Video Resources

Access more information on a range of different subject matters.

Brief History of Sydney Olympic Park
https://www.youtube.com/watch?v=7ux_k17Ew2M

Bicentennial Park Remediation
https://www.youtube.com/watch?v=X0kEWDxqzy4

Bicentennial Park Wetlands and Ecology
https://www.youtube.com/watch?v=aagfCJInRpA

Green and Golden Bell Frog at Sydney Olympic Park
https://www.youtube.com/watch?v=Cysm7AljiUtY&list=PLf3WD4fy30u11M5EhfAH3tcZluNuWTrZw&index=2

A Timeline of Aboriginal History

WET (Wetland Education and Training) E-Book
This is an excellent resource for Stage 6 Geography and Biology

Fieldwork Techniques – Abiotic Testing

Water Temperature:
https://www.youtube.com/watch?v=sFThxX2PD ey8&list=PLf3WD4fy30u1bg3B8KP28QDLYzzZtcXc8&index=2&t=0s

Water Turbidity:
https://www.youtube.com/watch?v=Adfj1D3An3Q&list=PLf3WD4fy30u1bg3B8KP28QDLYzzZtcXc8&index=3&t=0s

Water Salinity:
https://www.youtube.com/watch?v=kAs7rge81jb4&list=PLf3WD4fy30u1bg3B8KP28QDLYzzZtcXc8&index=7&t=0s

Water pH:
https://www.youtube.com/watch?v=kAs7rge81jb4&list=PLf3WD4fy30u1bg3B8KP28QDLYzzZtcXc8&index=7&t=0s

Sediment pH:
https://www.youtube.com/watch?v=U6rweBmL_Gs&list=PLf3WD4fy30u1bg3B8KP28QDLYzzZtcXc8&index=4&t=0s
Sediment Size:
https://www.youtube.com/watch?v=aBCDLlTV7K0&list=PLf3WD4fy30u1bg3B8KP28QDLYzzZtcXc8&index=5&t=0s

Light Intensity:
https://www.youtube.com/watch?v=cbb6SvHQUA4&list=PLf3WD4fy30u2D8gOSjCUNnUQfqbC4_6V&index=2&t=0s

Air Temperature:
https://www.youtube.com/watch?v=8NFpQaW9qrc&list=PLf3WD4fy30u2D8gOSjCUNnUQfqbC4_6V&index=4

Humidity:
https://www.youtube.com/watch?v=YJawe6DMR_s&list=PLf3WD4fy30u2D8gOSjCUNnUQfqbC4_6V&index=3&t=0s

Field Investigations – Sydney Grey Mangrove (Avicennia Marina) Adaptations

Grey Mangrove Root System:
https://www.youtube.com/watch?v=fVlkmTQdEu8

Mangrove Leaves Investigation:
https://www.youtube.com/watch?v=7pk02SxzP6s

Mangrove Leaves Adaptations:
https://www.youtube.com/watch?v=yjBs5jyXqHo

Mangrove Seeds:
https://www.youtube.com/watch?v=NKL8lyjUVzk

Mangrove Sediment Investigation:
https://www.youtube.com/watch?v=MqhZhWm1Er0
We’ve packaged up a large range of our educational resources including resource sheets and videos to make it as easy as possible for you to teach classes about the diverse and unique environments here at Sydney Olympic Park.

We’ve included material about our incredible Sydney Olympic Park Badu Mangroves, as well as examining the Built Environments of Sydney Olympic Park including Place and Liveability, Changing Places and Water in the World, amongst other areas.


Request more info or book with our Education Team at: education@sydneyolympicpark.com.au or education@sopa.nsw.gov.au
Restoring Ecosystems

Sydney Olympic Park’s once-degraded wetland and terrestrial ecosystems underwent extensive restoration works during the late 1990s in what was the largest land remediation exercise ever undertaken in Australia.

The high public profile and inflexible timeframe of the Sydney 2000 Olympic Games often referred to as ‘Green Games’ provided a strong social driver for fast-tracking these works and led to their integration with ecologically sustainable development initiatives occurring as part of the Games development.

The bid for the Games had included a set of environmental guidelines for implementation by host cities (Sydney 2000 Bid Limited 1993) based on sustainability principles adopted at the 1992 United Nations Earth Summit. They included commitments to the preservation and protection of natural ecosystems and endangered species, as well as energy and water conservation, waste minimisation, resource conservation and prevention of pollution.

The Park is located in a unique area in the centre of Sydney, 14 kilometres west of the central business district, and within the Parramatta River catchment of Sydney Harbour. The Park’s estuarine habitats are part of a larger network of estuarine habitats along the Parramatta River, but its terrestrial habitats are virtually an island in ecological terms – surrounding urban development has resulted in physical disconnection from most other flora and fauna habitats in the region.

Restoration works were undertaken as part of a wider urban renewal project that created sporting, residential, commercial and recreational precincts across 760 hectares of land. This land was historically subject to extensive land reclamation works and to controlled and uncontrolled landfilling, and was the site of various government-owned intensive industries that closed in the 1980s.

Remediation and restoration works

The ecological component of the restoration works sought to rebuild functional naturalistic ecosystems within an urban parkland environment and involved:

- remediation of 160 hectares of contaminated land and the recovery, consolidation and on-site containment of nine million cubic metres of excavated waste
- restoration works to 100 hectares of remnant estuarine wetlands and 20 hectares of remnant eucalypt forest
• dechannelisation of two kilometres of estuarine creekline, converting it from a concrete stormwater drainage channel into a naturalistic tidal waterway edged by saltmarsh terraces
• restoration of tidal flushing to a 35 hectare land-locked estuarine wetland
• construction of new wetland, grassland, woodland and saltmarsh landscapes on remediated lands, with over eight million seedlings planted on both salvaged and constructed topsoils
• design, construction and establishment of new habitats for target flora and fauna communities, particularly the endangered Green and Golden Bell Frog and the endangered Coastal Saltmarsh community. A network of seventy frog ponds were built over 90 hectares of land and linked by movement corridors and road underpasses. Saltmarsh terraces were built on the dechannelised banks of Haslams Creek to provide additional saltmarsh habitat.

The majority of these large-scale remediation works were undertaken between 1992 and 2001 at an estimated cost of AUS $137 million (approximately AUS $180,000 per hectare). Works were managed by New South Wales state government agencies.

Ecological underpinnings

Prior to remediation, the land now comprising Sydney Olympic Park was anecdotally regarded as having high biodiversity values despite a history of habitat alteration and industrial use, and its ecological isolation in urban surrounds. Site managers sought to integrate biodiversity conservation with site redevelopment. To assist this goal they established an expert review panel of professional ecologists and environmental scientists, and commissioned a suite of ecological studies to provide baseline information on the Park’s flora and fauna.

Various ecological research programs, monitoring programs and field trials were established, including funding of a PhD study of Green and Golden Bell Frog ecology, the saltmarsh plant Wilsonia backhousei, and prevalence and impact of endocrine disruptors. Many Honours projects have been undertaken at the site.

Park ecosystem management continues to be underpinned by the advice of researchers, consultants, and other scientific experts. This involvement increased in 2009 with commencement of a five-year research program: Building sound restoration strategies for endangered amphibians, to be conducted in partnership with several universities and other government agencies.

Recent projects

Sydney Olympic Park Authority now manages the 640 hectare precinct that is Sydney Olympic Park. Habitat restoration and management works are an ongoing component of Park management. Recent projects include:

• assisted regeneration of an endangered remnant forest community including bush regeneration within the core forest, promotion of passive regeneration at the forest edge, propagation and planting of local provenance seedlings on degraded adjacent lands, and establishment of a ‘demonstration garden’ to showcase forest species in education and visitation programs
• restoration of remnant stands of endangered Coastal Saltmarsh, including primary weeding of large expanses of the weed Juncus acutus and removal of colonising mangrove seedlings from mapped saltmarsh habitats
Fact sheet – Restoring Ecosystems

- rehabilitation of saltmarsh terraces along the reconstructed estuarine Haslams Creek. Following successful field trials, mangrove mulch was mixed into the saltmarsh substrate and the area was rapidly colonised by saltmarsh seedlings
- refurbishment of ponds and plantings for the endangered Green and Golden Bell Frog, in an ongoing periodic disturbance management regime
- restoration of tidal flushing to the ‘Waterbird Refuge’, an altered estuarine wetland that provides habitat for migratory shorebirds protected under international intergovernmental agreements
- construction of fishways between estuarine and fresh water creek systems to enable fish passage from the Parramatta River estuary to upstream habitats in Lake Belvedere and Boundary Creek that were previously inaccessible due to road culverts
- ecological monitoring, research and adaptive management of remnant and constructed ecological systems
- recognition as one of the top 25 ecological restoration projects in Australia

Environment reports available from Sydney Olympic Park Authority provide further information on many of these projects.

Ecological outcomes

The success of the restoration works is seen in the improved condition of Sydney Olympic Park’s habitats and the rich biodiversity that they now support. Over 300 hectares of the Park is managed as habitat for species and communities protected under environmental legislation. The Park’s habitats support three endangered ecological communities, protected marine vegetation, over 180 species of birds, seven species of frogs, ten species of bats, 15 species of reptiles, many species of native fish, and thousands of invertebrate species. The original Green and Golden Bell Frog population has been conserved and two new satellite populations have established new habitats on remediated lands. Coastal Saltmarsh has increased in extent from 20 hectares in 2002 to 25 hectares in 2010. Migratory shorebirds have returned to feed and roost at the Waterbird Refuge.

Environmental awards

The restoration works have won several major environmental awards including:

- The United Nations Environment Program’s Global 500 Award for Environmental Excellence (2001)
- Gold Banksia Award (2000)
- Banksia Award - Conservation of Flora and Fauna (2000)
- Energy Australia-National Trust Heritage Award - landscape conservation commendation - saltmarsh (2005)
- recognised as one of the top 25 ecological restoration projects in Australiasia.
Extension and education programs

The parklands at Sydney Olympic Park attracted almost 2.5 million visitors in 2010–11 and more than 20,000 children participated in environmental education programs. Customised Technical Insight Tours and ecological professional development workshops (WET workshops) are also conducted at the Park.

Sydney Olympic Park is a ‘best practice demonstration site’ for the Green and Golden Bell Frog and for Coastal Saltmarsh. The demonstration sites project was established by the NSW Department of Environment and Heritage and the Sydney Metropolitan Catchment Management Authority to educate land managers and the community about the ‘priority’ threatened species and communities within the Sydney region and how to best manage them for conservation. Best practice management guidelines aimed at land managers have been produced for these species and communities. Interpretive signage has been installed and a series of technical and community field days are held each year.
Tidal flows into the Waterbird Refuge at Bicentennial Park are carefully regulated to provide optimum levels for its feathered and finned inhabitants, and to minimise the generation of wetland odours.

Restoration

• The ten-hectare wetland was created in the 1950s as a result of unfinished works to create industrial land from tidal mudflats. Clay bund walls were built to enclose the mudflats and sediment was pumped in from Homebush Bay to raise the height of the reclaimed land. The works were abandoned before the bunds were completely filled with sediment, and the enclosed wetland subsequently developed into a significant waterbird habitat with a high abundance and diversity of resident and migratory birds.

• Over time, the ecological health of the wetland diminished due to lack of tidal exchange. Species diversity declined, algal blooms frequently occurred in the stagnant waters, and the combination of rotting algae, shallow water and nutrient-rich sediments regularly caused strong odour emissions.

• Restoration of the wetland followed years of detailed scientific study and careful planning. Scientists determined that restoration of tidal flushing to the land-locked wetland would improve its ecological health and reduce algal blooms and odour generation.

• Sydney Olympic Park Authority installed a solar-powered computer-operated tidal gate in the bund wall in 2007, at a cost of $187,000. Gate settings are varied seasonally to regulate the extent of inundation occurring with each tidal cycle.
Managing the Wetland

• Five years later, the wetland is vastly improved. Pacific Golden Plovers have been recorded feeding in the wetland in October 2012 for the first time in over fifteen years. These annual migrants travel from breeding grounds in the northern hemisphere to Australia each spring, before making the long trip back north in autumn. Other species dependent upon the wetland include migratory Bar-tailed Godwits and Sharp-tailed Sandpipers, as well as resident Black-winged Stilts, Grey Teals and Australian Pelicans and native fish including Silver Bream and Luderick. Endangered Coastal saltmarsh vegetation is expanding around wetland fringes, algal blooms occur less often, and odour generation is significantly reduced compared to pre-2007 levels.

• Together with the surrounding mangrove forest, the wetland is listed as a ‘Wetland of National Importance’ by the Commonwealth Government because of its high ecological values.

• A level of odour generation continues to occur within the wetland, and this is a normal and unavoidable occurrence in this type of waterbody. Odour generation is due to chemical reactions and microbial activity in the wetland and its sediments which cause the production of hydrogen sulphide, commonly known as rotten-egg gas. Odour strength varies greatly with climatic factors and the monthly tidal cycle — the strongest odours typically occur after warm, still nights, when tides are low.

• The tidal gate is an important tool in minimising odour generation. During the warmer months, the tidal gate is typically set to enable high levels of tidal exchange. This maximises water circulation within the wetland and keeps oxygen levels high, both of which reduce odour generation. If a series of low tides occur, which can sometimes last for weeks, the amount of tidal exchange is limited until a high tide comes and flushes the wetland, assisting in alleviating odour levels.
Remediation

Legal and illegal landfilling operations occurred over several decades on lands that are now within Sydney Olympic Park. The majority of landfilling operations were broadacre fill, and few if any environmental controls were applied.

In a site-wide study conducted in 1991, boreholes were installed on a 50m grid across the site, generally to a depth of 1.6m. Soil and groundwater samples were collected for laboratory analysis to determine the locations and nature of wastes; further investigations were conducted where indicated. Approximately 160-hectares of the site was identified as containing wastes including:

- power station ash
- demolition rubble
- asbestos
- industrial hydrocarbons
- domestic garbage
- dredging material from the Parramatta River

Between 1992 and 2000, the NSW Government allocated $137 million for remedial action to clean up polluted areas. Remedial action varied according to the type and location of the waste and local hydrogeological conditions. It included the recovery, consolidation and on-site containment of approximately nine million cubic metres of waste.

Arising from the extensive clean up program was a quantity of excavated soil contaminated with scheduled chemical waste, which underwent a specialised treatment procedure.

Following remediation, the landfills were certified as suitable for particular land uses by an accredited site auditor (as established by the NSW Contaminated Lands Management Act 1997).

This remediation project was the largest of its kind in Australia and represents a significant environmental achievement and legacy for the people of NSW.
Acid sulphate soils

Several areas of the parklands were found to contain naturally formed acid sulphate soils (mainly located in or adjacent to estuarine areas such as the Parramatta River and Haslams Creek). When naturally occurring sulphides (from acid sulphate soils) are disturbed and exposed to air, oxidation occurs and sulphuric acid is ultimately produced. This sulphuric acid can drain into waterways and have severe detrimental environmental effects.

Where acid sulphate soils were excavated, these soils were transported, consolidated in deep pits or used as landfill mounds and covered in a manner designed to avoid acid leaching into local waterways and polluting the environment.

Scheduled Chemical Waste

Arising from the extensive clean up program was a quantity of excavated soil contaminated with scheduled chemical waste. Broadly, scheduled chemical waste can be defined as hazardous material containing chemicals exceeding a concentration threshold and is difficult to safely dispose of without special technologies and facilities.

The treatment of scheduled chemical waste at Sydney Olympic Park pioneered use of innovative environmental technology and successfully reduced contaminants with a concentration of up to 900,000 parts per million to a concentration of less than one part per million.

There are 24 compounds listed in the 1994 Scheduled Chemical Waste Chemical Control Order, under the Environmentally Hazardous Chemicals Act (1985). These include a range of chlorinated benzenes, chlorinated phenols and organochlorine compounds formerly commonly used as pesticides such as DDT, DDE, DDD, Dieldrin, Endrin, Heptachlor and Chlordane. Material is considered to be scheduled chemical waste if it contains one or more of the listed 24 compounds where the total concentration of those constituents is more than one milligram per kilogram (or one part per million).

Arising from the extensive excavation and remediation works during the initial development of infrastructure at Sydney Olympic Park, approximately 400 tonnes of contaminated material was stockpiled in a secure area.

In 1999 the NSW Environment Protection Authority (EPA) issued Sydney Olympic Park Authority with a licence under the Environmentally Hazardous Chemicals Act (1985) to treat this waste material.

In determining the appropriate treatment process, the Authority undertook extensive consultation with national and local stakeholders. A summary of the proposed treatment process was advertised in state and local newspapers inviting submissions from the local community. Sydney Olympic Park Authority also consulted with members of the Homebush Bay Environmental Reference Group. This group included community representatives, academics and environmental non-government organisations and was established to facilitate public communication in relation to remediation activities occurring at the Park.

The treatment process occurred in two stages - Indirect Thermal Desorption (ITD) and Base Catalysed Destruction (BCD). Prior to developing this technology, the only option was the permanent storage of highly contaminated materials in secure warehousing. The EPA, the Homebush Bay Environmental Reference Group and various environmental organisations endorsed the treatment process.
The treatment process can be simply summarised as:

- in August 1999 the stockpiled waste material was sorted, mechanically screened and crushed
- the Stage 1 ITD process commenced in September 1999 and used heat to separate the concentrated chemical waste from the soil. End products included: treated residual soil, water and a concentrated chemical sludge (stockpiled for treatment in Stage 2 of the process)
- the Stage 2 BCD treatment processed concentrated waste and therein created more easily managed end products.

In accordance with the EPA Licence, environmental monitoring of dust, vapours, noise and water occurred throughout the project.

The Stage 2 treatment was completed in May 2002. Approximately 37,000kg of highly concentrated material, some in the order of 900,000 parts per million (ppm), was treated down to a final aggregated concentration of less than 1 part per million. Under the Scheduled Chemical Waste Chemical Control Order, this treated material was no longer classified as scheduled chemical waste.

With the completion of treatment of the waste, all residual materials were disposed to appropriately licenced facilities and the final site validation processes and documentation were completed (March 2003) with final sign off from the Independent Site Auditor received 3 April 2003.

Remediated Lands Management

Today, Sydney Olympic Park Authority has responsibility for the day-to-day and long-term management of ten engineered landfills constructed between 1983 and 2001. These span some 105 hectares and have been rehabilitated and transformed into open space and parklands.

The Authority is committed to managing remediated landfills and leachate systems to ensure:

- their integrity is maintained
- human health and the environment is protected
- statutory compliance is achieved

The decomposition of waste produces leachate which must be contained and treated without risk to people or the environment. The leachate transfer system consists of over 12 kilometres of rising mains, 26 pump pits, 12 treatment ponds, and three storage tanks. Leachate collected in subsurface collection drains gravitates to a pump pit where it is transferred under pressure to a treatment location.

The majority of leachate is treated at a nearby commercial liquid waste treatment plant. Some leachate is treated in constructed evaporation ponds. Leachate from the site of a former gas works facility at Wilson Park is treated in bioremediation ponds where bacteria degrade hydrocarbons to water and carbon dioxide.

Information correct as of October 2011.
**Parklands**

The parklands at Sydney Olympic Park provide 430 hectares of open space, recreation areas, wetlands and waterways and are located in the heart of the growing metropolitan Sydney. One of Australia’s largest urban parklands, it is a diverse and special place where protected remnant woodlands, rare saltmarshes, waterbird refuge and mangroves stand alongside places of heritage significance to create a unique parkland setting.

A lasting legacy of the Sydney 2000 Olympic and Paralympic Games, the parklands have been designed and built on land formerly used by government industries including the State Abattoirs, State Brickworks and Commonwealth Department of Defence, and are the result of remediating industrial land – an internationally recognised leading environmental remediation and urban renewal project.

