LODDON SHIRE COUNCIL

CLIMATE PROOFING SPORT & RECREATION FACILITIES STRATEGY

May 2011

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

LODDON SHIRE

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1.0 Executive Summary

Arguably the most important social institutions in the small communities of Loddon are its sports clubs. Sports clubs provide opportunities for local people of all ages and abilities to come together to take part in, support or watch physical activities such as lawn bowls, tennis, golf, netball, hockey, cricket and football.

Whilst there are many health benefits associated with being physically active, the social benefits of getting together on a regular basis with friends and neighbours cannot be overstated. These social gatherings provide opportunities for people to have some fun, share experiences, talk over some of their problems, or simply enjoy escaping from the daily pressures of work and life. Without access to sports facilities (which are nearly all very dependent on water), life for many people in Loddon Shire would be significantly degraded.

Further, lack of lifestyle opportunities such as the availability of sports clubs will make it harder to attract new residents and businesses to the area and may even result in a population decline. This in turn impacts negatively on all aspects of the region, including schools, health services, existing businesses, existing sports clubs and other community organisations.

In recent years, sports clubs in Loddon Shire have faced many challenges such as declining population levels, ageing of the community, maintenance and replacement of ageing infrastructure, increased number of regulations, etc. However, one of the biggest challenges of all has been climate change and the impact of a ten year drought. Climate change has had a significant impact on the ability of sport and recreation clubs to access water to maintain sports grounds to a satisfactory standard. Rainfall levels have decreased, temperatures have increased and access to potable or irrigation water through water authorities has decreased.

According to *Climate Change in Australia*[1], global warming has contributed to reduced rainfall across southern Australia, with a 30% decrease in storm growth measured in the past 30 years. At the same time, the average temperature in Australia has increased 0.9 degrees Celsius. Accompanying these climatic changes, local water authorities have implemented water restrictions across Loddon Shire, reducing the amount of water available for irrigation of farms, residences and sports grounds.

All of these factors combined have resulted in sports grounds:

- drying out more quickly from higher temperatures
- receiving less natural irrigation through rainfall
- exposed to deteriorating quality of water and water security from the Loddon River
- having limited or even no access to water from water authorities due to water restrictions and low storage levels in reservoirs
- providing hard, uneven and potentially dangerous playing surfaces

[1] *Climate Change in Australia*, CSIRO, 2007

This strategy has identified a number of works to reduce water use; to increase the security of supply of water; and reduce leakage of storage systems at sport and recreation facilities in Loddon Shire, with the ultimate aim of 'drought proofing' sports facilities. The implementation of water saving measures such as water tanks, warm season grasses, in-ground irrigation systems, thermal pool blankets, etc will reduce the amount of water required and also reduce ongoing operational costs; thereby improving the ongoing financial viability of some clubs.

When implemented, the actions will allow sport and recreation facilities to be developed and maintained to a safe standard for all year use in the Loddon Shire community and in some instances will help to reduce ongoing operational costs (both human and financial), thereby helping to retain these invaluable community assets for the next generation.

The works proposed in this Strategy are therefore designed to 'climate proof' as many sporting facilities in Loddon Shire as possible and at the same time help communities to retain their invaluable sport and recreation assets.

2.0 Introduction

Loddon Shire is located in north-west Victoria, 175km from Melbourne. It covers an area of approximately 6,700 square metres and features agriculture as its predominant industry. According to the Australian Bureau of Statistics' Index of Relative Socio-Economic Disadvantage score, Loddon Shire is one of the most disadvantaged local government areas in Victoria.

Loddon Shire currently has a population of approximately 8,073 people[2]. Whilst the number of older adults in the community, those over 65 years of age, is expected to increase considerably (from 20.6% to 31.1%[3]), the overall population is expected to decrease by approximately 299 people to 7,774 by 2026[4]. Areas most likely to record growth are the larger centres such as Wedderburn and Boort, as well as areas closer to Bendigo such as Inglewood[5].

Funded by the Federal Department of Environment, Water, Heritage and the Arts and the Shire of Loddon, the aim of this Strategy is to identify ways in which to 'drought-proof' sport and recreation facilities in Loddon Shire. The term 'drought-proofing', refers to positioning recreation reserves so that they have the best chance possible to withstand periods of low rainfall and reduced supply from other water sources, using all available resources.

There are 46 sport and recreation facilities across Loddon Shire that the Council wishes to drought proof through this project, to ensure that these facilities are able to be used by communities in the long term. These facilities include ovals used for football and cricket; hockey pitches; croquet greens; lawn bowls greens; tennis courts; swimming pools; and Little Lake Boort, which is used for recreational activities and irrigation of sporting facilities.

This project involved reviewing water and turf management practices of the 46 specified turf based playing fields / swimming facilities in Loddon Shire with a view to identifying:

- Options to reduce water use, e.g. installation of improved irrigation systems, installation of thermal swimming pool blankets, development of hard courts, installation of water efficient appliances, etc.
- Options to access more alternative sources of water, e.g. storm water, rainwater and recycled water.
- Improved turf management practices, e.g. most appropriate types of turf to reduce water use, yet provide a quality playing surface.
- Enhanced Turf maintenance schedules to ensure that playing surfaces are maintained in optimum condition, within resources available.
- Long term facility requirements to increase sustainability of clubs, e.g. extension to club rooms, decommissioning of tennis courts and development of shared courts, improved landscaping and play opportunities, etc.

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[2] Australian Bureau of Statistics – *National Regional Profile: Loddon (S) (Local Government Area)* – Released 29/04/2010: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/LGA23940Population/People12004-2008?opendocument&tabname=Summary&prodno=LGA23940&issue=2004-2008

[3] *Victoria in Future 2006-2026: Loddon* - Victorian State Government (2008)

[4] *Victoria in Future 2006-2026: Loddon* - Victorian State Government (2008)

[5] *Town Trends* – Loddon Shire Council (2006): http://www.loddon.vic.gov.au/Files/TownTrends.pdf

These 46 playing fields / swimming pools include:

- Bears Lagoon Tennis Club
- Boort Bowls Club
- Boort Croquet Club
- Boort Park (football, cricket and hockey)
- Boort Swimming Pool
- Boort Tennis Club
- Bridgewater Bowls Club
- Bridgewater Recreation Reserve (football, cricket)
- Calivil Recreation Reserve (football, cricket, tennis, bowls)
- Donaldson Park, Wedderburn (football, tennis, bowls and hockey)
- Inglewood Bowls Club
- Inglewood Recreation Reserve (football, cricket, tennis)
- Inglewood Swimming Pool
- Janiember Recreation Reserve, Serpentine (football)
- Korong Vale Recreation Reserve (bowls and tennis)
- Little Lake Boort
- Market Square, Wedderburn (cricket)
- Mitchell Park, Pyramid Hill (football, cricket)
- Mitiamo Recreation Reserve (football and tennis)
- Mitiamo Swimming Pool
- Newbridge (football, cricket, tennis)
- Pyramid Hill Bowls and Tennis Complex
- Pyramid Hill Swimming Pool
- Serpentine Bowls and Tennis Complex
- Wedderburn Swimming Pool
- Winzar Recreation Reserve, Dingee (cricket, bowls and tennis)

The strategies identified for each site have been incorporated into 20 individual master plans for sport and recreation clubs in Loddon Shire. These master plans should be read in conjunction with this overview report.

2.1 Methodology

In order to develop a Strategy to 'drought-proof' sport and recreation facilities in the Loddon Shire, the project team undertook the following tasks:

Turf Management

- Assessed the type of turf currently planted on sports fields throughout the Shire
- Identified the most appropriate type of turf or surface for each sporting field
- Identified suitable maintenance regimes to improve the quality of playing surfaces

Water Management

- Assessed the amount of water currently used to irrigate sports fields
- Assessed the source of water for each sports field
- Identified the amount of water required for each sports field
- Identified water saving initiatives to reduce the amount of water required for sports fields
- Identified alternative sources of water for sports fields

Sports Infrastructure and Management

- Surveyed Sports and Recreation Clubs
- Reviewed Club and Community Planning Documents
- Met on site with Club Represenatives and Interviewed Key Stakeholders
- Physically Audited Club Facilities
- Identified Improvements to Increase Sustainability of Clubs

3.0 Context

A wide variety of reports were reviewed in order to identify relevant policies and strategic directions that may impact upon the drought-proofing of recreation reserves in Loddon Shire. A detailed literature review is included within the Appendix of this report. A summary of key aspects of the literature is as follows:

3.1 Sustainable Water Use Plan

The aim of Loddon Shire's *Sustainable Water Use Plan (2006-2011)* is to review and improve the management of water used by and billed to the Shire. The actions contained within the report are designed to reduce overall water consumption and substitute potable water with sustainable alternatives such as recycled water, stormwater and rainwater. It is anticipated that the Shire's 'standard' (i.e. typical year without restrictions) annual potable water use of 79,000kL could potentially reduce by at least 15% by 2011.

The report noted that Loddon Shire's potable water use is already between 50-75% less than some other Victorian Local Government Authorities.

Recreation reserve facilities identified as using the most potable water in Loddon Shire include Inglewood Recreation Reserve sports oval and tennis courts. In order to reduce water at this site, the plan recommends that a permanent water savings plan be implemented and that the Committee of Management undertake training in best practice for watering of sports grounds. The plan also recommends that night time pop-up sprinklers are installed at the site to reduce water use. This application also supports the installation of a new, more water efficient irrigation system at Inglewood Recreation Reserve.

Swimming pools were also identified as a major user of potable water in Loddon Shire. The swimming pool blankets proposed in this application will help to reduce the amount of evaporation from swimming pools and hence the amount of water required to fill each pool to the required levels.

The plan also proposes that catchment channels to the two reservoirs in Wedderburn are reinstated to allow more storm water run-off to be captured and retained for use on sporting facilities such as Donaldson Park (a regional level sports facility incorporating football, hockey, tennis, bowls and netball). This action is likely to reduce the amount of potable water that would otherwise be used by approximately 5ML annually. This funding application proposes to upgrade the Skinners Flat Reservoir to prevent leakages and thereby retain more stormwater.

Further, the plan states that best practice Council water management policies should be introduced across all departments in the Shire. Water Management policies include the installation of AAA rated appliances (such as low flow shower heads and dual flush toilets in sports club change rooms) and the preference for alternative sources of water, such as rainwater, stormwater or recycled water, wherever possible. Each of these practices is proposed within this funding application.

Loddon Shire's *Sustainable Water Use Plan (2006-2011)* recognises that there will be less water available in the future for the maintenance of Council's assets, such as parks and gardens; municipal officers,

caravan parks, swimming pools, fire tracks and sport and recreation reserves. In order to address a future with less water, Council has committed to train shire staff and asset managers in sustainable water application to grassed areas. It has also identified that one of the major barriers to savings water is poor communication. To address this issue, Council has committed to designating specific officers to monitor water consumption and provide feedback to Councillors and other key stakeholders. Further, Council has committed to taking on a leadership role so that any contractors appointed by the Shire will need to identify water saving measures in the design of assets (such as water tanks, stormwater harvesting, AAA rated water supply appliances, drought tolerant grasses, etc) and implement water savings measures during the construction of assets.

3.2 Position Document Water Security for Urban Communities

Loddon Shire has also produced a document titled *Position Document Water Security for Urban Communities*. In this document, Council states that it wishes to develop a partnership with Coliban Water to ensure that at least one sporting facility / public open space is provided with sufficient water to be retained in good playing condition. Hence the ability to reduce water use at all sporting facilities, but particularly secondary facilities, is critical if decisions need to be made in the future of how to distribute limited water resources.

3.3 Climate Change Adaptation Plan

Another related document is Loddon Shire's *Climate Change Adaptation Plan 2009*. One of the key actions identified in this document is the need to assist the Loddon community to understand and adapt to climate change, through leading by example. By installing water saving measures at the sport and recreation sites identified in this funding application; by ensuring training sessions are held with committee of management members; and by ensuring that suitable media coverage is attained explaining why it is important to undertake such measures, it is hoped that the community will become more aware of the climatic changes occurring globally and will understand that there will be less water available for sport and recreation facilities (as well as agricultural pursuits) in the Loddon area in the future.

4.0 Sustainable Turf Management

Natural grass sports facilities are vital for the provision of sport in any community. The development of these facilities generally requires considerable investment by municipal bodies and local communities. This investment can be wasted if inadequate resources are not available for on-going management.

The management of sports turf areas needs to be seen as a specialised skill utilising appropriate grass types that can tolerate drier conditions yet still provide good quality playing surfaces throughout the year. This will involve supplying appropriate resources such as fertilisers, irrigation, weed and pest management, and mowing, on a regular basis. The excessive limiting of any of these inputs will reduce te ability of the turf to provide the desired grass cover needed for active sports use.

In any management program, the fertiliser inputs should be based on the analysis of the existing soil conditions, so that deficiencies can be corrected and the application of abundant nutrients can be reduced. It is recommended that annual soil analyses should be carried out prior to the development of the fertiliser program. No soil testing or analysis was carried out as part of this project, so no on-going nutrient recommendations can be made.

4.1 Turf Management Gaps and Opportunities in Loddon Shire

Gap	Opportunity
Council allocates a specific amount of money to each Committee of Management without tagging any specific amount for the playing surface or stipulating any specific maintenance procedures	Council to specify a standard maintenance program and allocate a specific amount of money for the playing surface
Although clubs are required to inspect a ground before playing and sign documentation to state that the ground is considered suitable, there is no regular assessment of turf facilities by Council. This type of assessment is important from a risk management point of view.	Council to undertake regular assessment of all playing surfaces. Committees of Management to continue to assess and sign off on the playing surface before use (sports fields and tennis courts).
There is a lack of basic turf management knowledge by Committees of Management (e.g. use of pasture ryegrass, non turf registered herbicides and insecticides, inappropriate fertilisers, no soil testing etc.) throughout the region.	Closer relationship is required between Council's Turf Manager and Committees of Management in relation to maintenance programs. Consider holding a regional seminar to help educate Committees of Management on turf maintenance practices.

