to the Parramatta River.

A site assessment has identified the following at Macarthur Street reserve:

- The park is close to the Parramatta ferry wharf and the ferry passes in relatively close proximity to the river bank/sea wall
- The site is scheduled for a new stop on the new Parramatta Light Rail service.
- Parramatta CBD and the surrounding areas are undergoing significant re-development and there will be increasing demands placed on the open space for passive recreation.
- The park currently has limited facilities other than a naval historical memorial
- The site has limited paths and limited current connectivity to regional paths
- The reserve has minor vegetation along the foreshore and along the riverbed has good stands of mangrove vegetation
- The access to water is currently very difficult and would need formal access to be provided
- Potential for site to consist of fill behind the sea wall
- Ferry wash in this area needs to be considered due to the proximity of the ferry, however it is noted that due to the slow speeds of the ferry, the wash generated is relatively minor

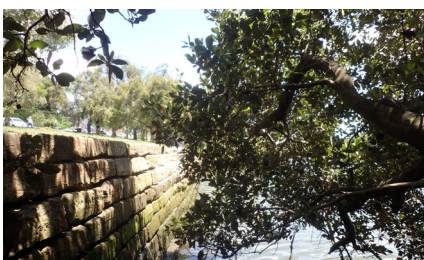
A wide range of potential opportunities have been identified at the site in previous studies including the Parramatta City River Strategy, Design Parramatta and City River Swim – Strategies for Parramatta River. These studies should be referred to for more detail on proposed activation opportunities.

A number of specific opportunities have been identified as part of this project:

- Increase existing activation for land based and river bank activity
- Potential to create access down to the river with a new deck at the base of the sea wall, which could provide a platform for better engagement with the river
- Potential to provide engagement with the mangroves through a new deck under the mangroves and to take advantage of the mangrove canopy and the shade that it provides

A strategy for Queens Wharf Reserve could consider the following:






- Support the implementation of existing strategies which focus on riverfront activation
- In the short term providing better access to the river foreshore, through steps and a deck down in front of the existing sea wall to help activate the water edge
- Undertake high level background studies, particularly heritage constraints which are a key constraint at the site
- Develop initial concepts for riverbank activation (e.g. see Case Studies in Section 5) including a sketch plan with options for discussion
- Undertake community consultation to better understand existing site uses and the community needs and desire for river edge access for the site
- Conduct exposure pathways analysis for both chemicals and pathogens
- Consider requirements for shark netting






## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Macarthur Street based on information and knowledge of the site at present (no water quality data is available for the site). The site is currently considered feasible for land based activation. The vertical sea wall combined with proximity to the Rivercat route limits options for in-river based activity. There are potential opportunities to increase engagement with the river through the creation of a floating type platform to provide access to the river's edge, which could be used for fishing, boat launching and similar activities.

Macarthur St Bridge is considered a **Local** site due to its limited land and foreshore area, and close proximity to the ferry route reducing its ability to attract large numbers to the site.

























	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic		Rivercat passes in close proximity	Discuss exclusion zones with RMS. Design in barriers
Water Quality		WQ not well known	Undertake WQ Monitoring as required
Bathymetry		Not known	Bathymetry survey as required
Publicly-available Land		Land available	
Ecological Restrictions		Existing mangroves	Ecological impact assessment

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection. Note that currently there is no wet weather site visit, water quality monitoring, sediment monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary

<b>KEY:</b>  High Vulnerability  Medium Vulnerability  Low Vulnerability	Water Quality			
	Water Clarity			
	River Sediment Quality			
	River Dynamics			
	River Bed Physical Hazards			
	River Bank and River Edge Characteristics			
	Heritage			
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.				

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Residential area Stormwater outlets are located close by
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
	Bacteriological Content Test		
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Moderate turbidity. Visible to about 0.3m from the surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-

River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No embayment, however minimal tidal flushing due to location at upstream end of tidal section of river Sandy sediments with minimal fine sediments
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Some muddy sediments at site
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Note no lab assessment of sediments undertaken at Macarthur St
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities, some boat wash
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Some rocks identified
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	No beach or other accessible shore, High sea wall restricts access to the river Mangroves located restrict areas of open access.
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	Queens Wharf Reserve is a locally listed heritage item, including the stone wall and archaeological site and the Parramatta River wetlands
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	Potential for impacts and needs to be further assessed



## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

Public Transport Access	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 200m from location, light rail, ferry and train				
Pedestrian & Cycle Access	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 2.2km of cycle path/boardwalk				
Parking	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 10 carparking spots within a 100m radius of the site				
Safety	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Moderate visibility from the street, existing street lighting and limited passive surveillance at night				
Adjacent open space	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50 000m <sup>2</sup>	50,000-100,000m <sup>2</sup>	more than 100,000 m <sup>2</sup>
	Why? 400,000m <sup>2</sup> of open space surrounding the site				
Open Space Network	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 3 existing parks within a 500m <sup>2</sup> radius				
Natural Hazards					
	Why? Not yet assessed				
Trees/shade	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover around 50% of the total site area				
Riverbank type	Muddy riverbank type				Sandy riverbank Type
	Why? Undesirable - Mangrove and steep vertical edges				
Vegetation	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 60% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Pleasant reserve with scattered trees and turf				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? No access to existing amenity				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1.0km to nearest Town Centre (Parramatta CBD)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Generally desirable - gently sloping to river edge				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? Community voting not conducted but community desirability workshops considered this site, ranking it fairly low.				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The site is located close to Parramatta CBD				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential, commercial use and parkland surround the site				

# Silverwater Park

Silverwater Park has a main foreshore area with a sea wall and rocky substrate along its edge as well as a more natural edge lined with mangroves. The site is located in close proximity to the Rivercat route. Silverwater Park is located on the junction of Duck River and Parramatta River, which currently has substantial industrial uses upstreams as well as close proximity to past historical heavy industrial uses. The park is located in the Greater Parramatta to the Olympic Peninsula (GPOP) area which is proposed for substantial re-development over the next 20 to 30 years.

A site assessment has identified the following at Silverwater Park:

- The site has a number of existing facilities at the site including a playground, picnic shelters, BBQs, seating, amenities and parking
- The ferry route and the proximity to the river's edge is a key issue which would need to be further explored for any potential river edge site activation
- The site is already active for a range of land based activities including fishing
- The park has a large area of carparking
- The site has a number of existing natural area providing a pleasant character and the site has a pleasant microclimate including breezes off the river
- There are hazards on the bed including a rocky muddy substrate

A strategy for Silverwater Park could consider the following:

- Liaise with RMS to understand implications of proximity to ferry wharf and potential RMS restrictions
- Further develop and workshop initial concept options that have been developed into an adopted Masterplan for the site

- Undertake community consultation to better understand existing site uses and the community needs and desire at the site and align this consultation with the development of the Masterplan for the park
- Liaise with Sydney Olympic Park and the EPA to better understand sediment constraints at the site
- Undertake high level background studies, such as service constraints and heritage constraints
- Consider potential for integration with future re-development for the area and developer contributions to park upgrades
- To further understand the risks of splash contact at the site, confirm dry weather water quality by doing an additional 3 to 6 months of sampling for pathogens.
- To conduct exposure pathways analysis for both chemicals and pathogens
- Consider requirements for shark netting

For further assessment and development of this strategy for Silverwater Park, refer to the case study in Section 5.





## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Silverwater Park based on information and knowledge of the site at present (including preliminary water quality data available for the site). The preliminary water quality results to date show that enterococci levels during dry weather are below the recommended threshold for swimming. However, during and shortly after rain events, even relatively small rain events, the enterococci levels are very high. Furthermore, the site is located downstream of industrial development and adjacent to former historical heavy industry, resulting in the potential for poor river sediment quality. The site is also located close to the ferry route which passes in close proximity to the river edge.

The river edge currently deters access due to the sea wall, and muddy and rocky substrate. The site is currently considered feasible only for land-based activation. With active interventions to the river edge to provide access to the water and protection from the ferry, splash contact could also be suitable.

Silverwater Park is considered to have the potential for a **District** site due to its location within the Greater Parramatta to the Olympic Peninsula corridor, its proximity to the regional recreational areas at Blaxland Commons and its location on the Parramatta River foreshore path. However, it is partially limited by the area of foreshore available due to the ferry route.

























	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic		Rivercat passes in close proximity	Discuss exclusion zones with RMS. Design in barriers
Water Quality		Poor in wet weather. Industrial catchment upstream. Historical landuses	Implement Masterplan
Bathymetry		Not known	Bathymetry survey as required
Publicly-available Land		Land available	
Ecological Restrictions		Existing mangroves	Ecological impact assessment Activate edges where mangroves have not established

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection and an initial preliminary screening water quality study. Note that currently there is no wet weather site visit, bathymetry data or dive study for this site. There is sediment monitoring.

### Vulnerability Summary

<b>KEY:</b>  High Vulnerability  Medium Vulnerability  Low Vulnerability	Water Quality	  
	Water Clarity	  
	River Sediment Quality	  
	River Dynamics	  
	River Bed Physical Hazards	  
	River Bank and River Edge Characteristics	  
	Heritage	  
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.		

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	The park's location at the junction of Duck River and Parramatta River means there is significant vulnerability of the site to water quality from large areas of upstream industrial landuse within this catchment.
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	High vulnerability. Monitoring undertaken during wet weather indicated very poor water quality and rapid deterioration of water quality even after small rainfall events.
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	Initial preliminary screening has shown that water quality was reasonable during dry weather and very poor during even small rainfall events.
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Reasonable with visibility to about 0.5m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No major embayments at the site. Sediments are dark muddy sediments with high proportion of fines.
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Muddy sediments at low tide as well as hazards on the floor
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Sediment at this site are typical for the Parramatta River, with elevated levels of heavy metals and dioxins, reflecting the industrial history of the River
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Generally low velocities with boat wash occurring when the Rivercat passes the site. The park's location at the junction of Duck River and Parramatta River is likely to cause a backwater eddy condition at the site and likely stagnant zones allowing for less scouring of fine sediment.
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	A range of hazards including slippery surfaces from fine sediment on rocks, bricks, oysters, concrete, reo bars, etc
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	There is very good access from the land where the sea wall is present, approx. 80 metres in length. There is a path immediately adjacent to the sea wall. Further to the west and up Duck River there is very poor access due to the dense stand of mangroves and access is generally not possible or preferable in this location. The sea wall is steep, vertical and requires access to the water's edge.
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	There are no listed heritage items in the LEP.
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

### DESIRABILITY

Public Transport Access	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 400m from location going to Auburn or Burwood every 15 mins at peak hour				
Pedestrian & Cycle Access	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to more than 3km of cycle path				
Parking	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? More than 100 carparking spots within a 100m radius of the site				
Safety	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Poor visibility from the street and no passive surveillance				
Adjacent open space	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50,000-100 000m <sup>2</sup>	more than 100,000 m <sup>2</sup>
	Why? More than 10,000m <sup>2</sup> of open space surrounding the site				
Open Space Network	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 3 existing parks within a 500m <sup>2</sup> radius, and adjacent to open space in Sydney Olympic Park				
Natural Hazards					
	Why? Not yet assessed.				
Trees/shade	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 17,000m <sup>2</sup> (around 15% of the total site area). Picnic shelters are also present.				
Riverbank type	Muddy riverbank type				Sandy riverbank Type
	Why? Undesirable - Muddy, and limited access to water				
Vegetation	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 75% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Pleasant park adjacent to road bridge and industrial areas				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as play equipment, shelters, public toilet				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? More than 2.5km to nearest Town Centre (Auburn or Sydney Olympic Park)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? View accross the river and the bridge above, relatively flat terrain				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 359 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? Adjacent to Camellia and within the Greater Parramatta to the Olympic Peninsula redevelopment area				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Surrounds are currently industrial use				

# Meadowbank Baths

Meadowbank Baths has a number of potential options for activation, both upstream and downstream of the rail bridge. The area downstream of the rail bridge, while containing a sandy beach, is adjacent to the ferry wharf and limited in foreshore open space. The preferred location for swim site activation is therefore upstream (west) of the rail bridge in the location of the former Meadowbank Baths.

A site assessment has identified the following at Meadowbank Baths:

- Proximity to the ferry and the need to consider its route for safety
- The site parking is used for commuter parking and is in high demand on the weekends
- The site is in a major re-development area with high density development close to the site
- The reserve currently has an active, regionally significant, shared path along the foreshore which restricts the amenity of the foreshore due to the use by both cyclists and pedestrians and future activation would require careful consideration of potential conflicts between users
- The site is well used and would be easily activated
- The reserve has well-established vegetation areas providing good shade however the site has limited shade along the foreshore itself
- The access to water is currently difficult and would need formal access to be provided
- At the time of visiting, there was minimal disturbance from boat wake at the site upstream of the bridge
- The site has a number of existing facilities in close proximity including parking, picnic shelters, seating, paths, amenities and café
- Potential for site to be fill behind sea wall.

- Historical land use in the vicinity of Meadowbank Baths, including heavy industry on the opposite river banks which may have left a legacy of contaminated river sediment.

A number of potential opportunities have been identified:

- Increase existing activation for water based activity and splash play
- Potential to provide a stepping platform over the rocks and provide an opportunity to explore the mangrove and intertidal zone
- Ecological sea wall restoration

A strategy for Meadowbank Baths could consider the following:










- Liaise with RMS to understand implications of proximity to ferry wharf and potential restrictions due to proximity of ferry
- Confirm water quality, by doing an initial screening assessment for pathogens and exposure pathways analysis for both chemicals and pathogens
- Undertake community consultation to better understand existing site uses and the community needs and desire for swimming at the site
- Undertake high level background studies, including heritage constraints, and develop initial concepts for swim site activation, developing a sketch plan with options for discussion
- Consider a foreshore access path strategy for the site
- Consider requirements for shark netting




## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Meadowbank Baths based on information and knowledge of the site at present (no water quality data is available for the site). The current site has steep vertical edges and a rocky substrate which is in close proximity to the ferry route. Furthermore the site is located opposite to historical heavy industry resulting in the potential for poor river sediment quality. The Rivercat ferry passes in close proximity to the site. The river edge has limited access due to a sea wall and rocky substrate. The site is currently considered feasible for land-based activation although with active interventions to the river edge to provide access to the water, splash contact could also be suitable. A swim site could be suitable in the future depending on water quality and through interventions such as re-construction of the former baths or similar.

Meadowbank Baths is considered to have the potential for a **District** site due to its location on the Parramatta River foreshore path but it is but is partially limited by the area of land and foreshore available.

























	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic	  	Rivercat in close proximity	Map exclusion zones, design in barriers
Water Quality	  	WQ unknown at present	Undertake WQ Monitoring
Bathymetry	  	Observations indicate reasonable depths	Undertake bathymetry survey
Publicly-available Land	  	Limited land available	
Ecological Restrictions	  	Limited, some mangroves are present	Flora and fauna study as required

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection of the upstream area and an initial preliminary screening sediment study. Note that currently there is no wet weather site visit, water quality monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary

<b>KEY:</b>  High Vulnerability  Medium Vulnerability  Low Vulnerability	Water Quality	  
	Water Clarity	  
	River Sediment Quality	  
	River Dynamics	  
	River Bed Physical Hazards	  
	River Bank and River Edge Characteristics	  
	Heritage	  
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.		