Today, the parklands are playing an increasingly important role as both a local park and as a significant regional park destination as Sydney grows. The parklands are an association of many different parks and places brought together as a single entity for management purposes.

- Sydney Olympic Park comprises of 640 hectares, of which 430 hectares are the parklands.
- There are now over 2.6 million visits to the parklands annually, representing 24 percent of Sydney Olympic Park total visitation.
- The parklands include the leisure and play areas of Bicentennial Park, Wentworth Common and Blaxland Riverside Park; the sporting grounds at Wilson Park and Archery Park, and Monster and Mountain X facilities; the heritage listed Newington Armory; the more natural areas of Newington Nature Reserve and Badu Mangroves; the Brickpit and 100 hectares of wetlands and waterways.
- Over 300 hectares (nearly half of the Park) provides habitat for threatened species, endangered ecological communities and protected marine vegetation.
- The Park’s rich biodiversity includes three endangered ecological communities, over 180 native bird species and seven frog species. The Park is also home to 400 native plant species, 10 bat species, 15 reptile species, many fish species and many thousands of invertebrate species. The Park supports one of the largest remaining populations of the endangered Green and Golden Bell Frog remaining in NSW.
- Sydney Olympic Park offers 35 kilometres of pedestrian/cycle paths and cyclists represent 33 per cent of overall visitors to the parklands.
Archery Park

- Archery Park is located on Bennelong Parkway, between Haslams Creek and Nuwi Wetland, and is 6 hectares in size. This large open space features bocce courts, picnic shelters and free barbecues.
- Archery Park is a flat open field bordered by mangroves, a protected species.
- The award winning archery centre building is based on environmentally sustainable design principles.
- Archery Park served as the venue for archery competition during the Sydney 2000 Olympic and Paralympic Games, and now operates as a world-class archery facility.
- Today, the Archery Centre, which includes an on-site pro shop, offers a variety of archery programs to suit the needs of recreational or competitive archers.

Badu Mangroves

- The 65 hectare Badu Mangroves, located within Bicentennial Park and listed on the Directory of Important Wetlands in Australia, is an ecologically significant estuarine wetland system.
- The wetland was developed following a series of land reclamation and dredging works spanning several decades, and includes extensive mangrove stands, and open water waterbird refuge, a saltmarsh community and an estuarine creek system. This area is home to the largest stand of grey mangroves in Sydney.
- A purpose built Bird Hide provides the opportunity for uninterrupted views of the Waterbird Refuge where many native bird species including migratory shorebirds inhabit the area.
- A collection of platforms, towers, boardwalks, bird hides and pathways provide a variety of viewing opportunities from which the wetland systems can be enjoyed and studied.
- The Waterbird Refuge is rich in birdlife, and provides habitat for large numbers and species of birds, including migratory species protected under international agreements.
- In conjunction with Bicentennial Park, Badu Mangroves supports public interpretation and school education programs and passive recreational activities.

Bicentennial Park

- The 100 hectare park was opened to the public in 1988 to commemorate the Australian Bicentenary.
- Bicentennial Park is the busiest of all the parks at Sydney Olympic Park. It offers outstanding facilities including two playgrounds, waterplay area, free barbecues, picnic pavilions, pedestrian/cycle pathways and the Treillage Tower with a high viewing platform.
- Bicentennial Park contains several permanent public art installations, including the Peace Monument, the Treillage water feature, the Sun Dial, ‘Cyrus the Great’ and the Silent Hearts Memorial Garden.
• Bicycle paths form part of the regional Bay to Bay Walk, which links Parramatta with Homebush and Botany Bays. Bike hire is available for visitors to enjoy more than 8 kilometres of pedestrian/ cycle pathways in Bicentennial Park.

• Lake Belvedere provides breeding habitat for a large number and diversity of waterbirds, and in a highly accessible location for birdwatching and photography.

• WatervieW in Bicentennial Park, opened in 2006, overlooks Lake Belvedere and includes a function centre with an inviting cafe, ‘Lilies on the Park’.

• The Education Centre and Field Studies Tower have recently been refurbished and showcase sustainable building design and materials. Sydney Olympic Park Authority utilises the Centre to teach over 20,000 school children per annum with hands on learning curriculum based environmental education programs.

Blaxland Riverside Park

• Opened in March 2007, Blaxland Riverside Park is a 20 hectare site and is the newest of the parkland areas. It is situated on the Parramatta River and bordered by Wilson Park, Newington Armory and Silverwater Correctional Centre.

• Blaxland Riverside Park has a unique history - the site was originally part of the land that was granted to John Blaxland in 1807. Newington House, the residence of the Blaxland family, remains in the grounds of the adjoining Silverwater Correctional Centre and is listed on the State Heritage Register.

• Blaxland Riverside Park is located on the banks of the Parramatta River and offers a range of open spaces suitable for picnics, recreation and events. The Park has free barbecues, shade shelters, plenty of parking, playground and waterplay area.

• The Armory Wharf Café was rebuilt in December 2008 after a fire destroyed the original building. The Armory Wharf Precinct received the prestigious Australian Institute of Architects Walter Burley Griffin Award for Urban Design. Open every day, it is a wonderful place to enjoy a bite to eat and relax by the river.

Brickpit

• The Brickpit is located between Sydney Showground and Wentworth Common - the north eastern corner of the town centre.

• In 1910, the Minister responsible for Public Works put forward a proposal to build a brickworks to supply the Department of Public Works. The Brickpit was excavated as part of the State Brickworks operation from 1910 to 1988. The Brickpit supplied nearly 60 per cent of the red bricks built in Sydney’s homes.

• Following cessation of the quarrying activity, the Brickpit developed into a freshwater wetland. When bidding for the Sydney 2000 Olympic and Paralympic Games a number of possible uses for the Brickpit were put forward. However, once the Green and Golden Bell Frog population was identified onsite, it was partially developed as water storage for the Water Reclamation and Mangement Scheme (water recycling scheme) and the remainder was conserved and enhanced as frog habitat. This area now supports a key population of the endangered Green and Golden Bell Frog, as well as 91 bird species.
• In 2005, the Authority built the ‘Brickpit Ring Walk’ allowing people to experience the Brickpit while ensuring the fragile habitat is protected. The Ring Walk is raised 18.5 metres above the sandstone floor of the Brickpit and is 550 metres in circumference. The outer panel of the ring includes the Brickpit history through the voices of workers recounting their experiences, urban ecology, soundscapes of frog and bird calls, and the water management scheme.

• The Ring Walk design won the 2006 National Trust Heritage Award.

Haslams Creek & Narawang Wetland

• Haslams Creek has been reconstructed and both sides of the creek have been landscaped as parkland for recreation.

• Haslams Creek is an important estuarine ecosystem, which include extensive areas of replacement saltmarsh habitat containing the threatened species, Wilsonia backhousei.

• Narawang wetland is a 1.6km corridor of 26 freshwater ponds, native plantings. Paths and boardwalks weave through the wetland and link with regional pedestrian/cycle access routes.

• Narawang wetland supports multiple important functions including a floodplain for Haslams Creek, providing habitat for native fauna including the Green and Golden Bell Frog and Lathams Snipe, and supplementary habitat for species in the adjoining Newington Nature Reserve.

• The wetland is used for harvesting stormwater runoff from adjoining residential areas and its principal use is for irrigating the parklands.

Kronos Hill

• Kronos Hill is situated next to Haslams Creek, at the northern end of Olympic Boulevard. It is 22 hectares in size and contains three remediated landfills, two large constructed freshwater wetlands, 23 constructed frog ponds and five frog underpasses providing primary habitat for the Green and Golden Bell Frogs.

• The Northern Water Feature, using recycled water, is at the base of Kronos Hill and is an important landmark as it is a transition point between the built environment of the town centre and the natural features of the parklands. Haslams Pier, containing ‘Osmosis’ a permanent public art installation, and The Pyramid are also located at the northern end of Olympic Boulevard.

• Pedestrian/cycle paths across Kronos Hill afford significant views of the area providing easy access to the parklands and P5 car park from the venues in the town centre.

Newington Armory

• Newington Armory is part of the former Royal Australian Navy Armament Depot (RANAD) Newington. It is now listed on the state heritage register due to its significant and rare extensive military and industrial landscape. It is a 52 hectare riverside landscape with hills and woodlands and features over 100 heritage buildings.

• Ammunition used by Australian and British Naval ships were received, maintained, stored and issued by the Depot.

• The depot was originally built in 1897 as a powder magazine to replace a magazine on Goat Island. The site expanded with growing need for ammunition storage. The depot
was an integral part of the 'Sydney Ammunition Pipeline', a chain of facilities that also included Kingswood armament depot, Spectacle Island, Rose Bay and Double Bay powder magazines.

• Today, the precinct is evolving into a cultural and recreational hub and includes programs and activities.

• In addition to its military and industrial landscape, Newington Armory is also a unique arts precinct including a gallery, theatre, outdoor amphitheatre and visual arts studios. The Gallery is the home to the largest annual metropolitan ARTEXPRESS exhibition.

• Sydney Olympic Park Authority runs:
  – an ‘Artists at the Armory’ program, utilising heritage-listed buildings of Newington Armory to provide studio and workshop space as well as, residential accommodation for painters, sculptors, printmakers and ceramicists. Since its inception in 2005, the program has attracted more than 120 artists; with 25 of these from overseas; and
  – ‘Scientists in Residence’ program, providing residential accommodation and workspace for ecologist studying the Park’s ecosystem.

• The Armory Theatre has been transformed from a naval non-explosive storehouse to a flexible performance space with a maximum audience capacity of 250 people for small theatrical performances, concerts, meetings and workshops.

• The Armory is home to the Sydney Olympic Park Lodge, a 98 bed accommodation facility, providing a camp style environment for all ages. Groups can combine their stay with a wide range of education programs, behind-the-scenes tours and recreational activities offered in the Park.

• In 2008, the Birds Australia Discovery Centre opened in Newington Armory. The Centre includes an extensive bird book library, an education room and interpretation centre for bird conservation.

• A partnership between Ausgrid and Sydney Olympic Park Authority delivers renewable energy education programs at the historic Newington Armory from the ‘Ausgrid Education Centre’. The Centre is a home to school excursions where students gain an appreciation of renewable energy sources such as solar, thermal, wind, hydro, tidal and biomass.

• Adapted to transport people the original 1940’s electromobile leads the way on the heritage listed light gauge railway. The Heritage Railway Discovery Tour enables visitors to enjoy the history of the area and view an amazing collection of armaments.

• A range of outdoor recreational activities and tours are available from the Armory, including the Heritage Train Discovery Tour, disc golf, bicycle and Segway hire.

Newington Nature Reserve

• Newington Nature Reserve is managed by Sydney Olympic Park Authority under an adopted Plan of Management in accordance with Section 75 of the NSW National Parks and Wildlife Act (1974).

• Previously the reserve was part of a larger area called Newington Royal Australian Navy Armament Depot (RANAD), which was managed by the Commonwealth Department of Defence. Public access to the reserve was restricted by the Royal Australian Navy for over a hundred years.
• The 47 hectare reserve has two distinct parts: 13 hectare remnant woodland of Sydney Turpentine-Ironbark Forest and a 34 hectare highly engineered estuarine wetland system.

• The reserve provides habitat for many flora and fauna species including migratory birds, the critically endangered ecological communities of the Sydney Turpentine-Ironbark Forest, Coastal Saltmarsh and Swamp-Oak Floodplain forest and the vulnerable *Wilsonia backhousei*.

**Wentworth Common**

• Wentworth Common is an 18 hectare site and was the former location of the State Brickworks. It is now a large open recreational space providing picnic shelters, free barbecues, pedestrian/cycle paths, toilets and parking. There is also an adventure playground featuring a flying fox with a sandpit, a slide, climbing frame, swings and shade sails. A smaller playground for younger children has a waterplay area, swings and a giant sandpit.

• Wentworth Common has significant value as primary habitat for the endangered Green and Golden Bell Frog and other frog species, as well as numerous waterbird and insect-eating bird species.

• The Bay Marker, accessible by cyclists and pedestrians, provides views over Homebush Bay, Parramatta River and growing residential development areas in Wentworth Point and Rhodes.

• The glass walled building at Wentworth Common houses the Water Reclamation and Management Scheme (WRAMS), which is responsible for recycling more than 820 million litres of water annually. This water is used for non-drinking purposes across Sydney Olympic Park and irrigation of the extensive parklands.

**Wilson Park**

• Wilson Park, 13 hectares in size, is a sporting and community asset for the local community and contains two playing fields, car park and amenity buildings.

**Woo-la-ra**

• Woo-la-ra (of aboriginal origin, meaning ‘look-out place’), is located near the ferry wharf, and comprises of two constructed, grassed elevated landforms: the conical Silverwater Marker, and the naturalistic hill known as Woo-la-ra.

• Pedestrian/cycle paths lead to Woo-la-ra’s summit and provide 360 degree views of the adjacent Newington Nature Reserve, surrounding lands and Sydney city skyline.
Parks in the town centre

Cathy Freeman Park

- Cathy Freeman Park (formerly known as The Overflow) is home of the Sydney 2000 Olympic Games Cauldron, a number of artworks and a children's playground. The Olympic Cauldron at Sydney Olympic Park, reignited on special occasions, stands on 24 stainless steel columns, with a 10 metre curtain of water falling from its edge, providing a wonderful, wet playground to cool off in.

- A sculpture in homage to the eight women torchbearers at the Opening Ceremonies of both the Olympic and Paralympic Games is situated in this park. Along with a pathway of lights, called The Stride, which represents the extraordinary strides of Cathy Freeman's gold medal winning run.

Jacaranda Square

- Unofficially referred to as Sydney Olympic Park's town square, Jacaranda Square has been enhanced to provide an ‘everyday’ park for the community, as well as an easy thoroughfare for commuters to access the railway station from the eastern end.

- Centrally located between Australia Avenue and the railway station, the Square is designed for passive recreation and community gathering particularly aimed at employees of Sydney Olympic Park to enjoy on an office break and the soon-to-arrive residential population.

- The result of a design competition won by a group of ASPECT Studios in collaboration with McGregor Westlake Architects and Deuce Design, the Square includes seating, shade structure and a café set among a landscape of native trees.

- A recycled brick pavement is featured, which links the square to the heritage of the nearby Brickpit: the site of the former NSW State Brickworks.

Stockroute Park

- Located off Herb Elliot Avenue, Stockroute Park is a sculptural landscape that links Sydney Olympic Park to the Olympic Games in Ancient Greece and celebrates the Greek origins of many Australian citizens. With a grove of eucalyptus trees, the apparent remains of an ancient temple emerge, with olive and cypress trees and five column drums — the number of Olympic rings. A large disc is embedded in the ground as though it had been hurled from ancient Greece by a discus-thrower (Discobolus). It has now become a contemporary disc: a CD-ROM. The eucalypt trees stand as custodians of the land and indigenous Australia. Olive trees are among the most ancient in existence and are the living connection between our contemporary Olympic Games and the original games held in 776 BC. Olive branches were used to make crowns for the victors and hence the olive leaf is a symbol of victory and peace. The cypress tree, a symbol of immortality, was sacred to Artemis, the daughter of Zeus, and in the context of the Sydney site represents the immortal spirit of the Olympic Games.
Mangrove Fact Sheet

Mangrove is a term used to describe a diverse group of plants that prefer tropical climates and grow in the intertidal zone. Mangroves are halophytes which means they are plants that are adapted to living in salty environments.

There are 69 species of mangroves world-wide. The 69 species belong to 20 different families of plants that do not share a common ancestry. This means that the term mangrove is really a descriptive term to describe often unrelated plants.

In Australia there are around 39 different species of mangroves. In NSW however there are only 5 species. These are the River, Grey, Red, Large-leaved and Milky mangrove. As you move south from the Queensland border, the number of mangrove species declines to the two that are found in Sydney: *Avicennia marina* (Grey) and *Aegiceras corniculatum* (River), both of which are present in the Badu mangroves at Sydney Olympic Park. No mangroves are found as far south as Tasmania.

Adaptations of Mangroves

An adaptation is any behavioural, physiological or anatomical (structural) characteristic that increases the probability of the survival and reproductive success of any individual or individuals that possess that characteristic.

Adaptations are the features of an organism that are selected in the process of natural selection. Because adaptations are linked to the evolution of species only features that improve the chances of reaching reproductive age or reproducing more often can be adaptations.

Mangroves have specialised adaptations to cope with:

- saline soil
- waterlogged soil
- lack of aeration.

Although there are some similarities in the adaptations used by mangroves to overcome these problems, not all mangroves overcome the problems in exactly the same way.

Adaptations of the Grey Mangrove (*Avicennia marina*)

The Grey Mangrove is the most common mangrove found at Sydney Olympic Park.

*Avicennia marina* (Grey Mangrove)
The Root System

Most mangroves have shallow root systems. For support, the grey mangrove has both anchor roots and cable roots. The anchor roots grow vertically down into the soil and support the horizontal cable roots. The grey mangrove may grow to a maximum height of 10 metres, and as a result, requires a dense meshwork of roots to support this biomass above the soil. Nutritive roots are the fine hair-like roots growing out of the anchor and cable roots. They extract mineral nutrients from the soil.

Respiration

Most terrestrial plants gain their supply of oxygen for respiration in the roots from the air spaces between the soil particles. In the anoxic (or anaerobic) soils typical of mangrove ecosystems, this mechanism is not available. To supply the oxygen necessary for plant respiration, the grey mangrove has specialised air-breathing roots called the pneumatophores. Pneumatophores have been found up to 30 metres away from the parent plant. The pneumatophore acts like a snorkel by growing up from the cable roots to sit like a peg above the soil line. Occasionally you will also see aerial roots growing out of the trunk up near the canopy.

Lenticels are the small pores present on the tip of the pneumatophore (and bark on the trunk of the tree) allowing entry of air into the root system. Once inside the pneumatophore, air is conducted throughout the plant’s root system by means of an internal gas pathway, involving a specialised spongy tissue called the aerenchyma. The gas spaces in this aerenchyma can store enough air for up to six hours, so that even if the pneumatophore is covered by the tide for this long, there will still be plenty of oxygen for respiration.

Adaptations to the Salty Environment

Mangroves live in an environment where the soil can be as saline as the sea. They need to have mechanisms to gain the fresh water required for plant metabolism whilst preventing salinity affecting cellular processes. Measurements of the xylem sap of *Avicennia marina* suggest it has a root system that is able to restrict entry of up to 95% of the salt present in surrounding water. This restriction process is referred to as salt exclusion. So how is the salt that gains entry through the xylem removed from the plant? You may have tasted the underside of a mangrove leaf. The salt present there is secreted through small glands to the leaf exterior (salt secretion) where rain or dew will wash it back in the environment. There is no evidence for salt accumulation in the grey mangrove, but other mangrove species (such as the milky mangrove) may use this mechanism to remove salt.

Water retention

The waxy cuticle on the upper side of the grey mangrove leaf helps prevent water loss through the leaves and serves as protection from salt spray. You might feel a rough texture on the underside of the leaf. Fine hairs here also help prevent evapotranspiration. Both the shiny waxy cuticle and the light grey underside of the leaf serve as reflective surfaces, thereby reducing the amount of solar radiation absorbed by the leaf and helping to keep the plant cool on hot days.
Reproduction

The saline and anaerobic conditions present on the mangrove forest floor present a hostile environment to any germinating seeds. To overcome this problem, mangrove fruits actually germinate on the tree before they fall off into the mud. The term viviparous (literally meaning being born alive) is used to describe this phenomenon. By this mechanism, the developing seedling (called a propagule) can receive nutrients and water from the parent tree during germination.