4.2 Estimated Irrigation Requirements for Cool and Warm Season Turf

The estimated water use and irrigation requirement of cool and warm season sports fields were calculated. The model used is based on evaporation, rainfall and turf grass crop factors.

- ***Weather Data:*** Evaporation and rainfall data were obtained from the nearest Bureau of Meteorology stations; evaporation from Pyramid Hill (1969 – 1993) and rainfall from Boort (1981 – 2010)

- ***Crop Factors:*** The crop factor is the proportion of water used by a plant compared to the depth of water evaporated from a Class 'A' pan.

  Sportsfields: Crop factors range from 0.4 to 0.6 for warm-season and from 0.7 to 0.8 for cool-season turf under survival conditions and normal maintenance (strong to vigorous growth) respectively. Under survival conditions the sportsfield cannot tolerate any wear and will be more prone to summer stresses (i.e. heat) and disease

  Couchgrass Bowling Greens & Tennis Courts: Crop factors range from 0.8 for normal maintenance (strong to vigorous growth) to 0.5 for a green under survival conditions. Under survival conditions the green / court cannot be used as it cannot tolerate any wear and will be more prone to summer stresses (ie. heat) and disease.

- ***Turf Water Use:*** The water used by a turf (evapotranspiration) is calculated by multiplying evaporation by the crop factor and needs to be supplied by either rainfall or irrigation.

- ***Theoretical irrigation requirement:*** The amount of irrigation required is calculated by subtracting the rainfall from the water used by the turf. The volume of irrigation required can then be calculated given 1 L equals 1 mm of water over $1m^2$.

The annual irrigation requirement is;

Sportsfields

Maintenance		***Survival***	
Cool season turf	**9.9 ML/ha/year**	***Cool season turf***	**8.3 ML/ha/year**
Warm season turf	**6.8 ML/ha/year**	***Warm season turf***	**3.8 ML/ha/year**

Couchgrass Bowling Greens & Tennis Courts (warm season grasses)

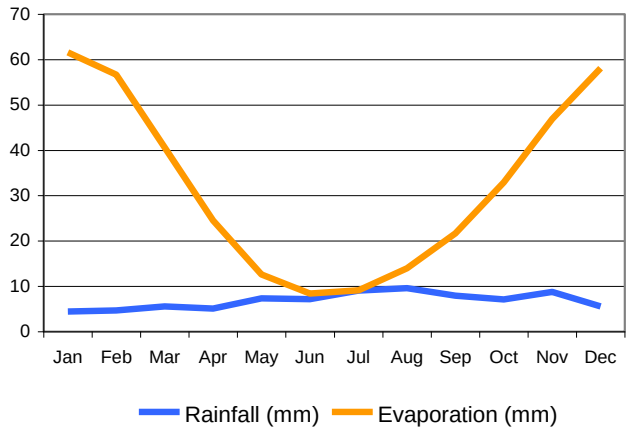
Maintenance	**9.9 ML/ha/year**	***Survival***	**5.3 ML/ha/year**

It should be noted that the calculated (theoretical) irrigation requirement is generally significantly less than the actual amount used in practice due to inherent inefficiencies in sprinkler distribution, the affect of wind on distribution and non-effective rainfall (i.e. deep drainage, runoff, evaporation etc.). The actual irrigation requirement also assumes the incidence of average rainfall and in a drought year this is an under estimate.

4.3 Estimated Water Requirements: Sports Fields (Normal Maintenance)

Mean Weekly Rainfall & Evaporation - Loddon Shire

Month	Rainfall mm	Evap. mm
January	4.5	61.6
February	4.7	56.7
March	5.6	40.6
April	5.1	24.5
May	7.3	12.6
June	7.1	8.4
July	9.1	9.1
August	9.6	14.0
September	7.9	21.7
October	7.1	32.9
November	8.8	46.9
December	5.6	58.1
Annual	**359**	**1,676**



Warm Season Turf (Crop Factor = 0.6)

Month	Weekly Turf Water Req. mm/week	Weekly Turf Irrig. Req. mm/week	Weekly Turf Irrig. Req. ML/ha/week	Monthly Turf Irrig. Req. ML/ha/month
January	37.0	**32.5**	**0.32**	**1.44**
February	34.0	**29.4**	**0.29**	**1.17**
March	24.4	**18.8**	**0.19**	**0.83**
April	14.7	**9.6**	**0.10**	**0.41**
May	7.6	**0.2**	**0.00**	**0.01**
June	5.0	-2.1	-0.02	-0.09
July	5.5	-3.6	-0.04	-0.16
August	8.4	-1.2	-0.01	-0.05
September	13.0	**5.1**	**0.05**	**0.22**
October	19.7	**12.6**	**0.13**	**0.56**
November	28.1	**19.4**	**0.19**	**0.83**
December	34.9	**29.3**	**0.29**	**1.30**
				6.77

Shaded values indicate irrigation required

Cool Season Turf (Crop Factor = 0.8)

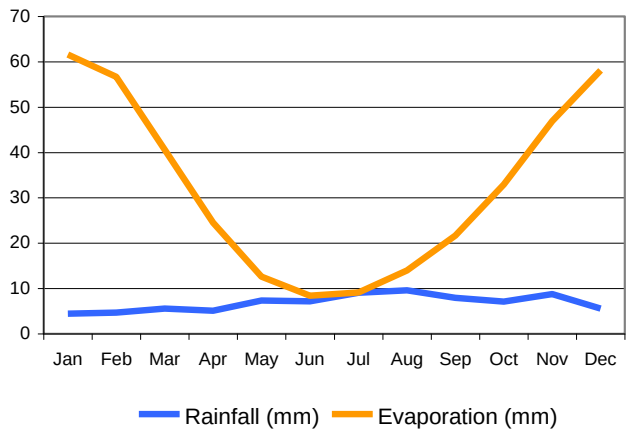
Month	Weekly Turf Water Req. mm/week	Weekly Turf Irrig. Req. mm/week	Weekly Turf Irrig. Req. ML/ha/week	Monthly Turf Irrig. Req. ML/ha/month
January	49.3	**44.8**	**0.45**	**1.98**
February	45.4	**40.7**	**0.41**	**1.63**
March	32.5	**26.9**	**0.27**	**1.19**
April	19.6	**14.5**	**0.15**	**0.62**
May	10.1	**2.7**	**0.03**	**0.12**
June	6.7	-0.4	0.00	-0.02
July	7.3	-1.8	-0.02	-0.08
August	11.2	**1.6**	**0.02**	**0.07**
September	17.4	**9.4**	**0.09**	**0.40**
October	26.3	**19.2**	**0.19**	**0.85**
November	37.5	**28.7**	**0.29**	**1.23**
December	46.5	**40.9**	**0.41**	**1.81**
				9.92

Shaded values indicate irrigation required

4.4 Estimated Water Requirements: Sports Fields (Survival)

Mean Weekly Rainfall & Evaporation - Loddon Shire

Month	Rainfall mm	Evap. mm
January	4.5	61.6
February	4.7	56.7
March	5.6	40.6
April	5.1	24.5
May	7.3	12.6
June	7.1	8.4
July	9.1	9.1
August	9.6	14.0
September	7.9	21.7
October	7.1	32.9
November	8.8	46.9
December	5.6	58.1
Annual	**359**	**1,676**



Warm Season Turf (Crop Factor = 0.4)

Month	Weekly Turf Water Req. mm/week	Weekly Turf Irrig. Req. mm/week	Weekly Turf Irrig. Req. ML/ha/week	Monthly Turf Irrig. Req. ML/ha/month
January	24.6	**20.2**	**0.20**	**0.89**
February	22.7	**18.0**	**0.18**	**0.72**
March	16.2	**10.7**	**0.11**	**0.47**
April	9.8	**4.7**	**0.05**	**0.20**
May	5.0	-2.3	-0.02	-0.10
June	3.4	-3.8	-0.04	-0.16
July	3.6	-5.4	-0.05	-0.24
August	5.6	-4.0	-0.04	-0.18
September	8.7	**0.7**	**0.01**	**0.03**
October	13.2	**6.0**	**0.06**	**0.27**
November	18.8	**10.0**	**0.10**	**0.43**
December	23.2	**17.7**	**0.18**	**0.78**
				3.80

Shaded values indicate irrigation required

Cool Season Turf (Crop Factor = 0.7)

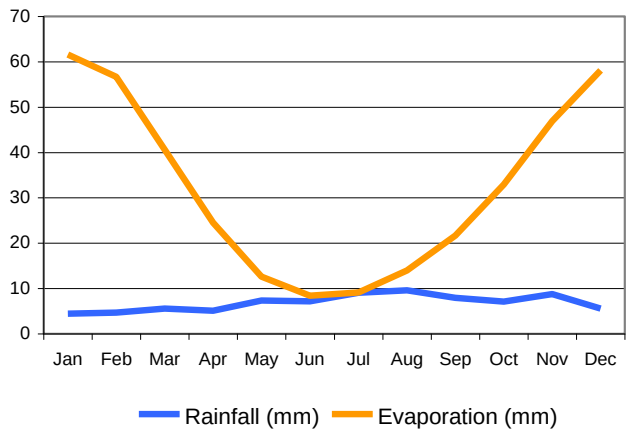
Month	Weekly Turf Water Req. mm/week	Weekly Turf Irrig. Req. mm/week	Weekly Turf Irrig. Req. ML/ha/week	Monthly Turf Irrig. Req. ML/ha/month
January	43.1	**38.6**	**0.39**	**1.71**
February	39.7	**35.0**	**0.35**	**1.40**
March	28.4	**22.9**	**0.23**	**1.01**
April	17.2	**12.1**	**0.12**	**0.52**
May	8.8	**1.5**	**0.01**	**0.07**
June	5.9	-1.3	-0.01	-0.05
July	6.4	-2.7	-0.03	-0.12
August	9.8	**0.2**	**0.00**	**0.01**
September	15.2	**7.3**	**0.07**	**0.31**
October	23.0	**15.9**	**0.16**	**0.70**
November	32.8	**24.1**	**0.24**	**1.03**
December	40.7	**35.1**	**0.35**	**1.55**
				8.32

Shaded values indicate irrigation required

4.5 Estimated Water Requirements: Bowling Greens and Tennis Courts

Mean Weekly Rainfall & Evaporation - Loddon Shire

Month	Rainfall mm	Evap. mm
January	4.5	61.6
February	4.7	56.7
March	5.6	40.6
April	5.1	24.5
May	7.3	12.6
June	7.1	8.4
July	9.1	9.1
August	9.6	14.0
September	7.9	21.7
October	7.1	32.9
November	8.8	46.9
December	5.6	58.1
Annual	**359**	**1,676**



Couchgrass - Normal Maintenance (Crop Factor = 0.8)

Month	Weekly Turf Water Req. mm/week	Weekly Turf Irrig. Req. mm/week	Weekly Turf Irrig. Req. ML/ha/week	Monthly Turf Irrig. Req. ML/ha/month
January	49.3	**44.8**	**0.45**	**1.98**
February	45.4	**40.7**	**0.41**	**1.63**
March	32.5	**26.9**	**0.27**	**1.19**
April	19.6	**14.5**	**0.15**	**0.62**
May	10.1	**2.7**	**0.03**	**0.12**
June	6.7	-0.4	0.00	-0.02
July	7.3	-1.8	-0.02	-0.08
August	11.2	**1.6**	**0.02**	**0.07**
September	17.4	**9.4**	**0.09**	**0.40**
October	26.3	**19.2**	**0.19**	**0.85**
November	37.5	**28.7**	**0.29**	**1.23**
December	46.5	**40.9**	**0.41**	**1.81**
				9.92

Shaded values indicate irrigation required

Couchgrass - Survival (Crop Factor = 0.5)

Month	Weekly Turf Water Req. mm/week	Weekly Turf Irrig. Req. mm/week	Weekly Turf Irrig. Req. ML/ha/week	Monthly Turf Irrig. Req. ML/ha/month
January	30.8	**26.3**	**0.26**	**1.17**
February	28.4	**23.7**	**0.24**	**0.95**
March	20.3	**14.7**	**0.15**	**0.65**
April	12.3	**7.2**	**0.07**	**0.31**
May	6.3	-1.0	-0.01	-0.05
June	4.2	-2.9	-0.03	-0.13
July	4.6	-4.5	-0.05	-0.20
August	7.0	-2.6	-0.03	-0.12
September	10.9	**2.9**	**0.03**	**0.13**
October	16.5	**9.3**	**0.09**	**0.41**
November	23.5	**14.7**	**0.15**	**0.63**
December	29.1	**23.5**	**0.23**	**1.04**
				5.28

Shaded values indicate irrigation required

4.6 Recreation Facility Condition Assessment

4.6.1 Sports Fields

Eleven football/cricket fields and two hockey fields are included in this group. At the time of inspection their condition varied widely with Wedderburn-Donaldson Park Football and Mitiamo rated as very good; Boort, Calivil, Donaldson Park Hockey, Newbridge and Pyramid Hill fields were rated as good; Boort Hockey, Bridgewater, Dingee, and Inglewood as poor; and Serpentine Reserve and Wedderburn Market Square as very poor. Most fields have generally good surface levels, and all have localised depressions and minor undulations, but the uneven surface at Boort Hockey, Inglewood and Wedderburn Market Square make the potential for player injury to be quite high. This is contributing to their low condition rating.

Most of the fields have a base of couch with mixes of weeds and ryegrass. It is important to promote the warm-season grass component to form a strong under-storey for the turf and thus stabilise the turf surface during winter. Winzar Recreation Reserve has recently been sown to ryegrass, no doubt to take advantage of seasonal rains, however as it is only used for summer sport, it is more logical to have couch grass. This will need to be established in this coming spring-summer season to provide an alternative to the ryegrass, which will be expected to die out over summer.

Kikuyu should be established into Boort Hockey and Wedderburn Market Square to provide a safe surface for play.

4.6.2 Bowling / Croquet Clubs

Nine bowling clubs were included in this group: Pyramid Hill has two standard sized square greens; Boort, Bridgewater and Wedderburn have one standard and one small green; Inglewood has one long green; while Calivil, Dingee, Korong Vale and Serpentine have one standard square green. Boort Croquet club has one large lawn area. All greens have virtually full cover of couch grass turf, either Santa Ana or Tifdwarf, and except for the small green at Bridgewater, are generally in good condition; these grasses are in dormancy at the present time and play is in recess.