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Residential areas around the site, but major industrial zones upstream Major stormwater outlet upstream of the site
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
	Bacteriological Content Test		
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Moderate turbidity. Visible to about 0.2m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No embayment, generally sandy sediments with some scattered fine sediment
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Minimal muddy sediments
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Generally low levels of sediment contamination for most contaminants identified in screening assessment, with potential risk identified with tests for chromium and dioxin like compounds associated with muddy sediments. However the dominant sediment is coarse sand with few visible fine sediments
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities, some potential for boat wash.
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Rocks, and dumped ballast material as part of river bank protection. Shallow bedrock.
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	No beach area; steep banks; no existing established vegetation Access points would need to be provided Limited area of gentle slopes to top of bank, then a steep reserve behind
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	Meadowbank Railway Bridge is State Significant Heritage listed and Memorial Park (reserve behind the site) is a locally listed heritage item
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	Potential for impacts and needs to be further assessed

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Meadowbank train station 200m and ferry wharf + buses				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to more than 3km of cycle path/boardwalk				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 30 carparking spots within a 100m radius of the site				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Poor visibility from the street, no street lighting, located on active foreshore path				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50,000-100,000m <sup>2</sup>	more than 100,000m <sup>2</sup>
	Why? 30,000m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 2 existing parks within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? Not yet assessed.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover over 50% of the total site area				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Undesirable - sea wall, shallow bedrock, limited area on top of river bank				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 50% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
Existing Facilities	Why? Highly residential area with some access to natural environment, pleasant well shaded park adjacent to foreshore				
	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
Proximity to Town Centre	Why? No Kiosk, shelters, playground in close proximity				
	2.5km+	2km	1.5km	1km	0.5 km
Topography and Views	Why? 1.0km to nearest Town Centre at Meadowbank				
	Steep Terrain and limited views				Flat Terrain and good views
Planning Controls	Why? Flat terrain and good views across the river and to heritage bridge				
Land Ownership	Why? Not yet assessed.				
Governance	Why? Not yet assessed.				
Funding	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 400 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The site is undergoing significant redevelopment at Meadowbank and surrounding areas				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential and commercial use surrounds the site, and busy foreshore path				

## Brays Bay Reserve

Brays Bay Reserve has a large length of foreshore along the river with a shallow sloping sea wall and a mixed sandy/muddy substrate along its edge. The northern and southern side of the bays are lined with mangroves. The site is located at the shallow end of a large bay, off the main navigable part of the river. Brays Bay Reserve is an area of significant redevelopment (Rhodes Peninsula) and is a part of the Department of Planning's Rhodes East Priority Precinct. The site is located adjacent to former industrial land uses that are transforming into new high-density residential and mixed use development.

A site assessment has identified the following at Brays Bay Reserve:

- The river edge currently has limited activation and limited program along the river edge;
- The site has a number of existing facilities, typically located away from the river edge, including a playground, picnic shelters, seating, amenities and parking and close proximity to a restaurant and heritage area
- The site is partially active for a range of land-based activities including dog walking, which is likely to increase in the future with ongoing redevelopment
- The park has an area of carparking and is in close proximity to Rhodes train station
- The site has a number of existing established mature trees providing good shade and a pleasant character and the site has a pleasant microclimate including breezes off the river
- There are excellent views from the site looking out over the bay and the river

A strategy for Brays Bay Reserve could consider the following:

- Confirm water quality, by doing an initial screening assessment for pathogens and exposure pathways analysis for both chemicals and pathogens
- Collate community feedback for Brays Bay Reserve based on consultation for the Rhodes East Peninsula Precinct Plan, developed by the Department of Planning
- Further investigate the bathymetry and bed hazards using a dive study and the potential options for a constructed swimming pool type
- Do an initial heritage screening assessment to better understand the heritage of the site and any heritage constraints
- Undertake high level background studies, to better understand any service constraints and similar
- Further develop and workshop initial concept options that have been developed into an adopted Masterplan for the site
- Consider potential for integration of swim site activation with future re-development for the area and developer contributions to park upgrades
- Consider requirements for shark netting



For further assessment and development of this strategy for Brays Bay Reserve refer to the case study in Section 5.





## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Brays Bay Reserve based on information and knowledge of the site at present. The City of Canada Bay Council took one sample of water quality as a 'very quick screen'. The current site has steep vertical edges which currently prevents access to the river's edge. The site is currently considered feasible for land-based activation. With active interventions to the river edge to provide access to the water and protection from the ferry, the site could also be suitable for splash contact. Bathymetry data shows that the water depth is shallow close to the edges of the bay and any swim site would require wharf or jetty type structures to provide access to the deeper sections of the bay. A swim site could be suitable in the future depending on water quality results and combined with interventions such as re-construction of a jetty/pier or similar.

Brays Bay Reserve is considered a **Regional** site due to its location within the Rhodes East growth corridor and large land and foreshore available.

	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic		N.A.	
Water Quality		WQ unknown at present	Undertake WQ Monitoring
Bathymetry		Depth may limit swimming at low tides	Detailed survey of river to confirm best locations
Publicly-available Land		Land available	
Ecological Restrictions		Limited, some mangroves are present	Flora and fauna study as required

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection and an initial preliminary screening sediment study. Note that currently there is no wet weather site visit, water quality monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary



Water Quality	<span style="color: green;">●</span> <span style="color: yellow;">●</span> <span style="color: red;">●</span>
Water Clarity	<span style="color: green;">●</span> <span style="color: yellow;">●</span> <span style="color: red;">●</span>
River Sediment Quality	<span style="color: green;">●</span> <span style="color: yellow;">●</span> <span style="color: red;">●</span>
River Dynamics	<span style="color: green;">●</span> <span style="color: yellow;">●</span> <span style="color: red;">●</span>
River Bed Physical Hazards	<span style="color: green;">●</span> <span style="color: yellow;">●</span> <span style="color: red;">●</span>
River Bank and River Edge Characteristics	<span style="color: green;">●</span> <span style="color: yellow;">●</span> <span style="color: red;">●</span>
Heritage	<span style="color: green;">●</span> <span style="color: yellow;">●</span> <span style="color: red;">●</span>

Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	The site has a range of land uses including industrial, commercial, retail and residential.
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	Two grab samples were taken by Council in 2016 which found that total coliforms were approx. 900-1000 cfu/1000mL indicating potential for pathogens at the site.
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Clarity was OK with visibility to about 0.5 to 1m from surface. In contrast to other locations in the estuarine section of the river, the lack of flushing resulted in more floating litter and other visual indicators (e.g. oils) Sampling taken in late 2016 found turbidity was approx. 3-5 NTU from two grab samples.
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



Criteria	Test	Method	Observation
<b>River Sediment Quality</b>			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	Brays Bay reserve is on a large, wide embayment in the river At the sea wall location, sediments are typically fine and grey to dark grey. There is substantial coarse sand behind the residential houses to the north of the reserve.
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Dark grey muddy sediments present at low tide
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Initial sediment assessment undertaken at Brays Bay indicate low risk and compliance with guideline values except for potential dioxin-like compounds
<b>River Dynamics</b>			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
<b>River Bed Physical Hazards</b>			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	A range of hazards at the sea wall location including rocks some evidence of rubbish, etc
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
<b>River Bank and River Edge Characteristics</b>			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	In the sea wall area, there is good access from the landward side, but access to the water is poor. Physical intervention is required to enable access. Furthermore, with shallow water depths at the edges, some jetty or wharf structure into the water might be required.
<b>Heritage</b>			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	The reserve is listed as a local heritage item. The reserve also looks out to a heritage item - the Thomas Walker Hospital Group which will need to be considered in a visual analysis.
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

Public Transport Access	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Train, bus stop within 200m				
Pedestrian & Cycle Access	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Located at end of Kokoda Track walkway				
Parking	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? More than 100 carparking spots within a 100m radius of the site				
Safety	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Good visibility from the street, existing street lighting				
Adjacent open space	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50,000-100,000m <sup>2</sup>	more than 100,000m <sup>2</sup>
	Why? 40,000m <sup>2</sup> of open space surrounding the site				
Open Space Network	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 2 existing parks within a 500m <sup>2</sup> radius				
Natural Hazards					
	Why? Not yet assessed.				
Trees/shade	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover around 40% of the total site area				
Riverbank type	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable - sandy, with some fine sediment and steep vertical edges				
Vegetation	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? Less than 20% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
Why? Parkland setting, in a residential context					
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
Why? Access to existing amenity such as play equipment, shelters, public toilets					
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
Why? Less than 0.5km to nearest Town Centre (Rhodes)					
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
Why? Flat terrain and excellent views across the Bay					
Planning Controls					
Why? Not yet assessed.					
Land Ownership					
Why? Not yet assessed.					
Governance					
Why? Not yet assessed.					
Funding					
Why? Not yet assessed.					
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
Why? Note: site was not included as an option in the initial community vote but did get assessed in on-site community workshops.					
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
Why? Site is within Rhodes + Rhodes East development precincts					
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
Why? Residential and commercial use surrounds the site					

# Kissing Point Park

Kissing Point Park has a main beach area with potential for activation, particularly for splash contact. The activation at Kissing Point Park could be similar to many of the non-swimming beaches of Botany Bay which are used extensively for splash contact recreation and a wide range of activities. Kissing Point Park is located on the main Parramatta River shared path trail and hence receives significant recreational traffic.

A site assessment has identified the following at Kissing Point Park:

- A small area of sloping foreshore down to a sandy beach
- The current stormwater outlet presents a significant barrier to the water's edge providing both a visual and a physical barrier to the sandy beach
- The site is located in a low density residential area
- The beach and adjacent land area is only moderate in size, providing a limit on numbers that could be accommodated at the beach
- The park is located on a foreshore shared path providing activation of the site
- The site has existing salt marsh at the site which is re-colonising areas along the foreshore and which could be protected and enhanced
- The access to the beach could be made more accessible with additional paths along the beach edge
- There was visible litter at the beach with tidal debris and the site would benefit from daily beach cleaning
- The site has a number of existing facilities in nearby location including amenities, playground, ferry wharf, parking and picnic shelters

A strategy for Kissing Point Park could consider the following:

- Confirm water quality, by doing an initial screening assessment for pathogens and exposure pathways analysis for both chemicals and pathogens
- Monitor the impact of new drainage works on the site including impact on water ponding at the beach
- Further develop and workshop initial concept options that have been developed into an adopted Masterplan for the site
- Undertake community consultation to better understand existing site uses and the community needs and desire at the site and align this consultation with the development of the Masterplan for the park
- Do an initial heritage screening assessment to determine potential heritage constraints
- Consider requirements for shark netting
- Further develop a strategy for access to the beach and promotion of the beach as a destination
- Undertake a dive study
- Investigate the bathymetry as required, noting that the general bathymetry of the site is for a relatively flat shallow gradient into the river from the beach
- Further investigate options for a pontoon or similar structure in the water which could provide a different river site activation experience
- Consider requirements for shark netting




For further assessment and development of this strategy for Kissing Point Park refer to the case study in Section 5.



## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Kissing Point Park based on information and knowledge of the site at present (no water quality data is available for the site). The current site has good access to the water's edge and a sandy beach area. The site is currently considered feasible for land based activation and splash contact. Observations at low tide show that the water depth is very shallow for significant distances (50 to 100m) and hence any swim site would need to be located a significant distance from the shore. A floating pontoon could be a potential swim site activation at the site in the future.

Kissing Point Park is considered to have the potential for a **District** site due to its location on the Parramatta River foreshore path but is partially limited by the lack of area available and shallow bathymetry.

	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic		Rivercat wharf in close proximity	Discuss exclusion zones with RMS and design in barriers as required
Water Quality		WQ unknown at present	Undertake WQ Monitoring
Bathymetry		Very shallow depths limits swimming	Potential pontoon as recommended action
Publicly-available Land		Some land available, but is limited in size	
Ecological Restrictions		Saltmarsh on the foreshore	Flora and fauna study

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection and an initial preliminary screening sediment study. Note that currently there is no wet weather site visit, water quality monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary

**KEY:**

- High Vulnerability
- Medium Vulnerability
- Low Vulnerability

Water Quality	<span style="color: green;">○</span> <span style="color: yellow;">●</span> <span style="color: red;">○</span>
Water Clarity	<span style="color: green;">●</span> <span style="color: yellow;">○</span> <span style="color: red;">○</span>
River Sediment Quality	<span style="color: green;">●</span> <span style="color: yellow;">○</span> <span style="color: red;">○</span>
River Dynamics	<span style="color: green;">●</span> <span style="color: yellow;">○</span> <span style="color: red;">○</span>
River Bed Physical Hazards	<span style="color: green;">○</span> <span style="color: yellow;">●</span> <span style="color: red;">○</span>
River Bank and River Edge Characteristics	<span style="color: green;">○</span> <span style="color: yellow;">●</span>
Heritage	<span style="color: green;">●</span> <span style="color: yellow;">○</span> <span style="color: red;">○</span>

Results: There are no high vulnerability issues. The site is considered to be low to medium vulnerability overall.

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Residential Local stormwater outlets directly into the beach
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Generally good, visible to about 1m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



Criteria	Test	Method	Observation
<b>River Sediment Quality</b>			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No major embayments In the beach location, sediments are generally coarse to fine sand with some fine sediment.
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Minimal muddy sediments at low tide
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Initial screening sediment assessment undertaken at Kissing Point Park indicates low risk and compliance of samples with guideline values except for potential dioxin like compounds
<b>River Dynamics</b>			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities, site is affected by boat wash including from the Rivercat as well as private recreational vehicles.
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
<b>River Bed Physical Hazards</b>			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Minor hazards in the beach area were visible including shallow bedrock in some locations
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
<b>River Bank and River Edge Characteristics</b>			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	Good access from the landward side and into the water along a sandy beach; the key constraints are small patches of salt marsh and poor drainage from the stormwater outlet
<b>Heritage</b>			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	Kissing Point Park is listed as a local heritage item (former boat slip lanes).
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

### DESIRABILITY

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop and ferry in close proximity				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to more than 3 km of shared paths				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? More than 100 carparking spots within a 500m radius of the site				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Good visibility from the street, existing street lighting and on an active path				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10000m <sup>2</sup>	10000-50000m <sup>2</sup>	50000-100000m <sup>2</sup>	more than 100000m <sup>2</sup>
	Why? 40,000m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 2 existing parks within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? Not yet assessed				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 20% of main beach area				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable - sandy, natural banks				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? Less than 20% of edges are surrounded by vegetation/mangroves in beach area				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Parkland setting, storm water ponding detracts from beach area				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as play equipment, shelters, public toilets				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? Approximately 1.5km to the nearest Town Centre (Gladesville) or 1.8km to Ryde Town Centre				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Gently sloping to beach with good views over the river				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 335 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? Major redevelopment at Putney Hill, approximately 1km from the site				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential land surrounds the site				

# Putney Park

Putney Park has good opportunities for activation. The site has a large area of open reserve with a long frontage, with a generous area of waterfront location on the Parramatta River. The park is located on a small peninsula into the River and is located in a predominantly residential area. The peninsula creates a sheltered bay which is used for mooring watercraft on the river.