When the propagule becomes too heavy to remain attached, it falls from the parent tree. Flotation on the tide facilitates its dispersal. Once the receding tide deposits it on the mudflats, the seedling quickly develops roots to anchor it in position. The new plant feeds off the propagule until it develops its own photosynthetic leaves.

Pneumatophores rarely develop before the seedling is one year old. Until this time the seedling must survive periods of tidal inundation. To cope with these periods under water, the growing plantlet develops aerenchyma that extends from the leaf to the root. This allows oxygen generated during photosynthesis to be transferred from the leaves to the roots, and respiratory carbon dioxide from the roots to be sent up to the leaves during isolation by the tide from the air.

Acknowledgments

The Teachers of Plant Physiology, School of Biological Sciences, University of Sydney (http://bugs.bio.edu.au/Mangroves)
Australian Government Department of Environment and Heritage
State of the Marine Environment Report for Australia-Technical Annex: 1
What are the threats to mangroves?

Mangrove ecosystems are threatened on a global scale, and declining at a rate of approximately 1% per year. Mangroves occur in coastal areas, where human settlement, development, industry and aquaculture occur. In Australia, most of our population have settled in coastal areas and ongoing development continues to put pressure on mangrove environments.

A major threat to mangroves has been and continues to be land reclamation. The filling in of wetland environments to create new land had been common practice in the past for the purpose of building airports, industry, marinas and residential developments (eg. canal estates on the Gold Coast). Bund walls are built around wetland habitats to stop the inundation of the tide. Landfill is then used to fill in the wetlands. Further ecological damage can occur as a result of toxic materials being used in some landfill areas. It is estimated that for every hectare of reclaimed land three hectares of surrounding water must be dredged.

Stormwater runoff is another major threat to the mangrove ecosystem. In urban areas many creeks and tributaries are straightened and made into concrete canals. Untreated stormwater runoff is channelled down these canals, bringing pollutants from the surrounding catchment such as oils, chemicals, pesticides, fertilisers, eroded material (sediment) and litter into the wetland ecosystems. This can have such impacts as increased algal blooms, fish kills, increased speed of flood runoff causing erosion, increased sedimentation and the suffocation and strangulation of wetland wading birds.
What management strategies can be used to protect mangroves?

As a result of the ever declining area of mangrove wetlands, their protection is an important issue. Legislation has been put in place to ensure a reduction in their decline, on a local, national and global scale. In 1994 the Fisheries Management Act was enacted which established awareness of the significance of mangroves for the fishing industry. On a global scale, wetlands are protected under the Ramsar Agreement. The Badu Mangroves at Sydney Olympic Park are listed on the Register of the National Estate as a “Wetland of Ecological Significance”. Activities undertaken in and around the Badu Mangroves are regulated by the Parklands Plan of Management 2002. The Plan of Management is required and authorised by the Sydney Olympic Park Authority Act (2001), and was adopted by the NSW Minister for State Development and endorsed by the NSW Minister for the Environment in January 2003.

There are a number of management strategies employed at Sydney Olympic Park to protect the mangroves on site. Wetland areas in the park strictly monitored by scientists on a regular basis to ensure they remain healthy. A tidal flushing project was undertaking in 1998 to increase the health of the mangrove ecosystem and reduce mosquito breeding.

Leachate drains and pumps have been installed to capture the leachate (polluted groundwater) that is generated by past dump sites that were originally on the site of the current Bicentennial Park (Strathfield Tip & State Rail wrecking yards). Boardwalks and footpaths have been put in place to reduce the effects of trampling and erosion.

Signs and maps limiting some recreation activities in sensitive areas allow people to know what they are permitted to do in the wetlands. Gross Pollutant Traps (GPTs) and floating pollution booms have been installed along Powells Ck to reduce the impact of stormwater runoff. Extensive education programs are run for school groups and community groups to increase awareness of the value of the wetland ecosystem. Permits from the NSW Fisheries, are needed by Education Officers in order to cut small amounts of leaves and pneumatophores for educational purposes. Rules and regulations are enforced by Rangers who are permitted to give fines to people who do not obey the rules.

Acknowledgements

Food & Agriculture Organization of the United Nations - Status and trends in mangrove area extent worldwide


Further Reading

United Nations Website for Food & Agriculture Organization

www.fao.org/forestry/site/mangrove/en
Saltmarsh Fact Sheet

What is it?
Saltmarsh is a community of low herbaceous shrubs and grasses that are tolerant of high soil salinity and able to withstand inundation by the tide.

Where is it?
Saltmarsh plant communities live in the intertidal zone on the shores of estuaries and lagoons along the coastline, often on the landward side of mangroves. They are found between the average high tide mark and below the line of the king tide or Highest Astronomic Tide.

The diversity of saltmarsh species increases as you move south along the eastern seaboard of Australia: there are 10 species in the tropics increasing to up to 50 species in Victoria and Tasmania.

Saltmarsh at Bicentennial Park

Saltmarsh, together with mangroves comprise part of the intertidal wetlands at Sydney Olympic Park. The ten-hectare area of saltmarsh in the Badu Mangroves was created in the 1950s when the Maritime Services Board was realigning and back filling the edges of Homebush Bay. The construction of the sea walls resulted in the saltmarsh areas being cut off from normal tides. As a result, the saltmarsh area is only inundated by saltwater during spring king tides. A radio transmission tower for 2CH/2EA is located within this saltmarsh area.

What species make up saltmarsh?
Common saltmarsh species in NSW are red samphire or beaded glasswort (Sarcocornia quinqueflora), sea blite (Suaeda australis), salt couch (Sporobolus virginicus) and the native sea rush (Junctus kraussii).

At Sydney Olympic Park, there are also areas of the locally significant species Lampranthus tegens and Halosarcina pergranulata as well as the threatened saltmarsh plant Wilsonia backhausei, listed as vulnerable under the NSW Threatened Species Conservation Act of 1995.

Sarcocornia

Lampranthus tegens- a locally significant species
Adaptations of saltmarsh plants
Saltmarsh plants are adapted to hypersaline soils. After the plants are inundated with salty water during king tides, the shallow water evaporates, leaving the salt to accumulate over time in the soil. Adaptations of the plants to the hypersalinity include salt exclusion at the roots and salt accumulation in the fleshy stems. Adaptations to reduce water loss through transpiration include water storage in fleshy stems, small leaves and tiny insignificant flowers.

Of what value is saltmarsh?
The saltmarsh community is a very productive and important ecosystem. Juvenile fish are found in saltmarsh areas during spring tides and crab larvae are produced there from species inhabiting the saltmarsh zone. Saltmarsh vegetation becomes part of the food chain after colonization by bacteria and fungi. Tidal currents disperse this detritus material as it flows into the waterways, becoming available to filter feeders. The saltmarsh supports a range of invertebrates such as crabs, prawns and insects (such as the biting saltmarsh mosquito), which act as food for wading and migratory birds as well as insectivorous bats. Saltmarsh is important habitat for the roosting of many of the migratory shorebirds that use the East-Asian-Australasian flyway. These birds which visit Homebush Bay are protected under the bilateral treaties JAMBA (Japan Australia Migratory Bird Agreement) and CAMBA (China Australia Migratory Bird Agreement).
What are the threats to saltmarsh?

Saltmarsh plant communities are threatened on a global scale. In 1996 the best estimate of the area of saltmarsh in Australia was approximately 13,595 km². Only 59 km² of this lies in NSW and it is mainly distributed in fragmented patches of less than 100 hectares. At Homebush between 1930 and 1988, there has been a 60% decline in saltmarsh areas (mostly due to land reclamation) (see figure below). Today Homebush Bay hosts Parramatta River’s largest remaining mangrove forest and second largest saltmarsh community.

Historically large areas of saltmarsh have been infilled for roads, airport runways, and residential and recreational purposes. In some rural areas, grazing by domestic stock has caused plant loss and extensive damage by trampling.

Apart from land reclamation, other threatening processes include modified tidal flows (such as drainage for mosquito and midge control), altered fire regimes, weed invasion, damage by feral animals, and human disturbance such as damage by 4WD vehicles, dirt and mountain bikes.

These threats can be interrelated. For example, stormwater often discharges near saltmarsh plant communities, altering the tidal regimes and bringing nutrients from the catchment, which can then encourage and increase weed infestations that can outcompete saltmarsh species.

It is anticipated that as sea levels rise with climate change, mangroves are likely to encroach into saltmarsh areas, allowing nowhere for saltmarsh to go because hard barriers (such as roads, pavements and development) are usually in place on the landward side of saltmarsh. Incursion of mangroves into saltmarsh areas has already been documented on the east coast of Australia and in some areas in South Australia, with losses of saltmarsh to mangroves in some areas of up to 100%.
What management strategies can be used to protect saltmarsh?

Mangroves are protected under the Fisheries Management Act of 1994, however saltmarsh is not. Due to the pressure of increasing coastal development on wetlands, the State Environmental Planning Policy Number 14 (Coastal Wetlands) - SEPP14 - was introduced in 1985 to conserve wetlands (including saltmarsh) on the coast, but excludes the Sydney Region between Port Kembla and Broken Bay. In 2004, the NSW Scientific Committee classified Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions, as an Endangered Ecological Community under the NSW Threatened Species Act.
Sydney Olympic Park’s rich and colourful history, including the momentous Sydney 2000 Olympic and Paralympic Games, has left a lasting legacy that can be witnessed in each pocket of this iconic location.

A rolling hill tells of a time where the site was a wasteland in need of remediation; bunkers now used as classrooms were once lined with armament, an expansive pit now a feature of the parklands echoes a past where men once undertook back-breaking work to fulfil Sydney’s demand for bricks; and world-class venues were used to set records on a world-stage for the Olympic Games.

Aboriginal history

- Sydney Olympic Park is situated on the traditional lands of the Wann clan, known as the Wann-gal. The lands of the Wann-gal stretched along the southern shore of the Parramatta River between Cockle Bay (Cadi-gal land) and Rose Hill (Burramatta-gal land).

- The estuarine ecosystems in the area provided the Aboriginal communities with food, clothing and other resources necessary to their lifestyle as well as a means of travelling throughout the region by water.

- Physical evidence of the usage of the Homebush Bay area by Aboriginal people has been found in the form of stone artefacts located nearby. Aboriginal shell middens (campsites where shellfish and other foods were consumed) were known to have lined Homebush Bay and the Parramatta River but were destroyed in the limekilns in the eighteenth and nineteenth century and subsequent alterations to the shoreline.
European Settlement

- When Europeans arrived in 1788, Homebush Bay consisted of extensive tidal wetlands and thick bush. The area was first known as 'The Flats', and was recorded by Captain John Hunter within 10 days of the arrival of the First Fleet. Although reports of the time commented on the Aboriginal people living in the area, there is little official history of the traditional owners of the land at Homebush Bay.

- In 1797, the first grant was issued for land at Homebush Bay. One of the earliest land owners was Samuel Haslam after whom Haslams Creek was named.

- By 1811, most of the land around Homebush Bay lay within two large estates: the Newington Estate to the north of Haslams Creek and the Home Bush Estate between Haslams and Powells Creek.

Newington Estate

- In 1807, John Blaxland, one to the first free settlers to arrive in Australia, acquired 520 hectares of land which he named Newington after his family estate in Kent.

- Blaxland brought an experienced salt maker with him from England, who laid out salt pans on the edge of the Parramatta River. By 1827, the Newington Estate was sending eight tons of salt to Sydney each week. The Blaxland's were associated with the estate until the 1860s. In that time a tweed mill and flour mill were established in addition to cattle grazing, logging and coal mining exploration.

- Newington House, the Blaxland family's home and the Chapel of St Augustine, the family's chapel, survive from this period. Built in 1832, Newington House still stands today within Silverwater Correctional Complex. The house is an excellent example of an early colonial, Regency-style villa.

Home Bush Estate and Racecourse

- D’arcy Wentworth, acquitted of highway robbery in England and sent to Botany Bay as an assistant surgeon, acquired 370 hectares of land between Powells Creek and Haslams Creek in 1810. He named the property Home Bush, and started Australia’s first horse stud.

- D’arcy Wentworth died in 1827. In 1832, his son, William Charles Wentworth, was elected president of the Sydney Turf Club and in 1840 built a new racecourse on the Home Bush Estate adjacent to Parramatta River. With extensive training facilities, the course was the headquarters of Australian racing until 1859, when the Australian Jockey Club moved to Randwick.

- William is best known for crossing the Blue Mountains and the Bathurst Plains with William Lawson and Gregory Blaxland, brother of John Blaxland. Most of the estate remained with the Wentworth family until 1907.

- From 1879, parts of the Newington Estate were gradually purchased or resumed by the NSW Government for various uses including a gunpowder magazine. Newington House has served a variety of uses since the Blaxland era, including use as a boys’ boarding school (Newington College), a Benevolent Asylum for Aged Women, a State Hospital and, since the late 1960s, an administration block within the Silverwater Correctional Complex.

- In March 1907, much of the land from the Home Bush Estate was resumed by the Department of Public Works for the establishment of the State Abattoir.

- Today, the Tennis Centre, Sports Centre and Hockey Centre stand on the former racecourse.

Newington Armament Depot

- In 1882, land to the east of Newington House was resumed for the establishment of a powder magazine. Operations started in 1897, with the magazine being manned by the NSW Military Forces. It was later taken over by the Australian Navy and became known as the Royal Australian Naval Armament Depot (RANAD) Newington.
During World War II, the site underwent major expansion. Until the mid 1990s, the depot covered more than 250 hectares and featured 185 buildings, a wharf and a narrow gauge electric railway. Many of the buildings and facilities are historically significant.

In early 1997, the armament depot became an armament transfer station and was consolidated to the north of the site to allow for the development of the Athletes Village.

Today, this area is known as Newington Armory and Blaxland Riverside Park. Newington Armory is now heritage listed and has a Conservation Management Plan.

State Abattoir

In 1907, the New South Wales Government established the State Abattoir on the Home Bush Estate. Situated on what was then the western edge of Sydney, the Homebush Abattoir was the major supplier of meat for domestic and overseas markets for many years. At its peak, the abattoir employed 1,600 people and had the capacity to slaughter more than 20,000 animals daily.

In June 1988, the abattoir closed. Many of the old buildings have now been demolished to make way for new facilities. Constructed in 1920, the original Administration Building is a fine example of a Federation style commercial brick building which has been restored.

The Olympic Stadium was built on the site of the former abattoir saleyards.

State Brickworks

Early last century, increased building activity caused the price of building materials to rise. In order to control the price of bricks, the Government established the State Brickworks at the head of Homebush Bay in 1911. During the economic depression of the 1930s, the brickworks operated at a significant loss. In 1936, they were sold to private enterprise and closed in 1940.

After World War II, the Government re-established the State Brickworks due to a shortage of bricks. Two large pits were created to provide the clay to make the bricks. The first pit was closed and filled in during the 1960s. Work in the second pit ceased with the closure of the brickworks in 1988.

This pit is now an adopted home of the Green and Golden Bell Frog and a feature of the parklands.

Today, this is the location of the award winning Brickpit Ring Walk.

Landfilling

The environmental impact of wetland reclamation and landfilling has been significant. Over half of the existing land area, originally consisting of saltmarshes and wetlands, has been progressively reclaimed. The 1950s saw a huge push to create more waterfront industrial land. Dredging from the Parramatta River filled in large areas of mangrove forest.

In the 1960s and 70s, Homebush Bay became the dumping site for much of Sydney’s household and industrial waste.

1980s

By the early 1980s Homebush Bay had become a large tract of neglected land, which was bypassed as Sydney sprawled westward. The area, now in the demographic heart of Sydney, was earmarked as a major urban renewal project, which began with the establishment of the Sports Centre, the Australia Centre and the opening of Bicentennial Park.

Sydney’s successful bid for the 2000 Olympic and Paralympic Games provided the impetus for one of the largest remediation projects ever undertaken in Australia. The restoration of this unique site and the construction of world-class facilities created a legacy of sporting and recreational infrastructure for the next century and beyond.
2000s

- Sydney proudly hosted the 2000 Olympic and Paralympic Games. These Games provided the world with some of the greatest sporting and entertainment events ever witnessed in the history of the Olympic and Paralympic Games. Both Games were a great success and the Sydney 2000 Olympic Games was declared as “the best Games ever” by IOC President Juan Antonio Samaranch. The 2000 Games were known for the numerous Australian, Olympic, Paralympic and World records that were broken.

- Following the Games, the area became known as Sydney Olympic Park and an internationally admired example of sustainable urban renewal and development.

- In 2001, Sydney Olympic Park Authority was established as a statutory authority responsible for managing and developing 640 hectares of land that is Sydney Olympic Park.

- The Sydney Olympic Park Authority Act, requires the Authority to make all reasonable efforts to ensure that:
  - Sydney Olympic Park becomes an active and vibrant town centre within metropolitan Sydney;
  - Sydney Olympic Park becomes a premium destination for cultural, entertainment, recreation and sporting events;
  - any new development carried out in accordance with the Act complies with best practice environmental and town planning standards; and
  - the natural heritage of the Parklands is protected and enhanced.

- Sydney Olympic Park consisted of a town centre that included nine world-class sporting and entertainment venues, two hotels, commercial buildings for a growing business community and 430 hectares of parklands.

- In 2009, Sydney Olympic Park was officially designated as a suburb by the NSW Geographic Names Board and Master Plan 2030 was approved, guiding the future development of the Park.

Today

- The Sydney Olympic Park Authority, as a legacy of the Games, has successfully integrated world-class venue and parklands to create a new community for workers, residents, students and visitors.

- Sydney Olympic Park has evolved into a vibrant specialist economic centre, with 220 organisations and approximately 17,000 employees. Commercial office development since the Games has included 11 office buildings adding over 120,000 square metres of gross floor area.

- Sydney Olympic Park will witness new property investment for commercial, retail, education, residential and venue-related development. Over $1 billion of development projects have been approved since the Games at Sydney Olympic Park.

- Master Plan 2030 provides a blueprint for future urban development within the Park, providing for more than 31,500 jobs, 6,000 new dwellings constructed to house approximately 14,000 residents and 5,000 students while retaining major-event capability for up to 250,000 patrons and improving access to the 430 hectares of parklands.
Sydney Olympic Park is an internationally admired example of sustainable urban renewal and development. There has been $1.4 billion of development projects since the Sydney 2000 Olympic and Paralympic Games.

- The Park has evolved into a vibrant specialist economic centre, with over 200 organisations and approximately 14,000 employees and students with more commercial developments approved for completion by the end of 2014. The continued enhancement of Sydney Olympic Park will enrich the lives of those who live, work, play and learn at the Park.

- Sydney Olympic Park will witness new property investment for commercial, retail, education, residential and venue-related development. The development program saw first residents move into the suburb of Sydney Olympic Park in 2012.

- By 2020, it is anticipated that Sydney Olympic Park will have around $2.4 billion in development projects since the Sydney 2000 Olympic and Paralympic Games. Projects approved or under negotiation, cover most market sectors and will result in an additional 250,000 m² of development opportunities.
Sustainable development

• All buildings at Sydney Olympic Park affect the Park’s character and public domain. Design quality or ‘design excellence’ is a fundamental consideration in the assessment of all development proposals.

• The Sydney Olympic Park Authority Act 2001 charged the Authority with making all reasonable attempts to ensure that all new developments follow best practice environmental and town planning standards.

• Sydney Olympic Park Authority manages new commercial developments at Sydney Olympic Park to ensure buildings achieve a minimum of a 5 star rating from the Green Building Council of Australia. This requirement aids the Authority in achieving its vision for the Park, to be a best practice example for environmental performance.