4.6.3 Tennis Clubs

Of the ten tennis clubs in this group, Boort was rated as very good; Bears Lagoon, Dingee and Korong Vale as good; Calivil, Inglewood, Serpentine and Wedderburn as poor; Mitiamo and Pyramid Hill as very poor condition. All courts were predominantly couch grass of some variety. Condition was affected by the presence of weed species, unevenness of the surface and a lack of recent maintenance works e.g. mowing.

4.6.4 Swimming Pool Lawns

The five swimming pool facilities in the Shire at Boort, Inglewood, Mitiamo, Pyramid Hill and Wedderburn were inspected to ascertain the condition of their respective lawn areas. All were in poor to very poor condition.

These lawn areas are for passive use and may be considered to be unimportant however they have a significant effect on the aesthetics and enjoyment of the whole facility. All lawns areas have a dominant cover of kikuyu or couch grass which is ideal for this situation. Weed control and promotion of the existing warm-season grass cover will improve these areas.

4.7 Turf Maintenance

While many outdoor sports are played on grass (turf) surfaces often little consideration is given to the importance of the maintenance of that turf surface. There are several aspects of a turf surface which are frequently overlooked:

- a turf surface is a specialised grass sward;
- it is a living system;
- it is not indestructible;
- like any specialised crop, it needs appropriate care and management;
- if not looked after it will not provide a satisfactory surface.

The grasses used in these turf areas are selected to produce the best surface for the intended sport, and it is essential that the growing period of the grass coincides with the time of use. If a turf surface is used when the grass is not growing, either due to dormancy or inadequate maintenance, then the surface will be damaged.

It is also important to undertake some on-going maintenance throughout the year even though the sports may only use the area for a particular period. Lack of maintenance during the non-playing season will have significant detrimental effects on the performance of the turf during the playing season, e.g. mowing or weed control is needed as required in the off-season.

5.0 Sustainable Water Management

5.1 Water Management Principles

The first step towards 'drought proofing' a sports facility is to ensure sustainable water management principles and practices are in place. It is essential to know what water comes onto the site and what water leaves the site, what the quality of the water is and where water is used on site. Usage and costs need to be measured, monitored and reported on. The persons responsible for the site need to ensure water use is compliant with regulations as well as consider ways to reduce water use and look for alternative sources.

The following key water management principles were used to assist in the development of the water related recommendations for each recreation reserve:

- Assess the need for watering;
- Gain an understanding of how much water is used and how much is required;
- Improve watering practices;
- Improve the water efficiency of playing surfaces;
- Improve the efficiency of systems, equipment and fixtures;
- Improve water security by looking for alternative sources of supply; and
- Implement a strategy for when adequate water is not available.

A brief description of each of these principles and general comments on how these principles were applied to the Loddon Shire Recreation Reserve action plans is provided below.

5.2 Description and Application to Loddon Recreation Reserves

5.2.1 Assess the Need for Watering

A key consideration is to assess and review which areas actually need to be watered. This could include rationalising facilities, rationalising the area requiring irrigation, prioritising sites based on use and importance and assessing the feasibility of installing synthetic surfaces or hard surfaces where appropriate.

Some Tennis Clubs in the Shire have indicated they can get by with a reduced number of tennis courts, thus reducing the total quantity of water required to maintain the facilities at the club.

In some cases synthetic surfaces or hard courts have been recommended, predominantly tennis courts and cricket pitches. This provides the added bonus of year round playing and diversifying the activities played on the synthetic surface.

5.2.2 Understand Water Use and Water Requirement

For those areas that do need watering, it is important to gain an understanding of how much water is currently used, how much is required, where the water is sourced from and the level of water security. Monitoring water on a regular basis allows checking whether the actual watering is as per the water

budget. If there are discrepancies there is then an opportunity to investigate why and take action if required. Discrepancies could be for many reasons including over watering and leakages.

It's also useful to compare the water requirement with the water available for the facility (e.g. volume of any water shares) to assist with the assessment and prioritisation of water supply options.

For many of the recreation reserves assessed, water meters are not installed and water use data was either not available or not provided. Therefore it was difficult to gain an understanding of how much water was being used. With the recent drought and limitations on access to water for many of the clubs, it is likely that playing surfaces were being under-watered.

For the recreation reserves, it has been recommended that formal water use monitoring and annual reporting occurs, whereby clubs provide water readings to Loddon Shire on a regular agreed basis. Loddon Shire would then collate the data and put together a brief water use report annually which could feed into other annual council reporting requirements. This is something that Loddon Shire would need to set up and oversee. This data would then also be available to and be of benefit to each of the Clubs to assist with their own reporting as well as financial and infrastructure operation, maintenance and future planning.

To achieve the above, it is also suggested that one or more water meters may need to be installed. G-MW is likely to provide water meters for all of its customer users in the near future; however this will need to be confirmed with G-MW. Council and/or the clubs may also need to provide some water meters.

A summary of water requirement, water share license, source of water and level of security of supply for each of the recreation reserves is provided in Table 1.

Table 1: Summary of Water Supply Details for Loddon Shire Recreation Reserves

Recreation Reserve	Loddon Shire Priority Rating	Water requirement for a low rainfall year (ML/yr)	Current water share volume (ML)	Town water supply	River water supply	Local catchment dam	Stormwater / roofwater	Borewater	Recycled water	Carted water	Level of current security of supply	Comment on level of security of supply
Bears Lagoon Tennis Club	2	2.3	2		✓						Medium	Can access more water through temporary water market or transfer from farmers, but no other backup option available
Boort Bowls, Croquet & Tennis Complexes	2	11.8	NA		✓						Med-High	Can access more water through temporary water market or transfer from farmers, and receive water through Loddon Shire water share

Recreation Reserve	Loddon Shire Priority Rating	Water requirement for a low rainfall year (ML/yr)	Current water share volume (ML)	Town water supply	River water supply	Local catchment dam	Stormwater / roofwater	Borewater	Recycled water	Carted water	Level of current security of supply	Comment on level of security of supply
Boort Park	2	18.6	12		✓						Med-High	Can access more water through temporary water market or transfer from farmers, and receive water through Loddon Shire water share
Bridgewater Bowls Club	1	2.1	3	✓	✓						Medium	Can access more water through temporary water market or transfer from farmers, town water available as backup option.
Bridgewater Recreation Reserve	1	11.3	16		✓						Medium	Can access more water through temporary water market or transfer from farmers, but no other backup option available
Calivil Recreation Reserve	2	17	12		✓						Medium	Can access more water through temporary water market or transfer from farmers, but no other backup option available
Donaldson Park	1	22.5	NA			✓					Unknown	Reservoir yield is unknown and no water allocation agreement exists.
Inglewood Bowls Club	1	1.9	0	✓						✓	Low	
Inglewood Recreation Reserve	2	14.8	NA			✓					Unknown	Reservoir yield is unknown and no water allocation agreement exists.
KorongVale Bowls and Tennis	1	3.3	0	✓						✓	Low	
Little Lake Boort	2	NA	NA		✓						Medium	
Loddon Swimming Pools	2	NA	NA	✓	✓		✓				Med-High	
Market Square Reserve	2	9.5	NA	✓		✓					Unknown	Reservoir yield is unknown and no water allocation agreement exists.
Mitchell Park Recreation Reserve	2	13.8	6.5		✓						Med-High	Can access more water through temporary water market or transfer from farmers, and receive water through Loddon Shire water

Recreation Reserve	Loddon Shire Priority Rating	Water requirement for a low rainfall year (ML/yr)	Current water share volume (ML)	Town water supply	River water supply	Local catchment dam	Stormwater / roofwater	Borewater	Recycled water	Carted water	Level of current security of supply	Comment on level of security of supply
												share
Newbridge Recreation Reserve	2	11.6	14		✓			✓			Med-High	Can access more water through temporary water market or transfer from farmers, and use on-site bore water as emergency supply
Pyramid Hill Bowls and Tennis Centre	2	10.8	7.5		✓						Med-High	Can access more water through temporary water market or transfer from farmers, and receive water through Loddon Shire water share
Serpentine Recreation Reserve	1	10.7	14		✓						Medium	Can access more water through temporary water market or transfer from farmers, but no other backup option available
Serpentine Tennis and Bowls	1	2.7	unknown	✓	✓					✓	Medium	Can access more water through temporary water market or transfer from farmers, but no other backup option available
Winzar Recreation Reserve	2	15	4		✓						Medium	Can access more water through temporary water market or transfer from farmers, but no other backup option available. Very low water share.
Total		**179.7**	**91**									

5.2.3 Improve Watering Practices

There are a number of ways to improve watering practices of recreation reserves through education, implementing standard procedures, improving irrigation control and providing incentives to users of the particular facility. This is essential in ensuring watering is undertaken responsibly, efficiently and as designed or required. In addition other opportunities to reuse or reduce water use can be pursued such as within clubrooms and in toilets. This assists with raising awareness and setting the standard for those who are responsible for watering sports fields.

Community education is also important to ensure that acceptance and understanding takes place when new water savings initiatives are implemented.

For Loddon Shire recreation reserves, there did not appear any major areas for improving water practices. The key issues for the sites assessed were predominantly access to water and watering infrastructure.

5.2.4 Improve the Condition and Water Efficiency of Playing Surfaces

Conversions, changes and improvements can be made to irrigation areas to reduce the amount of watering required whilst still maintaining it as fit-for-purpose. Strategies include converting ground surfaces from cool season grass cover to warm season grass cover, replacing grassed surfaces with synthetic surfaces where appropriate and implementing appropriate turf management practices.

Section 4.0 and the Appendix provide more details on these strategies. Recommendations on how best to maintain the playing surfaces were provided for most of the recreation reserves assessed. Another key recommendation given was to promote the growth of warm season grasses in spring. This was mainly for football ovals as Bowls and Tennis playing surfaces already consisted of warm season grasses.

5.4.5 Improve the Efficiency of Systems, Equipment and Fixtures

Implement ways to improve the efficiency of systems, equipment and fixtures to reduce the amount of watering used to achieve the same, or an improved result. For irrigation systems this includes improving the design and maintenance of spray irrigation systems and converting from flood irrigation or manual irrigation to automatic in-ground spray irrigation or sub-surface irrigation. For buildings this will include waterless or low water use urinals, dual flush toilets, low water use or timer taps and showerheads.

Further details on different irrigation systems are provided in Section 8 of the Appendix. For some recreation reserves assessed, it was noted that the existing irrigation system was inadequate and in need of repair or replacement. In cases where it was unclear whether replacement was required, it has been recommended that an irrigation specialist assess the system first. Sub-surface irrigation was not recommended for any of the sites assessed, despite the substantial water savings. The biggest limitation with sub-surface irrigation is that it limits the ability to undertake deep aeration which is essential for maintaining playing fields, particularly sports ovals.

Recommendations were provided for many of the sites to replace building water fixtures with more water efficient fixtures. Although the total water savings is small, the cost savings could be significant, particularly as the price of potable water is quite expensive compared with untreated river water. In some cases it would be considered a low priority and could be undertaken during other building upgrades or when the existing fixtures are in need of replacement.

5.4.6 Consider Alternative Sources of Water

The common source of water for many Loddon Shire facilities is treated or untreated water from the river and channel systems or pipelines within the region. Channel and river systems are predominantly operated by Goulburn-Murray Water some townships are supplied by Coliban Water.. Rainwater collected from clubhouse roofs is also common although the amount of rainwater collected and used is minimal compared to what is required to irrigate playing fields. Rainwater is mainly used for building amenities.

Alternative water sources include storm water, groundwater (from bores), grey water and treated wastewater. These options generally have high capital expenditure costs and therefore are generally more appropriate for high priority sites. With these options, additional water storage volume is likely to be required. Implementing alternative sources of water does not reduce overall water consumption, however reduces the pressure

on the water supply system currently in use and increases the security of supply for the site by diversifying the sources of available water These options should be considered after all other strategies have been considered and implemented where applicable and economically viable.

Further details on options for alternative sources of water are provided in Section 8.4. General findings for specific alternative water sources considered in this project include:

- Stormwater capture and reuse was considered for sites with large roof area and hard surface areas (such as netball courts). In all cases, the quantity of water that could be captured was a small percentage of the irrigation requirement and although the option could be implemented as a backup supply, it was not considered a high priority action to implement.
- Treated wastewater options were considered which included discussions with Coliban Water on the potential of treated wastewater for particular towns. No towns indicated treated wastewater to be a viable option for recreation reserves, the main reason being due to the small volume of sewerage generated and the lack of existing infrastructure.
- Groundwater was considered for some sites based on discussions with G-MW and desktop analysis. The only areas considered worthwhile to investigate further for groundwater extraction were Bridgewater and Calivil. Based on information from the Victorian Water Resources Data Warehouse, salinity levels in other areas were considered too high. Sports fields, once established, should be able tolerate up to 1,200 -1,400 ppm, provided regular aeration is conducted. A small on site reverse osmosis desalination unit could be installed to treat the water before application, however this is likely to be expensive in terms of capital, operational and maintenance costs. If funding was available, clubs could undertake test bores on-site to check this, but it is unlikely to be worthwhile for a club to spend the money on this, particularly if other options are available.

5.4.7 Implement a Strategy for when Adequate Water is Not Available

In many cases it is not possible to put in place actions that will enable the site to become 'drought proof'. In these cases, there are strategies that can be implemented to assist recreation reserves to manage periods of low water availability. These include purchasing temporary water from the water market and receiving donated water through the rural water supply system for recreation reserves connected to the rural water system. For clubs that are not part of the rural water supply system there could be the option to obtain carted water from Loddon Shire or farmers able to donate water, in which case an appropriate storage would likely to be required. Other strategies that could be facilitated by Loddon Shire include prioritising sites based on use and importance and setting up an agreement with the relevant water authority on the provision of a set allocation of water for the Shire's key sports facilities during drought / water restriction periods.