AsiteassessmenthasidentifiedthefollowingatPutneyPark:

- The site has a small beach area, which is limited in high tide due to the sea wall
- The park is well used including for events where the natural amphitheatre is used for local concerts
- The park currently is well activated including a large playground with a small water play area as well as BBQs and picnic shelters
- The foreshore area of the swim site is well used and would be easily activated
- The reserve has minor vegetation along the foreshore and the riverbank, while the slopes behind the gentle sloping riverbank are well vegetated
- Access to water is currently difficult and would need formal access to be provided
- At the time of visiting the site was being used for splash play and for swimming by dogs
- Access to the site needs to be considered for large scale activation with limited parking and public transport options
- Putney Park is currently not on the foreshore path network due to the use of private boating slip lanes which provide a constraint on foreshore access to the north-west of the site
- Potential for site to be fill behind sea wall

- Overtopping of the sea wall is creating dead patches of grass in the low-lying areas behind the wall. Overtime this overtopping will undermine the wall. This area could become planted salt marsh.

A number of potential opportunities have been identified:

- Potential for swimming at the site subject to water quality
- Removal of part of the sea wall to provide greater access for swimming and to the beach
- Increase existing activation for water based activity and splash play
- Ecological sea wall restoration

A strategy for Putney Park could consider the following:






- In the short term providing better access to the beach area, through steps or similar, would help activate the water edge as there is already community demand for access to the water
- Consider options for ecological sea wall restoration combined with beach restoration opportunities to extend the beach area available
- Confirm water quality, by doing an initial screening assessment for pathogens and exposure pathways analysis for both chemicals and pathogens
- Undertake community consultation to better understand existing site uses and the community needs and desire for swimming at the site
- Undertake high level background studies, including heritage constraints and develop initial concepts for swim site activation for discussion
- Consider requirements for shark netting



## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Putney Park based on information and knowledge of the site at present (no water quality data is available for the site). The current site has limited access to the water's edge due to the steep vertical sea walls. At the base of the sea wall is a sandy beach area exposed at low tide. The site is currently considered feasible for land based activation and splash contact. Opportunities for splash contact could be easily improved through improved access to the river's edge. A swim site could be suitable in the future depending on water quality results and further consideration of defined zones which delineate private boat traffic zones and swimming areas.

Putney Park is considered to have the potential for a **Regional** swim site due to large land and foreshore area available and it currently hosts major events. Public transport and lack of parking are a potential limitation.

























	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic		Private boat traffic	Map exclusion zones
Water Quality		WQ unknown at present	Undertake WQ Monitoring
Bathymetry		Observations indicate reasonable depths	Undertake bathymetry survey. Access to the shoreline is required.
Publicly-available Land		Land available	
Ecological Restrictions		Limited ecological constraints	

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment are based on an initial preliminary dry weather site inspection. Note that currently there is no wet weather site visit, water quality monitoring, sediment monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary

<b>KEY:</b>  High Vulnerability  Medium Vulnerability  Low Vulnerability	Water Quality			
	Water Clarity			
	River Sediment Quality			
	River Dynamics			
	River Bed Physical Hazards			
	River Bank and River Edge Characteristics			
	Heritage			
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.				

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Residential area Minor stormwater outlets
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
	Bacteriological Content Test		
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Low turbidity. Visible to about 1.0m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	Minor embayment, sandy sediments with minimal fine sediments
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Minimal muddy sediments
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Note no lab assessment of sediments undertaken at Putney Park
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities, some boat wash.
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Few hazards, some rocks identified
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	No beach area at high tide and a small beach area at low tide – access points would need to be provided to beach; gentle slopes on top of bank, then steep reserve behind it; minimal vegetation on bank
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	Putney Park (house remains) is a locally listed heritage item
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	Potential for impacts and needs to be further assessed

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 50m going to Hurstville, Strathfield or Sydney Olympic Park every 10 mins at peak hour				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? No direct connection to path networks				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? More than 100 carparking spots within a 100m radius of the site				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Low visibility from the street, no existing street lighting, minimal passive surveillance				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50,000-100,000m <sup>2</sup>	more than 100,000 m <sup>2</sup>
	Why? 60,000m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 2 existing parks within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? Not yet assessed.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover around 40% of the total site area				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable - sandy, with steep vertical walls, restricting access				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? Main park area has less than 20% of foreshore edge surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Desirable planting and outlook				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as play equipment, shelters, public toilets, water play and events				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? Approximately 1.5km to the nearest Town Centre (Gladesville) or 1.8km to Ryde Town Centre				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Good views across river and large areas of flat land				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site has received 171 positive votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential surrounds				

# Quarantine Reserve

Quarantine Reserve has a main beach area with potential to activate for swimming, which is located in a pleasant park landscape. Quarantine Reserve is a former area used to stable agricultural animals prior to their entry into Australia.

A site assessment has identified the following at Quarantine Reserve:

- Pleasant conditions with a mixture of natural foreshore with vegetation to the river edge, a beach zone and a section of foreshore with a sea wall and fill behind the wall. The lack of activation of the foreshore has created a very pleasant environment in contrast to many other locations along the river and which contributes to the character of the site
- The site is located in a quiet residential area
- The beach area is only moderate in size, providing a limit on numbers that could be accommodated at the beach
- The park currently has limited path access down to the water's edge
- The park is located on a foreshore walking path providing activation of the site
- The site has a number of existing well-established vegetation areas providing excellent shade and the site has important ecological value
- The access to the beach is moderate and could be made accessible with additional paths
- There was visible litter at the beach with tidal debris and the site would benefit from daily beach cleaning
- The site has a number of existing facilities including amenities, parking, picnic shelters, BBQs and walking paths

A number of potential opportunities have been identified:

- Potential for swimming at the site subject to water quality
- Increase existing activation for water based activity and splash play
- Improve overall opportunities for beach play
- Ecological sea wall restoration

A strategy for Quarantine Reserve could consider the following:
















- Confirm water quality, by doing an initial screening assessment for pathogens and exposure pathways analysis for both chemicals and pathogens
- Undertake community consultation to better understand existing site uses and the community needs and desire for swimming at the site
- Undertake high level background studies, including heritage constraints and develop initial concepts for swim site activation developing a sketch plan with options for discussion
- Consider an access and path rationalisation strategy for the site, as well as signage and wayfinding
- Consider requirements for shark netting






## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Quarantine Reserve based on information and knowledge of the site at present (no water quality data is available for the site). The current site has good access to the water's edge with a sandy beach area. The site is currently considered feasible for land based activation and splash contact. The site would also be suitable for swimming with minimal interventions depending on water quality results.

Quarantine Reserve is considered to have the potential for a **District** site due to its large land and foreshore area available. Public transport and lack of parking are a potential limitation.

	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic	  	N.A.	
Water Quality	  	WQ unknown at present	Undertake WQ Monitoring
Bathymetry	  	Observations indicate reasonable depths	Undertake bathymetry survey.
Publicly-available Land	  	Land available	
Ecological Restrictions	  	Limited, some mangroves are present	Flora and fauna study as required

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection and an initial preliminary screening sediment study. Note that currently there is no wet weather site visit, water quality monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary



Water Quality	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
Water Clarity	<span style="color: green;">●</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
River Sediment Quality	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
River Dynamics	<span style="color: green;">●</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
River Bed Physical Hazards	<span style="color: green;">●</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
River Bank and River Edge Characteristics	<span style="color: green;">●</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
Heritage	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.			

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Residential area
	Site Analysis		Minor local stormwater outlets
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Ok slightly turbid. Visible to about 0.5m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	In the opening to a large embayment on the river, sediments were coarse sandy sediments, very few fine sediment
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Minimal muddy sediments
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Low levels of sediment contamination, with only potential risk identified with tests for dioxin like compounds associated with muddy sediments. However, the dominant sediment is coarse sand with few visible fine sediment.
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Some branches, however few hazards identified
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	Sandy beach with gentle sloping access with established native vegetation including mangroves; good areas of bushland vegetation along the foreshore in some locations. There are obvious access points outside the vegetation, however there are no paths to the foreshore edge at present, limiting universal access
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	Quarantine Reserve is a local heritage item and is heritage listed in the LEP
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	
			Potential for impacts and needs to be further assessed

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 500m				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 0.2km of path				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 20 carparking spots within a 100m radius of the site				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Poor visibility from the street, existing street lighting, some surveillance from adjacent houses				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50000-100,000m <sup>2</sup>	more than 100,000 m <sup>2</sup>
	Why? 21,000m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 2 existing parks within a 500 m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? Not yet assessed.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 10,000 m <sup>2</sup> (around 45% of the total site area)				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable – sandy, natural accessible edges				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 50% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Parkland setting, with historical interest and natural character				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as play equipment, shelters, public toilets				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 0.6km to nearest Town Centre (Abbotsford)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - Flat terrain and good views across the river				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? Not applicable				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low. There are no current building sites.				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential surrounds the site				

# Bayview Park

Bayview Park has a main beach area with potential to activate for swimming, which is located adjacent to the Bayview Park wharf. Bayview Park is on a peninsula which had industrial land uses that have mostly been re-developed into residential buildings. The area is continuing to re-develop; for example, with the former Bushells Factory currently proposed for re-development.

A site assessment has identified the following at Bayview Park:

- The site has a number of existing facilities at the site including a playground, picnic shelters, BBQs, seating, amenities and parking
- The ferry and the proximity to the main beach is a key issue which would need to be further explored at the site for any potential swim site activation
- The site is already active for a range of river-based activities including paddle boarding, swim site for dogs, beach walking and fishing, as well as land-based activities
- The beach area is relatively small, providing a limit on numbers that could be accommodated at the beach
- The park is currently dominated by carparking limiting the open space immediately behind the main beach
- The site has a number of existing well-established trees providing nice shade and the site has a pleasant microclimate including breezes off the river
- The access to the beach is gentle and could be made accessible
- There are hazards on the bottom of the baths including a rocky substrate
- There was visible litter at the beach with tidal debris and the site would benefit from daily beach cleaning
- The area to the immediate west of the wharf was undergoing erosion and exposing former fill at the site including bricks, and concrete.

A number of potential opportunities have been identified:

- Potential for swimming at the site subject to water quality and ferry constraints
- Increase existing activation for water based activity and splash play
- Improve overall potential for beach play
- Ecological sea wall restoration combined with better contact with foreshore
- Potential to rationalise carparking and improve overall access and relationship of the beach to the reserve
- Protect erosion of fill behind seawall and restore ecology to eroding banks

A strategy for Bayview Park could consider the following:
















- Liaise with RMS to understand implications of proximity to ferry wharf and potential restrictions due to proximity of ferry
- Confirm water quality, by doing an initial screening assessment for pathogens and exposure pathways analysis for both chemicals and pathogens
- Undertake community consultation to better understand existing site uses and the community needs and desire for swimming at the site
- Undertake high level background studies, including heritage and service constraints and develop initial concepts for swim site activation developing sketch plans for a range of upgrades
- Consider potential for integration with Bushell Site re-development and developer contributions to park upgrades
- Consider requirements for shark netting






## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Bayview Park based on information and knowledge of the site at present (no water quality data is available for the site). The current site has good access to the river's edge with a sandy beach area. The site has a ferry stop and proximity to the route for the ferry needs to be considered in future activation. The site is currently considered feasible for land based activation and splash contact. The site would also be suitable for swimming with minimal interventions depending on water quality results and defining a swimming area separate from the ferry route.

Bayview Park is considered to have the potential for a **Regional** site due to its large land and foreshore area available.

























	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic	  	Rivercat wharf in close proximity	Discuss exclusion zones with RMS and design in barriers as required
Water Quality	  	WQ unknown at present	Undertake WQ Monitoring
Bathymetry	  	Observations indicate reasonable depths	Undertake bathymetry survey.
Publicly-available Land	  	Land available	
Ecological Restrictions	  	Limited ecological constraints	

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection and an initial preliminary screening sediment study. Note that currently there is no wet weather site visit, water quality monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary

<b>KEY:</b>  High Vulnerability  Medium Vulnerability  Low Vulnerability	Water Quality	  
	Water Clarity	  
	River Sediment Quality	  
	River Dynamics	  
	River Bed Physical Hazards	  
	River Bank and River Edge Characteristics	  
	Heritage	  
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.		

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Local peninsula is a former industrial area Minor local stormwater outlets
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Ok slightly turbid. Visible to about 0.3m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	Within a large embayment on the river, although sediments found to be coarse sandy sediments, very few fine sediment
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Minimal muddy sediments
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Low levels of sediment contamination, with only potential risk identified with tests for dioxin like compounds associated with muddy sediments. However the dominant sediment is coarse sand with few visible fine sediment.
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	Rocks along foreshore and riverbed. In sections near the wharf, fill composed of bricks and concrete is visible. Shallow bed rock is evident in places.
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	Sandy beach with gently-sloping access and established native vegetation dominated by casuarinas. Further to the west of the wharf there are good mangrove stands which restrict access.
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	Bayview park is a local heritage item and is heritage listed in the LEP
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	Potential for impacts needs to be further assessed

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

### DESIRABILITY

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
					Why? Bus stop at 380 m; ferry stop at site
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
					Why? Connected to 2.8km of cycle path/boardwalk
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
					Why? More than 100 carparking spots within a 100m radius of the site
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
					Why? Poor visibility from the street, existing street lighting along path, some surveillance from properties, ferry
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10,000m <sup>2</sup>	10,000-50,000m <sup>2</sup>	50,000-100,000m <sup>2</sup>	more than 100,000m <sup>2</sup>
					Why? 20,000m <sup>2</sup> of open space surrounding the site
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
					Why? Access to 2 existing parks within a 500m <sup>2</sup> radius
<b>Natural Hazards</b>					
					Why? Not yet assessed.
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
					Why? Trees cover around 50% of the total site area
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
					Why? Desirable - sandy with some mangrove habitat and natural banks and some sea walls
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
					Why? 40% of edges are surrounded by vegetation/mangroves

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Extensive views. The site is dominated by an adjacent car park + road along foreshore in part of park				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenities such as public toilets, shelters, play equipment and boat ramp				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 2.0km to nearest Town Centre (Concord)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - relatively flat terrain and expansive outlook to the river				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 390 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? Bushshells' factory is a proposed redevelopment site				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential surrounds				

# Henley Baths

Henley Baths has one potential location to activate for swimming, which is located at the end of a small reserve at the end of Kelly St, Henley.