• For development on certain prominent sites, such as those along Olympic Boulevard, or where towers are permitted, building design is procured through a competitive design process. An external Design Review Panel, comprising eminent specialists in urban design, architecture, landscape architecture and sustainable development, advises the Authority on much of the new development at Sydney Olympic Park.

Master Plan 2030

Sydney Olympic Park’s Master Plan 2030 provides a blueprint for future urban development within the Park. The plan provides for more than 31,500 jobs, 5,000 students and 6,000 new dwellings constructed to house approximately 14,000 residents while retaining major-event capability for up to 250,000 patrons and improving access to the 430 hectares of parklands.

Completed developments

To ensure the highest quality design for 18 key sites in the town centre, Master Plan 2030 requires a competitive design process in which architects participate in a design competition to generate alternative design options for development proposals.

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<th>Date</th>
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<tr>
<td>2002</td>
<td>Quad 2 — 8 Parkview Drive (Commercial offices developed by General Property Trust)</td>
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<tr>
<td>2004</td>
<td>Quad 3 — 102 Bennelong Road (Commercial offices developed by General Property Trust)</td>
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<td>2005</td>
<td>Residential accommodation at Newington Armory (Lodge)</td>
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<td>2005</td>
<td>Waterview Convention Centre</td>
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<td>2006</td>
<td>NSWIS Building &amp; refurbished Sports House (6 Figtree Drive)</td>
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<td>2007</td>
<td>Quad Childcare Centre</td>
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<td>2007</td>
<td>Site 5 — 10 Dawn Fraser Avenue Commonwealth Bank Offices developed by Charter Hall</td>
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<td>2008</td>
<td>Pullman Hotel — 9 Olympic Boulevard (Accor)</td>
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<td>2008</td>
<td>Budget Ibis Hotel — 8 Edwin Flack Avenue (Accor)</td>
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<td>Site 6 — 8 Dawn Fraser Avenue Commonwealth Bank Offices developed by Colonial First State Properties</td>
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<tr>
<td>2008</td>
<td>Site 7 — 2 Dawn Fraser Avenue Commonwealth Bank Offices developed by Colonial First State Properties</td>
</tr>
<tr>
<td>2008</td>
<td>Quad 4 — 8 Parkview Drive (Commercial offices developed by General Property Trust)</td>
</tr>
<tr>
<td>2010</td>
<td>Site 8A — 8 Australia Avenue (Commercial offices developed by Watpac)</td>
</tr>
<tr>
<td>2012</td>
<td>Australia Towers – 11 Australia Avenue (Residential development by Site 3 Development Co. Pty Ltd) stage one (216 apartments) completed</td>
</tr>
<tr>
<td>2012</td>
<td>Site 60 — 5 Murray Rose Avenue (Commercial offices developed by General Property Trust)</td>
</tr>
<tr>
<td>2012</td>
<td>Site 8B — 7 Murray Rose Avenue (Commercial offices developed by FDC Construction &amp; Fitout)</td>
</tr>
<tr>
<td>2013</td>
<td>Site 22 — 6 Edwin Flack Avenue (Serviced apartment building developed by Quest)</td>
</tr>
<tr>
<td>2014</td>
<td>AFL HQ — Olympic Boulevard (Sports Admin) Site 4B — Stage 1, 10 Herb Elliot Avenue (Commercial offices developed by Fitzpatrick Investments) Site 107 — Netball Central</td>
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**Expected developments**

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<th>Site</th>
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<th>Developer</th>
<th>Commence Construction</th>
<th>Status</th>
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<tr>
<td>Site 3 — Stage 2 (7 Australia Avenue)</td>
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<td>Under construction</td>
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<tr>
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<td>FDC Construction &amp; Fitout</td>
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<tr>
<td>Site 60 — Stage 2 (5 Parkview Drive)</td>
<td>Commercial (13,675m²)</td>
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<td>Site 67 (100 Bennelong Parkway)</td>
<td>Residential (350 units)</td>
<td>Meriton</td>
<td>2015</td>
<td>Pending Approval</td>
</tr>
<tr>
<td>Ferry Wharf (Burroway Road)</td>
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<td>Payce</td>
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<tr>
<td>Site</td>
<td>Use</td>
<td>Developer</td>
<td>Commence Construction</td>
<td>Status</td>
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<tr>
<td>Site 68 (Bennelong Parkway)</td>
<td>Residential (380 units)</td>
<td>Ecove Group</td>
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</tr>
<tr>
<td>Site 53 (2 Figtree Drive)</td>
<td>Residential (400+ units)</td>
<td>Mirvac</td>
<td>2015</td>
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Biodiversity

Sydney Olympic Park’s rich biodiversity includes over 400 native plant species and over 200 native vertebrate animal species. It includes three endangered ecological communities, over 180 species of native bird, seven species of frog, 10 species of bat, 15 species of reptiles, native fish species, many thousands of species of invertebrates, protected marine vegetation, and three threatened plant species. This high species diversity and abundance in the geographic centre of a large and modern city contributes to Sydney Olympic Park’s high ecological, aesthetic and educational values.

The successful restoration and development of Sydney Olympic Park can be seen in the continued protection of the rich biodiversity it supports. The Park is a haven for species such as the Superb Fairy-wren and Blue-tongue Lizards that are disappearing from the urban environment. Highlights include a breeding pair of White-bellied Sea-eagles, increases in the extent of endangered ecological communities and the conservation expansion of the Green and Golden Bell Frog population.

The habitats of the Park are a mix of:

- recovering remnant estuarine and forest communities
- extensive areas of terrestrial plantings
- constructed freshwater wetlands still establishing on newly remediated fabricated landscapes built in the late 1990s.

Planning, design and construction of these new landscapes incorporated principles relating to the conservation and enhancement of biodiversity, and some landscape and planting elements were constructed or conserved specifically to promote biodiversity.

Some of the species and ecological communities dependent upon the Park’s habitats were once widespread in Sydney but are now uncommon in urban areas. These are of conservation significance at a local, regional, state, national or international level. The Park’s habitats also provide a stepping stone for nomadic fauna species moving between urban habitats, and a drought refuge for species from western New South Wales.

Nearly half (300 hectares) of the Park provides habitat for listed threatened species, protected marine vegetation and endangered ecological communities which are all protected under State or Commonwealth legislation. The 47-hectare Newington Nature Reserve, containing remnant forest and wetlands and gazetted under the National Parks and Wildlife Act 1974, lies within the Park. The estuarine wetlands of Newington Nature Reserve and Badu Mangroves, totaling 100 hectares, are both listed on the Directory of Important Wetlands in Australia.
**Threats and Pressures**

Sydney Olympic Park is located within the Parramatta River catchment of the Sydney Basin Bioregion, and its species and communities are part of the larger ecological systems of these regions. Its biodiversity is subject to the threats and pressures operating at these regional scales, such as urbanisation, and resulting in decrease in ecological integrity and extent, climate change, sea level rise, water quality, pests and diseases.

In ecological terms, Sydney Olympic Park is virtually an island - it is physically disconnected from most other flora and fauna habitats by surrounding urban development, and subject to the same ecological threats to which island ecosystems are especially prone. These include edge effects, low or zero rates of external recruitment by many species, and low recovery rates from localised perturbations (including anthropogenic impacts).

Other pressures on the Park’s biodiversity include the constructed and altered nature of the Park’s habitats, their immaturity (most are less than ten years old) and the Park’s many competing land use objectives. The Park’s habitats are subject to increasing human impact and increasing demand as a local and regional leisure destination as the Park continues to evolve, and residential and commercial development occurs within and around it.

**Biodiversity Management**

The nature of the Park’s habitats, their small size, constructed and altered nature, and many competing management objectives, means that ongoing active and adaptive management is needed to retain their ecological values. Stringent conditions are applied to maintenance works and visitor programs within ecologically-sensitive areas of the Park to ensure continued conservation of the Park’s biodiversity.

Ten species and communities are identified as ‘priority species’ for conservation and are the focus of specific management programs. These are:

- Sydney Turpentine-Ironbark Forest - a ‘critically endangered’ woodland community
- Green and Golden Bell Frog - Sydney Olympic Park supports one of the largest remaining New South Wales populations of this endangered species
- The largest remaining stand of Coastal Saltmarsh on the Parramatta River. This endangered ecological community contains large stands of *Wilsonia backhousei* (a threatened saltmarsh plant)
- The largest stand of Mangrove Forest (protected estuarine vegetation) on the Parramatta River
- Remnant Swamp Oak Floodplain Forest - an endangered ecological community of estuarine areas
- Migratory Shorebirds, protected under international treaties and Commonwealth and State legislation
- Latham’s Snipe - a bird that migrates to Australia from Japan each year and is protected under international treaties
- A population of the White-fronted Chat (listed as an endangered population) is one of two populations remaining in Sydney
- ‘Bush Birds’ - a group of small, mostly passerine birds such as the Superb Fairy Wren. Bush birds are disappearing from surrounding urban habitats
• Microchiropteran Bats, including the only maternity roost of the White-striped Freetailed Bat recorded in Sydney, and which is also the only maternity roost of this species recorded within a building.

Biodiversity Objectives

The *Sydney Olympic Park Authority Act 2001* requires the Authority to implement the principles of ecologically sustainable development in exercising its functions, and identifies protection and enhancement of the Park’s natural heritage as a key function of the Authority. Through implementation of the Environmental Guidelines, Sydney Olympic Park Authority is committed to the following objectives for biodiversity conservation:

• Protecting and enhancing the natural heritage and ecological integrity of Sydney Olympic Park - targeting priority species and communities, places of high biodiversity value, and biodiversity generally

• Applying an adaptive management approach to stewardship of Sydney Olympic Park’s biodiversity assets

• Ensuring conservation of biological diversity and ecological integrity is a fundamental consideration for all new developments, activities, levels or types of use, or management practices that affect the ecosystems of Sydney Olympic Park

• Promoting the ecological, aesthetic and educational values of an urban site with high species diversity and abundance

• Conserving and enhancing the remnant woodland and wetland habitats of Newington Nature Reserve in accordance with the Newington Nature Reserve Plan of Management, and managing adjoining lands in sympathy with the Reserve, and

• Maximising the habitat values of native plantings by promoting priority species and communities, providing structural complexity and plant species diversity, avoiding habitat fragmentation, promoting habitat linkages and large core areas, and prioritising the use of indigenous species in landscape planting schemes in the Parklands.
Sydney Olympic Park is home to the biggest collection of large-scale site-specific urban art in a single precinct in Australia. With more than 50 pieces of public art and urban cultural features spread across this multi-faceted site, the collection provides a unique record of the evolving cultural history of Sydney Olympic Park. As well as works relating to the Sydney 2000 Olympic and Paralympic Games, there are pieces that evoke the early industrial uses of the site.

The Sydney Olympic Park Urban Art Collection is a work in progress and is currently being reinterpreted as a vibrant outdoor art gallery. As it continues to grow, new permanent and temporary public artworks will further enhance the built and natural environments of this important Sydney precinct.

**5000 Calls**

**Location:** ANZ Stadium  
**Artists:** David Chesworth and Sonia Leber

The tree-filled plaza surrounding ANZ Stadium is called the Urban Forest. Located within its four and a half hectares of eucalypts is an intriguing artwork entitled ‘5,000 Calls’, a sound environment of the human voice.

Visitors moving through the Forest will hear a range of disembodied human voices captured whilst engaged in diverse tasks — from weightlifters, skateboarders, gymnasts, footballers and cricketers, to Vietnamese river chants and the singing of Aboriginal
children. The charged atmosphere of the Maori haka is there, along with the noises of stockmen herding cattle and the slow breathing of a dancer.

The sounds are emitted from 80 speakers discreetly placed in the light poles. Australian artists, David Chesworth and Sonia Leber, recorded 5,000 different sounds of human activity, including sporting cries, fragments of song and many other vocal noises to create ‘a soundscape of human effort’. The artists explain: “5,000 Calls can be seen as a kind of crowd composed of many individual voices which constantly combine and recombine in different ways. When new voices are introduced by visitors travelling through the space, they contribute to the evolving libretto, which is occasionally punctuated by the extraordinary sudden roar of the stadium crowd.”

A special computer program changes the order in which the sounds are played, so that each visit to the Urban Forest provides the listener with a new experience.

Chiron

Location: In front of Presidents Plaza, Sydney Showgrounds alongside Grand Parade
Artist/Designer: Andy Scott (Artist), Sculpture by the Sea Art Services (Co-designer)

The sculpture is a centaur, half-man and half-horse. It consists of intricately woven mild steel bars, which form a three-dimensional line drawing in space, and is approximately 3.4 metres high, 2.9 metres long, and 1.8 metres wide. ‘Chiron’ was the centaur responsible for the teaching of arts and medicine to ancient Greek heroes such as Apollo, Achilles, Jason and Hercules.

‘Chiron’, the centaur, evokes the spirit of the Sydney Showground’s signature event, the Royal Agricultural (Easter) Show, through its linkage of man and animal. As a creature of ancient Greek Mythology, the work also resonates strongly with the Park’s Olympic story.

The figure is posed with arms out, welcoming visitors to the Showground site; subtle twists of the spine and a tilt of the head give it a sense of animation.

First exhibited at Sydney’s annual Sculpture by the Sea exhibition, the sculpture was installed at its current location to coincide with the 2004 Royal Easter Show.

Feathers and Skies

Location: On the eastern and western entrance to ANZ Stadium
Artist: Neil Dawson

Each of these artworks consists of a 22 metre diameter double-helix aluminium ring structure circling the columns over the eastern and western entries to ANZ Stadium.

Feathers, located on the eastern entrance of the stadium, consist of 96 large images of feathers depicting the diverse range of Australian bird life. The artwork combines the motif of the traditional sporting victor’s laurel wreath with images from the natural environment of Homebush Bay — home of more than 180 bird species.

Skies, located on the western side of the Stadium, depicts Australian skies at different times of the day. The artwork combines a reference to the traditional sporting victor’s laurel wreath with images of Australia’s expansive skies. The spiralling band of aluminium is perforated unevenly, with solid metal representing clouds, and the perforated areas sunny days and a full moonlit night. The interior of the spiralling band is painted in the colours of the Olympic Medals: gold, silver and bronze.

The two companion works were created by New Zealand artist Neal Dawson to mark the entrances to the Olympic Stadium (now ANZ Stadium).
Games Memories

Location: ANZ Stadium forecourt near the junction of Olympic Boulevard and Dawn Fraser Avenue; Sydney Olympic Park Aquatic Centre and Allphones Arena (formerly known as Acer Arena)

Artist/Designer: Tony Caro Architecture (Architects) in collaboration with Root Projects Australia, Donny Woollagoodja (Artist for 3 Poles), Emery Vincent Design (Graphic Design), Wax Sound and Media (Multi-Media Programs)

Games Memories consists of a V-shaped forest of 480 poles, layed out at the eastern end of Olympic Plaza. Unashamedly nostalgic, it captures many of the elements that made the Games special to the athletes, volunteers, spectators in the stands and the billions watching or listening around the world.

Games Memories is primarily a permanent tribute to the volunteers who made the Sydney 2000 Olympic and Paralympic Games such a magnificent occasion. The overwhelming enthusiasm and team spirit of the volunteers inspired all those who attended the Games.

Games Memories was inspired by Stonehenge, indigenous meeting places and the existing form and detail of Sydney Olympic Park. The forest of poles represents the densely packed crowds that inhabited Sydney Olympic Park in September 2000. The random distribution of the poles and their varying heights is symbolic of the way that people randomly clustered across Olympic Plaza and Olympic Boulevard during the Games. Nearly 300 poles list the names of the 74,000 Olympic and Paralympic Volunteers who contributed their time and energy to these events. The poles have stainless steel ‘shields’, each accommodating 250 names. Follow the path of the poles to discover the names of those who helped stage the “best Games ever”. The volunteer walk is set out alphabetically by surname from the Olympic Boulevard end of the forest through to ANZ Stadium.

An additional 50 special poles in the forest interpret the spectator experience of the Games. These poles present Games information in an entertaining and innovative way, using graphics, audio and video, tactile finishes, humour, light and movement. Gold-winning performances in the long jump and triple jump are depicted alongside replicas of the Olympic and Paralympic medals. Other poles celebrate the lighting of the Games Cauldron, retrace the journey of the Olympic torch, show world records set during the games and remember the Olympic and Paralympic mascots. Three of the poles have been painted by Donny Woolagoodja — a prominent indigenous artist.

At the heart of the project is a multimedia presentation pod, a canopy-shaped structure comprising 12 plasma screens, displaying an exciting program which recalls the scale and spectacle of the Games. The 40 minute program features opening and closing ceremonies, athletes, crowds, and highlights from many Olympic and Paralympic finals.

Two smaller satellite installations are located at the Sydney Olympic Park Aquatic Centre and at Allphones Arena. Based on a similar design to the multimedia pod in the main installation, they incorporate plasma screens and seating for viewers. Each satellite features a 20 minute audio-visual program based on the sports held at the adjacent venue.

The project was launched by the Premier, The Hon. Bob Carr MLA, on 15 September 2002 — the second anniversary of the Olympic Games Opening Ceremony.
Lost and Found

**Location**: Floor of Allphones Arena (formerly known as Acer Arena)

**Artist/Designer**: Elizabeth Gower

Elizabeth Gower’s design for the foyer of Allphones Arena is a contemporary interpretation of traditional terrazzo paving, and features bold broken-line drawings of athletes and sporting motifs.

At ground level, the inlaid colours appear as abstract lines darting across the surface like reflections on water. When viewed from the upper levels of the building, these fragmented lines form images of figures and familiar objects that relate to the function and site of the arena.

Like the shapes we read into clouds or fire, these suggested images invite the viewer's imagination to complete their forms.

Munich Memorial

**Location**: Light Tower 14 on Olympic Boulevard

**Artist/Designer**: Unknown

The Munich Memorial honours the 11 Israeli athletes and officials who lost their lives during the Games of the XX Olympiad at Munich in 1972.

“On that nightmarish day, Black September, a Palestinian terrorist group, scaled a two-metre fence surrounding the athlete's village, found the second floor accommodation of the Israeli team and shot wrestling coach, Mosche Wieinberg. Weightlifter Yosef Romano was also killed as he blocked a door as two of his teammates jumped through a window to safety. Ten other athletes were taken hostage, with only one, Gad Tsabari, dashing through a hail of bullets to freedom. As volleyballers from Russia and Poland continued their Olympic competition, the terrorists demanded the release of 200 Palestinians and safe passage out of the country. When the terrorists and their nine remaining hostages were on the tarmac at a nearby military airport, West German police opened fire. In the shootout, all hostages were killed as well as four terrorists and one policeman. Ever since, the security of Olympic athletes has been paramount.”

The memorial, which was dedicated on 15 October 1999, contains the following inscription:

“They were swifter than eagles and stronger than lions” Samuel 2:1–23 and Hebrew Text which translates as:

“God of compassion, let them find shelter in the shadow of your wings and may their souls be bound up in the bond of everlasting life.”

The Munich Memorial is the first permanent Olympic dedication to the 5 September tragedy. The memorial was unveiled by Munich Olympic Game's swimming star Shane Gould.

Northern Water Feature

**Location**: Haslams Pier at the northern end of Olympic Boulevard

**Artist/Designer**: Hargreaves Associates (Architects), Sydney Fountains Waterforms and Abigroup Contractors (design and construction)

The northern end of Olympic Boulevard is home to one of the Park's most significant landscape design elements — The Northern Water Feature, an impressive ten metre high fountain that cascades water down granite terraces to the man-made wetland at the edge of Haslam's Creek.
It is comprised of a series of paved terraces leading down to a 500 square metre pool with a water depth ranging from 200 – 300mm, and includes three rows of water plumes, with two located in the terraces and one in the pool. The water plumes shoot from jets mounted at angles ranging from 60 degrees to the horizontal, up to 12 metres in distance and 8 metres in height.