For most recreation reserves in the Loddon Shire these strategies are required in periods of severe drought as there are no other viable options to ensure the reserves can become 'drought proof'. Many of the recreation reserves have already been implementing these strategies and often with the assistance of Loddon Shire. As of yet, there is no agreement with a water authority to provide a set allocation of water for key sports facilities during drought / water restriction periods. This option was suggested during initial discussions with Coliban Water, but further discussions are required between Loddon Shire and Coliban Water to develop it further.

6.0 Sustainable Sport and Recreation Clubs

Whilst the focus of this strategy is on drought-proofing sport and recreation facilities in terms of reducing the amount of potable water required; improving the quality of turf; and identifying alternative playing surfaces, it is also important to identify issues which may have an impact on club sustainability. For if a club cannot attract a sufficient number of players; is unable to pay its operational costs, cannot afford to replace its aged playing surface, etc, there is a very real risk that it may fold and therefore the investment in improving water and turf may have been wasted. Loddon Shire Council is committed to retaining sport and recreation facilities in small towns and hamlets throughout the municipality and therefore has a strong desire that sport and recreation clubs throughout the Shire remain sustainable.

The Master Plans which accompany this overview report, whilst not focusing specifically on governance or operational issues, focuses on other improvements needed at sport and recreation reserves to help clubs grow and respond to the changing environment in which they operate, in addition to water and turf based recommendations. This overview document identifies some of the challenges that need to be addressed by sport and recreation clubs in the Shire if they are to be sustainable.

6.1 What is a Sustainable Sport and Recreation Club?

A sustainable sport and recreation club is one that is likely to survive well into the future. Typically it will have:

- A vision for its future
- Strong leadership
- Strong governance structures with succession planning in place
- Appropriate plans in place to guide operations, e.g. business plan, annual plan, operational plan, maintenance plan, replacement schedule, master plan
- Appropriate policies in place to guide decision making, e.g. sunsmart policy, responsible serving of alcohol, hiring agreements, sponsorship guidelines, etc
- Risk management policies and procedures, e.g. chemical spills, fire, working with children, 'blood rule', insurance, etc
- Identified and addressed all health, safety and regulatory requirements, e.g. food handling regulations, sports field dimensions, etc
- Regular evaluation processes
- Effective two-way communication with stakeholders
- A focus on providing quality customer service
- A good understanding of the needs and expectations of participants and potential participants
- A stable or growing number of players, umpires, coaches and spectators
- Strong networks with other relevant partners , e.g. Loddon Shire, schools, state sporting associations and other community groups
- A welcoming environment where people of all abilities and ages are encouraged to participate
- A range of programs to attract both competitive and casual / social players

- Well run competitions and events
- Well managed and maintained facilities and equipment
- Sufficient volunteers or paid staff to assist with tasks
- Effective volunteer / staff recruitment, management and retention processes in place
- Sufficient funds to meet operational expenses
- Sufficient funds set aside to maintain and replace facilities and infrastructure
- A low environmental footprint

6.2 Benefits of Sport and Recreation

The benefits of participating in sport and recreation are well documented. Not only do individuals benefit from a health and wellbeing perspective, but the whole community benefits from a greater sense of community, economic opportunities, improvement to the environment, reduction in crime and a healthier society.

Participation in physical activity in rural communities, such as Loddon Shire, brings a different set of benefits to those achieved in regional or metropolitan settings. In rural communities, leisure provides one of the few social outlets where people who may spend much of their time isolated on farms or in small townships, come together to take part in activities with friends and neighbours in an atmosphere of camaraderie. The activity is sometimes secondary to the social benefits and enhanced sense of community connectedness achieved. Driscoll and Wood, in their report *Sporting Capital – Changes and Challenges for Rural Communities in Victoria*[6] identify three key components of a successful and functioning community as trust, goodwill and interaction; all three of which can be achieved through participation in sport and recreation by its ability to act as a 'social glue'.

Some of the benefits that can occur through participation in sport and recreation are:

Benefits	Individual and Community
Physical and Mental Health	• Reduced risk of colon cancer, heart disease, stroke, type 2 diabetes and high blood pressure • Less likely to become overweight or obese • Improved balance and coordination, resulting in fewer falls • Stronger muscles, joints and bones • Improved confidence and self-esteem • Improved body image • Improved motor skills • Less likely to suffer from depression and anxiety • Greater sense of achievement • Reduced stress levels • Higher energy and concentration levels

[6] RMIT (Driscoll, Kate and Wood, Liz) – "Sporting Capital – Changes and Challenges for Rural Communities in Victoria", 1999

	• Reduction in incidence and severity of illness and disability • Increased life expectancy
Social	• Greater sense of community • Stronger, more self-reliant communities • Greater social and friendship networks • Reduced anti-social behaviour and vandalism • Helps to develop shared attitudes, values and codes of behaviour in the community • Breaks down barriers between different sectors of the community • Stronger family relationships
Economic	• Employment in sport and recreation activities, events, venues, clubs • Improvements to local business viability through sale of sport and recreation equipment, services or programs • Reduction in health care costs – According to VicHealth[7], physical inactivity by Australians "costs the health system at least $400m in direct health care costs", and is responsible for approximately 8,000 deaths annually • Increases productivity of workers and reduces number of sick days • Potential to attract businesses to the region if quality sport and active recreation settings, programs and services exist • Flow on benefits to tourism businesses from people participating in sport and recreation events and activities
Environmental	• Protection of habitats, biodiversity and ecological integrity • More attractive living environments • A greater appreciation and awareness of the natural environment

6.3 Trends in Sport and Recreation

In terms of sports participation, management and infrastructure, there has been a trend in recent years towards the:

- movement away from many traditional organised sports such as football, cricket, netball and tennis to more individual or small group non-organised activities, e.g. walking, aerobics, fitness classes, cycling, swimming, running, etc
- installation of sports surfaces that help to reduce injuries and increase player comfort, e.g. sprung wooden floors, plexipave tennis courts
- installation of improved spectator facilities, e.g. retractable seating
- installation of facilities to encourage participation by people of all abilities, e.g. use of ramps, unisex toilets with change tables, single storey buildings to allow for wheelchair access, Braille signs, etc
- utilisation of indoor sporting facilities such as Leisure Centres with swimming pools for games and aspects of the training and recovery program for a range of different sports
- installation of lighting or higher standard of lighting to allow games and training to take place in the evenings

[7] VicHealth – "Physical Activity Fact Sheet", April 2007

- development of environmentally responsible practices such as solar hot water, recycled water systems, etc to reduce the impact of sports facilities and their users on the environment
- development or upgrading of facilities and equipment so that they meet the safety requirements of their designated sport, e.g. extension of netball courts to meet recommended run-off distances
- master planning of recreation reserves and leisure centres to ensure that needs of all existing and casual users are considered in the long term – including the linking of cycling / walking paths, development of play spaces, landscaping and BBQ / picnic facilities to encourage family use of facilities
- development of multi-use facilities and spaces which can cater for a variety of traditional activities as well as non-traditional or emerging activities, e.g. pilates, yoga, children's programs, women's day time social competitions, master's games, etc
- greater emphasis on social competitions mid week during the evenings as opposed to structured competition on a Saturday afternoon
- greater use of facilities by personal fitness trainers and their clients
- greater demands on some facilities by school groups due to the declining standard of school sporting infrastructure in some areas or the lack of facilities at new schools
- greater demand on sporting facilities for special events and tournaments
- greater demand for lifestyle/non-traditional forms of sport, i.e. games that can be played on the street or indoors, e.g. street soccer
- co-location of several sporting facilities to form recreation precincts
- understanding of the relationship between physical activity participation and improved health, wellbeing and social connectedness
- expectation by the community that facilities, programs, services and management will be of a reasonably high standard
- expectation that facilities will be available during a range of time slots throughout the week, including weeknight, early morning and weekends
- expectation by user groups that draws, ladder, information, etc about local sports competitions are available via the internet

6.4 Vision

Recreation Reserves in Loddon Shire will be sustainable sport and recreation assets that provide social, physical, economic and environmental benefits for users and the broader community.

6.5 Planning Principles

A number of key planning principles have been identified for Recreation Reserves in Loddon Shire to guide future planning decisions regarding programs, services or facilities at the site. These planning principles reflect and expand upon those identified in the Loddon Shire Recreation Needs Strategy. These planning principles are as follows:

Planning Principle	Wherever possible, Recreation Reserves in Loddon Shire will support and encourage:
Community Involvement and Benefit	Initiatives which involve the local community in the planning, management and operation of the site and provide ongoing physical, social, economic and environmental benefits to the community (including community strengthening), providing that a demonstrated need can be established.
Sustainability	Initiatives that will maintain or improve the sustainability of the site in terms of participation by local people, the environment, social opportunities and financing. The use of environmentally friendly materials and products will also be promoted.
Multi Use of Facilities	Facility developments and upgrades that are multipurpose in design to allow for a range of different groups and individuals to use the facility. It will encourage clubs and organisations to share facilities and management responsibilities so that facilities are used to their maximum capacity and limited resources (such as volunteers, and funds for operations and maintenance, etc) are best utilised. It will also allow opportunities for cross-promotion of activities and events and greater community interaction. Generally maintenance of existing buildings will be a priority over the development of new buildings, however new buildings will be considered if there is potential to expand the range of recreational opportunities available; provide for existing opportunities, reduce the number of buildings through consolidation and provide a more sustainable asset in the long term.
Access and Equity	Upgrades and developments that allow for greater access to facilities for people of all ages, gender, abilities and socio-economic backgrounds, for both active and passive activities. This involves providing a range of different recreational opportunities wherever possible and ensuring that barriers relating to factors such as costs and times are minimised wherever possible.
Provision of a Safe Environment	Initiatives that encourage a safe environment that adhere to Australian Safety Standards, Healthy By Design Guidelines and other relevant industry standards concerning safety.
Development of a Welcoming and Inviting Environment	Initiatives that help to create an inviting and welcoming environment through effective construction standards, building designs, landscaping, signage, traffic flow, pedestrian flow, parking, fencing and general maintenance. Such attention to detail will help create a sense of pride within the community and will be appealing for use by local residents as well as visitors to the area. Consideration should also be given to ensuring any development complements the surrounding areas.
Partnerships	Initiatives that include a range of relevant partners, so that limited resources are maximised and facilities, programs or services are not duplicated.

6.6 What are the Specific Challenges that need to be addressed for Clubs to be Sustainable in Loddon Shire?

There are numerous challenges that need to be addressed if a club is to be sustainable from a social, economic and environmental perspective. The following section identifies some of the challenges facing Loddon Shire sport and recreation clubs and identifies some strategies to improve long term sustainability:

6.6.1 Ageing Population

One of the main challenges for sporting clubs in Loddon Shire is the ageing of the population. With 31.1% of the population likely to be aged over 65 by 2026[8], there will be less people in the traditionally active age groups in the future (currently 20.6% of the population is over 65 years of age[9]). Clubs need to be able to respond to this issue if they are to survive, or adapt to fewer players and fewer teams. It is also important for older adults to be physically active to help maintain their health, therefore the provision of physical activity options suitable for older adults should be considered.

Some strategies to survive include introduction of veteran competitions; introduction of modified games (requiring less space and fewer players); move towards more social competitions and less competitive events; etc. Consideration also needs to be given to providing facilities with comfortable playing surfaces so they place less stress on joints of older players.

[8] *Victoria in Future 2006-2026: Loddon*, Victorian State Government (2008)
[9] *Victoria in Future 2006-2026: Loddon*, Victorian State Government (2008)

6.6.2 Minimal or Zero Population Growth

Some areas of Loddon Shire are currently experiencing and likely to continue to experience a decline in population or at best, a static population, hence it will be difficult to increase participation numbers. Areas most likely to grow are the larger centres, e.g. Wedderburn and Boort and areas closest to Bendigo, e.g. Inglewood. The Victorian Government predicts that Loddon Shire's current population of 8,073[10] will decline to a population of 7,774 (a loss of 299 people) by 2026[11].

Some strategies to overcome a smaller market base include introduction of events suitable for people of all ages and abilities to participate in (e.g. social bowls, petanque, modified twilight tennis, etc); introduction of mixed competitions; marketing strategies to attract players from other areas such as Bendigo or rationalisation / merging of clubs.

6.6.3 Declining Participation in Organised Sport

Participation in organised sporting competitions has declined in recent years throughout Australia. In Loddon Shire there has been a noticeable decrease in some of the summer sports such as tennis and cricket in several areas. Some of the reasons people have moved away from the traditional organised sport includes the time commitment, e.g. a sport such as cricket involves playing the game for most of Saturday afternoon; the time and cost to travel long distances to play a match (particularly for football / netball / hockey competitions); the requirement to take part in working bees and be involved in maintenance of facilities; preference for other activities such as water sports in summer; etc.

Some strategies to slow the drop-out rate in organised sport include moving competitions to weeknights; introducing more local social competitions for people of any ability; and collecting additional fees to pay someone to maintain facilities.

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[10] Australian Bureau of Statistics – *National Regional Profile: Loddon (S) (Local Government Area)* – Released 29/04/2010: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/LGA23940Population/People12004-2008?opendocument&tabname=Summary&prodno=LGA23940&issue=2004-2008

[11] *Victoria in Future 2006-2026: Loddon*, Victorian State Government (2008)

6.6.4 Competition from Other Physical Activities

Nationally there are a growing number of people taking part in sport and recreational activities such as walking, cycling, running and gym work / aerobic activities in preference to more traditional organised sports. Whilst these activities can often be undertaken informally, alone and at any time of the day, there is also a growing demand for organised events to support these activities, e.g. mountain bike riding events, fun runs, cycling events, zumba classes, etc.

Strategies which may allow people to continue to take part in walking, cycling, running and gym work / aerobics, yet be involved with a club, is to incorporate opportunities for these activities at recreation reserves, where possible. These activities may form part of club training, or the facility may provide space for such activities to occur, e.g. walking / running, cycling track around the perimeter of a recreation reserve; pump park for people to practice their mountain bike riding skills; a gym within the pavilion. Alternatively, clubs may decide to organise a specific event which they would market to their members and the broader community as a fundraiser, e.g. fun run, family cycling event, etc. By bringing people on site who take part in these activities on an informal basis, there may be an opportunity to recruit them to join a team or provide coaching / umpiring to retain their fitness level, both of which will help to sustain a club.