A site assessment has identified the following at Henley Baths:

- The site is in a relatively quiet residential area with limited access including limited parking and limited public transport and limited walking and cycling connections
- The small available open space area is physically disconnected from the water by a small sandstone 'cliff'
- The swim site is very small and provides access only for a limited number of people – it would not be suitable for catering for large numbers of people
- Close proximity to a number of private residences and private moorings and private recreational watercraft
- The site has some existing infrastructure including stair access down to the waters edge, access into the water and the remains of an old shark net.
- The access to the water edge is steep and is not universally accessible
- There are hazards on the bed at the baths including a rocky substrate

A number of potential opportunities have been identified:

- While there is very limited potential for large numbers of people there is potential to activate the site for the local population

A strategy for Henley Baths could consider the following:
















- Confirm water quality, by doing an initial screening assessment for pathogens and exposure pathways analysis for both chemicals and pathogens
- Undertake community consultation to better understand existing site uses and the community needs and desire for swimming at the site
- Do an initial heritage screening assessment to determine potential heritage constraints
- Upgrade access to the swim spot
- Upgrade signage and wayfinding to the main swim site
- Consider requirements for shark netting
- Undertake a dive study



## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Henley Baths based on information and knowledge of the site at present (no water quality data is available for the site). The current site has reasonable access to the water's edge with steps down to the water through a natural cliff line. The site has a lot of private boat traffic that needs to be separated from any swim areas. The site has a rocky base with oysters and other natural hazards that needs to be considered. The site is currently considered feasible for land based activation and splash contact. The site would also be suitable for swimming with minimal interventions depending on water quality results. The key limitation of the site is the limited space available both at the river's edge and the land, and would only be suitable for limited use at any one time, making it a local site.

Henley Baths are considered to have only limited potential for activation and is considered to be a **Local** site due to its lack of land and foreshore area available and limited access options.

	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic	  	Private boat traffic limits swim area	Map exclusion zones
Water Quality	  	WQ unknown at present	Undertake WQ Monitoring
Bathymetry	  	Observations indicate reasonable depths	
Publicly-available Land	  	Limited land available especially at access to shore	
Ecological Restrictions	  	Limited	Flora and fauna study as required

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspection. Note that currently there is no wet weather site visit, water quality monitoring, sediment monitoring, bathymetry data or dive study for this site.

### Vulnerability Summary



Water Quality	<span style="color: green;">●</span>	<span style="color: yellow;">●</span>	<span style="color: red;">●</span>
Water Clarity	<span style="color: green;">●</span>	<span style="color: yellow;">●</span>	<span style="color: red;">●</span>
River Sediment Quality		<span style="color: yellow;">●</span>	<span style="color: red;">●</span>
River Dynamics	<span style="color: green;">●</span>	<span style="color: yellow;">●</span>	<span style="color: red;">●</span>
River Bed Physical Hazards	<span style="color: green;">●</span>	<span style="color: yellow;">●</span>	<span style="color: red;">●</span>
River Bank and River Edge Characteristics	<span style="color: green;">●</span>	<span style="color: yellow;">●</span>	<span style="color: red;">●</span>
Heritage	<span style="color: green;">●</span>	<span style="color: yellow;">●</span>	<span style="color: red;">●</span>
Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.			

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Single dwelling residential area
	Site Analysis		No major outlets
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Generally good, visible to about 1m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



River Sediment Quality			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No major embayments Rocky bed around swim site and some sand
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Minimal muddy sediments
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Note no lab assessment of sediments undertaken at Henley Baths
River Dynamics			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
River Bed Physical Hazards			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	A range of hazards at the sea wall location including rocks, oysters, boat moorings, etc
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
River Bank and River Edge Characteristics			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	Steep rocky cliff Access to the water's edge with stairs Limited vegetation
Heritage			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	The house adjacent to the baths has been identified as heritage significance
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	Consideration to impacts on adjacent house would need to be considered in any future works

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop within 500m				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 0.2km of cycle path/boardwalk				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 10 carparking spots within a 100m radius of the site				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Poor visibility from the street, no existing street lighting, some passive surveillance from adjacent houses				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10 000m <sup>2</sup>	10 000-50 000m <sup>2</sup>	50000-100000m <sup>2</sup>	more than 100000m <sup>2</sup>
	Why? 700m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 1 existing park within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? Not yet assessed.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover around 45% of the total site area				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable, deep water at rocky edge, limited area of access				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? Less than 20% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Neighbourhood setting makes for peaceful site				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as public toilets				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1.9km to nearest Town Centre (Gladesville)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Undesirable - uneven terrain, good view along river				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 240 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low there are no current building sites				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential surrounds				

# Callan Park

Callan Park currently has a number of potential locations for swim site activation, with a number of distinct characteristics:

- Sea wall immediately adjacent to the Bay Run and Callan Park access road. This area has the least potential for activation without significant additional works to the access road, and carparking
- Sea wall immediately adjacent to open lawn and scattered trees. This area has significant potential for activation for swimming.
- Natural rocky and beach shore area with fringing native vegetation. This area has some potential activation for swimming but would not be able to cater for significant numbers.

A site assessment has identified the following at Callan Park:

- Significant erosion of the sea wall is occurring in a number of locations
- There are a number of large services and submarine cables at the site which need to be considered
- Current beaches are used by local dogs and their owners including for splash play and are also being used to store boats
- The site has lots of different users which need to be accommodated including people using the Bay Run for walking, running, cycling and recreation, and sports clubs and their players
- The site is also an important heritage site which will need to be considered
- Governance is an important consideration at the site and any identified opportunities
- The site has significant fill of varying quality
- There are a range of hazards on the bed in the sea wall section including oysters, rocks, fill and dumped material (concrete, reo, bricks, glass, etc)

A number of potential opportunities have been identified:

- High activation potential due to its location on the popular Bay Run
- Excellent opportunities for ecological sea wall restoration
- A large number of fish have been observed at the site
- The existing natural beach sites have significant potential for easy activation for swimming
- Incorporation into the Landscape Structure Plan for Callan Park being developed by OEH

A strategy for Callan Park could consider the following:






- Short term strategy activating the natural beaches for swimming
- Confirm water quality, by doing an initial screening assessment for pathogens
- Undertake community consultation to better understand existing site uses and community needs
- Do an initial heritage screening assessment to determine potential heritage constraints; impacts on heritage would need to be considered in any future works
- Upgrade access to the main beach
- Upgrade signage and wayfinding to the main beach
- Consider requirements for shark netting
- Develop a strategy for access to the beach for dogs and their owners
- Undertake a dive study
- Discuss and agree governance arrangements for any future swim site



## FEASIBILITY ASSESSMENT

An initial feasibility assessment has been undertaken for Callan Park based on information and knowledge of the site at present (no water quality data is available for the site). Callan Park has two potential sites – a natural beach area and an existing sea wall area which extends from opposite the sports fields and north towards the sandy beach. The current sandy beach area site has a steep ‘goat track’ access to the water’s edge down to a sandy beach area. The site is currently considered feasible for land based activation and splash contact and would also be suitable for swimming pending water quality results and improved access to the beach. The sea wall area is currently suitable for land-based activation. With improved access to the river edge and water, this area could also be suitable for splash contact or swimming (depending on water quality). If improved, the natural sea wall area needs to further consider hazards on the river bed including fill, rubble and other building materials.

Callan Park is considered to have the potential for a **Regional** site due to its large land and foreshore area available and location on the popular Bay Run.

	Score	Key feasibility observations	Recommended actions/mitigations
Boat Traffic		NA.	
Water Quality		WQ unknown at present	Undertake WQ Monitoring
Bathymetry		Unknown at present	Undertake bathymetry survey
Publicly-available Land		Land available	Heritage study
Ecological Restrictions		Native veg present	Flora and fauna study as required

**KEY:**  Low Feasibility  Medium Feasibility  High Feasibility

A medium- to long-term strategy would involve a larger swimming spot in the sea wall area and would require:

- Confirm water quality, by doing an initial screening assessment for pathogens
- Investigate the bathymetry and bed hazards and the potential options for a constructed swimming pool type option at Callan Park
- Undertake high level background studies, including heritage and service constraints and develop initial concepts for swim site activation, developing on existing Callan Park masterplans
- Undertake community consultation to better understand existing site uses and community needs

## VULNERABILITY ASSESSMENT

The vulnerability checklist assesses vulnerable conditions and can be used to gain an initial understanding of the vulnerability of a site. The following assessment is based on an initial preliminary dry weather site inspections. Note that currently there is no wet weather site visit, water quality monitoring, sediment monitoring, bathymetry data or dive study for this site.

Note: The results of the sea wall areas were different to those of the natural shoreline areas in some criteria of the vulnerability assessment.

### Vulnerability Summary

**KEY:**

- High Vulnerability
- Medium Vulnerability
- Low Vulnerability

Water Quality	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
Water Clarity	<span style="color: green;">●</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
River Sediment Quality	<span style="color: green;">●</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
River Dynamics	<span style="color: green;">●</span>	<span style="color: yellow;">○</span>	<span style="color: red;">○</span>
River Bed Physical Hazards	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
River Bank and River Edge Characteristics	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>
Heritage	<span style="color: green;">○</span>	<span style="color: yellow;">●</span>	<span style="color: red;">○</span>

Results: There are few high vulnerability issues. The site is considered to be low to medium vulnerability overall.

### Vulnerability Checklist

Criteria	Test	Method	Observation
<b>Water Quality</b>			
Levels of pollution such as heavy metals and pathogens in the water	Aerial Map Site Analysis	Conduct a site analysis to determine the proximity of the site to industrial areas, sewer overflows and stormwater outlets	Previous hospital, and fill at site. Large stormwater channel outlet near sea wall location No major outlets near beach section
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm of rainfall	-
	Water Quality Heavy Metal and Pathogen Tests Bacteriological Content Test	Implement a monitoring program for water quality using samples collected over a period of 12 months	-
<b>Water Clarity</b>			
Turbidity of the water (i.e. highly discoloured or murky water)	Dry Weather Visual Check	Conduct a visual check of the area following a dry period/no rain for three days - Is the water clarity desirable for swimming?	Generally good, visible to about 1m from surface
	Wet Weather Visual Check	Conduct a visual check of the area following more than 10mm or rainfall - Is the water clarity desirable for swimming?	-
	Water Turbidity Physical Content Test	Implement a monitoring program for water turbidity using turbidity measures collected over a period of 12 months	-



Criteria	Test	Method	Observation
<b>River Sediment Quality</b>			
Fine silt and mud are a risk to poor water quality due to contaminated sediments	Aerial Map Site Analysis	Conduct a site analysis to determine the embayment of the site and sediment type	No major embayments At sea wall location sediments are fine grey and coarse sand At beach location sediments are coarse sand
	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Is there visual muddy sediment?	Minimal muddy sediments at low tide
	River Sediment Samples	Coordinate a physical content test of the river sediment by measuring samples around the site	Note: no lab assessment undertaken at Callan Park
<b>River Dynamics</b>			
Certain flow conditions and high velocity rates in a river	Dry Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following 3 days of dry weather. Measure the amount of time it takes for a floating object to travel the set distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	Low velocities
	Wet Weather Velocity Check	Conduct a velocity test by measuring a set distance along the river via Google maps. Visit the site following more than 10mm of rainfall. Measure the amount of time it takes for a floating object to travel that distance. If the time taken is greater than 0.5m per second this is a potential vulnerability.	-
<b>River Bed Physical Hazards</b>			
Both natural woody debris and rocks as well as artificial hazards such as glass and sharps	Low Tide or Low Water Level Visual Check	Conduct a visual check of the area at low tide - Are there any physical hazards protruding from the water or riverbed?	A range of hazards at the sea wall location including bricks, rocks, oysters, concrete with exposed reo, etc Minor hazards at the beach area (shallow bedrock)
	Dive Study	Coordinate a dive study of the river bed for physical hazards	Recommended
<b>River Bank and River Edge Characteristics</b>			
Highly vegetated edge conditions, such as mangroves or inaccessible shores	Aerial Map Site Analysis	Conduct a site analysis to determine the site's potential access points for swimmers. This includes assessment of proximity to large mangrove habitats and/or other vegetation, slope of the riverbank, etc.	In the sea wall area, low height sea wall, with flat adjacent accessible shore In the beach area, there are sandy beaches with steep natural bush track access with existing native vegetation
<b>Heritage</b>			
Value, proximity and level of protection of heritage items	State, local and Aboriginal Heritage Items	Research State and local heritage sites and the Aboriginal Heritage Information Management System by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	Callan Park is a heritage listed site with a range of heritage items that need to be considered
	National and World Heritage Items	Research National and World heritage sites by searching <a href="http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx">http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx</a>	
	Aboriginal archaeological Due Diligence	Identify potential impacts and mitigation measures according to the Due Diligence Code for the Protection of Aboriginal Objects in NSW	
	Visual Study To/From Heritage Sites	Conduct a visual check of the site to/from heritage sites to see if any views will be impacted	

## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

Public Transport Access	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop with 500m from location				
Pedestrian & Cycle Access	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to Bay Run				
Parking	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 40 carparking spots within a 100m radius of the site				
Safety	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Poor visibility from the street, existing street lighting, activated by Bay Run and sports field				
Adjacent open space	0-5000m <sup>2</sup>	5000-10 000m <sup>2</sup>	10 000-50 000m <sup>2</sup>	50 000-100 000m <sup>2</sup>	more than 100 000 m <sup>2</sup>
	Why? More than 100,00m <sup>2</sup> of open space surrounding the site				
Open Space Network	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 3 existing parks within a 500m <sup>2</sup> radius and part of Bay Run network				
Natural Hazards					
	Why? Not yet assessed.				
Trees/shade	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 20% of the total site area				
Riverbank type	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable - sandy in some locations, rocky and rubble in some areas				
Vegetation	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? Less than 10% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Natural setting, historic buildings, scenic beach				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as public toilets, shelters and play equipment				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1.0km to nearest Town Centre (Rozelle)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - flat terrain in sea wall area, good views across the bay, with beach				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? Not applicable				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? Redevelopment occurring along Victoria Road and Rozelle town centre				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? The adjacent land use is mixed, and is activated by the Bay Run and sports clubs				



## Lake Parramatta

Lake Parramatta is a decommissioned drinking water reservoir located approximately 3 km north of the City of Parramatta and only 1.5 km north of the North Parramatta urban renewal area. It is located on Hunts Creek, just upstream of its confluence with Darling Mills Creek. The Lake has a surface area of 10.5 hectares and when full holds about 490 million litres of water. The Lake is located in a significant bushland reserve but its catchment includes urban development.

Significantly, despite the level of urbanisation in the catchment, Hunts Creek itself is protected within a bushland reserve and the creek has been retained in a natural condition. This provides a significant level of “disconnection” between the urban areas and Lake Parramatta.

Swimming was officially re-opened at Lake Parramatta by the City of Parramatta in January 2015. The site has become increasingly popular with tens of thousands of visitors during the summer months.

A desirability assessment of Lake Parramatta was undertaken to understand the current strengths and weaknesses of Lake Parramatta for swimming and is shown below.



## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 300m from location going to Parramatta every 30 mins at peak hour				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 0.5km of cycle path/boardwalk and the Hunts Creek walking trail				
<b>Parking</b>	10 carparking spots	20 carparking spots	50 carparking spots	100 carparking spots	200+ carparking spots
	Why? 68 carparking spots within a 100m radius of the site plus nearby street parking				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Poor visibility from the street, existing street lighting				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10000m <sup>2</sup>	10000-50000m <sup>2</sup>	50 000-100 000m <sup>2</sup>	more than 100000m <sup>2</sup>
	Why? 13500m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 1 existing park within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? A dive study was undertaken prior to pening for swimming and hazards were removed. A tree adjacent to the swim area has been taken down to manage safety.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 10500m <sup>2</sup> this is around 35% of the total site area				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank type
	Why? Rocky				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 70% of edges are surrounded by vegetation/mangroves				



Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Natural setting				
Existing Facilities	No existing amenity	Public Toilet	Public toilet, shelters	Public toilet, shelters, play Equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as play equipment, shelters, public toilet, boat hire				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1km to nearest Town Centre (North Parramatta)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - Flat terrain				
Planning Controls					
	Why?				
Land Ownership					
	Why? Owned and activated by Parramatta Council				
Governance					
	Why? One land manager owns land and water; inexpensive to run – \$10,000/year				
Funding					
	Why? Fully supported by council upgrades to amenities; additional government grants were also received.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 776 positive votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low; There are no current building sites.				
Adjacent land use	Heavy Industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential, commercial use and parkland surround the site				



## Cabarita Beach

Cabarita Park has a swimmable river beach and is located in a pleasant location with good views of the river. The beach has a long section of sand and also has shady spots on the beach increasing the overall amenity along the river's edge. In the 1930s, an in-ground pool just south of Cabarita Point was constructed, and is now the current location of Cabarita Pool, which is fed by treated river water. The beach site was recently officially re-opened as a swim site in March 2016.

The park also includes a playground, a pool, a kiosk, BBQs and a picnic shelter, amenities and a conservatory. The range of different programs and activities ensures that the site is well activated. It is also located in close proximity to a ferry wharf. The park has significant heritage significance and has been a popular recreation facility dating back to the 1880s.

A desirability assessment of Cabarita Beach was undertaken to understand the current strengths and weaknesses of Cabarita Beach for swimming and is shown below.



## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 50m				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 2.2km of cycle path/boardwalk				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 110 carparking spots within a 100m radius of the site				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Good visibility from the street, no existing street lighting				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10000m <sup>2</sup>	10 000-50000m <sup>2</sup>	50000-100000m <sup>2</sup>	more than 100000m <sup>2</sup>
	Why? 100 850m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 1 existing park within a 500m <sup>2</sup> radius				
<b>Natural Hazards</b>					
	Why? Not yet assessed.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 5300m <sup>2</sup> (around 35% of the total site area)				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable – sandy base, some weed offshore				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 30% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Varied natural landscape and extensive outlook				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as play equipment, shelters, public toilets				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1km to nearest Town Centre (Breakfast Point)				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - Flat terrain				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 344 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low and there is one current building site				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? Residential and recreational parkland surrounds				





## Chiswick Baths

Chiswick Baths is an un-patrolled swimming beach with a shark net. Water quality is suitable for swimming most of the time but, like the beaches, may be closed after heavy rain due to water quality not being considered safe for swimming. The site was recently upgraded (cleaned up and provided with an outdoor shower) and officially re-opened as a swim site in March 2016. Two activation events have been held in the past three years. Facilities at the park include an outdoor shower, amenities, picnic shelters and BBQ area.

A desirability assessment of Cabarita Beach was undertaken to understand the current strengths and weaknesses of Chiswick Baths for swimming and is shown below.



## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
	Why? Bus stop 130m going to Sydney CBD, Campsie, Woolloomooloo or Haymarket every 5 minutes at peak hour. Ferries from Chiswick wharf to Cabarita and Darling Harbour				
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
	Why? Connected to 0km of cycle path/boardwalk				
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
	Why? 40 carparking spots within a 100m radius of the site				
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
	Why? Good visibility from the street, no existing street lighting				
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10 000m <sup>2</sup>	10 000-50 000m <sup>2</sup>	50 000-100 000m <sup>2</sup>	more than 100 000 m <sup>2</sup>
	Why? 15 000m <sup>2</sup> of open space surrounding the site				
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
	Why? Access to 2 existing parks within a 500m radius				
<b>Natural Hazards</b>					
	Why? Not yet assessed.				
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
	Why? Trees cover 2000m <sup>2</sup> (around 15% of the total site area)				
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
	Why? Desirable - sandy with some mangrove habitat				
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
	Why? 50% of edges are surrounded by vegetation/mangroves				

Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Adjacent parkland is well proportioned and is a pleasant entrance to the baths				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as public toilets, shelters and play equipment				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 1.5km to nearest Town Centre				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - slope down to baths offers a pleasant aspect				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 358 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low there are no current building sites				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? The adjacent land use is mixed				



## Dawn Fraser Baths

Dawn Fraser Baths were built in the 1880s and is one of Sydney's oldest swimming pools. The pool is located on the river and is completely enclosed by a two-storey building with wooden fences and decking. The pool includes a 50-metre lap swimming section and a small, shallow beach area (inundated in high tide). The pool contains large areas of decking and seating areas as well as a shark net.

The pools also includes a range of facilities including a kiosk, amenities and change rooms and a large expanse of foreshore parklands adjacent to the pool area. The pool and its buildings are heritage listed and is the only enclosed harbour pool that remains in its original form in Sydney.

A desirability assessment of Dawn Fraser Baths was undertaken to understand the current strengths and weaknesses of Dawn Fraser Baths for swimming and is shown below.



## DESIRABILITY ASSESSMENT

A desirability assessment has been undertaken by a qualified urban planner undertaking desktop assessment as well as a preliminary high-level site visit. Sites were assessed according to each ranking criteria developed. This initial assessment is one part of a broader process to assess a site's desirability and should be used in combination with community consultation. Community desire for a swim site is the most important factor in a site's desirability and this assessment is not a substitute for community consultation.

The desirability value, based on the current state of each site, is not a fixed value but can change over time with provision of additional infrastructure (e.g. amenities or facilities) or programs (e.g. provision of weekend coffee carts or food vans).

### DESIRABILITY

<b>Public Transport Access</b>	Nothing within 500m	Ferry or bus stop within 500m, train within 1 km	Train station within 500m	Bus and train station within 500m	Ferry, bus and station within 500m
Why? Bus stop every 300m from location going to Balmain, Campsie or Haymarket every 15 mins at peak hour					
<b>Pedestrian &amp; Cycle Access</b>	less than 0.5km of path network	0.5km of path network	1km of path network	2km of path network	more than 3km of path network
Why? Connected to 0.5km of cycle path/boardwalk					
<b>Parking</b>	less than 10 carparking spots	10-20 carparking spots	20-50 carparking spots	50-100 carparking spots	more than 100 carparking spots
Why? 30 carparking spots within a 100m radius of the site					
<b>Safety</b>	Poor visibility from the street No existing street lighting		Poor visibility from the street OR existing street lighting		High visibility from the street AND existing street lighting
Why? Poor visibility from the street, existing street lighting					
<b>Adjacent open space</b>	0-5000m <sup>2</sup>	5000-10 000m <sup>2</sup>	10000-50000m <sup>2</sup>	50000-100000m <sup>2</sup>	more than 100000m <sup>2</sup>
Why? 27 200m <sup>2</sup> of open space surrounding the site					
<b>Open Space Network</b>	0 existing parks within 500m radius	1 existing park within 500m radius	2 existing parks within 500m radius	3 existing parks within 500m radius	4 existing parks within 500m radius
Why? Access to 3 existing parks within a 500m <sup>2</sup> radius					
<b>Natural Hazards</b>					
Why? Not yet assessed.					
<b>Trees/shade</b>	Trees cover 10% of total site area	Trees cover 20% of total site area	Trees cover 30% of total site area	Trees cover 40% of total site area	Trees cover 50% of total site area
Why? Trees cover 17100m <sup>2</sup> (around 40% of the total site area)					
<b>Riverbank type</b>	Muddy riverbank type				Sandy riverbank Type
Why? Desirable - sandy					
<b>Vegetation</b>	100% of edges surrounded	80% of edges surrounded	60% of edges surrounded	40% of edges surrounded	20% of edges surrounded
Why? 50% of edges are surrounded by vegetation/mangroves					



































































Site Character	Poor Quality Riverbank Edge				High Quality Riverbank Edge
	Why? Natural setting				
Existing Facilities	No existing amenity	Public toilet	Public toilet, shelters	Public toilet, shelters, play equipment	Public toilet, shelters, play equipment, boat hire
	Why? Access to existing amenity such as public toilets, shelters, play equipment and kiosk				
Proximity to Town Centre	2.5km+	2km	1.5km	1km	0.5 km
	Why? 0.3km to nearest Town Centre				
Topography and Views	Steep Terrain and limited views				Flat Terrain and good views
	Why? Desirable - flat terrain				
Planning Controls					
	Why? Not yet assessed.				
Land Ownership					
	Why? Not yet assessed.				
Governance					
	Why? Not yet assessed.				
Funding					
	Why? Not yet assessed.				
Identified Community Demand	50 votes	100 votes	200 votes	300 votes	500 votes +
	Why? The site received 148 votes from the online Parramatta River Catchment Group swim site campaign (refer <a href="http://www.ourlivingriver.com.au">www.ourlivingriver.com.au</a> for details)				
Future Redevelopment	No current building sites within 500m radius	1 current building sites within 500m radius	3 current building sites within 500m radius	5 current building sites within 500m radius	10 + current building sites within 500m radius
	Why? The chances of future redevelopment are relatively low and there are no current building sites				
Adjacent land use	Heavy industrial	Parklands	Single use	Mixed use	Highly activated
	Why? The adjacent land use is mixed				






## 4.0 Summary of Site Assessment

The following is a summary of identified sites along the Parramatta River and their potential for activation. The desirability scores are an average score of all the desirability criteria with equal weighting given to each criterion. This enables an overall indication of the ease of activation due to the desirability of a site. Low desirability scores do not

necessarily indicate that a site is an unsuitable swim site; rather, it indicates that more interventions will be required to achieve a relatively desirable site.

	FEASIBILITY	VULNERABILITY	DESIRABILITY	ACTIVATION
Lake Parramatta	  		2.9	REGIONAL
Little Coogee	  		3.4	REGIONAL
Parramatta CBD	  		3.3	REGIONAL
MacArthur St Bridge	  		3.1	LOCAL
Silverwater Park	  		3.2	DISTRICT
Meadowbank Baths	  		2.4	DISTRICT
Brays Bay Reserve	  		3.5	REGIONAL
Putney Park	  		2.9	DISTRICT
Kissing Point Park	  		3.5	REGIONAL
Cabarita Beach	  		3.8	REGIONAL
Quarantine Reserve	  		2.9	DISTRICT
Henley Baths	  		2	LOCAL
Bayview Park	  		3.3	REGIONAL
Chiswick Baths	  		2.9	DISTRICT
Callan Park	  		3.1	REGIONAL
Dawn Fraser Baths	  		3.5	REGIONAL

Key:

	Swimmable		High Desirability
	Splash Contact		Medium Desirability
	Land based		Low Desirability

The studies and analysis undertaken as part of the Parramatta River Masterplan planning phase is summarised in the table below. Note that as part of the background reports for the Parramatta River Masterplan, various supporting studies have been undertaken either by the Parramatta River Catchment Group or taken from Council's historical studies (e.g. bathymetry studies) or undertaken by Council's in support of the Parramatta River Masterplan (e.g. City of Parramatta water quality monitoring studies and sediment screening of six sites funded jointly by OEH and three councils). Due to the available budgets, the supporting sediment study has been targeted at specific sites which are anticipated to have potential for activation and are also at risk of sediment contamination.

These studies have been reviewed as part of the swim site activation framework to undertake preliminary assessments of the feasibility, vulnerability and desirability of each potential new swim site.

Site	Dry Weather Site Visit	Wet Weather Site Visit	Initial WQ Monitoring	Initial Sediment Monitoring	Community Desirability Assessment	Bathymetry Study
Little Coogee	✓				✓	
Parramatta CBD	✓		✓		✓	✓
MacArthur St Bridge	✓				✓	
Silverwater Park	✓		✓	✓	✓	
Meadowbank Baths	✓			✓	✓	
Brays Bay Reserve	✓			✓	✓	✓
Kissing Point Park	✓			✓	✓	
Putney Park	✓				✓	
Quarantine Reserve	✓			✓	✓	
Bayview Park	✓			✓	✓	
Henley Baths	✓				✓	
Callan Park	✓				✓	

A summary of the recommended strategy and next steps for each site is shown below. The chosen activation opportunity is **not intended to be a final assessment** since further work is needed at all sites before making a final decision on this.

The recommended next steps highlight the potential strategic steps to progress each site and are not exhaustive – there are a range of other technical studies and on-ground works that could also be undertaken.

Site	Immediate activation opportunity	Potential future activation	Key strategic next steps
General – All			<ul style="list-style-type: none"> <li>– Seek Council support for activation of the site</li> <li>– Undertake water and sediment quality analysis and exposure pathways assessment monitoring to assess feasibility for swimming</li> <li>– Develop an initial sketch plan for the site, including swim site opportunities, as a basis for consultation</li> </ul>
Little Coogee	Splash contact	Swimming	<ul style="list-style-type: none"> <li>– Seek Parramatta Park Trust support for activation of the site</li> <li>– Promote the site as a riverbank picnic spot</li> </ul>
Parramatta CBD	Splash contact	Swimming	<ul style="list-style-type: none"> <li>– Strategic support for City of Parramatta studies</li> </ul>
MacArthur St Bridge	Land based	Splash contact	<ul style="list-style-type: none"> <li>– Strategic support for City of Parramatta studies</li> <li>– Consideration of improved access to river's edge</li> </ul>
Silverwater Park	Land based	Splash contact	<ul style="list-style-type: none"> <li>– Develop an adopted Masterplan plan for the site including swim site opportunities</li> <li>– Discuss with RMS constraints due to Rivercat</li> <li>– Discuss with RMS potential for recreational boating</li> <li>– Liaise with SOPA and review historical sediment studies</li> </ul>
Meadowbank Baths	Land based	Splash contact + swimming	<ul style="list-style-type: none"> <li>– Discuss with RMS constraints due to Rivercat</li> <li>– Discuss with RMS potential for recreational boating</li> </ul>
Brays Bay Reserve	Land based	Swimming	<ul style="list-style-type: none"> <li>– Develop an adopted Masterplan plan for the site including swim site opportunities</li> </ul>
Kissing Point Park	Splash contact	Splash contact	<ul style="list-style-type: none"> <li>– Develop an adopted Masterplan plan for the site including future swim site opportunities</li> <li>– Discuss with RMS constraints due to Rivercat</li> <li>– Undertake minor works to improve access to the beach</li> </ul>
Putney Park	Splash contact	Swimming	<ul style="list-style-type: none"> <li>– Undertake minor works to improve access to the beach</li> </ul>
Quarantine Reserve	Splash contact	Swimming	
Bayview Park	Splash contact	Swimming	<ul style="list-style-type: none"> <li>– Discuss with RMS constraints due to Rivercat</li> </ul>
Henley Baths	Splash contact	Swimming	<ul style="list-style-type: none"> <li>– Activate site as a 'local's' swim spot</li> </ul>
Callan Park	Splash contact	Swimming	<ul style="list-style-type: none"> <li>– Seek Government support for activation of the site</li> <li>– Develop a plan for the future swim sites</li> <li>– Signage and wayfinding to existing beach</li> </ul>

In the initial screening stages, an enterococci test is sufficient as the only water quality indicator, being used in the guidelines for recreational waters. It entails:

- Daily grab samples from the same location (as close as possible to the swim site location) for approximately 4 weeks (20 sample points)
- Lab assessment of enterococci only
- Record rainfall in previous 24 hours from nearest rainfall station (Refer BOM website for details).