The water feature is a visual representation of the cleansing of the Park’s stormwater run-off, and has become emblematic of the water management and ESD principles that underpin Sydney Olympic Park.

The water feature is illuminated at night.

**Osmosis**

**Location:** Haslam’s Pier at the northern end of Olympic Boulevard next to the Northern Water Feature  
**Artist/Designer:** Ari Purhonen

Australian sculptor Ari Purhonen has transformed Haslam’s Pier with an innovative artwork built into the pier’s floor surface.

As you walk along the pier, the artwork gradually becomes manifest through the metal grating of the floor surface. A series of painted aluminium rods change colour across the spectrum, and appear to change direction as you move along the pier.

The range of colours evokes the way water causes light to break into its rainbow spectrum. The sculpture creates an optical effect that changes as visitors stroll along the length of the pier. Subtle shifting angles of the rods underneath the web-forged metal create the illusion of movement. The hardwood flooring also features a line of inlaid brass. Initially following the direction of Olympic Boulevard, the brass line, too, changes direction and gradually opens out towards the wetland.

The sculpture is especially responsive to changing light conditions, taking on a different character as the conditions vary. At night, fluorescent illumination in the floor creates a psychedelic effect. During the day, bright sunlight brings out the effect of movement. Osmosis is an environmental work that marks the border between the urban development precinct of the Park and the parklands. It is also a poetic interpretation of the flow of stormwater from Olympic Plaza, and the cleansing action of the soil, air and wetland treatment ponds.

**ANZ Stadium Glass Panels**

**Location:** Eastern and Western entrances of ANZ Stadium  
**Artist/Designer:** Axolohozone Glass and Robyn Wakefield

The patterned glass panels located at the four entrances to ANZ Stadium are inspired by the venue’s original logo. This logo, consisting of concentric circles, was in turn inspired by an indigenous symbol for a meeting place.

Because the Stadium functions as the Park’s main meeting place and the symbolic ‘centre’ of the Olympic Venue, approval was sought from and granted by the NSW Aboriginal Land Council for the use of this indigenous symbol.
ANZ Stadium Foundation Stone

**Location:** Adjacent to the reception area on the eastern entrance of ANZ Stadium

The Foundation Stone was donated by the Greek Ministry of Culture (7th Directorate of Antiquities of Olympia) and the Municipality of Olympia, with the support of the Athens 2004 Olympic Games Organising Committee, to honour the Sydney 2000 Olympic Games and the official opening of Stadium Australia, the Olympic Stadium (now ANZ Stadium).

The fossilised coral stone (concyliaitis lithos) was the material most widely used in the temples and public edifices of ancient Olympia. The temples of Zeus and Hera, the Gymnasium and the Palaistra are among the most important monuments of the Altis built from such stone 3,000 years ago. The coral stone is a limestone formed in the sea 1 to 5 million years ago from the accumulation of non-organic shells of sea-organisms, which were fossilised over centuries.

This particular stone was extracted from the ancient quarry at Louvros, located approximately 10 kilometres east of Olympia. The quarry is currently not in use, and special authority was required from the Greek Government for the stone’s extraction. The stone, part of the protected cultural heritage of Greece, is a very rare and unique gesture to the Australian people on the occasion of the Games of the new millennium, which immediately preceded the Athens games of 2004.

The Foundation Stone was officially handed over by Dr Stratis Stratigis, President of the Athens 2004 Olympic Games Organising Committee, representing the people of Greece. Around the circumference of the foundation stone is an inscription in Ancient Greek text, a quote from Aristotle (Rhetoric I, XI 14–15) that reads “Where there is contest, victory exists”.

Athletics Centre Mural

**Location:** Athletics Centre reception area

**Artist/Designer:** Unknown

The mural consists of figurative images of athletes engaged in running, shot put, discus throw, javelin, pole vault, long jump and high jump. It is done in the style of a very old painting to simulate the effect of paint coming away from the wall of an ancient mural; it is as if the mural was painted during the first Olympic Games held in Greece. Set against the background of the modern Sydney Olympic Park Athletic Centre, the mural celebrates the journey and spirit of the various athletic sports into the 21st century and the Sydney 2000 Olympic Games.

Discobolus

**Location:** Herb Elliot Avenue in Stockroute Park

**Artist/Designer:** Robert Owen

In Stockroute Park, Australian artist Robert Owen has created a sculptural landscape that links Sydney Olympic Park to the Olympic Games in Ancient Greece and celebrates the Greek origins of many Australian citizens. Within a grove of eucalyptus trees, the apparent remains of an ancient temple emerge, with olive and cypress trees and five column drums — the number of Olympic rings. A large disc is embedded in the ground as though it had been hurled from ancient Greece by a discus-thrower (Discobolus). It has now become a contemporary disc — a CD-ROM. The eucalypt trees stand as custodians of the land and indigenous Australia. Olive trees are among the most ancient in existence and are the living connection between our contemporary Olympic Games and the original games held in 776 BC. Olive branches were used to make crowns for the victors and hence the olive leaf is a symbol of victory and peace. The cypress
tree, a symbol of immortality, was sacred to Artemis, the daughter of Zeus, and in the context of the Sydney site represents the immortal spirit of the Olympic Games.

Fragments of architectural details and a dry stonewall reference ancient archaeological sites and boundaries. The trachyte cobblestones used in the seating wall opposite were salvaged from the State Abattoirs which operated on this site from 1910 to 1988.

Discobolus was funded by the Hellenic community of Australia and commissioned as part of the Olympic Public Art Program. This work was launched by the Honourable Michael Knight MP, Minister for the Olympics, on February 1999, and unveiled by His Excellency the Honourable Sir William Deane, AC, KBE, Governor-General of the Commonwealth of Australia on 13 August 2000.

In the Shadows

**Location:** In Boundary Creek under the bridges that lead to the Tennis Centre from Shirley Strickland Avenue  
**Artist:** Janet Laurence

In The Shadows is an environmental artwork that creates an atmospheric zone through which one passes via the three bridges connecting the Southern Boulevard terminus to the Tennis Centre. The work comprises 21 vertical transparent wands representing scientific measuring instruments which stand at various heights within Boundary Creek. The wands are inscribed with measurements and formulae for chemical elements and compounds and environmental conditions. These features evoke the capture of scientific data used in water quality analysis, which regularly takes place in this remediated creek. At varying intervals, water blurps and aerates randomly, whilst sequenced along the 100 metre length of the artwork, atmospheric vaporous fog moves, rises and dissipates, transforming and cooling the creek environment.

The edges of the creek are lined with bullrushes, and the banks form a casuarina forest either side, framing the work while creating a green, organic space between the very highly constructed environments of the Tennis Centre and the Boulevard. This work aims to reveal the transforming chemistry of water remediation by creating a poetic ‘alchemical’ zone as a metaphor for the actual transformation of Homebush Bay from its degraded, contaminated industrial past into Sydney Olympic Park, a green and living site for the future.

Rivers of Light and Path of Champions

**Location:** Paving in the forecourt of Sydney Olympic Park Aquatic Centre and Sydney Olympic Park Athletic Centre

The Sydney Olympic Park Path of Champions commemorates the achievements of Australia’s sporting men and women in major Olympic sporting disciplines. The individual paths are venue-related, thus athletic prowess is celebrated at the Athletic Centre, and swimming, diving, water polo, and synchronized swimming achievements are celebrated at the Aquatic Centre. To qualify for inclusion, an athlete must have been an Olympic Champion (Gold Medallist), a World Champion or a World Record Holder in events recognised by the international athletics and swimming bodies.

The Aquatic Path of Champions currently consists of 95 plaques of Australian athletes and was installed for the official opening in January 1995. The Athletic Path of Champions currently consists of 13 plaques of NSW athletes and was installed for the official opening in March 1994. Located in the paving within these pathways is a series of designs representing flowing rivers. At night, a continuous pattern of glass bricks passing through the river design illuminates and changes colour. The resulting River of Light celebrates swimmers and athletes who have brought glory to Australia.
**Sydney Olympic Park Foundation Stone**

**Location:** In the grass in front of the Sydney Olympic Park Aquatic Centre alongside Olympic Boulevard

The Sydney Olympic Park Foundation Stone is a sandstone rock that was procured for its size and visual balance. It was unveiled by H.E. Mr Juan Antonio Samaranch, President of the International Olympic Committee, on 15 May 1998.

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**The Friends of Tennis NSW Champion Pathway**

**Location:** Southern entrance to the Tennis Centre, right in front of the NSW Tennis Museum

These terracotta bricks, made by PGH Clay Bricks and Pavers at Schofields, NSW, have been imprinted with around 500 names in memory of tennis greats and supporters. The project was initiated by The Friends of the NSW Tennis Association Inc. in 1989 as a fund-raising campaign to help refit a new building for the Australian Tennis Museum when it was based at White City.

A brick was made for every winner of the NSW title; in addition, individuals or clubs could buy a brick with their name imprinted on it for $50.00 and have it laid beside Centre Court at White City. In 2000, the brick pavers were moved to the current home of Tennis NSW at the Sydney Olympic Park Tennis Centre.

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**The Sprinter**

**Location:** In front of Sydney Olympic Park Athletic Centre near the intersection of Dawn Fraser Avenue and Edwin Flack Avenue

**Artist:** Dominique Sutton

To celebrate the Sydney 2000 Olympic Games, AMP commissioned Sydney sculptor Dominique Sutton to design three figures representing the Olympic and Paralympic ideals. The three figures, depicting a gymnast, a Paralympic basketballer and a sprinter, were airlifted and installed atop the AMP Tower in July 1998, becoming a focal point of celebrations in the lead up to and during the Games.

One of the figures, The Sprinter, has been permanently relocated at Sydney Olympic Park. In its new location, viewers are offered a much closer vantage point than was possible when the sculpture was perched in its original site more than 300 metres above ground.

The Sprinter weighs 3.5 tonnes and is an impressive 12 metre high three dimensional steel rendition of an elite athlete. Captured at the instant of maximum speed, it is an iconic image of movement. AMP has generously bequeathed The Sprinter to Sydney Olympic Park. AMP donated the other two sculptures — a gymnast and a Paralympic basketballer — to the Australian Institute of Sport, Canberra.
The Thin Blue Line

**Location**: Outside Sydney Aquatic Centre on Olympic Boulevard, ANZ Stadium on Dawn Fraser Avenue and at various places in Sydney

The Thin Blue Line is a 90mm wide bright blue line marked along the road surface. It guided Sydney 2000 Games marathon competitors along the 42.2 kilometre route from North Sydney to the Olympic Stadium. It was also used in the Paralympics wheelchair marathons. As a tribute to the competitors in these traditional Olympic events, remnants of The Thin Blue Line remain outside the Sydney Aquatic Centre on Olympic Boulevard and ANZ Stadium on Dawn Fraser Avenue and at various other places in Sydney.

The line itself has made the metaphoric journey from being a purely functional feature to being re-interpreted as a unique site-specific artwork. The Thin Blue Line evokes the memory of the Sydney 2000 Games and connects the central business district, Sydney's east and the inner western suburbs with the Park.

Boral Olympic Dream Pathway

**Location**: Fig Grove

The Boral Olympic Dream Pathway, at Fig Grove, is a living memory of the Sydney 2000 Olympic and Paralympic Games. The pathway consists of nearly 100,000 pavers on which the names of thousands of athletes, spectators, supporters and Boral employees, are engraved. Construction materials giant Boral Ltd, which was one of the official suppliers of building and construction materials to the Sydney Games, sponsored the project. The objective of the project was to give every Australian the chance to make Olympic Games history, by leaving a personal, permanent message at the site of the Games.

World champion athlete Cathy Freeman has dedicated a paver to her family, inscribed with the message “To my family, love Cathy”. Olympic legend Herb Elliot also endorsed the program, presenting Cathy Freeman with a special brick from the Australian Olympic Committee. These bricks are laid along with thousands of others engraved with personalised messages in the heart of Sydney Olympic Park. The ornamental pavers were manufactured at Boral’s brick factory in Bringelly, New South Wales.

Fig Grove Fountain

**Location**: In the Fig Grove, near the intersection of Dawn Fraser Avenue and Olympic Boulevard  
**Artist/Designer**: Hargreaves Associates

Celebrating water at the high point central to the site, the Fig Grove fountain is composed of three metre high jets of water, arcing over pathways that continue the paving patterning of Olympic Plaza through the site. These 25 metre long tunnels of water pulse into the grove and symbolically tie the beginning of the Plaza to its end at Haslam’s Creek to the north. Ten mature figs, relics of the site’s historic abattoir past, have been transplanted here imbuing the grove with a strong sense of place at the heart of Sydney Olympic Park.

There are two separate water features included in Fig Grove. They are referred to as the Fig Grove higher and lower water features. Each has a similar design system but are vertically separated by a height of 1 m. Each water feature comprises an inclined triangular plane that is finished with a special pattern of stone that is designed to create a specific water flow pattern, referred to as the cascade flow. Each feature also includes a tunnel formed by the water jets that arc over the floating walkway.
Olympic Rings

**Location:** Fig Grove alongside Dawn Fraser Avenue

The Olympic symbol of five rings represents the union of five continents and the meeting places of athletes from all over the world at the Olympic Games. After the Olympic Games, following agreement with the Australian Olympic Committee (AOC) and the International Olympic Committee, the Olympic Rings were laid in granite in Fig Grove.

The presence of Olympic Rings at the centre of Sydney Olympic Park, just opposite ANZ Stadium, highlights the Olympic legacy of Sydney Olympic Park and its venues. It underlines and points towards the various other artworks in the surrounding built environment that have an element of Olympic history embedded in them.

This is the first time the Olympic insignia has been officially incorporated in an Olympic venue.

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**Relay**

**Location:** Fig Grove

**Artists:** Paul Carter and Ruark Lewis

Engraved into the granite steps at Fig Grove is a prose poem entitled Relay, which has been created by artists Paul Carter and Ruark Lewis. The poem refers to four points in Olympic history: the Olympic Games at Athens in 1896 (red tier); Melbourne in 1956 (yellow tier); Sydney in 2000 (blue tier); and the Games of the future (green tier).

Relay is not a monument, but a celebration of memorable, fleeting instances. The words of the text generally share their first and last letters, as if a baton is being handed on from one word to the next. Reading the text is like watching a race — the polychromatic design, revealing hidden words inside the words — creates the effect of runners jockeying for position. Relay is about ordinary moments transfixed in memory, and as different words jostle for attention, it is as if our individually different experiences are being represented. The text on the vertical risers is complemented by thirty ‘graffiti clusters’, exquisitely playful, irrelevant, childlike designs derived from the handwriting of thirty of our most renowned Olympians, including Herb Elliot, Dawn Fraser, Betty Cuthbert and Shane Gould. The allusion to graffiti acknowledges the simple need we spectators feel to say “I was here”, however fleetingly.

**An Eventful Path**

**Location:** Olympic Park Railway Station Forecourt

**Artist/Designer:** Aspect Sydney and Feeder Graphic Design

An Eventful Path is a visionary public installation that celebrates and commemorates the intense festivity at Sydney Olympic Park created by events such as the Sydney 2000 Olympic Games, Sydney 2000 Paralympic Games and the 2003 Rugby World Cup. The installation is a 45 metre long path comprising blocks of cast coloured glass, stainless steel channel, fluorescent lights and honed concrete pavement.

The composition of coloured glass symbolises the many components required to stage international events of this scale. The linear path is an abstract time line celebrating the past and looking towards the future. During the day, the installation appears seamlessly integrated into the station forecourt. At night, it turns into a beautiful, glowing line of colours and people are attracted to walk along it’s length, reading the inscribed plaques as they travel.
Installed as a complete work, it evolves over time with the inscription of bronze plaques to commemorate each new major event held at Sydney Olympic Park. The installation will only commemorate ‘major events’ of the calibre of the Sydney 2000 Olympic and Sydney 2000 Paralympic Games and the 2003 Rugby World Cup.

**Eight Women**

**Location:** Northern end of Cathy Freeman Park (formerly The Overflow), near the intersection of Grand Parade and Showground Road  
**Artist:** Imants Tillers

This sculptural installation was inspired by and celebrates the eight women who were involved in lighting the Sydney 2000 Olympic and Paralympic Games Cauldron. Seven of Australia’s greatest female Olympic athletes, Betty Cuthbert, Raelene Boyle, Dawn Fraser, Shirley Strickland, Shane Gould, Debbie Flintoff-King, and Cathy Freeman, carried the Torch in the Opening Ceremony to light the Olympic Cauldron. The ceremonial medley was a tribute to a century of women’s participation in the Olympic Games and a reminder of the huge contribution women have made to Australian Olympic history. The eighth women represented is Australian Paralympian, Louise Sauvage, who ignited the Paralympic Cauldron.

Rather than a one-to-one correspondence between a particular athlete and a particular form, in this group portrait, individual attributes are interwoven into a collective whole. Eight Women is an image that commemorates athletic energy and achievement.

**Paralympic Games Patrons Memorial**

**Location:** Southern end of Cathy Freeman Park (formerly The Overflow) near the intersection of Olympic Boulevard and Dawn Fraser Avenue

The Sydney Paralympic Organising Committee’s recognition of the donors to the Paralympic Patron’s Fund is recorded on the granite wall at the southern end of Cathy Freeman Park (formerly The Overflow). The donors contributed nearly $15 million, and their generosity helped fund the highly successful Sydney 2000 Paralympic Games.

The Paralympic Games is the world’s leading international sporting event for athletes with a disability. The Paralympic Games was held in Sydney, Australia, in October 2000 just after the Olympic Games. 3,843 athletes from 122 countries, plus a delegation of independent athletes from East Timor, attended the Sydney 2000 Paralympic Games. It was the largest Games in Paralympic history. Athletes were divided into six different disability groups — amputees, cerebral palsy, intellectual disability, les autres (for athletes with a range of conditions), vision-impaired and wheelchair. They competed at the highest level in 18 sports, including archery, athletics, basketball, cycling, equestrian, fencing, sailing, swimming and tennis. The event was larger than the 1956 Melbourne Olympic Games and the 1998 Commonwealth Games.

Australia recorded its best ever performance in the medals, including 63 gold. The Paralympic Games Memorial provides a unique opportunity for people to appreciate the skills and achievements of the world’s best athletes with a disability and members of the community who, by supporting the Games, helped these athletes showcase their skills.
The Attractor

**Location**: Southern end of Cathy Freeman Park (formerly The Overflow) near the intersection of Dawn Fraser Avenue and Showground Road  
**Artist**: Imants Tillers

This 25 metre tall sculpture symbolises not only the fundamental principles of Olympism, but also the noblest of human endeavours. According to the artist, the giant ladder as a symbol of ascension has an obvious meaning in the context of sport and the Olympics – it suggests the desire to ascend, to scale heights, to climb up, to improve, to achieve and transcend one’s limitations.

Each of the six rungs of The Attractor bears a word, from the lowest rung upwards: sensus, imaginatio, ratio, intellectus, intelligentia, verbum.

- **Sensus** — perceive, feeling  
- **Imaginatio** — imagination  
- **Ratio** — account, reckoning, reason  
- **Intellectus** — understand, realise, meaning  
- **Intelligentia** — intelligence  
- **Verbum** — word, proverb

The Attractor was inspired by an illustration from a book by 17th century metaphysician, Robert Fludd.

The Cauldron

**Location**: Northern end of Cathy Freeman Park (formerly The Overflow)  
**Artist**: Michael Scott-Mitchell

The lighting of the Olympic Cauldron was one of the most spectacular moments of the Sydney 2000 Olympic Games. Cathy Freeman walked to a pool of water, and as she swept the flaming Olympic torch across it, a ring of fire sprung from the submerged Olympic Cauldron. The flaming Olympic Cauldron, with water cascading from its lower flutings, then rose to be joined with the mast, which emerged from behind the northern stand of the Stadium. This combined structure then ascended to its maximum height, where it stood for the duration of the Games.