6.6.5 Catering for Emerging Sport and Recreation Activities

Sport and recreation activities invariably experience peaks and troughs in popularity. Squash for example was very popular during the 1970's, but many squash centres were sold and developed as housing during the 1980's and 1990's, hence there are few facilities now where squash can be played in country Victoria. Periodically 'new' activities emerge which gain rapid popularity such as soccer, which saw a massive growth in participation, particularly amongst juniors following the 2006 World Cup. Other physical activities which could be housed at a recreation reserve include touch football, beach volleyball, petanque, parcour, community gardens, learn to ride facilities, conferences, expos, playgroup, yoga, pilates, gentle exercise for older adults, etc.

In order to cater for changing sport and recreation trends, it is important to design facilities in such a way that they can be used for a variety of different activities according to demand.

6.6.6 Effective and Efficient Governance

Governance relates to the management of an organisation, including the development of policies, plans and processes. Sports clubs and Recreation Reserves in Loddon Shire are governed by Committees of Management, generally appointed by Loddon Shire or the Department of Sustainability and Environment. Club based Committees of Management comprise of representatives who play or have an involvement with the specific club, whereas a Recreation Reserve Committee of Management is typically made up of representatives of user groups of a reserve and sometimes a community representative. The success of club, and its ultimate sustainability, can often be directly attributed to the standard and implementation of its policies, plans and processes (its governance). In small communities such as Loddon Shire, it is sometimes difficult to attract a sufficient number of interested people to join a committee. Or as is often the case, the same people serve on multiple committees. Further, due to time constraints, lack of specific skills or lack of awareness of their roles and responsibilities, some committee members are just focused on club survival on a day to day basis, rather than focusing on the big picture, or the long term sustainability of the club.

Some strategies to increase the effectiveness and efficiency of governance include exploring alternative models, such as a town based committee of management that take responsibility for all forms of sport and recreation (including cycling / walking opportunities) within the town. Relevant training opportunities should also be made available to committee members to help them increase their skills and understand their roles and responsibilities. Planning, development of policies and the development of committee handbooks should also be a major focus to ensure effective governance. Further, succession planning must be considered so that corporate knowledge is passed on from year to year.

A key role of each Committee of Management will be to evaluate their individual master plans each year and ensure that an annual work plan is developed which incorporates the major strategies for that particular year.

6.6.7 Increasing the Number of Volunteers and / or Reducing the Burden on Volunteers

Without volunteers, the sport and recreation clubs in Loddon Shire would not exist. Many clubs report a weekly volunteer contribution in excess of 30 hours. The monetary value of volunteer labour in Loddon Shire is significant. However, the existing volunteer base is decreasing in size and the demands placed on volunteers continue to increase. Many of the volunteers who help with tasks such as maintaining sports surfaces, particularly in clubs that traditionally attract older participants (such as bowls clubs) are ageing and no longer as fit and active as they once were. Some of these volunteers are struggling to operate old and heavy machinery, or are contemplating retiring from volunteer services altogether. New or changing regulations such as working with children certificates, food handling requirements, liquour licensing requirements, etc, which although acknowledged as beneficial, create additional demands on volunteer time and energy. Unfortunately the number of people who have indicated a willingness to be involved in volunteering is limited.

> "The challenge accepted by volunteers as they seek to provide sport and recreation to their community appears to be hindered by the need to comply with administrative issues"
>
> Source: The Cost of Delivering Sport and Recreation to the Victorian Community – DPCD, 2001

Some strategies to increase the number of volunteers is to develop a Shire based volunteer website whereby people with skills to offer can be matched up with volunteering opportunities. Another strategy is for clubs to develop a recruitment strategy whereby they identify the type of skills they need in a volunteer and deliberately target specific people who possess such skills through an advertising campaign or face to face discussions. In order to reduce the burden on existing volunteers, clubs need to consider the introduction of initiatives which decrease the amount of time volunteers are required to spend on tasks such as maintenance or administration, e.g. conversion of lawn tennis court into a hard surface, computerizing specific tasks, outsourcing particular tasks where feasible, etc.

6.6.8 Transforming the Recreation Reserve into a Community Hub

In the past, a recreation reserve and its pavilion were often considered to be the exclusive property of the tenant sporting clubs. Despite the fact that the land belongs to Loddon Shire or the Crown, non-participants often felt that they weren't welcome to use the reserve. Some clubs actively discouraged people walking dogs on sports oval or hiring pavilions for meetings or events. Discouraging use by non-participants of

tenants clubs fails to realize the benefits that such people can bring to the site: passive surveillance during non-training or game times; a sense of place created by having people actively using the site at all times; possible income through hire of facilities; increased chance of obtaining government funding due to high levels of community use; and even future players, officials and administrators through exposure to facilities and opportunities on site. There is a growing recognition throughout the Shire that the recreation reserve and its pavilion are in fact valuable community assets and in many cases, the centre of the community, or its hub.

Strategies to help promote greater use of recreation reserves and to transform these sites into valuable community hubs include sending a message (policies and promotional activities) to the community that local people are welcome to use recreation reserves and pavilions for a variety of different activities. Another part of the strategy to redefine recreation reserves as community hubs is to spend some time and money into creating attractive spaces that people will want to use (e.g. welcoming signage, quality landscaping, shade, walking / cycling paths, accessible buildings and facilities, comfortable buildings, play opportunities, picnic / BBQ facilities where appropriate, etc).

6.6.9 Complying to New Standards and Legislation

In recent times, a number of new standards, legislation and expected level of service have been brought in to improve service delivery, safety of participants and access. Whilst these initiatives are very positive and have benefited participants, nevertheless it has been challenging for some clubs in Loddon Shire to comply with such standards and legislation due to limited funds and time. Some of the most common examples of standards and legislation that need to be addressed in Loddon Shire include ensuring that netball courts meet Netball Victoria standards in terms of run-off; the expectation that both male and female umpire change rooms will be provided in pavilions; and the need to comply with Disability Discrimination Act in terms of access for people of all abilities, etc.

In order to assist clubs to comply with new standards and legislation, it is important that they work in partnership with partners to share the cost of implementing relevant initiatives, or at least to develop a plan to implement such initiatives. In the long term, clubs that do not comply with such standards and legislation may find that certain events such as netball grand finals will not be permitted to be held at the site (thereby impacting on finances of clubs); players may be injured as a result of facilities not deemed sufficiently safe (and court cases many ensue); tenant clubs may be fined for being in breach of legislation; and players / officials may be lost due to inadequate facilities.

6.6.10 Maintaining Ageing Infrastructure and Equipment

Much of the sporting infrastructure in existence in Loddon Shire was developed around 40 years ago. Due to limited funds by tenant clubs and other financial priorities, in many instances very little has been spent on maintaining buildings or upgrading infrastructure over the years. This has resulted in a situation whereby much of the sporting infrastructure in Loddon Shire has reached or is nearing the end of its lifespan. The dilemma is that the cost to upgrade or replace infrastructure is beyond the financial capacity of many clubs and Loddon Shire. Whilst it is possible to source assistance from state and federal government for facility upgrades, applications need to emphasise how the proposed works will increase participation (which is difficult in an areas where the population is relative static or even in decline in some areas) and also need to be accompanied by a significant local funding contribution.

Council's Recreation Strategy articulates a number of policy statements supported by Council including:

Infrastructure Development

Priority will be given to recreation development proposals that:

- are designed to cater for a range of uses or additional community activities;
- minimise management and asset maintenance imposts on the community;
- form part of a community hub or are part of a strategy to establish a community hub;
- consolidate existing functions and buildings;
- have 'spin-off' benefits e.g. tourism benefits; and
- reflect community pride.

Infrastructure Maintenance

- Maintenance of existing buildings will generally be a priority over the development of new buildings.

Sustainability

- Planning and provision for recreation must be sustainable into the future.

Strategies to assist with improving and / or replacing infrastructure and equipment at recreation reserves at the least possible cost include development of an equipment pool whereby a range of items such as mowers can be shared between a number of different clubs; development of partnerships with

other organisations to help share the cost of upgrades / new developments; development of budgeted maintenance schedules so that assets should therefore last longer; development of a budgeted replacement schedule so that clubs have sufficient revenue to replace infrastructure at the end of its useful life; development of staged developments for new or upgraded facilities; modifications to existing facilities as opposed to new facilities; installation of infrastructure which has low ongoing maintenance responsibilities and a long life expectancy; consideration of the installation of portable facilities such as toilet blocks which can be relocated according to demand; decommissioning of some facilities.

6.6.11 Limiting Operational Costs

The cost required to maintain playing surfaces and buildings has increased significantly in recent years. There has been a major increase in electricity costs, water costs, insurance and fertilizer for example. At the same time, very few clubs have been able to increase their income as player numbers are relatively static in line with population trends and fee structures have been designed to reflect the ability of local people to pay for their sport and recreation activities. Other forms of potential revenue to clubs such as sponsorship opportunities, gate takings and income from kiosks and bars is also limited by the capacity of local people and businesses to pay. Whilst some recreation reserves are able to split these costs between a number of different clubs, or in fact have one club (generally the football / netball club) partially subsidise the operational costs of other clubs, this is not the case for a small number of single purpose facilities.

Some strategies to assist in limiting operational costs include a shift away from single purpose facilities to multi-purpose facilities where costs can be shared by several different organisations; the installation of cost saving measures such as water tanks, solar electricity; development of group insurance schemes; greater support from Loddon Shire to assist with operational tasks or costs; incorporation of environmentally sustainable design features into building designs which can reduce operational costs such as double glazing, passive heating, low flow taps, etc.

6.6.12 Minimising Environmental Impact

A key component of sustainability relates to reducing the impact of people and their activities on the environment and the earth's natural resources so that ecosystem functions and components are not degraded. The recent drought has certainly highlighted the need for clubs to use limited water sparingly and to consider initiatives which reduce the impact of the club on the environment. However, given the limited financial resources of many sport and recreation clubs within Loddon Shire, some initiatives, such as the installation of synthetic playing surfaces or desalination plants, may not always be possible due to the high purchase price and ongoing or replacement costs.

Some strategies to reduce the impact of sport and recreation clubs on the environment include incorporation of environmentally design features into buildings and surrounds including dual flush toilets; low flow shower heads and taps; north face design to incorporate passive heating from the sun; double glazing of windows; natural ventilation; solar hot water; solar electricity; landscaping to provide shade in summer and let sunlight through in winter; landscaping to prevent soil erosion; installation of water tanks to collect rainwater; grey water recycling systems; replanting trees that have been removed; installation of synthetic surfaces; etc.

6.7 Defining Suitable Levels of Infrastructure and Services for Recreation Reserves

To assist Loddon Shire Council to develop a fair and consistent strategy in terms of what standard of infrastructure it will support at Recreation Reserves, the following classification system has been developed. This classification system is based on industry standards. It must be noted that clubs may choose to exceed the standard themselves, but Council will only provide assistance, where possible, to meet the specified standard.

- Municipal Facility: a good to medium quality sports ground with several user groups
- Local Facility: a fair quality sports ground, often with only one user group

This table indicates the type of facilities that are likely to be found at Municipal and Local Grade recreation facilities. Note that in most municipalities there is at least one regional facility which provides a premier level ground, with multiple user groups. These facilities are typically found in major residential areas. There are no grounds in Loddon considered to be of a regional standard.

Facility	Municipal Grade Ground	Local Grade Ground
Playing surface	▪ Good standard of playing surface	▪ Basic standard of playing surface
Change rooms	▪ Separate change facilities for each team	▪ Basic change facilities
Warm up area	▪ Warm up area incorporated into change facilities	▪ No warm up area
Umpires change room	▪ Separate change facilities for male and female umpires – basic level	▪ Not usually, or shared with players
Medical rooms	▪ No	▪ No
Massage tables	▪ Yes – 1-2 tables	▪ No
Coaches box	▪ Not usually a designated space	▪ No
Media facilities	▪ No	▪ No
Timekeepers area	▪ Designated space	▪ Not a designated space
Ground lighting	▪ Training level lighting	▪ No lighting
Siren	▪ Yes	▪ Sometimes
Scoreboard	▪ Yes	▪ Sometimes
Public address system	▪ No	▪ No
Irrigation system	▪ Automatic or manual irrigation system	▪ Either no system or a manual system
Underground drainage	▪ Limited or no underground drainage	▪ Limited or no underground drainage
Rain water tanks	▪ Yes	▪ Yes
Dual flush toilets	▪ Yes	▪ Yes
Low flow shower heads and taps	▪ Yes	▪ Yes

Facility	Municipal Grade Ground	Local Grade Ground
Access to recycled water	▪ Sometimes	▪ No
Moisture sensors installed	▪ No	▪ No
Synthetic playing surfaces	▪ No	▪ No
Dams	▪ Yes, if required	▪ Yes, if required
Bores	▪ Yes, if required	▪ No
Purchase of Permanent Water Right	▪ Yes, if required	▪ No
Access to Temporary water (if available)	▪ Yes, if required	▪ Yes, if required
Warm season grasses	▪ Yes	▪ Yes
Recycling of water from clubrooms and change facilities	▪ Yes	▪ Yes
Fencing	▪ Fully fenced	▪ Some grounds may have basic fencing
Car parking facilities	▪ Less formal unsealed car parking facilities. Parking space for people with disabilities and access for emergency vehicle and delivery vehicle.	▪ Basic unsealed car parking facilities. Parking space for people with disabilities and access for emergency vehicle.
Social club rooms	▪ Small social club rooms usually catering for less than 100 patrons. Disabled access.	▪ Shared facilities or no facilities. Disabled access.
Public toilets	▪ Sufficient number of public toilets to cater for anticipated	▪ Basic public toilets to cater for anticipated crowd level, i.e. 1:250.