A full suite of water quality analyses is not recommended because it is significantly more expensive and enterococci is already the most sensitive and useful as a screening indicator for the suitability for swimming. Should this initial testing indicate that water quality is not suitable, a more detailed monitoring program that assesses additional indicators (e.g. bacteriophages and bacteroids) will be needed.

All sites would need to be assessed to fully consider potential exposure pathways and their risk to human health, and ensure that these are adequately managed. Each site needs to be assessed for potential exposure and risk to humans from different pollution sources – this is a requirement by the EPA and NSW Health and is part of the National Guidelines approach (e.g. Beachwatch sanitary inspection).





## 5.0 Case Study Sites

Of the twelve proposed (as yet unbuilt) swimming sites assessed in section 3.0, three (Silverwater Park, Kissing Point Park and Brays Bay Reserve) have been selected for further development in this section as case study sites.

# Silverwater Park

## Vulnerability Assessment Overview

As outlined in Section 3, the initial vulnerability assessment identified potential water quality and watercraft hazards at the site and the site's history. These vulnerabilities are discussed further below.

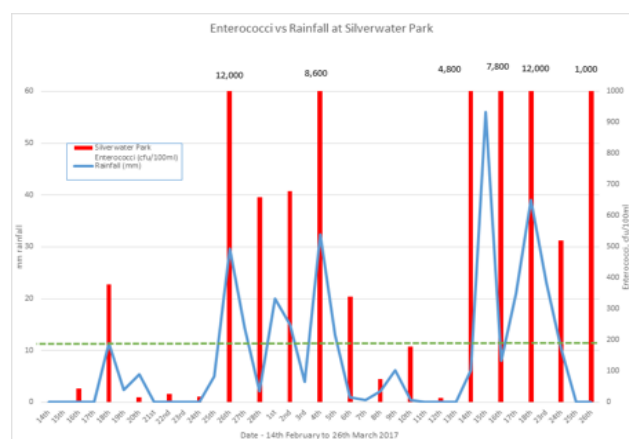
### Water Quality

The water quality at Silverwater Park, due to its location on the confluence of Duck River and Parramatta River, is influenced by the industrialised catchment of Duck River. These catchments are much more susceptible to changes in water quality due to illegal discharges. An example of the potential impact occurred in March 2017 when the Duck River turned a crimson colour.

To better understand the potential risks from pathogens at the site, City of Parramatta Council undertook 18 water quality samples over 6 weeks. Enterococci was sampled, which is the recommended pathogen indicator for assessing water quality for swimming. Levels of enterococci over 200 cfu/100mL are considered unsuitable for swimming.

The results of the water quality sampling are included below and show that enterococci levels are very strongly related to rainfall. More than about 5mm of rain results in levels of enterococci higher than 200. The initial results indicate that in dry weather enterococci levels are significantly lower and appear suitable for swimming.

Given the fluctuations in water quality at this site, particularly in wet weather, secondary contact activities such as kayaking and boating would be more appropriate.



### Site History

Silverwater Park, is also located adjacent to a former town gas site, now Wilson Park. The site also produced petroleum products, solvents and tar-bituminous products. A by-product of the manufacturing process was tar sludge which was contained in ponds adjacent to the Parramatta River. After its closure, tarry wastes were found to be leaching into the Parramatta River in the 1980s and was remediated in the late 1990s.

### Watercraft Hazard

The Parramatta Rivercat passes relatively closely to the riverbanks at Silverwater site as shown in the figure below. Also, the narrow channel width in the upper part of the estuarine section of the river restricts watercraft from this part of the river. This reduces the possibilities of water-based recreation activities at present.

### Silverwater Park Swim Site Activation Strategy

Given the above vulnerabilities, a site strategy was developed, which focussed on secondary contact. Three ways of engaging with water and activating the site for greater river based recreation have been identified:

1. Splash water play – A new playground which creates play spaces over and on the river while reducing immersive contact with the river water. The contact would be similar to secondary contact recreation activities. The water play space is protected from contact with the ferry by a timber boardwalk and balustrade and protected from the ferry wash by rock surrounds which also serve as ecological elements (**items 5, 6 & 7 on the sketch design overleaf**)
2. Boat Hire – a boat ramp on the left side of the timber deck allows for the launch of boats onto Duck River/Parramatta River. This would require a change to the current restrictions of watercraft west of the Silverwater Bridge. In particular, as Duck River is not affected by the Rivercat it would seem initially feasible to allow kayaking up Duck River. (**item 1 on the sketch design overleaf**)



3. Ecological play – Through creating a new ecological foreshore there are opportunities to create new elements of interaction along the riverbank. Similar to the way that rock platforms are explored by all ages at the beach, it is proposed to create new ecological elements which also provide interesting places to explore along the water's edge. **(item 3 on the sketch design overleaf)**

### Broader Site Opportunities & Analyses

The key analysis points of the site which have been included in the design:

- Currently the site is valuable underutilised land with ageing facilities (shelters, BBQs, playground, etc).
- Good potential for greater connectivity to the foreshore and its riverine environment through the extension of the cycle path through the site.
- The site has good existing facilities which can be re-used. In particular the car-park provides relatively good access to the site in addition the foreshore active transport network.
- Is located in an area of significant re-development in the vicinity of the park (e.g. Camellia redevelopment) – Silverwater park will become a much more important green space for the surrounding future developments.
- The design is based on maximising the potential of the site by engaging visitors in multiple programs (walking, informal ball games, picnics, boating, cycling, etc).
- Potential for the site to be an integrated district and local destination as it there is the ability to walk/bicycle to site or to drive/take public transport to site and due to the potential for it to link to other regional attractions (e.g. Blaxland Riverside Commons).
- Within the site the rectangular path network defines and demarcates the park from the ecological space. The path network also connects the back of site to the water through providing a clear network and boundary.
- Provision of large scale picnic shelters for the community – this allows for community events and caters for the different local community groups and typical large family picnic
- The informal play field can accommodate informal sporting activities, picnics and public events.
- The splash water play element and water together create a dynamic and unique experience for the area

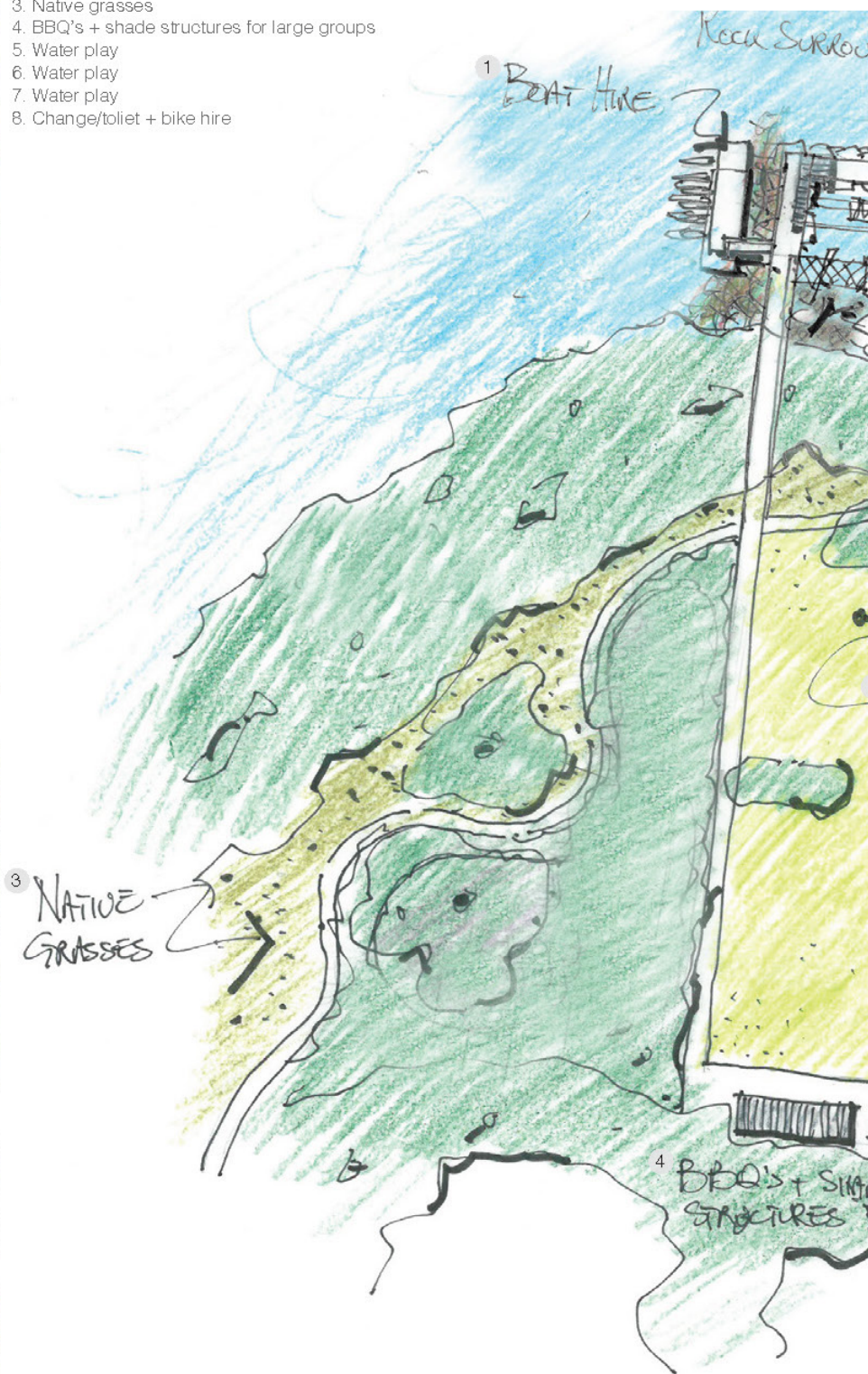
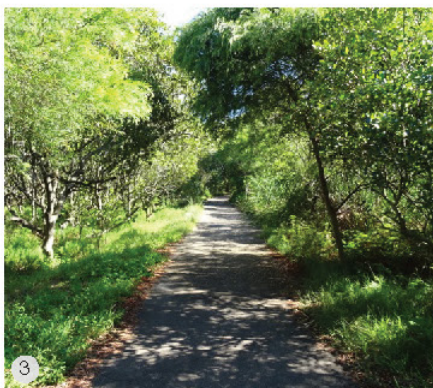
Through the design process a number of suggested possibilities have also been identified:

- Interest for a Parramatta based rowing club to be established. Paddle NSW and Dragon Boating are also other potential interested parties.
- Potential for a sandy beach on the land side (as there are no similar beaches along the river in Parramatta)
- Potential to form part of a larger Masterplan for this area including consideration of access to the site from Silverwater Rd
- Opportunities for a network and series of experiences along the Parramatta River. Silverwater Park could be one destination along the Parramatta foreshore trail
- The requirement for service levels and materials to be aligned ensuring that the maintenance requirements for Council are sustainable
- Potential for lifeguards at the site (noting that legally they are not required).





1. Boat hire
2. Open play lawn
3. Native grasses
4. BBQ's + shade structures for large groups
5. Water play
6. Water play
7. Water play
8. Change/toilet + bike hire



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**Client**  
 Parramatta River Catchment Group

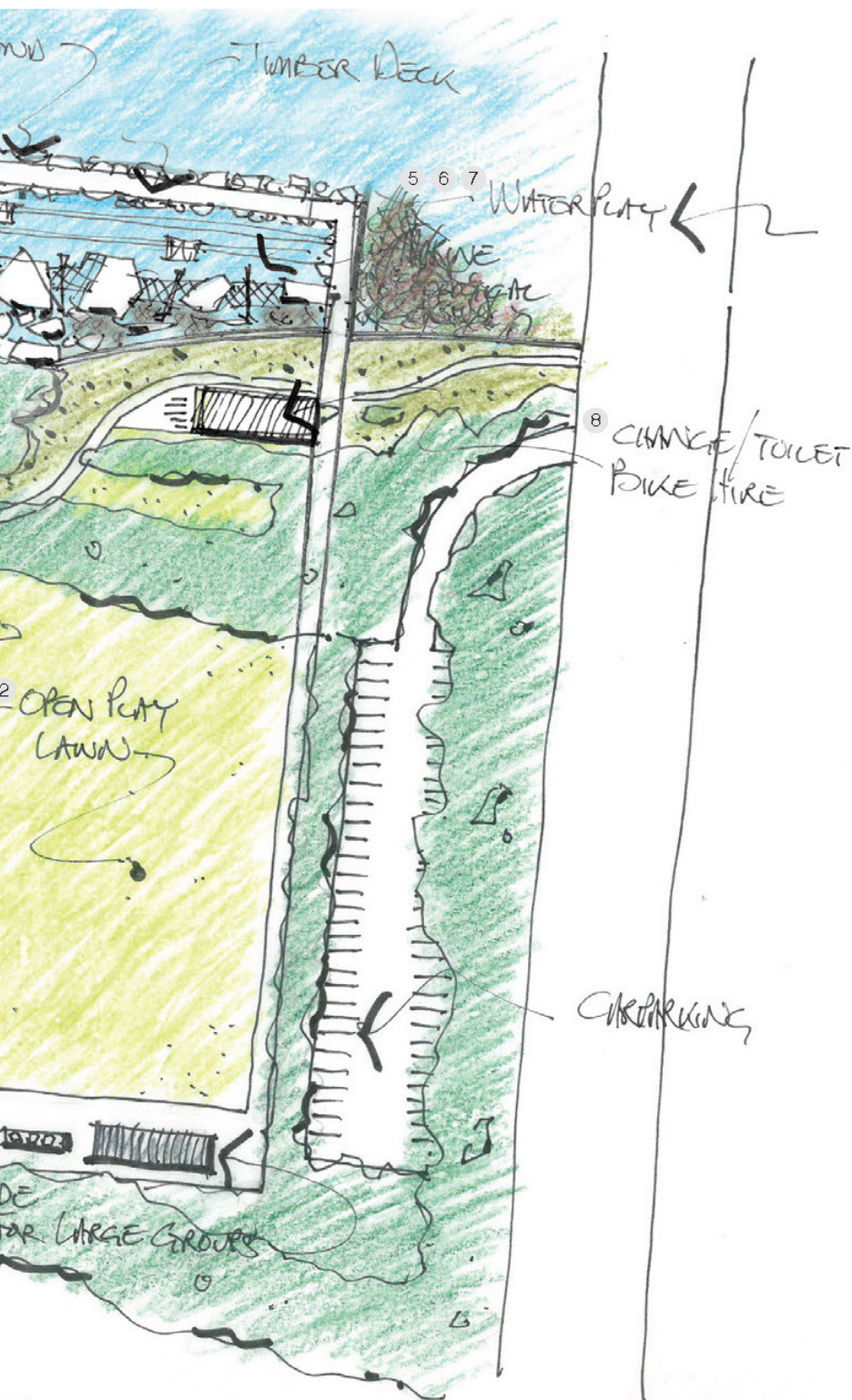
**Project No.** Proj No.  
**Silverwater Park Swim Activation**

**Address**  
 30 Darcy Street

**Phase**  
 Sketch Design

**Key Plan**





#### Scale & Orientation

1: 500 @ A1



0 5 10 15 20 25 M

All dimensions are in millimetres unless otherwise noted. Do not scale from this drawing.