After the Games, the Olympic Cauldron was relocated to Cathy Freeman Park (formerly The Overflow), a few hundred metres from where it burned in the Olympic Stadium. The names of the 1,972 Olympic Medalists and 2,627 Paralympic Medallists at the Sydney Games are recorded on gold, silver and bronze nameplates at the base of the Olympic Cauldron. A shallow dome of white marble commemorates the first Olympic Games of the modern era, held in Athens in 1896. Reignited to commemorate special occasions, including future Olympic Games held at other sites, the Olympic Cauldron stands on 24 stainless steel columns and weighs approximately seven tonnes.
The Stride

**Location:** Southern part of Cathy Freeman Park (formerly The Overflow) alongside Olympic Boulevard, leading to the Cauldron

**Artist/Designer:** Alexander Tzannes Associates

The eyes of Australia were on Cathy Freeman when she won gold in the women's athletics 400 metres final at the Sydney 2000 Olympic Games. Cathy’s win brought Australia its 100th Olympic gold medal, and for many the race was a symbolic victory for reconciliation. The Stride, a line of lights set in the pathway leading to the Cauldron, represent the points of impact as her feet drove her towards the finish line.

Visitors to the Park are often seen trying to match her extraordinary gold medal winning strides as they replicate her steps along the artwork. The table below gives the details of Cathy Freeman’s strides:

<table>
<thead>
<tr>
<th>Distance Metres</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
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<tr>
<td>Speed kilometres per hour</td>
<td>28.27</td>
<td>30.56</td>
<td>29.85</td>
<td>27.75</td>
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<td>Split Seconds</td>
<td>12.30</td>
<td>24.08</td>
<td>36.15</td>
<td>49.11</td>
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<tr>
<td>Average stride metres</td>
<td>2.17</td>
<td>2.32</td>
<td>2.22</td>
<td>2.25</td>
</tr>
</tbody>
</table>

Australia Map Mosaic

**Location:** Rose Garden near Building A, Vernon Buildings, Dawn Fraser Avenue. Adjacent to the Olympic Park Railway Station

**Artist:** Cynthia Turner (Artist), Tony Virtu (Tiler), Gillian Smart (Landscape Architect), YWCA Landcare Environment Action Program (Garden restoration)

The Australia Map Mosaic consists of a colourful image of a sheep, a pig and a beef cow with the words “Metropolitan Meat Industry Board State Abattoir Homebush Bay 1915–1988” written underneath. The mosaic is a link to the site’s industrial past, which was once home to the NSW State Abattoirs, the largest institution of its kind in the Commonwealth.

The Abattoir Heritage Precinct, located between Herb Elliot and Dawn Fraser Avenues, is comprised of a series of historic buildings that formed the administrative core of the State Abattoirs. The administration buildings are also sometimes referred to as the Vernon Buildings as they were designed by Walter Liberty Vernon (1846–1914) during his tenure as NSW Government Architect.

The Federation-period gardens were designed by Joseph Maiden (1859–1925), Director of Sydney Botanic Gardens and Government Botanist. During the inter-war years, a team of gardeners created floral displays in the shape of a map of Australia. After the Second World War, the number of floral displays was reduced, with many replaced by low maintenance shrubs. Following the Olympic era garden restoration project, the Vernon Buildings were used as an Olympic and Paralympic Visitor Centre, and the map of Australia was re-introduced as a mosaic. This mosaic was built in the original location of the Australia Map floral display on the corner of the rainforest garden and meatworks path.
Bulls Head and 6/9 Surrounds Mosaic

**Location:** Playfair Courtyard near Building C, Vernon Buildings, Dawn Fraser Avenue. Adjacent to the Olympic Park Railway Station

**Artist:** Cynthia Turner (Artist), Tony Virtu (Tiler), Gillian Smart (Landscape Architect), YWCA Landcare Environment Action Program (Garden restoration)

The Bulls Head and 6/9 Surrounds Mosaic consists of a central design of a Bulls Head surrounded by an interlocked pattern of 6 and 9 filled with mosaic tiles. The mosaic provides a link to the industrial history of the Sydney Olympic Park site and the old NSW State Abattoirs. The number ‘69' is commemorative of Playfair Cattle, which were branded with ‘69' stamped in purple dye. Thomas Playfair (1832–1893) was founder of the Flemington Saleyards.

Drinking Trough Animal Memorial

**Location:** Rose Garden, Vernon Buildings, Dawn Fraser Avenue. Adjacent to the Olympic Park Railway Station

**Designer:** Gillian Smart

The memorial attempts to recreate the atmosphere of the NSW State Abattoirs, which operated on the current site of Sydney Olympic Park between 1913–1988. Five animal drinking troughs, salvaged from the Abattoir, are buried in the ground and planted with flowers including "Forget-Me-Nots”. They are laid out to resemble graves, and at the end of each of them is a timber headstone upon which is attached a hand made ceramic tile.

Each tile features the verse of a nursery rhyme, a reminder of how our stories, culture and industry are intertwined. The following lines, from left to right, are written on the different tiles:

Clickety Click Clickety Clack, Hear the wheels of the railway track
To market to market, Jiggety Jig Jiggety Jog
Here a Moo, there a moo, everywhere a moo, e i e i o
Flipperty Flop Flipperty Flop here comes the butcher to bring us a .........

Little boy blue come blow your horn

The Abattoirs were officially opened in 1913 and by 1923 the Homebush Abattoir was the biggest of its kind in the Commonwealth and employed up to 1600 men. It had a killing capacity of 20,000 sheep, 1,500 cattle, 2,000 pigs and 1,300 calves per day. The economic viability of the Abattoir declined with time and it was officially closed in June 1988.

Playfair Memorial Drinking Fountain

**Location:** Playfair Courtyard, Building C, Dawn Fraser Avenue. Adjacent to the Olympic Park Railway Station

**Artist:** William P Mackintosh

The Playfair Memorial Fountain is an important example of a late 19th century ornamental drinking fountain. It was erected to commemorate Alderman Thomas Playfair (1832–1893). Playfair, a one time Mayor of the City of Sydney, was founder of the Flemington Saleyards and moderniser of the Sydney water supply.

The fountain was built from New South Wales white polished marble quarried at Caloola Creek, near Bathurst. The fountain is set on a patent axed base comprising five square
blocks of Bowral trachyte. Four of the trachyte blocks form a plinth and the fifth block is placed centrally as the base of the urn-like fountain. The fountain was originally fitted with two silver plates or gunmetal taps and two drinking cups, which were attached by stapled chains. The taps, cups and chains are missing.

The Playfair Memorial Fountain was unveiled by the Mayor of Sydney, Alderman Isaac Ellis Ives on the afternoon of the 28th May 1896 as a memorial to Alderman Thomas Playfair. The fountain demonstrates the importance the Sydney City Council placed on major civic reforms such as improvements to the water supply. It is a rare example of a Victorian-era drinking fountain and of the sculptor’s work. William P MacIntosh was a prominent sculptor in Sydney during the late 19th century, and was responsible for the marble statue groups on the Queen Victoria Building, among other notable works.

Sheep Furniture

**Location:** Vernon Buildings, Dawn Fraser Avenue. Adjacent to the Olympic Park Railway Station  
**Artist/Designer:** Ian Bartholemew (Artist) and Gillian Smart (Designer)

Located throughout the heritage Abattoir precinct are timber seats carved with images that recreate the atmosphere of the old NSW State Abattoirs.

These timber seats were added to the precinct when it was revamped for use as the visitor centre for the Sydney Olympics and Paralympics. Roses are featured in the Rose Garden, with bulls heads and the 6/9 motif featured on the timber seats in the Playfair Courtyard. Benches in the garden feature carved bull and sheep heads.

The Sheep Stock Route

**Location:** Rose Garden, Vernon Buildings, Dawn Fraser Avenue. Adjacent to the Olympic Park Railway Station  
**Designer:** Gillian Smart, Smart Landscape Architecture

In the Rose Garden in the Vernon Buildings are a set of trachyte stone setts etched with sheep footprints that recreate the atmosphere of the old NSW State Abattoirs.

The sheep footprints remind us that drovers directed sheep along this pathway to the mutton slaughterhouses in the 1970’s. The fenced stockroute cut through the rose beds in a straight line to the other end of the garden. The trachyte stone setts originally paved the Flemington salesyards before they were moved to the area where the Stadium is now located.

Bicentennial Park Sundial

**Location:** Bicentennial Park, near the Treillage tower. Accessible from the pedestrian path that leads to the Education Centre and Badu Mangroves area of the Park  
**Artist/Designer:** Lorna Harrison (Landscape Architect), Lionel Glendenning (Project Architect), John Harrison (Mathematical Calculations)

Bicentennial Park was constructed in the early 1980s and was opened to the public to celebrate Australia’s Bicentenary in 1988. The design of the Park is based on the traditional landscape design principles of order, geometry, focal points and axes. The Sundial, which is located between two of Bicentennial Park’s dense forest grids, creates a distinctive ambience in a clearing.

The top end of the 8 metre long, square cross-section steel gnomon of this sundial is used as a nodus point to indicate the date, with solstice and equinox date lines marked out on the terrazzo horizontal dial plate, which is 30 metres across.
The Sundial consists of a marble topped concrete ground slab with inlaid brass-work defining the time lines and periods of the calendar. A brick and structural wall set at one side of the slab is used to support the cantilevered time hand. Attached to the brick wall is an engraved panel and chart explaining the reading of the dial.

The Sundial is fully functional and the structure on which it is mounted faces onto a gentle grass slope – an ideal event venue that is available for hire.

**Bicentennial Park Water Feature**

**Location:** Bicentennial Park, between the Bennelong Parkway Bridge and the Powell’s Creek pedestrian bridge  
**Artist/Designer:** Lorna Harrison (Landscape Architect — Initial design), Lionel Glendenning (Project Architect — Initial design), Department of Public Works (Original Construction), Spackman and Mossop Landscape Architects & Lahz Nimmo Architects (Refurbishment Architects), Dave Creasy (Hydraulic Engineer)

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An east-west axis was established in response to the existing topography of the site, with avenues of plane trees reinforcing the strong linear quality of a raised plateau built atop a former rubbish tip. Bisecting this is a north-south axis comprising the mangrove vista and other wide bands of plantings. Where these axes meet, at the highest point in the Park, is the Treillage Tower. Situated in front of the Treillage Tower, on the east-west, axis is the Bicentennial Park Water Feature.

The original Bicentennial Park Water Feature was created as part of the initial construction of Bicentennial Park. It contained 199 splashing fountains, from which flowed a canal of sparkling water, terminating with the 200th water jet, commemorating 200 years of European settlement. Reconfigured in 2001, the current Bicentennial Park Water Feature is an interactive fountain with 109 fountains and 360 fogging jets.

**Treillage Tower**

**Location:** Bicentennial Park, towards the Powell’s Creek end of the Bicentennial Park Water Feature  
**Artist/Designer:** Lorna Harrison (Landscape Architect — initial design), Lionel Glendenning (Project Architect — initial design), Spackman and Mossop Landscape Architects and Lahz Nimmo Architects (refurbishment architects), Dave Creasy (Hydraulic Engineer)

The Treillage Tower is the centerpiece of Bicentennial Park. It is a square, 3 storey, 17m high viewing tower constructed with a trellis. Treillage is a French word for lattice. It was commonly used in gardens in the 16th century. This prominent lattice tower has a high viewing platform, which affords views over Bicentennial Park and the Parramatta River, with the city skyline in the distance.

**Cyrus the Great**

**Location:** Bicentennial Park, near the pedestrian bridge that crosses Bennelong Parkway linking Bicentennial Park to the Town Centre of Sydney Olympic Park  
**Artist/Designer:** Lewis Batros (Artist) and Fereshteh Sadegh (Co Designer)

This is a replica of a bas relief discovered in Pasargade, the capital city of Persia, founded by Cyrus. It depicts Cyrus the Great (580–529 BC) in a Babylonian costume, Jewish helmet, with two wings and a short Persian beard.
Cyrus was the first Achaemenian Emperor of Persia, and issued a decree on his aims and policies, later hailed as his charter of the rights of nations. Inscribed on a clay cylinder, this is the first known Declaration of Human Rights, and is now kept at the British Museum. A replica of the cylinder is also at the United Nations in New York. The so-called ‘Cyrus cylinder’ was issued by Cyrus in Babylon (550 BC).

The bas relief symbolises multiculturism and celebrates the peaceful coexistence of people from different backgrounds and cultures in one land. The statue was unveiled by Mary Dimech, Multicultural Program Manager, Australia Council for the Arts. The International College Spain and the Australia Council for the Arts assisted by providing major sponsorship contributions.

**Migration**

**Location:** Bicentennial Park, north of Lake Belvedere  
**Artist/Designer:** Martin O’Dea-Clouston Associates (Designer), Urban Art Project (Art fabricator), Bruce Delprado (Engineer), Griffith Landscape Management (Installation)

This distinctive artwork marks the Fishway feature of the Park, which improves the diversity of fish in Lake Belvedere and reduces local flooding. Migration is an art piece about native fish migration. It is sited within the phragmites beds at Bicentennial Park’s Fishway — a channel graded to allow native fish migration between Lake Belvedere and Powell’s Creek.

The fishway sculpture was conceived as an abstract piece viewed as if you are underwater, swimming with the fish through the sea grasses within an ocean of blue sky. The fish appears as an abstract outline as you approach head on, but becomes visible as a fish when you walk past it, viewing it side on.

**Obelisks**

**Location:** Bicentennial Park, on the eastern side of the Victoria Avenue entrance (Concord West)  
**Artist/Designer:** John Moran and Henry Bardon

The Obelisks were created by the NSW Premier’s Department to commemorate the Bicentennial Celebrations. They were initially installed in central Sydney, and were shifted at a later date to Bicentennial Park. The objective of setting up the Obelisks, and other Bicentennial decorations, was to engender a feeling of pride and achievement in all people who visited the city. The Obelisks were originally located on Macquarie & Bent Streets, near Moreshead Fountain.

The concept of the Obelisk as a Bicentennial decoration was based on the Macquarie Place obelisk designed by Francis Greenway in 1816. The Obelisks were illuminated using festoon lights to highlight the outline and a central base light to illuminate the inside of the Obelisk top. Each pair of Obelisks had a different coloured base light. The Obelisks added to the overall effect of the street decorations and illuminations.

**Peace Monument**

**Location:** Bicentennial Park, north of the distinctive Bicentennial Park Water Feature and easily accessible from the one-way road system  
**Artist:** Michael Kitching

This monumental public sculpture is dedicated to Peace and was commissioned by the NSW Government in 1986 to commemorate the International Year of Peace. The layout of this work is based on a complex interplay involving the Earth’s axis and the trajectories followed by the planets in our Solar System. The sculpture is a three-dimensional map,
illustrating what it might be like to be out in space looking back at earth. In this sense, it reminds us of our fragile place in the solar system. We do not feel or see the earth turning, hence we are rarely conscious that we live on a sphere constantly spinning through space.

The rod near the largest sphere on the sculpture is parallel to the north-south axis of our planet. By facing east it is possible to imagine the earth rotating around the real axis beneath our feet. The angle this rod makes with the ground is equal to our latitude south of the equator. The time of day can be marked from the shadow of the rod as it moves over the ground.

The rod at the other end of the other monument points in the same direction as the plane where all the planets, the Sun and the Moon pass over us from east to west.

Throughout history, bells have been rung to celebrate peace. There are three bells in the monument: one each for The Earth, The Moon and Space. During the construction of the monument, none of the numerous ongoing military conflicts were resolved, and three major new wars were declared. The bells are currently filled with stops and cannot be rung. The artist has suggested that the bells will ring out one day – when there is peace throughout the world. Needless to say, they have not chimed yet……

**Powell’s Creek Bridge**

**Location**: Bicentennial Park, on Powell’s Creek between Treillage Tower and the Concord West picnic area  
**Artist/Architect**: Richard Goodwin

Forming a link between Bicentennial Park and Concord West, the artwork consists of the flowing curved trusses and timber decking attached to a smaller existing bridge. This elaborate metal exoskeleton has been added to the existing bridge almost like a prosthesis. The artist refers to such prostheses, which characterise a lot of his architectural and sculptural work, as parasites. Through them, he draws attention to the relationship between structures, as well as to the relationship between ourselves and these structures.

Drawing on the energy of the writhing mangroves, the parasite bridge attachments transform the existing structure into a new form. Thus public art performs the trick of re-inventing and transforming an existing structure. The flowing curved trusses accentuate both the sense of movement of walking and the asymmetric organic energy of growth. This is sculpture that blurs the boundaries between art, architecture and engineering.

**Sydney Olympic Park Welcome Sign**

**Location**: Newington Armory and Blaxland Riverside Park, Holker Street retaining wall near the intersection with Jamieson Street and Holker Street  
**Artist/Designer**: Hassell Pty Ltd (Concept Design) and Dot Dash (Engineering Design)

The Holker Street Threshold is one of the major vehicle entry points into Sydney Olympic Park. The Welcome Sign is the major entry statement on the Western side of the Park. This sign consists of painted steel panels and the Sydney Olympic Park logo mounted on the wall in a rhythmic and colourful arrangement. The panel is fitted with fluorescent light fittings and is illuminated at night.
Brickpit Ring Walk and Machinery

**Location:** Wentworth Common  
**Artist/Designer:** Durbach Block (Architect), Sue Barnsley Design (Landscape Architect), GMW Urban (Construction), David Chesworth and Sonia Leber, WAXSM (Soundscape Design), Eskimo Design (Interpretive Signage Design)

The Brickpit Ring Walk is an elevated circular walkway that allows visitors to access and view the Brickpit from above while preserving the habitat of the endangered Green and Golden Bell frog below. The walkway, 550 metres in circumference and raised 18.5 metres above the sandstone floor of the Brickpit, is an Environmental Interpretive Centre and outdoor exhibition. Located just outside the two entrances to the Brickpit Ring Walk are pieces of machinery that were salvaged from the original Brickpit.

Interpretive material is digitally printed on the colourful outer panels of the ring. This material links various narratives: the history of the Brickpit as an industrial site; the evolution of the Green and Golden Bell Frog habitat; the site’s unique geology; and the innovative water recycling initiative (WRAMS). To this are added soundscapes of frog and bird calls and actual workers recounting their experiences to create a strong human connection to the place.

Reconciling public access, safety and wildlife conservation in a way that transforms these ambitions into an iconic structure, the Brickpit Ring Walk is beautiful in its simplicity and poetic in its vision. The Brickpit Ring Walk is one of the 12 Australian buildings chosen to represent Australia at the 2006 Venice Architecture Biennale.

Sydney Olympic Park Markers

**Location:** Wentworth Common, Blaxland Riverside Park, Hill Road and Australia Avenue

Sydney Olympic Park is made up of sprawling and diverse parcels of parklands, sports venues and heritage precincts. During the remediation of the Park, five 10–20 metre high conical shaped earth mounds were built using materials that were unsuitable for re-use in construction. These markers are a permanent visual reminder of the exceptional reclamation effort accomplished at Sydney Olympic Park.

The Bay Marker at Wentworth Common, Haslam’s Marker at the southern end of Hill Road, River Marker at Blaxland Riverside Park, Silverwater Marker next to Woo-la-ra and the Bicentennial Marker on Australia Avenue evoke the Southern Cross Constellation. They also represent the five Olympic Rings, and serve as a reminder built into the landscape that the Olympic Games were held at the Park.