Facility	Municipal Grade Ground	Local Grade Ground
	crowd level, i.e. 1:250. Unisex disabled toilet.	Unisex disabled toilet.
Cricket pitch	▪ Generally concrete or synthetic pitch	▪ Concrete or synthetic pitch
Spectator facilities	▪ Limited spectator facilities	▪ Limited or no spectator facilities
Kiosk	▪ Basic level kiosk with facilities to heat food	▪ Sometimes a basic level kiosk with no permanent food heating facilities
Utilisation	▪ Shared use with the community when not in use by sport	▪ Shared use with the community
Level of competition	▪ District or senior level	▪ Local and junior level competitions
Location	▪ May be a stand-alone ground or may form part of a larger park / recreation precinct	▪ May be a stand-alone ground or may form part of a larger park / recreation precinct
Access	▪ Public access restricted during games	▪ No restrictions of public access
Maintenance	▪ Medium level of maintenance	▪ Low level of maintenance

Note that not all facilities at a recreation reserve may necessarily fall within the same standard.

7.0 Overview of and Recommendations for each Recreation Reserve

Accompanying this report are individual master plans for each Recreation Reserve identified in this Strategy, containing a variety of information including extracts from relevant literature, demographic information, a summary of key issues identified from community consultation, water options, turf management and maintenance, an audit of facilities, a series or prioritised and costed recommendations and a basic site plan. Proposed developments at each reserve have been identified and prioritised, based on a number of factors including whether or not the development is consistent with the vision and planning principles identified for the site. Developments have been included if the proposed works:

1. have been demonstrated through a number of sources such as community plans, previous master plans, surveys, etc, as needed by the community
2. are consistent with the grading of the reserve and the type of infrastructure and facilities expected within each grading, i.e. municipal or local level facility
3. will help to maintain and / or increase participation in sport and recreation opportunities
4. are likely to benefit the broader community (from a social, physical, economic and / or environmental perspective) and involve the community in operations or management
5. create improved access for people of all abilities, ages, genders, etc
6. increase the opportunity for the site to be used for a variety of different and / or new activities
7. are likely to increase safety of users and reduce risk management issues
8. are likely to allow the site to meet industry standards, regulations and legislation
9. reflect best practice and current industry trends
10. are likely to decrease the impact on the environment and natural resources, e.g. installation of water saving devices, double glazing on windows, etc
11. are likely to be financially sustainable in the long term and take into consideration whole of life funding costs, including development of replacement schedules
12. are likely to decrease operational costs
13. are likely to reduce the demands on volunteers time (for activities such as mowing, watering, line marking, etc)
14. will rectify existing infrastructure that is currently in a very poor state or beyond repair
15. are likely to attract external funding
16. are within the resource capacity of communities to achieve, i.e. plans are cost effective, user groups have sufficient resources to make the required financial contribution, user groups can provide some in-kind labour, user groups can assist with project management, suitable plans have been developed, etc
17. enhance the appearance and usability of the site, e.g. improved landscaping, heating / cooling, marked car parking bays, etc
18. involve a number of partners to assist with funding and / or operations, management and maintenance

The following section provides a summary of key aspects of each master plan.

A full master plan was not undertaken for Little Lake Boort and the five Loddon Shire swimming pools (Wedderburn, Pyramid Hill, Boort, Inglewood and Mitiamo). A summary of the assessment for these sites is provided in Section 7.

A cost-benefit analysis of water related actions for each recreation reserve was undertaken to assist Loddon Shire and individual sports clubs to prioritise the implementation of actions. Details of the analysis are provided in Section 8.7.

7.1 Bears Lagoon Tennis Club

Location	Bears Lagoon 
Tenants	• Bears Lagoon Tennis Club
Activities	• Tennis • Community meetings, events, celebrations, etc
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process
Turf Management Recommendations	• Treatment for disease/insect reduction • Fertilising in spring to promote couch grass cover • Implementation of an annual maintenance program • Purchase a new mower to maintain lawn courts
Recreation Infrastructure Recommendations	• Upgrade both male and female toilet facilities • Replace ageing fence around tennis courts • Provide additional shade for opposition team • Install external fan under the roof of the verandah
Comments	• Although Bears Lagoon Tennis Club is a stand-alone, single purpose facility, it is recommended that it be retained at its current site as it is the only sport and recreation facility in Bears Lagoon. This facility, with its tennis courts and pavilion, is an extremely important asset for the Bears Lagoon community.

7.2 Boort Bowls, Croquet and Tennis Complex

Location	Boort 
Tenants	• Boort Bowls Club • Boort Croquet Club • Boort Tennis Club
Activities	• Bowls • Croquet • Tennis
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Install sub-meters and implement a formal water use monitoring and annual reporting process • Install an additional tank at the bowls club to allow it to harvest more rainwater and reduce reliance on potable water • Upgrade dam pump • Replace the pump from the No. 3 Channel • Upgrade Bowling Club toilets and Tennis Club taps and showers to water efficient fixtures

Turf Management Recommendations	• Bowls:
	  ○ Treat for disease reduction
	  ○ Fertilise in spring to promote couch grass cover
	  ○ Implement an annual maintenance program
	• Croquet:
	  ○ Treat for weed & Fairy Ring reduction
	  ○ Fertilise in spring to promote couch grass cover
	  ○ Control Dead Spot control in spring
	  ○ Implement an annual maintenance program
	  ○ Purchase a new croquet mower
	• Tennis:
	  ○ Broadleaf weed & kikuyu control
	  ○ Implement disease control program
	  ○ Fertilise in spring to promote couch grass cover
	  ○ Implement an annual maintenance program

Recreation Infrastructure Recommendations	• Upgrade club house with storage, shelter and a kitchenette • Improve accessibility for people with disabilities at the bowls club, e.g. disabled toilet, wheelchair access, entrance ramps and disabled car parking spaces on the main road • Improve outdoor BBQ area by providing a cover and shade • Upgrade tennis courts to provide a more even playing surface • Install lights on two courts to allow night time tennis (long term plan)
Comments	

7.3 Boort Park

Location	Boort   
Tenants	• Boort Football Netball Hockey Club • Boort Cricket Club (inactive in 2010/11) • Boort Agricultural Show Society
Activities	• Football • Cricket • Hockey • Netball • Meetings / social functions • Agricultural Shows
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods. • Implement a formal water use monitoring and annual reporting process. • Upgrade toilets, showers and taps to water efficient fixtures. • Install rainwater tanks to collect water from club house roof and use for toilet flushing, cleaning and other non-drinking purposes.
Turf Management Recommendations	• Sports Oval: ○ Spray broadleaf weeds ○ Over-sow with ryegrass for winter cover ○ Strategic topdressing ○ Aerate twice a year ○ Develop program to promote couch in spring ○ Establish couch grass on the sports oval and over-sow with rye grass so that the sports oval remains green over winter ○ Implement an annual maintenance program • Hockey Field: ○ Spray broadleaf weeds ○ Over-sow with ryegrass for winter cover ○ Strategic topdressing ○ Aerate twice a year ○ Over-sow with kikuyu seed in spring ○ Implement an annual maintenance program
Recreation Infrastructure	• Construct basic facility with shelter and storage space for hockey club • Install lights to enable hockey club to train on winter evenings

Recommendations	• Upgrade Pavilion:
	  ○ Extend social rooms to cater for club functions (18 m x 5 m extension)
	  ○ Develop a change room for use by female umpires (if netball change facilities are inadequate)
	  ○ Upgrade kitchen (2 new stoves, 2 range hoods and new fridges) to better cater for club functions
	• Upgrade public toilets
	• Install more lights for football club training
	• Construct a small shed on site to be utilised as a gymnasium
	• Build new scoreboard near the playground, incorporating regulation size stairs and power
	• Extend netball shelter full length of court

Comments	

7.4 Bridgewater Bowls Club

Location	Bridgewater  
Tenants	Bridgewater Bowls Club
Activities	• Lawn Bowls • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Purchase an additional tank for storage of water • Assess the feasibility of replacing the front bowls green (closest to Main St) with synthetic turf to reduce water use and increase access to the bowling green year round and include a storm water harvesting and collection system (low priority)
Turf Management Recommendations	• Treatment for Fairy Ring reduction • Fertilising in spring to promote couch grass cover • Implementation of an annual maintenance program • Re-seed the rear bowls green to improve the condition of the playing surface
Recreation Infrastructure Recommendations	• Upgrade club house by painting interior and exterior, installing new windows, converting existing male toilets into a store room and developing new male toilets • Purchase a motorised broom • Replace old shelters • Improve landscaping at the Bowls Club • Replace fence around perimeter of the bowling green • Replace storage shed
Comments	• Due to the high cost of developing a synthetic bowls green and the need to replace the surface after 10-15 years, and given that the front green is a secondary green, the development of a synthetic pitch on the front green is a low priority.

7.5 Bridgewater Recreation Reserve

Location	Bridgewater 
Tenants	• Bridgewater Football Netball Club • Bridgewater Cricket Club • Bridgewater Tennis Club
Activities	• Football • Netball • Cricket • Tennis • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement an ongoing water use monitoring and reporting program • Irrigation specialist to assess the current system and provide recommendations to either upgrade or replace the system • Implement the recommendations provided by the irrigation specialist • Proceed with the development of a groundwater source at the Recreation Reserve. This includes confirming the water quality, location, obtaining the construction license, transferring an existing license to extract groundwater, installing the bore and pump. • Asses the need to purchase and install a rainwater/storm water harvesting system which collects run-off from the netball / tennis courts as a back-up emergency water supply.
Turf Management Recommendations	• Resurface and re-grade the oval and plant with warm season grasses • Spraying of broadleaf weeds • Over-sowing with ryegrass for winter cover • Strategic topdressing • Aerating twice a year • Developing a program to promote couch in spring • Implementing an annual maintenance program

Recreation Infrastructure Recommendations	• Construct concrete pathways and paving around the Sports Pavilion to improve access to the facility • Construct drainage near the pavilion to reduce pooling of water • Install two additional floodlights around the sports ground to reduce wear and tear in one section of the ground and to allow night games to be played on the ground • Replace mower • Provide shade and protective barriers around playground equipment • Install new boundary fencing along Newbridge Rd • Install photovoltaic cells on pavilion roof to generate electricity
Comments	

7.6 Calivil Recreation Reserve

Location	Calivil    
Tenants	• Calivil Football Netball Club • Calivil Cricket Club • Calivil Tennis Club • Calivil Bowls Club • Calivil Senior Citizens Club
Activities	• Football • Netball • Cricket • Tennis • Bowls • Senior Citizens • Meetings / social events
Water Management Recommendations	• Implement a formal water use monitoring and annual reporting process • Investigate the sinking of a bore to provide an alternative source of water for the Recreation Reserve • Purchase a 250,000 litre water tank to provide water storage • Install a new irrigation system on the bowls green to reduce water use

Turf Management Recommendations	• Sports Ground:
	  ○ Spraying of broadleaf weeds
	  ○ Over-sowing with ryegrass for winter cover
	  ○ Strategic topdressing
	  ○ Aerating twice a year
	  ○ Developing a program to promote couch in spring
	  ○ Implementing an annual maintenance program
	• Bowling Green:
	  ○ Fertilising in spring to promote couch grass cover
	  ○ Spring Dead Spot control in spring
	  ○ Implementing an annual maintenance program
	• Tennis Courts (until decommissioned):
	  ○ Treating for weed and Fairy Ring reduction
	  ○ Fertilising in spring to promote couch grass cover
	  ○ Implementing an annual maintenance program

Recreation Infrastructure Recommendations	• Resurface courts and relocate light towers to meet Netball Victoria standards. Line-mark these two courts for tennis. • Install lights for bowls to allow night time training and games • Construct a BBQ to encourage visitation by people passing through the

	area • Consider development of a campground at the Recreation Reserve to help increase tourism visitation to the region • Install shade sails to provide a safer and more attractive play space • Re-vegetate and landscape around the entire recreation reserve to improve visual amenity of the site • Consider the development of a farmer's market and alternative expos at the Recreation Reserve to increase revenue in the local community • Modify power supply to the football shed • Install safety signage around play area and additional directional signage to and around the reserve • Retain seven grass courts in the short term and develop four new hard courts (two over existing netball courts) • Install one extra light tower on the football oval • Construct a covered and paved area which links the pavilion to the change rooms • Install fence along the road near the tennis complex to prevent children from going on to the road
Comments	

7.7 Donaldson Park, Wedderburn

Location	Wedderburn   
Tenants	• Wedderburn Football Netball Hockey Club • Wedderburn Bowls Club • Wedderburn Lawn Tennis Club • Wedderburn Harness Racing Club
Activities	• Football • Netball • Hockey • Lawn Bowls • Tennis • Meetings / social functions
Water Management Recommendations	• Calculate the yield of the old town water supply system and put in place a water allocation process. • Develop and implement an ongoing program of works for Skinners Flat Reserve and Caravan Park dam including de-silting the storages and cleaning out the catch drains. • Investigate potential for stormwater harvesting from Nardoo Creek • Develop a water allocation agreement for key sports facilities during restriction periods • Replace two grass tennis courts with two synthetic (hard) tennis courts with lights to reduce water use and to provide for year round tennis. • Upgrade existing irrigation system • Review potential to use recycled water from the Wedderburn Sewerage Reclamation Plant

Turf Management Recommendations	• Sports Oval:
	  ○ Plant with warm season grasses to reduce water use and costs
	  ○ Strategic topdressing
	  ○ Aerate twice a year
	  ○ Develop program to promote kikuyu in spring
	  ○ Implement an annual maintenance program
	• Hockey Field:
	  ○ Spray broadleaf weeds
	  ○ Over sow with ryegrass for winter cover
	  ○ Strategic topdressing
	  ○ Aerate twice a year