#### Revision Log

Rev Revision Description

By/Checked

Date

#### Sheet Title

Water Play Option

Sheet No.

01

Rev



# Kissing Point Park

Kissing Point Park is located adjacent to a local residential community along the foreshore of the Parramatta River. The park is a relatively active site due to its adjacent uses including Ryde riverwalk, a boat launch wharf, ferry wharf, playground, carpark and toilets. The site has a small sandy beach area which provides the best access to the river foreshore due to its current open outlook and gentle slopes to the water edge. The site also has a small community of salt marsh at the back of the beach.

## Vulnerability Assessment Overview

### Stormwater Outlet

One of the key vulnerabilities of the site at present are the two stormwater outlets that discharge onto the beach. These outlets restrict access to the water's edge and detract from water quality and the overall appearance of the site. The site has been designed to improve the water quality discharged from the outlets and to re-direct the outlets away from the main part of the beach to improve access to the beach.

### Bathymetry

A second vulnerability of the site is the river bathymetry with gentle gradients creating long lengths of shallow water depths at the river's edge.

## Kissing Point Park Swim Site Activation Strategy

The strategy for activating Kissing Point Park's water edge is to:

- Enhance the sandy beach environment to welcome people down onto the beach to walk along the water's edge, sit and play on the sand or to explore the rock platforms at the ends of the beach
- At low tide when the river bed is exposed, encourage opportunities to explore the sand/mud flats and play on the bed of the river
- Create a seating edge at the back of the sandy beach, a common element of many ocean beaches across Sydney
- Enhance and retain the existing salt marsh, an endangered ecological community
- Create a grassy bank behind the beach for picnics and sun baking with views out across the Parramatta River



Figure: Stormwater outlet reducing access to and amenity of the beach



Figure: Sandy bed of the river becoming exposed (mid-tide)

## Design

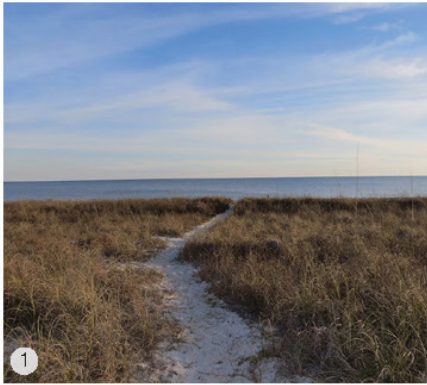
The design principles for the activation of river edge is to:

- Enhance the sandy beach and create a beautiful beach. The sand creates different characteristic to much of the existing Parramatta River edge and the sand provides encouragement of a beach-like characteristic.
- Evoke the idea of running into the water and splashing around. The sand and lawn allow for this, reminiscent of a beachfront.
- Enhance the beach environment and access to the beach environment through treating the stormwater outlets discharging into the sandy beach and re-directing the stormwater outlet away from the sandy part of the beach.
- Re-direct the stormwater outlets and pipes into a bio-infiltration swale which infiltrates the water into the existing sandy soils and re-directs high flows away from the centre of the beach.
- Creating a beautiful element in the landscape bringing people down to the water's edge; i.e. a new timber deck that frames the site and the design elements that sit alongside it
- Allow for people watching from both the water and the land through creation of design elements like a concrete wall edge, lawn or timber deck
- Integrate the rock pools into the site, similar to Dee Why and South Curl Curl where suburban meets nature
- Protect and enhance the existing salt marsh community by further planting out the salt marsh at the right levels on the site. People walking above it on the deck rather than trampling through it will help to improve its overall health and growth into the future.
- Provide a gently sloping lawn and grassy slope for picnics and sunbathing and to give visitors multiple options to sit and relax on site.

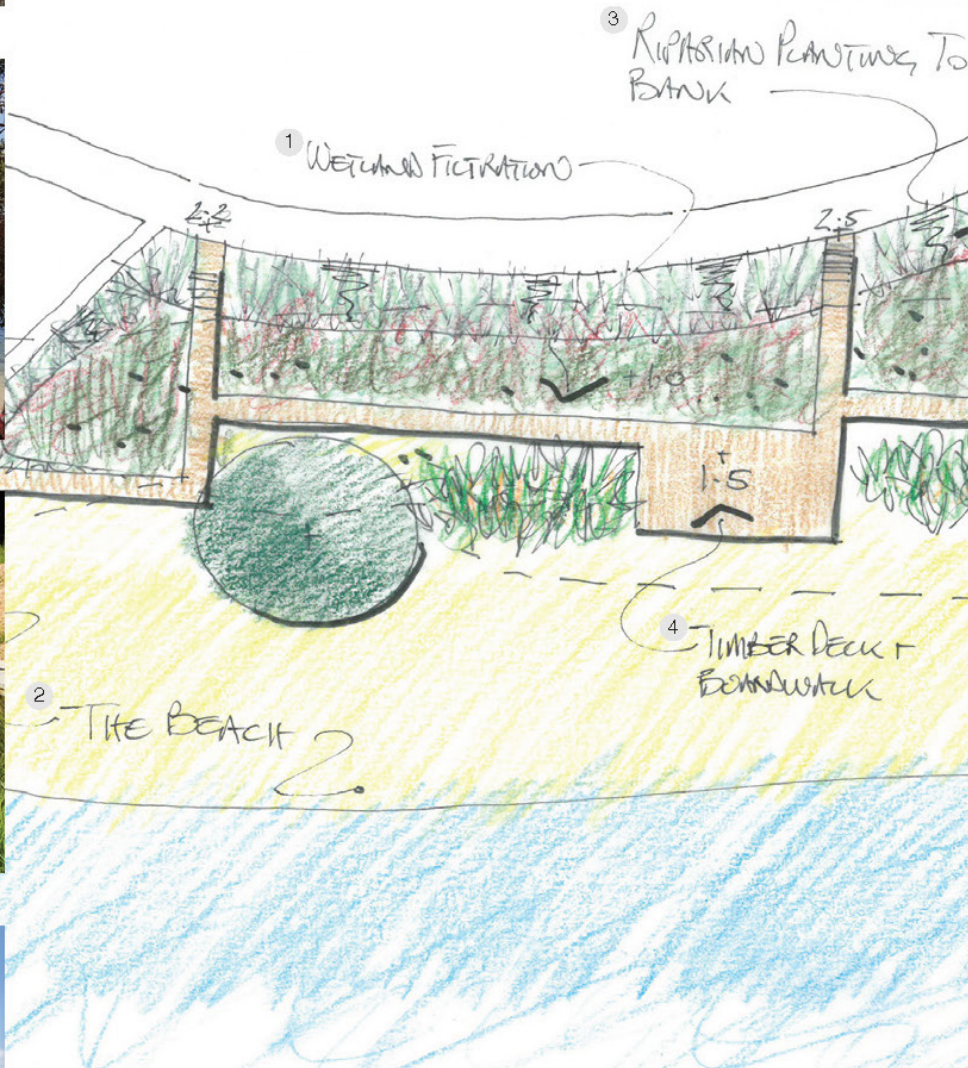
Key design issues for the site include:

- Location of the boardwalk above the king tide level (or other suitable level);
- Resolution of stormwater drainage and the impact that this could have on the beach;
- Requirement to ensure that localised flooding is eliminated;
- Ensuring that in large events stormwater can be safely conveyed through the swale and into the river without causing flooding;
- Maintenance required to ensure that the sand is well-maintained and free of debris, similar to the way that the ocean beaches are cleaned on a regular basis.





1. Infiltration zone
2. The beach
3. Riparian planting to bank
4. Timber deck + boardwalk
5. Concrete wall edge
6. Retained salt marsh
7. Lawn
8. Concrete path



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Client  
 Parramatta River Catchment Group

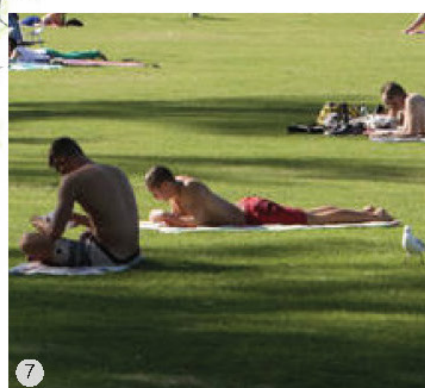
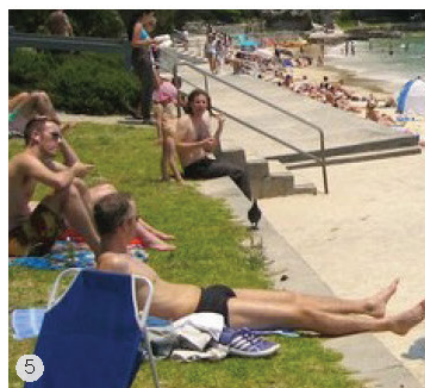
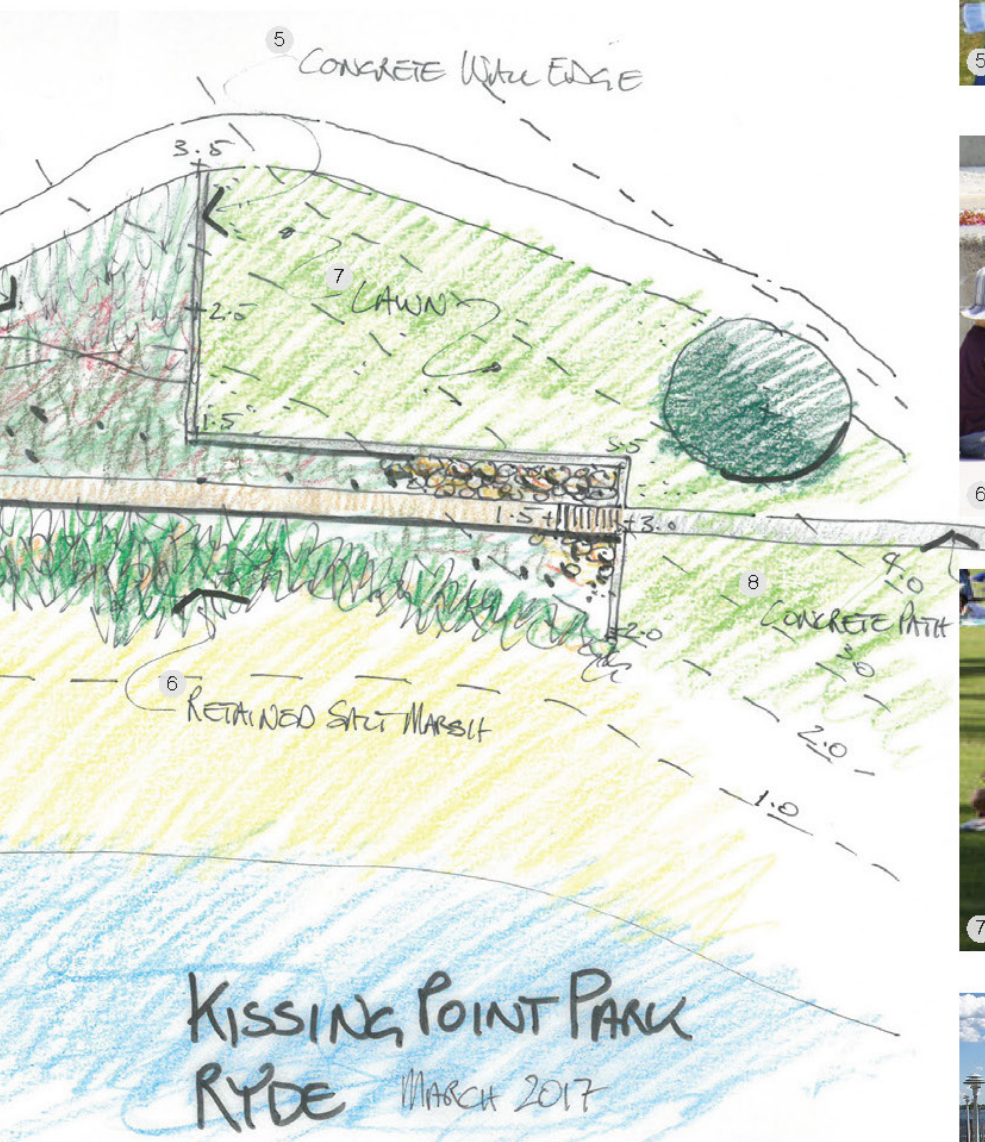
Project No. Proj No.  
**Kissing Point Park**

Address  
 Waterview Street

Phase  
**Sketch Design**

Key Plan





#### Scale & Orientation

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0 2 4 6 8 10 M

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#### Revision Log

Rev Revision Description

By/Checked Date

#### Sheet Title

Beach Activation Option

Sheet No.

02

Rev

## Brays Bay Reserve

Brays Bay Reserve is located in the Rhodes East Priority Precinct, identified as a potential priority precinct for redevelopment. As part of the potential redevelopment, opportunities have been identified to improve the amenity and facilities of existing open space and public domain including Brays Bay Reserve. A river pool and foreshore bank works have been proposed as part of the redevelopment. The approach to Brays Bay Reserve builds on these opportunities identified in the precinct planning process and provides a strategy for activation of Parramatta River at the site.

### Vulnerability Assessment Overview

It is noted that while limited water quality testing has been undertaken at the site, and the water quality is not well known, sampling undertaken to date at the northern tip of the Rhodes peninsula found moderate levels of pathogens (total coliforms). Given the uncertainty over water quality, consideration was given to staging of the works and uses alternative to swimming at the site. A strategy was developed which allowed the site structures to be activated with boating (e.g. boat hire facilities, boat launch facilities) which could be constructed as part of the first stage of a river-based activity.

Other key vulnerabilities for the site has been identified as potentially low water depths of the site and river sediment.

The site has an industrial history with its use as an industrial site for most of the 20th century. The site was a former iron works as well as being used for ship building. This industrial history may have caused potential impacts on the sediment quality in the vicinity of the pool. Further sediment testing will be required to understand the vulnerability of the site to contaminated river sediment impacting on human and environmental health.

The site has also been identified as having potential shallow depths. A review of the available information on water depths is shown in the figure below (from AUS Chart 203) which shows the depths in the river at lowest astronomical tide. This indicates that water depth varies in the river adjacent to the reserve between 1 and 2m. Water depths will need to be considered in the location, and form of the pool.