Pole Forest

**Location:** Entrance to Sydney Olympic Park Archery Centre on Bennelong Parkway  
**Artist/Designer:** Pheobe Pape, Stutchbury & Pape (Architect), Robert Herbertson (Engineer-Structural Design Group), Cooinda Constructions (Builder) and AustFab (Fabricator)

Sydney Olympic Park Archery Centre was the site of Australia’s first Olympic gold medal in archery, and is one of the simplest yet most elegant Games venues. The entrance to the Park is marked by the artwork Pole Forest, which is comprised of a matrix of recycled timber poles.

The idea of the pole forest grew from the desire to place trees in the landscape, thereby evoking a sense of the historical link between forests and archery. The soil and site conditions, however, did not allow this, and so the idea of recycling dead trees to create a sculptural forest was born.
The poles are placed to complement the setting of the archery building and recognise the presence of the creek. They also set up a constantly changing visual dynamic as one moves through the site.

The planting of fluid waving native grasses in subtle swathes of colour surrounding both the field and the poles creates a soft background while attracting many native seed-eating birds back to the site.

Green and Golden Bell Frog and Sun Baking Lizard

**Location:** Wentworth Common Children’s Playground  
**Artist/Designer:** Chris Bennetts, Newton Bishop and Sam Re (Ishi Buki Sandstone Sculpture)

These sandstone sculptures were commissioned by Sydney Olympic Park Authority as part of the children’s playground project in Wentworth Common. Two sculptures are of the Green and Golden Bell Frog and one represents a sun-baking Lizard.

The Green and Golden Bell Frog, an endangered species under the Threatened Species Conservation Act 1995 that has vanished from 90 per cent of its original range, has established breeding grounds across the Sydney Olympic Park precinct. The primary habitats include the Brickpit, Kronos Hill, Wentworth Common and Narawang Wetland; the species is also regularly recorded in wetlands and grasslands in other parts of the Park. Sydney Olympic Park remains home to one of New South Wales largest populations of Green and Golden Bell Frogs.

Conservation of the frog species throughout this rapid site redevelopment became a key planning parameter that shaped how the Park looks and is managed today. The Sydney Games organisers were forced to shift the site of the venue for the Tennis Centre because the original plan threatened the Green and Golden Bell Frog population in the Brickpit and the surrounding areas. This effort to re-establish the Green and Golden Bell Frog species is arguably one of the largest habitat construction projects ever undertaken for an endangered amphibian.

The sculptures, as well as being playful and atmospheric, also bring to the attention of children and adults the importance of conserving our flora and fauna.
The Environmental Guidelines for Sydney Olympic Park were updated in 2008.

- The draft new guidelines were approved by the Sydney Olympic Park Authority Board on 28th February 2008, and adopted subject to the Minister's consent; and

- Consent for the SOPA Board to amend the original guidelines was given by the Minister for Planning on the 27th June 2008.
Statement of Environmental Policy

In carrying out all of its functions, Sydney Olympic Park Authority is committed to the principles of ecologically sustainable development (ESD) within the meaning of the NSW Local Government Act (1993), and as interpreted in these Environmental Guidelines. 1

Through implementation of the Environmental Guidelines, the Authority seeks to set a high standard of environmental performance and work to continually improve the sustainability of Sydney Olympic Park and the business activities of Sydney Olympic Park Authority. Priority will be given to preventing pollution, conserving habitat and species, reducing resource consumption; preserving unique features and heritage; demonstrating best practice by example; and complying with statutory and regulatory requirements.

The Sydney Olympic Park Authority is committed to the care, control, management, and development of Sydney Olympic Park in accordance with its Environmental Management System (EMS).

The Sydney Olympic Park Authority’s Environmental Management System has been developed for use by its personnel, contractors and key stakeholders as a means of helping the Authority achieve its commitment to Ecologically Sustainable Development. The Environmental Management System provides the management framework through which the Authority will:

- Comply with all relevant state and national statutes and international biodiversity conservation treaties.
- Provide a systematic approach to managing the environmental impacts of its activities, projects and maintenance programs;
- Manage environmental risks through risk reduction strategies and contingency planning;
- Provide environmental awareness and procedures training for staff and contractors;
- Share environmental knowledge and experience with others;
- Continually improve its environmental performance;
- Report on its environmental performance through statutory and non-statutory reporting and information exchange forms; and
- Implement the Parklands Plan of Management to deliver a best practice approach in adaptive parkland management.

The Environmental Management System is based on the requirements of the International Standard for Environmental Management Systems, ISO 14001:1996 and describes how the Authority will manage its environmental affairs and continue to meet, and improve on its Ecologically Sustainable Development performance.

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1 This commitment is set out in Section 15 of the SOPA Act (2001) as an obligation for SOPA: SEE copy of ESD extract in Part 6.
The Olympic Games Environmental Legacy

The 1993 Environmental Guidelines formed part of Sydney’s bid to host the 2000 Summer Olympic Games, and were subsequently applied to transforming Sydney Olympic Park’s degraded landscapes, building Olympic sporting venues and hosting the Olympic Games.

Implementation of the 1993 Environmental Guidelines was externally assessed by the Earth Council - an international non-governmental organisation created after the 1992 United Nations Summit on Ecologically Sustainable Development. Four reviews were conducted between 1996 and 2000, with an 8½/10 rating being awarded in the final review. The Chairman of the Earth Council concluded that Sydney 2000 would have a significant positive legacy in promoting sustainable development in the form of:

- Pioneering the large-scale application of sustainable development principles to a major construction and event project;
- Developing and testing new tools and practices that have been shared freely in Australia and globally;
- Raising awareness among professionals, government planners and regulators that sustainable development is a viable approach;
- Setting a series of best practice benchmarks against which others in comparable circumstances are now meeting or extending themselves to exceed; and
- Mainstreaming high levels of environmental performance into the building and construction industry within Australia and all around the World.

Through implementation of the 1993 Environmental Guidelines a number of tangible legacy outcomes were achieved including:

- World class environmentally responsible venues and facilities were built for the Sydney 2000 Olympic and Paralympic Games and now provide Sydney with an excellent major events precinct at Sydney Olympic Park and specialist venues in other areas;
- Approximately 160 hectares of badly degraded public land was remediated and restored and, along with other rehabilitated land, one of the largest and most diverse urban parklands in Australia (425 hectares) was created;
- Remnant wetlands and forest were conserved and enhanced, and native flora and fauna including the endangered Green and Golden Bell Frog were protected;
- Australia’s first large scale urban water recycling system was established, saving approximately 850 million litres of drinking water each year; and
- Environmental education, interpretation and research programs were developed and continue today, as a contribution to improving the community’s knowledge and practices in environmental sustainability.

Sydney Olympic Park has won many prestigious international and national environmental awards including: the ‘Global 500 Role of Honor’ from the United Nation Environment Program; three ‘Banksia Awards’ (including the Gold Award); the ‘Rivercare 2000 Award’ (Gold).
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1: PRELIMINARIES

1.1 Title and Status of the Guidelines

The Environmental Guidelines for Sydney Olympic Park (2008) are the Environmental Guidelines referred to in Section 4 of the Sydney Olympic Park Authority Act (2001) and are an amendment to the Environmental Guidelines for the Summer Olympic Games (1993) for the purposes of Section 49 of the Sydney Olympic Park Act.

1.2 Principal Objective

The principal objective of the Environmental Guidelines is to set out a general scheme of environmental issues and commitments that aim to implement the Environmental Policy of the Sydney Olympic Park Authority with regards to the care, control, management, and development of Sydney Olympic Park.

1.3 Application of the Guidelines

The Environmental Guidelines apply to the whole of the land identified as Sydney Olympic Park in the Sydney Olympic Park Act. In accordance with Section 20 of the Sydney Olympic Park Authority Act the Authority must before carrying out any proposed development, consider whether the proposed development is consistent with the Environmental Guidelines. Section 18 of the Sydney Olympic Park Authority Act requires the Authority to prepare and maintain a Master Plan for Sydney Olympic Park that is consistent with the Environmental Guidelines.

1.4 Commencement of the Guidelines

The Minister responsible for the Sydney Olympic Park Authority (the NSW Minister for Planning) consented to Sydney Olympic Park Authority adopting the Environmental Guidelines on 27th June 2008 and for the purposes of the Environmental Guidelines they were adopted by the Authority and came into effect on that date.

1.5 Revocation Date

The Environmental Guidelines may be amended at any time in accordance with the requirements of Section 49 of the Sydney Olympic Park Authority Act. There is no expiry date for the Environmental Guidelines however it is expected they will be reviewed and if required amended within 5 years from commencement.

1.6 Revocation of a Previous Guidelines

The Environmental Guidelines known as the Environmental Guidelines for Sydney Olympic Park cancel the original Environmental Guidelines known as the Environmental Guidelines for the Summer Olympic Games (1993) and as such the original Environmental Guidelines no longer have any force or affect.
2: CONTEXT & PRINCIPLES

The Environmental Guidelines are not prescriptive in the sense of rigidly specifying actions that must be taken and they do not attempt to address all environmental issues. Rather, they focus on highlighting key environmental issues for Sydney Olympic Park; defining the major challenges these issues present Sydney Olympic Park Authority; and state the various commitments that Sydney Olympic Park Authority has made to progressively enhance the sustainability of Sydney Olympic Park.

As such the Environmental Guidelines provide an important reference point for (a) planners, developers, event owners and place managers to test the quality and relevance of their environmental sustainability effort at Sydney Olympic Park; and (b) assessment and consent authorities to check the adequacy of development and operational proposals at Sydney Olympic Park in terms of potential to enhance environmental sustainability outcomes.

2.1 Global Perspective

As the twenty-first century unfolds, there is growing realisation that the environmental impact of human activities on the Earth’s weather, climate, oceans, land, geology, natural resources, ecosystems, and other environmental elements, is having potentially devastating impacts on human living conditions and life support ecosystems across the globe. Water shortages, desertification, soil degradation, greenhouse gas emissions, elevated sediment and nutrient flows in rivers and seas, and other environmental problems are increasingly becoming the common side effects of modern human activities.

Globally, economic growth and increasing world populations continue to place increased pressure on the environment and the ability of ecological systems to sustain themselves. This is evidenced in part by:

- growing rates of energy consumption;
- loss of water supply and water quality;
- threats to biodiversity and natural resources;
- extinction of species and natural communities;
- increasing amounts of waste being generated;
- impacts of increasing populations and housing demand; and
- accelerating changes in global climates.

2.2 National Direction

Australia has a National Strategy for Ecologically Sustainable Development that aims to meet the needs of Australians today, without compromising the ability of future generations to meet their own needs.

Four principles that are necessary in understanding and realistically pursuing sustainable development are:

- The precautionary approach;
- Intergenerational equity;
- Biodiversity conservation; and
- Environmental value pricing.

In the Australian context, these approaches, together, aim to prevent and reverse adverse impacts of economic and minimise social activity on ecosystems, while continuing to allow the sustainable, equitable development of society.
2.3 NSW State Commitments

The NSW Government is committed to sustainable development in the State Plan (2006) through its focus on: achieving growing prosperity across NSW; delivering better services; fairness and opportunity; supporting rights, respect and responsibility; and promoting an environment for living. The State Plan also includes targets for natural resource management – biodiversity, water, and land – in ways that relate to intrinsic values of the environment not just human utility values. A number of NSW Government agencies are directly engaged in the environmental sustainability initiatives, and all agencies are required to consider environmental sustainability in their business decision-making.

The NSW Government has defined the objects, functions, duties and obligations of the Sydney Olympic Park Authority in State Legislation through the Sydney Olympic Park Authority Act (2001). In the environment areas the Act requires Sydney Olympic Park Authority to:

- Protect and enhance the natural and cultural heritage of Sydney Olympic Park (S13);
- Carry out its functions taking into consideration the principles of ecologically sustainable development (S15);
- Make a Master Plan that may provide for the protection, enhancement and use of waterfront areas, parklands and areas of natural vegetation (S18);
- Consider whether developments are consistent with the Environmental Guidelines before they are carried out (S20);
- Maintain, improve, encourage the use and enjoyment, and protect the environment of the Parklands, and achieve the proposes of the Newington Nature Reserve (S28: S37);
- Maintain and extend the use of the water reclamation and management scheme, and encourage the use of renewable energy (S48); and
- Produce a state of the environment report annually addressing a number of particular environmental areas and associated performance levels (S50).

2.4 Local Position

The Environmental Guidelines are the framework through which the Authority guides its own and others activities at Sydney Olympic Park into “thinking globally and acting locally”.

The Sydney Olympic Park Authority was established in 2001 to care for, control, manage, and develop the 640 hectares that comprise Sydney Olympic Park (the Park), as a lasting legacy for the people of NSW. The Authority is obliged and committed to developing Sydney Olympic Park into a modern and sustainable new town, while preserving a robust capability as a major events precinct; and maintaining, enhancing and protecting the parklands and particularly the natural environment therein for present and future generations.

The 1993 Environmental Guidelines for Sydney Olympic Park (the Environmental Guidelines for the Summer Olympic Games (1993)) were integral to Sydney's successful bid to host the Sydney 2000 Olympic Games. Notwithstanding the significance of the 1993 Environmental Guidelines in their contribution to the planning for the construction of Olympic venues and the staging of major events – they were not intended, nor were they comprehensive enough, to guide the longer term environmental issues associated with place management and township development.
The Environmental Guidelines have been amended to cater for sustainable development at Sydney Olympic Park taking into account:

- all of the future roles established for Sydney Olympic Park (as a major event precinct, a modern new township, and a regional parkland);
- a more contemporary and holistic understanding of environment beyond ecology alone;
- recent advances in environmental technology and research; and
- lessons learned through the practical application of the original guidelines.
3: GENERAL COMMITMENTS

Sydney Olympic Park Authority aspires for Sydney Olympic Park to be recognised locally, nationally and internationally as a place that champions sustainable development and achieves excellence in environmental management. To support these aspirations, implementation of the Environmental Guidelines will be in consideration of the global, national and local contexts set out above, and will be guided by the following important commitments applicable to Sydney Olympic Park as it evolves to become a modern new township in metropolitan Sydney, in addition to its current role as the premier major events precinct in NSW and a world class regional parklands with high biodiversity values.

3.1 Involving People

People exist as a part of the environment not apart from it. Encouraging a high level of community involvement and promoting a strong sense of community identity with the local environment and the more important elements of it (through opportunities in volunteering, education and tour programs, participation in environmental conservation initiatives, and learning from a range of information sources) is an important way of strengthening peoples appreciation of and relationship to the environment.

The environmental programs and activities occurring at Sydney Olympic Park have the potential to foster a greater community understanding of environmentally sustainable development, and in doing so can stir the imagination and challenge people to work towards sustainability. As part of Sydney Olympic Park Authority’s community service obligations it will continue to facilitate and where appropriate deliver environmental programs and activities, and continue to produce an annual state of environment report as its major public reporting mechanism for communicating sustainability at Sydney Olympic Park to stakeholders and the broader community.

3.2 Social Capital

The connections within and between social networks is a core concept in public thinking around the world, and while not the solution to all the problems of modern society, it does have particular importance to the future Sydney Olympic Park. To build and nurture the social capital of Sydney Olympic Park, the principles of social equity and opportunity, and designing for people and communities, will be applied in the future development of the township and parklands. Public spaces and community facilities will be designed and operated to make positive contributions to recreation and leisure opportunities, cultural celebration, intellectual stimulation, spiritual expression, and otherwise generally seek to enhance the emotional and physical health and well-being of inhabitants.

Sydney Olympic Park Authority will as far as possible ensure that social connectivity is promoted, and social impacts are assessed and managed as part of its process for planning and delivering developments and activities. Sydney Olympic Park Authority’s care, control and management of the place will preserve and enhance ‘great experience’ opportunities for those in the precinct. A priority will be for community infrastructure to be developed to an adequate level and in a timely manner; and people from all sections of the community should be able to participate fully in community life – including those with modest incomes; those from culturally and linguistically diverse backgrounds; and people with disabilities.
3.3 Liveable Places

Liveable places are the stage for the public lives of all in a community. They are the parks and plazas where families gather to celebrate, public events are performed, workers seek lunch-time respite, children play, sporting competitions are held, and where cultures mix. They are the streets in front of homes and businesses where friends run into each other, and where exchanges both social and economic take place. They are the front porches of our public buildings where we interact with each other and Government. ²

The places at Sydney Olympic Park will as far as possible be planned, designed, operated and furnished in ways that residents, visitors and workers can: undertake activities and use facilities that will enhance their physical, intellectual, emotional and spiritual well-being; have safe and equitable access to places and transport options; and experience a range of lifestyles reflective of a vibrant major event precinct and a world-class parklands environment.

3.4 Environment Protection

Contemporary environment protection standards tend to focus on minimising further environmental loss and compliance with defined statutory performance targets – whereas in a world seeking sustainable development there is a need to go further and reverse established trends by: reducing consumption of resources, repairing damage from pollution of the environment, and preventing incremental loss of biodiversity.

In this spirit Sydney Olympic Park Authority will as far as possible seek to achieve compliance in all of its environmentally-impacting endeavors at Sydney Olympic Park with a view to continuously reducing the environmental footprint of its operations. There will be an emphasis on addressing the conservation of flora and fauna; the resilience of recreation and leisure spaces; the adaptive re-use of heritage buildings and artifacts; maintaining the social capability of open space; protecting the quality of land and water systems; and improving the efficiency of water and energy consumption.

3.5 Development Planning & Design

The nature of an urban place, the viability of its local economy, the quality of life it supports, and the significance of its contribution to wider society is very much dependent on the adequacy of the environmental planning and development design that underpin it and the resultant character, diversity, scale, layout, aesthetics of the place, its uses and physical attributes.

To achieve Sydney Olympic Park Authority’s obligations with regards to the ongoing development of Sydney Olympic Park’s modern new township and associated township uses, Sydney Olympic Park Authority will manage the evolution of the place through a formal Master Plan. The Master Plan will be supported by various strategies and guidelines that incorporate best practice planning and design principles and that will promote a sustainable place to support the changing business, event, visitation, worker and resident needs of the precinct into the future. Importantly development will take place in a manner that will not compromise the established major sporting and entertainment event venue activities, public domain event operations, or ecologically important habitats.

² Adapted from How to Turn a Place Around – A Handbook for Creating Successful Public Spaces by Project for Public Spaces, Inc. 2001.
3.6 Adaptive Management

Sydney Olympic Park is a rapidly evolving place that will be influenced on an ongoing basis by changing economic, social and environmental conditions. In this context it is important to be able to continuously respond to and/or anticipate the changing needs and values of the place and its environment over time, which is best accommodated by an adaptive management and continuous improvement approach to development and operations.

Adaptive management – making continuous adjustments to plans and programs in light of new information or understanding is important for Sydney Olympic Park where there are multiple competing roles for the place concurrent with various complex and dynamic social and environmental issues, and where relevant technological advancement and environmental impacts are likely. To support this approach to management, Sydney Olympic Park Authority will as far as possible actively support research, learning and studies to help better understand and support the incremental adaptation of new information to improving environmental performance in the built and natural areas of Sydney Olympic Park.

3.7 Asset Functionality

The built and natural physical assets of a place are the foundation to its character, resilience, fitness for purpose, and overall contribution to its roles in support of society. The environmental sustainability of a place like Sydney Olympic Park is highly influenced by good initial design of the built assets, the selection of materials for their construction, the efficiency of their operating regimes, and the demand for ongoing maintenance. For natural assets the levels of impact from visitor and management activity, the standards of presentation required, the resilience of the natural systems, and the intensity of uses impacts greatly on the sustainability of the environment.