	○ Develop program to promote kikuyu in spring ○ Implement an annual maintenance program • Bowls Club: ○ Treat for Fairy Ring reduction ○ Fertilise in spring to promote even couch grass cover ○ Implement an annual maintenance program • Tennis Club ○ Treat for Fairy Ring reduction ○ Fertilise in spring to promote couch grass cover ○ Implement an annual maintenance program
Recreation Infrastructure Recommendations	• Upgrade second netball court to meet Netball Victoria standards by extending run-off; resurfacing; relocating lights and shed; installing a new spectator shelter; line-marking for tennis; closing off the external Park entrance; making a new entrance for access / pavilion deliveries via the on-site car park; and improving paving around the court. • Extend kitchen and construct administrative space. Ensure kitchen upgrade includes provision for low water use fixtures and appliances. • Demolish the old tennis shed and develop an adventure / outdoor play space in this area; and also a more traditional play space near the netball courts (equipment has already been purchased for the second play space, but not yet positioned) • Extend change and toilet facilities; provide external access to toilet facilities; upgrade disabled toilet to meet DDA requirements; upgrade and increase size of kitchen, bar and social facility to cater for 80-150 people; improve viewing area over sports ground. • Install signage that reflects Council's corporate style and provides information on opportunities at the Park. • Improve landscaping throughout the park, particularly around the water tank and the standpipe, to create a more attractive and welcoming environment • Seal main entrance from Chapel St to improve condition of internal roadway (i.e. reduce pot holes) • Demolish existing sheds and build one new shed, able to provide some shelter and storage for hockey equipment • Decommission Hospital Street toilet block once pavilion extension is complete. In the meantime, use a modular toilet block provided by Loddon Shire. • Render and smarten up existing public toilets near the bowls green • Review use of harness racing in 2013-15 to determine future of pavilion and the track. In the meantime, attempt to increase use of the pavilion, e.g. hockey change facility, cricket pavilion (if cricket moves to the site), Little Athletics pavilion (if this activity is established), community gym shared with Wedderburn P-12 College, etc. • Improve maintenance of harness racing track so that it does not become too compacted from cars parking on it during the football season. If Harness racing is no longer viable at the site (after review in 2013 - 2015), convert a section of the track to car parking • Consider development of seating between hockey field and football ground • Install two lights at the southern end of the hockey field

	• Develop an electronic ground booking system • Continue to explore opportunities for new activities / user groups • Continue to plant trees along Nardoo Walking Track
Comments	

7.8 Inglewood Bowls Club

Location	Inglewood 
Tenants	• Inglewood Bowls Club
Activities	• Lawn Bowls • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Install a new pump for the irrigation system to allow a larger volume of water to be dispersed to the turf • Assess feasibility of connecting to the Inglewood Old Town Reservoir and source funding for pipeline construction if feasible. **Or** • Undertake a cost benefit analysis regarding relocating the club to Inglewood Recreation Reserve to access Reservoir water (NOTE THAT THIS IS NOT SUPPORTED BY CURRENT COMMITTEE).
Turf Management Recommendations	• Treatment for Fairy Ring reduction • Fertilising in spring to promote couch grass cover • Spring Dead Spot control in spring • Implementation of an annual maintenance program
Recreation Infrastructure Recommendations	-
Comments	

7.9 Inglewood Recreation Reserve

Location	Inglewood  
Tenants	• Inglewood Football Netball Club • Inglewood Cricket Club • Inglewood Tennis Club
Activities	• Football • Netball • Cricket • Tennis • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Calculate the yield of the Old Inglewood Reservoir and put in place a water allocation process. • Develop and implement an ongoing program of works for the Old Town Reservoir including de-silting the storage and cleaning out the catch drains. • Implement a formal water use monitoring and annual reporting process Secure water for the ground by upgrading catch drains to allow the Inglewood Reservoir to fill so that water can then be transferred to the sports complex for irrigation purposes • Purchase a water tank to connect to pavilion and change rooms

Turf Management Recommendations	• Sports Ground:
	  ○ Install a new irrigation system to allow more efficient use of water and plant warm season grasses to provide a better playing surface.
	  ○ Spraying of broadleaf weeds
	  ○ Over-sowing with ryegrass for winter cover
	  ○ Significant topdressing – 200 cubic metres
	  ○ Aerating twice a year
	  ○ Development of a program to promote couch in spring
	  ○ Implementation of an annual maintenance program
	• Tennis Courts:

	○ Treatment for weed control ○ Fertilising in spring to promote couch grass cover ○ Implementation of an annual maintenance program
Recreation Infrastructure Recommendations	• Upgrade toilets in Sports Centre so that they are accessible from inside and outside; and install a unisex disabled toilet with baby / toddler change facilities • Install a ramp at entrance to pavilion and a new door to allow disabled access • Install a range hood in the kitchen area to meet regulations • Install some speed humps with signage around the sports oval to prevent people travelling too fast through the site • Upgrade Sports Centre to improve overall appearance and amenity – including painting and new floor coverings • Develop change facilities for netballers and female umpires – as part of the tennis pavilion • Install heating and cooling in the pavilion • Provide a cover over the louver windows • Clean and refocus lights on sports ground • Install more shelter, shade and seating around the Recreation Reserve • Upgrade the canteen and the bar • Upgrade lights for sports oval and netball courts • Upgrade football / cricket showers and toilets in change rooms • Upgrade public toilets • Develop a rebound wall to allow people to practice their tennis alone or in pairs.
Comments	

7.10 Janiember Park, Serpentine

Location	Serpentine  
Tenants	• Serpentine Football Netball Club • Serpentine Playgroup
Activities	• Football • Netball • Playgroup • Meetings / Social Functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Upgrade irrigation system so that it is fully automated • Purchase and install a storage tank and associated pipe-work to connect to the new pipeline. Tank size and other details will need to be determined once the pipeline design and supply is confirmed by GMW. • Improve landscaping around the front of the Community Centre and by planting drought tolerant species and reducing the amount of grass to be watered • Upgrade inefficient water fixtures (toilets and taps)
Turf Management Recommendations	• Replant sports oval with warm season grasses to reduce water use • Spraying broadleaf weeds • Over-sowing with ryegrass for winter cover • Strategic topdressing • Aerating twice a year • Developing a program to promote couch in spring • Implementing an annual maintenance program
Recreation Infrastructure Recommendations	• Increase run-off on netball to meet Netball Victoria standards • Install a new playground in the grassed area behind the scoreboard and next to the Community Centre with a protective barrier or fence

	• Re-route Coliban water tankers from internal road at the Reserve to an alternative / new road when accessing the treatment plant due to potential safety issues and degradation of the internal roads • Consider installation of traffic calming measures between netball courts and the Community Centre to increase safety at the site for pedestrians and children • Widen drop off area in front of Community Centre so that buses can access this area more easily • Increase size of football and netball change rooms, and improve umpire change rooms, the social rooms and canteen facilities. • Develop a walking path to Serpentine township from the Reserve • Install a BBQ and picnic tables at the site
Comments	• The cricket club is currently in recess

7.11 Korong Vale Recreation Reserve

Location	Korong Vale 
Tenants	• Korong Vale Bowls Club • Korong Vale Tennis Club
Activities	• Lawn Bowls • Tennis • Meetings / social functions
Water Management Recommendations	• Implement an ongoing water use monitoring and reporting program • Develop a water allocation agreement for key sports facilities during restriction periods • Develop a formal agreement between the bowls and tennis club on shared use of water. • Purchase and install a rainwater/storm water harvesting system which includes a 100 kL tank, storm water collection pit and pump and associated plumbing works. • Upgrade irrigation system of Korong Vale Bowls Club (straighten poles and place poles back into ground with new cement blocks)

Turf Management Recommendations	• Bowls:
	  ○ Spraying for broadleaf weed control
	  ○ Fertiliser in spring to promote couch grass cover
	  ○ Spring Dead Spot control in spring
	  ○ Implementation of an annual maintenance program
	• Tennis:
	  ○ Treatment for Fairy Ring reduction
	  ○ Fertiliser in spring to promote couch grass cover
	  ○ Implementation of an annual maintenance program
	  ○ Conduct a training session for club members interested in learning more about maintenance

Recreation Infrastructure Recommendations	• Install new lighting at the Korong Vale Bowls Club and Tennis Club • Upgrade retractable shade at the bowls club to protect players from the sun (install rollers, catches and clips) • Work in partnership with Loddon Shire and Sports Focus to deliver a seminar series for small clubs on fundraising, sponsorship and adapting activities to small populations
Comments	

7.12 Little Lake Boort

Location	Boort 
Tenants	• Little Lake Boort Management Committee
Activities	• Water skiing, bird watching, fishing and passive recreation (walking, picknicking)
Water Management Recommendations	• None
Turf Management Recommendations	• Not assessed
Recreation Infrastructure Recommendations	• Not assessed
Comments	• Little Lake Boort has an environmental water entitlement of 300 ML per year as well as a number of other options to obtain water for the lake if required.

7.13 Market Square, Wedderburn

Location	Wedderburn  
Tenants	• Wedderburn Band Cricket Club • Wedderburn Vintage Engine Club
Activities	• Cricket • Vintage Engine activities • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Liaise with Loddon Shire and Donaldson Park to ensure Skinners Flat / Caravan Park Dam water supply system is improved and a formal water sharing arrangement is in place. • Install more sprinklers so that the whole ground is covered (not just the turf wicket area)
Turf Management Recommendations	• Undertake ground renovations to improve playing surface • Spraying broadleaf weeds • Over-sowing with ryegrass for winter cover • Strategic topdressing • Aeration twice a year • Over-sowing with kikuyu seed in spring • Implementation of an annual maintenance program • Upgrade and extend centre turf wickets
Recreation Infrastructure Recommendations	• Install signage recognising the tenants of the site • Install a handrail along the external ramp • Undertake some landscaping around the site to improve amenity and create a formalised car parking area • Install a white picket or post and rail fence made out of recycled white plastic around the perimeter of the sports grounds to improve visual

	appeal • Develop a walking track around the sports ground to link to Nardoo Track • Develop a commercial kitchen, including installation of a range hood in the kitchen area. • Install a verandah at the front of the pavilion to provide shade for cricket players • Install a BBQ with concrete flooring next to the pavilion • Develop a pathway connecting the pavilion and toilets • Upgrade and extend centre turf wickets • Develop a walking track round the sports ground to link Nardoo Track • Install a sound shell at the site for performances • Develop a third cricket practice wicket
Comments	• If club relocates to Donaldson Park, only some of these works will not be required (e.g. walking track, sound shell, etc).

7.14 Mitchell Park, Pyramid Hill

Location	Pyramid Hill  
Tenants	• Pyramid Hill Football Netball Club • Pyramid Hill Cricket Club • Old Machinery Club
Activities	• Football • Netball • Cricket • Old Machinery activities • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Set up an agreement with Loddon Shire to access a set volume of water from the Loddon Shire's Pyramid Hill-Boort Irrigation water share. • Replace existing irrigation system • Purchase and install a 100kL water tank to collect rainwater from clubhouse and use for toilet flushing and other non drinking building purposes. • Consider replacement of turf wickets with synthetic wickets to reduce water usage
Turf Management Recommendations	• Improvement to water pressure • Spraying of broadleaf weeds • Strategic topdressing • Aerating twice a year • Developing a program to promote couch in spring • Implementing an annual maintenance program • Purchase a ride on mower to maintain the grounds
Recreation Infrastructure	• Reseal both courts and extend run-off to meet Netball Victoria standards and to improve safety for netballers

Recommendations	• Upgrade fire service to ensure safety of patrons in the pavilion should a fire break out • Install light near playground to improve visibility of children playing in the area, particularly on training nights • Install signage to warn motorists to slow down around the playground area as there may be children playing there or running onto roadways • Provide access for people with disabilities to top floor of the pavilion • Need to install heating and cooling in the pavilion, a skylight and better acoustics • Construct a verandah to the south end of the pavilion for netball spectators • Improve aesthetics of the ground through ongoing planting and upkeep of more trees • Seal internal road around oval and provide signage and speed humps • Replace training lighting around the sports oval to improve visibility during training sessions • Replace gate, fence and track to provide safe access for users of Mitchell Park • Replace original toilet block
Comments	

7.15 Mitiamo Recreation Reserve

Location	Mitiamo 
Tenants	• Mitiamo Football Netball Club • Mitiamo Tennis Club
Activities	• Football • Netball • Tennis • Meetings / social functions
Water Management Recommendations	• Develop an agreement with the MRWS to access water from the proposed pipeline and install rainwater tank (100 kL storage), pump and pipe for on-site distribution. • Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Decommission all 5 lawn tennis courts and construct 2 new shared netball / tennis courts (which meet Netball Victoria standards). • Relocate the two tanks near the tennis courts to the buildings and connect to the roof for toilet flushing • Replace single flush toilets and high flow showerheads and taps with water efficient fixtures. • Assess the need to supplement the water supply (depending on the outcomes of the MRWS agreement) with stormwater runoff from the new netball / tennis hard courts and implement a stormwater harvesting system. • Improve the existing irrigation system on the sports oval when it reaches the end of its useful life and replace the pump
Turf Management Recommendations	• Spraying of broadleaf weeds • Over-sowing with ryegrass for winter cover • Strategic topdressing • Aerating twice a year • Developing a program to promote couch in spring • Implementing an annual maintenance program
Recreation	• Relocate existing light poles and upgrade lighting of the netball courts

Infrastructure Recommendations	• Improve drainage around the court area so that water does not pool on the courts • Construct a basic club facility (or obtain a transportable building) to provide shelter, a toilet, a shower and storage space next to the courts. • Re-vegetate Recreation Reserve by planting trees on eastern and western boundaries and erecting a fence on neighbour's property (20 metres) to enclose the trees • Survey oval and improve drainage on southern side of ground • Install sturdy cafe plastic sheeting around the verandah to increase capacity of the pavilion to cater for events • Relocate entrance to recreation reserve further to the east to allow a car-free area around the netball / tennis and play area
Comments	• Until such time as the tennis courts are decommissioned, the lawn courts will need broadleaf weed control, fertilising in spring to promote couch grass cover and the implementation of an annual maintenance plan. • Although the football club is keen to upgrade the light towers around the sports ground to allow football games to be held at night, this is not supported as it is not consistent with the standard of facilities that could be expected for a municipal grade ground. • Football club is also keen to extend the pavilion by approximately 4 metres to increase capacity for events and functions and also to provide additional storage space. It is felt that the installation of sturdy café plastic sheeting may be a more cost effective way to increase function space at this point in time.