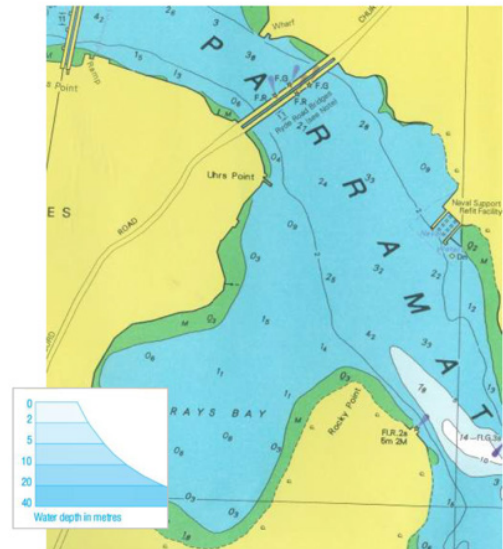


Figure 14: Extract of AUS Chart 203 (Australian Hydrographic Service showing approximate river water depths within the study area at Chart Datum which approximates to Lowest Astronomical Tide).

Figure: Approximate river depths at Brays Bay Reserve at Low Tide (AUS Chart 203)

### Brays Bay Reserve Swim Site Activation Strategy

The strategy for the site of creating a natural river-based swimming opportunity as opposed to a treated river water pool is based on:

- the preference to have a more natural river-based experience;
- a treated water pool requiring charges for use;
- avoiding having a fenced swimming pool site in the middle of the park which would be required if there was an entry fee;
- a treated river water pool requiring locating the pool adjacent to the shore along with servicing, amenities and administration facilities;
- Council's preference to have a low-cost option for swimming as swimming pool facilities typically do not recover their operating costs.

A strategy has also been developed for the site which uses a natural treatment system to treat the water flowing through the pool. It is proposed that all water entering the pool would flow through a sea grass and mangrove treatment system integrated into the foreshore. Research of natural sea grass meadows (Lamb et. Al, (2017), Science 355: 6326) found that there was a 50% reduction in the abundance of pathogens when seagrass meadows were present. This system would therefore provide both for new ecological habitat as well as a natural treatment system for the pool.



## Broader Site Opportunities & Analyses

The design at Brays Bay is based on the following design principles:

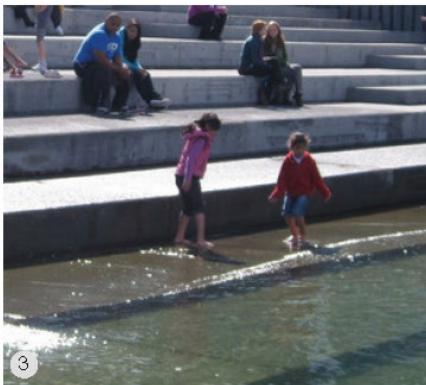
- Simplicity of shapes – a circular pool as a strong icon at the site. Pedestrians, cyclists and motorists driving along the Parramatta River can see the Bay and the pool within the river, boosting its identity;
- The space is currently underutilised; through activation of the river foreshore and the pool, more activity is created within the park and river areas.
- Provision of a foreshore path allows for a walking environment engaging with the water and its ecological aspects (including mangroves, sandy beaches and rock platforms);
- A new entry Plaza co-located with a café, aligned with the new pedestrian land bridge to the Rhodes Railway Station which has been identified as part of the Rhodes East precinct plan; the plaza creates a central axis, a focal point and a sense of entry for the reserve;
- A more diverse demographic of users for the site; e.g. a children's playground; off-leash dog park
- Densification, in planting and in program;
- Creation of new ecological zones including mangroves, sea grasses and oysters to filter riverwater before it enters the pool and as passive cleaning;
- Re-use or continuation of use of existing facilities such as carpark and restaurant;
- Brays Bay Reserve as important green space given the future and current development of nearby Rhodes East and Rhodes West, which will intensify use of the site.



Figure: Existing Brays bay Reserve foreshore with development of Rhodes West in background



1. Entry plaza + building (toilet/changerooms)
2. Childrens play with shade structure + BBQ's
3. Entry plaza
4. Planted seawall edge cleans all water entering bay
5. Pool/deck + access
6. Marine ecological zone + water filter
7. New mangroves planting
8. Shade structures + BBQ's for large groups



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Client  
 Parramatta River Catchment Group

Project No. Proj No.  
**Brays Bay**

Address  
 Concord Road

Phase  
 Sketch Design

Key Plan



DESTRUCTURES +  
POOLS FOR  
MAGE GROUPS

7 New Mangroves Planting.

6 MARINE Ecological  
ZONE + WATER FILTER.

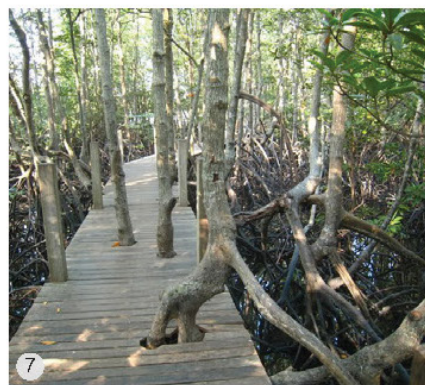
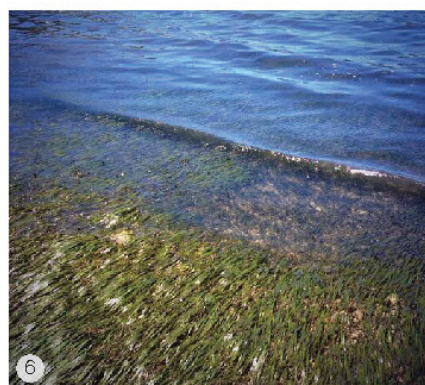
5 Pool/Deck + Access  
Deck.

GRADUAL LAWN.

ANTENNA SEAWALL  
EDGE CLEANS AND  
WATER ENTERING BAY



BAY - CANADA BAY



#### Scale & Orientation

1: 1000 @ A1



0 10 20 30 40 50M

All dimensions are in millimetres unless otherwise noted. Do not scale from this drawing.

#### Revision Log

Rev Revision Description

By/Checked Date

#### Sheet Title

Natural Pool Option

Sheet No.

04

Rev



## 6.0 Local, National and International Precedents for Urban River Swimming



The precedents listed below have been chosen for their application of the criteria explored in this report. The projects range from major to minor activation interventions, and highlight the diverse range of design responses, outcomes and relationships to various river locations.

## RIVER SWIMMING

### COPENHAGEN HARBOUR BATHS

**Precedent** River pool in a prominent location



**Location** Copenhagen, Denmark

Size total area of 2500 m<sup>2</sup>

**Facilities** Toilets, lockers, hot showers, deck chairs, lifeguard and 5 pools- 2 of which are for children

**Surrounds** High-density residential, some commercial

**Water Type** River water, quality checked daily

**Edge Type** Defined entry points and designed formal edged to replicate swimming pool

**Budget** \$787,000

**Analysis** The Copenhagen Harbour Baths extend past existing park over the water's edge, addressing community demand, enhancing accessibility and creating additional opportunity for community activities in a prominent location in Copenhagen.

**Applicability** The type of uses for an intervention of this kind may include:

- areas linking to public space or commercial strips
- along a river edge to enhance activation
- activation of new precincts

## RIVER SWIMMING

PIRRAMA PARK

**Precedent** New Destination park on river with heritage elements and



**Location** Sydney, Australia

**Size** 1.8 hectares

**Facilities** Public toilets, playground, cafe, picnic facilities pontoon, bike stands, disabled access and parking

**Surrounds** Medium density residential and some commercial

**Water Type** Johnsons Bay, saltwater

**Edge Type** Designed edged stepping down to the water and designed edges replicating pontoon and swimming pool

**Cost** \$26,000,000

**Other Features** Rainwater capture and reuse, solar panels, energy efficient lighting and recycled wooden decking

**Analysis** Pirrama Park activates the waterfront by providing stepped down access to the water's edge as well as water play elements, strengthening the connection to the bay. The design has retained the old pier as a heritage item, highlighting past connections to the water. The park is further activated through additional activities such as markets and festivals. There is strong access to an existing extensive pedestrian and cycle network as well as providing vehicular access and parking.

**Applicability** The type of uses for an intervention of this kind may include:

- areas linking to public space or commercial strips
- along a river edge to enhance activation
- activation of new precincts

## TREATED WATER RIVER SWIM SITE

'OF SOIL AND WATER': KINGS CROSS POND CLUB

**Precedent** Naturally-purified swimming pool by a commercial operator



**Location** Kings Cross, London

**Size** 40m long - space for 40 bathers, total area of 2200m<sup>2</sup>

**Facilities** Toilets, lockers, hot showers, deck chairs, lifeguard and 1 pool

**Surrounds** Future high-density residential development

**Water Type** Fresh water, purified through a natural closed-loop process using wetland and submerged water plants to filter the water and keep it clear

**Edge Type** Designed edge to replicate swimming pool

**Cost** Unidentified

**Analysis** The temporary installation provides access to a natural pool in a rapidly-developing city. The natural swimming pool creates a space for community gathering and recreation, activating an underused site within a transitional environment.

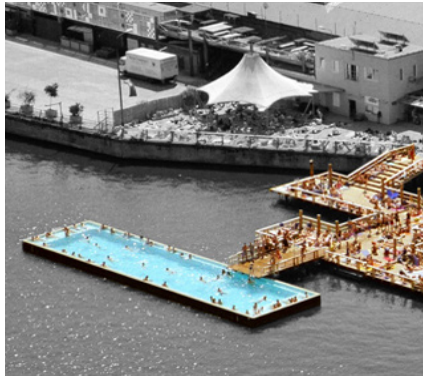
**Applicability** The type of uses for an intervention of this kind may include:

- areas of high-density development that require activation
- existing recreational areas
- activation of new precincts
- areas of urban renewal

## TREATED WATER RIVER SWIM SITE

BADESCHIFF

**Precedent** Swimming pool 'within' the river, where water quality is not suitable



**Location** Berlin, Germany

**Size** 32m long

**Facilities** Toilets, lockers, hot showers, deck chairs and lifeguard  
**Surrounds** Medium-density residential and commercial

**Water Type** Chlorinated fresh water

**Edge Type** Defined entry points and designed edges replicating pontoon and swimming pool

**Cost** Unidentified

**Other Activities** Yoga classes, massages, wooden pier, sandy beach, open-air bar

**Analysis** The Badeschiff is reminiscent of the European bath culture. Extending from an existing barge, the pool provides the community with enhanced connections to the River Spree, both in summer and winter. The Badeschiff has become a cultural icon in the city, activating its surrounds as well as the water's edge.

**Applicability** The type of uses for an intervention of this kind may include:

- areas linking to public space or commercial strips
- along a river edge to enhance activation
- activation of new precincts
- areas of urban renewal

## TREATED WATER RIVER SWIM SITE

NLANDS SURF PARK

**Precedent** Treated stormwater used for inland surfing and recreation by the community.



**Location** Austin, Texas, USA

**Size** 5.5 hectares

**Facilities** Surfboard and gear hire, restaurant, lockers, hot showers, surf shop, deck chairs, first aid office, the lagoon and boardwalk

**Surrounds** Open space private land with farming, located along Highway 71

**Water Type** Freshwater coming from reservoir

**Edge Type** Sand to water's edge to emulate the beach

**Cost** Unidentified

**Analysis** Nland Surf Park brings surf culture to the inland town of Austin. The park provides a fresh water lagoon for surfing and recreational activities. The lagoon is filled with rainwater that is cleaned using a bio-filtration system. The treated water in the lagoon is self-sustaining providing year-round activation. The sand edge is reminiscent of the beach and allows anyone who visits to engage with the waterfront regardless of their swimming ability and whether they are surfing or not.

**Applicability** The type of uses for an intervention of this kind may include:

- areas of large open space
- along a river edge to enhance activation
- activation of new precincts
- areas of urban renewal



## SPLASH CONTACT

### GLEBE FORESHORE

**Precedent** Foreshore activation encouraging engagement with the river without swimming pools.



**Location** Sydney, Australia

**Size** 2.5 km walking and cycling track

**Facilities** Toilets, bike racks, boat and kayak ramps, disabled access, boardwalks on water's edge, a beach, pontoons, storage and mangrove restoration

**Surrounds** Low-density residential, some commercial, industrial and parklands

**Water Type** Rozelle Bay, saltwater

**Edge Type** Designed seawalls and steps down to the water's edge

**Budget** \$20,000,000 for 5 stages over 10 years

**Analysis** The Glebe Foreshore stretches across the iconic Sydney waterfront. It provides extensive pedestrian and cyclist access to the waterfront, whilst connecting to several recreational areas. The Glebe Foreshore has activated the water's edge becoming a popular tourist walk and exercising trail. The mangrove habitat reconstruction also includes coastal saltmarsh habitat.

**Applicability** The type of uses for an intervention of this kind may include:

- areas linking to public space or commercial strips
- along a river edge to enhance activation
- activation of new precincts
- areas of urban renewal

## SPLASH CONTACT

ADVENTURE PARK

**Precedent** Splash play in a river without contact



**Location** Huntington Beach, California, USA

**Designer** Not specified

**Size** 142 hectares (entire park)

**Facilities** Toilets, pedestrian and cycle paths, picnic facilities, and vehicle and parking access

**Surrounds** Low density residential and parkland

**Water Type** Fresh water, man-made pond

**Edge Type** Natural landscape to water's edge

**Cost** Unidentified.

**Activation** As a part of the Huntington Beach Central Park with its strong community setting, the Adventure Park provides water play with various interactions along the pond for children and their parents. The wide demographic aids in successful activation of the park.

**Applicability** The type of uses for an intervention of this kind may include:

- areas linking to public space
- along a river edge to enhance activation
- activation of new precincts
- areas of urban renewal

## SPLASH CONTACT

MILL RIVER PARK AND GREENWAY

**Precedent** River access, ecological restoration and new linear parklands along river foreshore



**Location** Stamford, Connecticut, USA

**Size** 12 hectare

**Facilities** Toilets, benches, pedestrian paths, community and educational pavilions allow for programmable activities and bird-watching. To be added to the park are a sculpture garden, kayak area, amphitheatre, rain garden, dog run and light sculptures.

**Surrounds** Medium to high-density residential and commercial

**Water Type** Tidal and brackish water, riparian corridor, poses high flood risk

**Edge Type** Natural landscape to water's edge

**Cost** Unidentified

**Activation** A once-polluted and derelict waterway now has robust bio-habitats, increased biodiversity and a strong sense of community ownership and involvement. The Public-Private Partnership allows the community to be involved in maintenance and protection of the park, and builds a strong community heart centred around the river. Accessibility to the water's edge and walkways along the river encourages year-round activation.

**Applicability** The type of uses for an intervention of this kind may include:

- areas that require ecological interventions
- enhance existing ecological corridors
- areas of urban renewal
- areas that suffer adversely from flooding or tidal movement