In recognition of the criticality of built and natural physical assets to Sydney Olympic Park, Sydney Olympic Park Authority will as far as possible emphasise in all of its work:

- holistic and pro-active asset management strategies;
- high quality standards of asset maintenance and servicing;
- restricting over-use of assets where future capacity is at risk;
- timely asset replacement and refurbishment; and
- maximisation of asset lifecycles commensurate with service level demands.

In particular this approach involves a commitment to NSW Government Total Asset Management Policies and an annual review and update of asset management plans to ensure a robust asset management program, and an effective asset operations regime.
4: SUSTAINABILITY ISSUES & OBJECTIVES

The Environmental Guidelines address the key issues of significance for Sydney Olympic Park and set particular objectives for each in the context of environmental sustainability and Sydney Olympic Park’s future as a modern new township; a premier major events precinct; and a world class regional parklands with high biodiversity values.

4.1 Water Conservation

Water is fundamental to life on Earth, and freshwater is a scarce global resource. Australia is the driest of the world’s inhabited continents, yet its twenty-first century urban settlements have inherited water-wasting cultural attitudes and infrastructure systems. Inadequate understanding of water conservation opportunities and related poor water management practices can lead to significant water wastage which in turn can result in drinking water shortages and/or cause environmental impacts from pollution, erosion and loss of habitat.

Sydney Olympic Park has a locally integrated approach to water conservation based on storm-water reuse, waste-water reprocessing, and water demand reduction. A Water Reclamation and Management Scheme (WRAMS) was introduced in 1999 that was Australia’s first large scale urban water treatment scheme designed initially to save more than 850 million litres of drinking water annually, through avoiding the use of potable water for non-drinking purposes (such as irrigation, toilet flushing, cleaning surfaces etc). Sydney Olympic Park’s water conservation program is being incrementally adapted to refine local management strategies and also integrate with Sydney’s emerging metropolitan water recycling infrastructure network and wider community water conservation initiatives. The water conservation program also supports reductions in down-stream water pollution; provides ecological flows for isolated water bodies in drought periods; and allows the operation of recreational water features without potable water consumption.

Water Conservation Objectives

Sydney Olympic Park Authority seeks to build on significant water conservation achievements at Sydney Olympic Park in the past, to further improve its performance, with an emphasis on increased water use efficiency and reductions in overall water demand. In pursuit of this objective, wherever possible Sydney Olympic Park Authority is committed to:

(a) Minimising overall public domain water use at Sydney Olympic Park (potable and non-potable water) using best practice environmental design principles, innovative technology, water sensitive urban design, water efficient landscaping and other demand management practices;
(b) Requiring all new developments to maximise opportunities for building and infrastructure design to incorporate water collection and recycling systems;
(c) Avoiding adverse impacts on water quality or quantity in local streams, wetlands and groundwater from operations, developments, and major event activities at Sydney Olympic Park; and
(d) Working with lead agencies in the promotion of sustainable water resource management practices through integration of water infrastructure, sharing knowledge and experience, and supporting education and research programs.
4.2 Energy Conservation

To be sustainable, the planet must operate on and consume no more than its current income of energy. Fossil fuel energy represents eons of stored solar energy, which – at current rates of usage – is rapidly approaching exhaustion. In addition, the world community is grappling with the threat of climate change brought about by the use of fossil fuels and the associated discharge of greenhouse gases into the atmosphere.

The Intergovernmental Panel on Climate Change (IPCC)\(^3\) has reported that warming of the earth’s climate system is unequivocal, evident from observations of increases in global average air temperatures, widespread melting of snow and ice, and rising global average sea levels.\(^4\) While Australia’s total national greenhouse gas emissions are small at a global level, its per-capita emissions are among the highest in the world.

Sydney Olympic Park Authority’s main energy source is from electricity. To date Sydney Olympic Park Authority has implemented a broad range of energy reduction and energy generation initiatives, including the use of natural lighting and natural ventilation in buildings, energy efficient lighting and air conditioning systems and the installation of renewable (photovoltaic) electricity generation systems throughout the Park. The Park’s solar generation program includes the ‘towers of power’ and a small solar power generation station in addition to a number of independent solar pump and lighting units in remote areas. The Park’s energy conservation program is supported by the purchase of ‘green power’, introduction of energy demand minimisation strategies, and periodic energy audits to monitor performance.

Energy Conservation Objectives

Sydney Olympic Park Authority seeks to take advantage of the opportunities that arise to improve energy use efficiency, offset energy consumption through co-generation, and reduce overall energy demand. In pursuit of this objective, wherever possible Sydney Olympic Park is committed to:

(a) Minimising overall public domain energy and peak load demand levels at Sydney Olympic Park.
(b) Prioritising in developments the use of passive solar design, natural ventilation and selection of energy efficient materials to enhance thermal performance.
(c) Requiring energy-efficient: heating and cooling systems, building management systems, lighting, and energy consuming appliances to be incorporated in all new building projects at Sydney Olympic Park.
(d) Adapting and applying best available environmental design principles, technology, demand-management, and procurement practices to progressively and significantly reduce greenhouse gas emissions.

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\(^3\) The IPCC is an international body of scientists established under the United Nations Environment Program and the World Meteorological Organisation.
4.3 Material Selection

To be sustainable, the planet must operate on and consume no more than its current income. The materials that make up the products we use in our homes, businesses and industry can have environmental impacts throughout their life-cycle - from extraction, manufacture, distribution, use and in disposal. Environmentally responsible purchasing and life-cycle assessment are being increasingly used around the globe to highlight and reduce the environmental footprint of materials consumption.

The Sydney Olympic Park Authority – through its development control and/or asset management activities - carefully monitors materials selection for new and existing developments and in the maintenance and/or refurbishment of existing facilities across Sydney Olympic Park, to reduce harmful toxic materials and impacts on the environment. Sydney Olympic Park Authority also ensures that its operations and management practices minimise the use of harmful materials that are likely to deplete natural resources and/or create toxic pollution.

Materials Selection Objectives

Sydney Olympic Park Authority seeks to effectively promote the use of sustainable materials and avoid use of materials which deplete natural resources or create toxic pollution in their manufacture, use or disposal. In pursuit of this objective, wherever possible Sydney Olympic Park Authority is committed to:

(a) Considering whole-of-life impacts on the environment when selecting materials for development and operations;
(b) Prioritising the selection of natural non-toxic materials such as natural fibre insulation, and non-toxic paints, glues, varnishes, polishes, solvents and cleaning products;
(c) Maximising the use of recycled and recyclable materials in developments and operations, including for consumer packaging;
(d) Encouraging material re-use for major event overlay (design for disassembly and re-use);
(e) Prioritising non-use of chlorine, fluorine and hydrogen based carbon gases and promote as alternatives the use of non-ozone depleting, non-greenhouse warming gas refrigerants in construction, major events and other operations;
(f) Minimising the need for use of chemical control of weeds, pests and diseases - maximising opportunities for integrated control methods;
(g) Minimising the use of known environmentally damaging or unhealthy products such as chlorine based products and chlorine bleached paper, and completely avoiding products that include toxic substances such as some treated timber products; and
(h) Prioritising the use of low impact timber products including low emission composite timber in construction and major event overlay activities, and timber from managed sustainable sources (verifiable where possible via a chain of custody process) - ensuring no imported or local rainforest timber is used in developments or other activities.
4.4 Waste Management

Industrialised countries across the world are increasingly adopting ‘zero’ or ‘low’ waste strategies, in recognition of the major environmental impacts of cradle-to-grave waste flows (to landfill or incineration). Reducing waste in turn improves conservation of our natural resources and minimises the environmental harm from disposal of solid waste – this is particularly important with a growing population in NSW and a healthy economy that is producing more goods and services. Waste reduction and recycling can avoid greenhouse gas, save water and energy, conserve virgin resources and improve the health of our soils.

The Sydney Olympic Park Authority's current waste management approach focuses on all three components of the low waste strategy – reduce the creation of waste; then reuse any waste; then recycle as much as possible of what if anything is left over. Sydney Olympic Park Authority aims to minimise waste from all new developments and activities, maximise the use of recycled materials, and generally promote a reduction in the amount of solid waste going to landfill. Sydney Olympic Park Authority's primary reference document for waste management is its Waste Reduction and Purchasing Plan.

Sydney Olympic Park Authority oversees about 106 hectares of remediated landfill areas and closely manages all aspects of their containment and liquid waste management to best practice standard. Waste liquid (leachate) is mostly disposed of to a liquid waste treatment plant and subsequently the treated water is sent to sewer. Sydney Olympic Park Authority is currently using bio-remediation methods and evaporation ponds for treatment of leachate in some areas, and is pursuing alternative leachate treatment and reuse options (instead of the treatment plant and sewer process) for the future, to enhance the environmental sustainability of the whole landfill remediation process.

Waste Management Objectives

Sydney Olympic Park Authority seeks to effectively promote and support increased economic development and precinct visitation while achieving reductions in overall waste production, and increases in waste stream recycling. In pursuit of this objective, wherever possible Sydney Olympic Park Authority is committed to:

(a) Maximising appropriate opportunities to increase the proportion of recycling for waste produced in the public domain including green waste collection, re-use, and composting;

(b) Requiring waste management performance and recycling targets for all developments throughout design, construction and operational activities, with a minimum of 80 percent of construction and demolition waste to be recycled or re-used for each development;

(c) Encouraging public domain concessionaires and service providers to minimise where practical the packaging of foodstuffs for visitor consumption, and otherwise to use non-toxic, recyclable, and biodegradable packaging and materials for their products;

(d) Educating visitors, workers and residents regarding waste minimisation and management issues, and working in cooperation with venues and businesses to minimise waste generation and maximise recycling of materials; and

(e) Maximising appropriate opportunities to improve the sustainability of leachate treatment and disposal methods.
4.5 Transport

Globally, energy efficient transport and a lower dependence on private vehicles are indicators of more sustainable communities, however to get increased take-up in the use of public transport requires highly efficient and reliable transport services. Urban sprawl in Sydney and other large metropolitan cities worldwide – without matching upgrades in public transport - has influenced an increase in the dependence on the motor vehicle for work and recreation trips. This in turn increases demand for fossil fuel and road-based infrastructure. Burning fossil fuel has local air pollution and health consequences and wider implications as a source of greenhouse gas pollution. Road infrastructure can have substantial environmental impacts including loss of habitat, disruption to ecological corridors, contributing to water pollution, and loss of amenity.

The town centre of Sydney Olympic Park was purpose designed to efficiently and effectively move very large crowds into and out of the Park during major events and as such encourage extensive use of public transport to and from the Park. Investment in public transport infrastructure at the Park has significantly reduced the environmental impact of hosting major events through reductions in private vehicle use, and the resultant reduction in otherwise comparable greenhouse gas emissions and air pollution. The future traffic generation from development of Sydney Olympic Park’s commercial and residential precincts will add to the established major event activity and increase pressure on local and regional traffic and transport networks.

Transport Management Objectives

Sydney Olympic Park Authority seeks to effectively promote efficient and reliable transport services in order to minimise increases in base road traffic demand and to significantly increase the proportion of visitors and workers arriving by public transport. In pursuit of this objective, wherever possible Sydney Olympic Park Authority is committed to:

(a) Establishing Sydney Olympic Park as a destination where the option for travel by public transport is well supported for event patrons and commuters; and transport plans include strategies to reduce car dependency.

(b) Applying ‘demand management’ techniques (including integrated ticketing, car-parking controls, priority bus lanes, etc) that encourage public transport use and discourage excessive road based private transport accessing Sydney Olympic Park – particularly during peak commuter times and major events periods.

(c) Coordinating appropriate road traffic and public transport infrastructure improvements and refinements to reflect changes in the form and function of Sydney Olympic Park and evolving community attitudes to more sustainable transport options.

(d) Promoting and supporting innovative transport modes, sustainable transport technologies, and the use of alternative fuels.

(e) Designing new developments at Sydney Olympic Park to be as ‘walkable’ as possible, connecting transport nodes to walk-ways and cycle-ways, and ensure cycle-ways accommodate the needs of recreational cyclists, pedestrians and workplace commuters.
4.6 Pollution Control

The introduction of chemical or energy contaminants into the environment can - when in excess of natural levels - cause harm to human health, other living organisms, and the environment generally. Land remediation and other forms of urban renewal are important ways of decontaminating places for reuse, and improving the social and environmental well-being of inhabitants, and creating new habitats. The impact of pollution including noise, heat, and light and the contamination of air and water heightens the potential for increased disruption to peoples work and leisure activities, and ecosystems.

Sydney Olympic Park experiences the full range of regional and local air quality, noise, heat, and light impacts each day. The Park itself is subject to the typical urban noise from roads, rail and aircraft, and in addition as a major events precinct is sometimes a generator of loud noise and bright light outside normal working hours – in the event venues themselves and in the public domain. There is also significant sports and entertainment event activity during most day-times mid-week and on weekends which have the potential to impact on the growing worker and resident population of Sydney Olympic Park. The Parklands in contrast are usually more peaceful and serene with less visitor density and less intense forms of use, though they can be affected by activities and events elsewhere in the Park. Sydney Olympic Park Authority's primary reference documents for pollution control are its Remediated Lands Management Plan, Noise Management Guidelines, Environmental management System incorporating a Work Permit System.

Pollution Control Objectives

Sydney Olympic Park Authority seeks to work within its span of control and influence, to effectively manage compliance with applicable noise, air, light, and water quality standards while balancing the different and sometimes conflicting roles of Sydney Olympic Park and the interests of different stakeholders. In pursuit of this objective, wherever possible Sydney Olympic Park Authority is committed to:

(a) Complying with all relevant statutes and regulatory requirements;
(b) Minimising light pollution by limiting use of lights at inappropriate times, locations, and intensities; and avoiding loss of habitat values or natural ambience for open spaces;
(c) Promoting the design and physical construction of new buildings so that they mitigate environmental impacts associated with major events;
(d) Managing remediated landfills and leachate systems to ensure their integrity is maintained, human health and the environment is protected, and statutory compliance is achieved;
(e) Ensuring development, operations, and event activities do not adversely impact on the water quality of wetlands and watercourses; and
(f) Validating all soils and ‘fill’ materials proposed to be imported into Sydney Olympic Park, and reject those that are not free from contamination.
4.7 Biodiversity

Biodiversity loss is occurring world-wide. The Millennium Ecosystems Assessment has found that human actions are fundamentally, and to a significant extent irreversibly, changing the diversity of life on earth, and most of these changes represent a loss of biodiversity. Change in important components of biodiversity were more rapid in the last 50 years than at any time in human history. Drivers of biodiversity loss and ecosystems services change include: habitat change, climate change, invasion of alien species, and pollution. Australia is one of the twelve most biologically diverse countries in the world.

Sydney Olympic Park contains high species diversity and abundance, including species of local, regional, national and international significance. Native species and remnant ecosystems have been actively conserved and their distribution extended throughout redevelopment of the Park. The Sydney Olympic Park Authority's management programs seek to continue to conserve and enhance the biological diversity and ecological integrity of the Park. Sydney Olympic Park Authority's primary reference document for biodiversity management is its Biodiversity Management Plan.

Biodiversity Objectives

Sydney Olympic Park Authority seeks to appropriately monitor, conserve and enhance wildlife habitat, and the stability of remnant ecological communities and flora and fauna populations where landscapes are largely constructed and levels of visitation and development are increasing significantly. In pursuit of this objective, wherever possible Sydney Olympic Park Authority is committed to:

(a) Protecting and enhancing the natural heritage and ecological integrity of Sydney Olympic Park – targeting priority species and communities, places of high biodiversity value, and biodiversity generally;
(b) Applying an adaptive management approach to stewardship of Sydney Olympic Park’s biodiversity assets;
(c) Ensuring conservation of biological diversity and ecological integrity is a fundamental consideration for new developments, activities, levels or types of use, or management practices that affect the ecosystems of Sydney Olympic Park;
(d) Promoting the ecological, aesthetic and educational value of an urban site with high species diversity and abundance;
(e) Conserving and enhancing the remnant woodland and wetland habitats of Newington Nature Reserve in accordance with the Newington Nature Reserve Plan of Management, and managing adjoining lands in sympathy with the Reserve; and
(f) Maximising the habitat values of native plantings by promoting priority species and communities, providing structural complexity and plant species diversity, avoiding habitat fragmentation; promoting habitat linkages and large core areas; and prioritising the use of indigenous species in landscape planting schemes in the Parklands.

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4.8 Public Open Space

Globally there is an increasing appreciation and understanding that parks and open spaces are of immense value to communities. Public lands that are readily accessible, well furnished, with a diversity of spaces, and a rich heritage, present multiple environmental, educational and recreational opportunities. Public land also provides substantial social benefits and contributes significantly to the health and well-being of individuals. Public open space is now recognised in urban environments as an important ecological, economic, psychological and social resource.

Sydney Olympic Park includes over 500 hectares of public open space comprised of parklands (with over 300 hectares of natural areas) and urban public domain. In 2006 there were in excess of 8 million visitors for the year. The Park includes a diversity of leisure activity spaces; habitat for several protected species and communities; and significant heritage buildings, landscapes and artifacts. Key features include the former State Abattoirs; the former State Brickworks, and the former Royal Australian Navy Armaments Depot.


Public Open Space Objectives

Sydney Olympic Park Authority seeks to encourage the appropriate use of the parklands and urban public domain while carefully balancing conflicting interests to ensure preservation of social capacity, protection of unique and important elements, and conservation of heritage and habitats – without any net loss of public open space. In pursuit of this objective, wherever possible Sydney Olympic Park Authority is committed to:

(a) Promoting and increasing the recreational, historical, scientific, educational and cultural values of the parklands, while recognising the intrinsic values of public open space in addition to its utility services values;

(b) Encouraging the appropriate use, benefit and enjoyment of the parklands by the public, facilitating opportunities to improve physical health and well-being, social cohesion, cultural expression, and a diversity of leisure experiences;

(c) Maintaining public access to the parklands whilst ensuring the protection, restoration, and improvement of the environmental features, heritage items, and ecological elements;

(d) Ensuring wherever possible that spaces are used and managed in such a way that both the land and its natural resources (including water, soil, flora, fauna and scenic quality) are sustained in perpetuity; and

(e) Protecting and enhancing the natural and cultural (Aboriginal and non-Aboriginal) heritage of the Park, particularly the Parklands;

(f) Giving priority to multi-use of places and spaces, and avoiding where possible the occupation or disposal of public open space for purely private purposes.
PART 5: CONCLUDING COMMENTS

Sydney Olympic Park occupies a special place in the heart of most Australians. It is a place where Olympic dreams were fulfilled and where Australia showed the world that, in addition to its talented athletes, it was a modern, innovative and capable nation.

The challenge of living in harmony with the environment has not diminished since the 2000 Olympic Games which were widely perceived as ‘the green games’. In fact it can be argued that this issue remains the greatest challenge of humanity. Therefore it is crucial to build on the standards of the Environmental Guidelines for the Summer Olympic Games (1993) to continue the effort to make and sustain Sydney Olympic Park a place, which inspires others through its environmental innovation and high standards.

The Environmental Guidelines for Sydney Olympic Park will support and progress the transition of Sydney Olympic Park from a major venue based sports and entertainment destination into a multifunctional modern new township in addition to its premier major events precinct and world class regional parklands precinct with high biodiversity values.

PART 6: DEFINITION OF ‘PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT’

The NSW Local Government Act (1993) defines the principles of ecologically sustainable development (ESD) as follows:

“Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes.

Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

(a) The precautionary principle — namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
   (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
   (ii) an assessment of the risk-weighted consequences of various options,

(b) Inter-generational equity — namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations,

(c) Conservation of biological diversity and ecological integrity — namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) Improved valuation, pricing and incentive mechanisms — namely, that environmental factors should be included in the valuation of assets and services, such as:
   (i) polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
   (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
   (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.”