7.16 Newbridge Recreation Reserve

Location	Newbridge  
Tenants	• Newbridge Football Netball Club • Newbridge Cricket Club • Newbridge Tennis Club
Activities	• Football • Netball • Cricket • Tennis • Camping
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods. • Implement a formal water use monitoring and annual reporting process. • Install an in-ground irrigation sprinkler system to decrease water use; decrease amount of time spent watering; and improve condition of the ground. • Liaise with Coliban Water on potential for recycled water option if the proposal to provide a reticulated sewage system to the town goes ahead.
Turf Management Recommendations	• Spraying of broadleaf weeds • Strategic topdressing • Aerating twice a year • Developing a program to promote couch in spring • Implementing an annual maintenance program • Reshaping and drainage for long term improvement
Recreation Infrastructure Recommendations	• Develop a new community sports pavilion to cater for social events and to provide suitable change facilities for players and umpires; and also upgrade power. Incorporate water efficient fixtures and additional rainwater tanks to collect roof water for building amenity water use including pavilion showers. • Reconstruct netball courts to meet Netball Victoria standards (over

	existing tennis courts). • Mentor young people to take on administrative roles on the Newbridge Recreation Reserve Committee of Management to ensure its ongoing sustainability. • Provide shade trees and a BBQ in playground / picnic area to provide a more comfortable place for people to recreate. • Develop a track along reserve extending this around the top of the reserve. • Fence the site to prevent sheep from causing damage
Comments	

7.17 Pyramid Hill Bowls and Tennis Complex

Location	Pyramid Hill 
Tenants	• Pyramid Hill Bowls Club • Pyramid Hill Tennis Club
Activities	• Lawn Bowls • Tennis • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Set up an agreement with Loddon Shire to access a set volume of water from the Loddon Shire's Pyramid Hill-Boort Irrigation water share. • Develop two synthetic tennis courts with lights to reduce water usage and to provide year round tennis opportunities for the community and also install an in-ground irrigation system on the tennis courts to eliminate the need for flood irrigation and to more effectively irrigate the tennis courts. • Install a water tank for emergency water storage (for carted and channel water when available) near pump and shed.

Turf Management Recommendations	• Bowls Green:
	  ○ Treatment for disease reduction
	  ○ Fertilising in spring to promote even couch grass cover
	  ○ Implementation of an annual maintenance program
	• Tennis Courts:
	  ○ Mowing
	  ○ Treatment for weed reduction
	  ○ Fertilising in spring to promote couch grass cover
	  ○ Implementation of an annual maintenance program

Recreation Infrastructure	• Install a fence near the channel to prevent children from falling into the water; between the playground and the fire training track; and between

Recommendations	the playground and the main road • Erect signage from main road to direct people to the tennis courts • Plant trees on the western side of the tennis / swimming pavilion to help keep players and the pavilion cooler and to provide additional shade in the car park • Purchase a new motorised spraying machine to more effectively maintain the bowls greens • Upgrade the bowls pavilion kitchen by installing new carpet throughout the pavilion and air conditioning • Install lighting at the Bowls Club to allow night time training, competitions and events • Undertake additional planting and landscaping around the tennis area, particularly at either end of the complex once the end tennis courts have been removed.
Comments	

7.18 Serpentine Bowls and Tennis Complex

Location	Serpentine  
Tenants	• Serpentine Bowls Club • Serpentine Tennis Club
Activities	• Lawn Bowls • Tennis • Meetings / social events
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Purchase and install a storage tank and associated pipe works to connect to the new pipeline. Tank size and other details will need to be determined once the pipeline design and supply is confirmed by GMW.
Turf Management Recommendations	• Treatment for Fairy Ring reduction • Fertilising in spring to promote couch grass cover • Implementation of an annual maintenance program • Eradicate onion weed from tennis courts
Recreation Infrastructure Recommendations	• Develop a strategy to attract additional players to both tennis and bowls • Improve accessibility of pavilion to tennis club by installing larger windows, forming a path outside the tennis fence and constructing a verandah on the northern side. • Replace shade structures (posts and roof) around bowls • Develop a basic play space for children near the tennis courts
Comments	

7.19 Winzar Recreation Reserve, Dingee

Location	Dingee 
Tenants	• Dingee Bowls Club • Dingee Tennis Club • Dingee Cricket Club • Dingee Playgroup
Activities	• Bowls • Tennis • Cricket • Playgroup • Meetings / social functions
Water Management Recommendations	• Develop a water allocation agreement for key sports facilities during restriction periods • Implement a formal water use monitoring and annual reporting process • Consider purchasing a permanent water allocation of 4 ML to assist with irrigation of sports fields or opt to rely on the purchase of temporary water from the market on an as required basis. • Fill in the dam as water will be sourced from a pipeline in the future and a new water storage tank has been installed recently. • Review the adequacy of the tennis courts sprinkler system and replace or upgrade the sprinkler system if required.
Turf Management Recommendations	• Sports Oval: ○ Strategic top dressing ○ Aerating twice a year ○ Development of a program to introduce couch grass in spring ○ Implementation of an annual maintenance program ○ Improve condition of cricket wicket and oval • Tennis Courts: ○ Treatment for weed reduction ○ Fertilising in spring to promote couch grass cover ○ Implementation an annual maintenance program • Bowling Green:

	○ Treatment for disease reduction ○ Fertilising in spring to promote couch grass cover ○ Implementation of an annual maintenance program
Recreation Infrastructure Recommendations	• Convert one lawn tennis court to hard court to allow for year round multi-purpose use; install lights; and line mark for other sports such as netball and basketball • Upgrade lighting on the bowling green • Improve condition of cricket wicket and oval • Continue to develop the walking track around the reserve to form a self-contained loop from Dingee and link up with Tang Tang Reserve • Upgrade cricket practice nets • Level ground around pavilion; repair exterior wall to match new extension; and install carpet in function area • Share a care taker with another community to maintain sports facilities • Formalise bowls club parking area with pine bollards and install lighting.
Comments	

7.20 Swimming Pools

Location	Boort, Inglewood, Mitiamo, Pyramid Hill and Wedderburn  
Tenants	• Swimming pools are managed by external contractors
Activities	• Swimming / water play
Water Management Recommendations	• Continue to work through the actions listed in the previously developed swimming pool water management action plans • Purchase and install pool covers for Boort, Inglewood and Wedderburn swimming pools
Turf Management Recommendations	• Weed control and promotion of the existing warm-season grass cover of recreational lawn areas
Recreation Infrastructure Recommendations	• Not assessed
Comments	• Water management action plans were developed for the five swimming pools in 2006 and have been implemented over the last four years.

8.0 Appendices

8.1 Literature Review

Document	Relevance

Loddon Shire Council Addressing Population Decline in Loddon Shire (2008)	• The purpose of this report is to profile Loddon Shire Council's response to community concern about the declining population.
	• The report recognizes that Loddon Shire has experienced an annual decline in population each year of around 1%.
	• Factors that have contributed to population decline include:
	  ○ Death rate is higher than the birth rate in the Shire
	  ○ Inward migration is not high
	  ○ Changes in the agricultural industry, which has meant less people working on farms and therefore less people living in the area
	  ○ Unemployment, resulting in people moving to other areas to gain employment
	  ○ Prolonged drought conditions, which has resulted in some families moving out of the area
	  ○ Poor access to services such as health, education, transport and community services, which has resulted in people moving to other areas to receive better access.
	• The report recognises that local community leadership is critical to the ongoing sustainability and growth of towns, and at the same time, local government has a key role in facilitating communities to remain sustainable by partnering with other levels of government to support regional development, mobilise resources for education, build community capacity building and advocate for essential community services.
	• The report also identifies that Loddon is rated in the top eight municipalities in Victoria for volunteering and community involvement.
	• Community plans undertaken in the Shire recognise the need to use storm water, recycle water and to improve sport and recreation infrastructure.

Loddon Shire Council Council Plan 2009-2013	• Council's vision: "Loddon will be a proud community leading rural Australia as a great place to live, work and visit" • The Loddon community wants Council to show leadership in respect to water issues • Asset management by Council has been identified as the biggest challenge facing Council's financial resources • Climate change adaptation is considered to be an important role for Council when working with communities • There is potential for residential growth in the rural sector of the southern part of the Shire • Due to its low rates base, Council is heavily reliant of grant from State and Federal Government • Council's Youth Strategy identifies the need to ensure that existing sports are sustainable and remain strong and that opportunities are provided to participate in alternative sport, recreation and leisure pursuits

	• Council needs to understand the impact of climate change on its operations and develop mechanisms to adapt to such changes, as well as helping the community to understand these changes.
Loddon Shire Council Loddon Community Plan (2006)	• This plan identifies the process of instigating community planning in Loddon Shire and specifies the needs of communities in relation to sport and recreation and water access on a town by town basis (where identified), as follows: o Boort – Little Lake Boort, community and recreation facilities o Pyramid Hill – upgrade of sport and social facilities, water quality o Yarrawalla – improved infrastructure, water quality o Calivil – infrastructure, landscaping / beautification, community facilities o Mitiamo – maintenance and upgrade of recreation facilities, improvements to public amenities at the swimming pool o Dingee – recreation reserve, town water supply and drainage o Korong Vale – improved recreational opportunities o Inglewood – improved recreation opportunities, water conservation o Wedderburn – water supply, improved recreation opportunities (e.g. multi-purpose tennis / netball courts) o Eddington – maintenance of recreation facilities, drainage o Arnold – improve standards of facilities, support sports groups o Newbridge – recreation reserve improvements o Tarnagulla – improvements to recreation opportunities
Loddon Shire Council Recreation Strategy (2007)	• The purpose of this document is to provide a framework to guide Loddon Shire's decision making processes as they relate to recreation services, programs and infrastructure between 2007-2016. • Relevant priorities for years 1-3 are as follows: o Maximise the sustainability of existing sports across the Shire. o Prepare an integrated data base for recreation and social infrastructure that includes: a full listing of all assets from which groups operate including those that are on land that is owned and or managed by other agencies (e.g. DSE reserves);condition status and expected lifespan; costs associated with compliance e.g. legislation, standards, policy); and usage numbers and frequency of use. o Work with clubs and organisations (operating on both Council and non-Council owned land) to ensure that appropriate risk management protocols are in place. o Identify opportunities to increase use of school facilities for indoor recreation / sporting activities. o Actively support the co-location of the Bridgewater Lawn Bowls Club and Golf Club and maximize opportunities for the redevelopment to address other community recreation/social infrastructure needs o Implement the 10 year program of works to maximise the lifecycle and use of community pools.

	○ Advocate to water management agencies to ensure that water systems are well maintained. ○ Work with clubs and organisations to identify priorities in relation to responsible water management practices and systems and opportunities to address these. ○ Review Reserve Master Plan proformas to ensure that they reflect the principles and priorities identified in the Recreation Strategy e.g. consolidation of buildings, creation of community hubs, integration with township planning, compliance with contribution policies, referral and consultation requirements. ○ Develop a policy that clearly articulates consistent service and support levels to community groups/organisations • Relevant priorities for years 4-6 are: ○ Support the development of alternative (indoor and outdoor) sporting opportunities e.g. soccer, badminton. • Relevant priorities for years 7-10 are: ○ Actively work with clubs/organisations to identify opportunities for clubs to develop integrated and cooperative management structures. ○ Identify and support opportunities for Tennis Clubs to develop integrated facilities that consider provision of infrastructure across 'districts' (hard courts, lighting) that increases participation and reduces operational costs (e.g. water, court maintenance). ○ Identify opportunities for innovative water access, storage and usage strategies to maximise access to water for recreation and open space purposes. General principles to guide Council's decision-making for recreation service provision include: • provision for recreation will be based on substantiated need i.e. activities are viable • priority will be given to recreation development proposals that: ○ are designed to cater for a range of uses ○ consolidate existing functions and buildings ○ are projects for maintenance or renewal of existing buildings. These projects will generally be a priority over the development of new buildings.
Loddon Shire Council Position Document – Water Security for Urban Communities (2009)	• This report recognises that organized competitive sport plays a pivotal role in maintaining the health and wellbeing of rural communities and that the inability to maintain sports grounds through lack of water can have dire consequences. • The report also recognizes the value of swimming pools in family life in summer months. • Coliban Water manages all township water supplies • Council's role in water provision is one of advocacy

- The following table shows which supply system currently delivers water to the various townships (the tick) and which supply systems could potentially deliver water (the letter P)

	GRAMPIANS	LODDON RIVER	GOULBURN	LODDON DEEP LEAD
BOORT			√	
PYRAMID HILL			√	
MYSIA			√	
BORUNG	√			
KORONG VALE	√			
WEDDERBURN	√			
MITIAMO			√	
DINGEE			√	
SERPENTINE		√	P	P
JARKLIN		√	P	P
BRIDGEWATER		√	P	P
INGLEWOOD		√	P	P
NEWBRIDGE		P	P	P
TARNGULLA		√		P
LAANECOORIE		√		P

Overview of water supply authorities:

- Grampians System – the recently completed Wimmera Mallee Pipeline delivers water to Wedderburn, Korong Vale and Borung
- Loddon System – the Loddon system is no longer reliable in terms of its water quality and water security, and is expected to continue to decline. All townships supplied by the Loddon River system have at least one alternative source of water. The report recommends that Council advocates for alternative water supplies for Tarnagulla, Laaenecoorie, Bridgewater, Inglewood and Serpentine and that it works with Coliban Water to secure a reticulated water supply for the township of Newbridge.
- Goulburn System – this system has large water storages and is the most reliable source of water for townships in Loddon Shire, despite the fact that in recent years there has been a reduction in allocations. Three ways Loddon urban communities can be connected to the Goulburn system are: by a pipe from Waranga Western Channel (WWC) at Bears Lagoon (as part of the proposed East Loddon Water Works District D&S Pipeline Project); by a pipe connected to the Bendigo Water supply system (supplied from the WWC at Colbinabbin); and by pipes from both sources.
- Loddon Deep Lead – this major aquifier, which has significant reserves, is situated below the Loddon Valley to the east of the Loddon River and is fed from recharge areas on the northern slopes of the Great Dividing Range. The Mid Loddon Ground Water Reference Committee manages water extraction and water trading is possible. The current annual extraction is around 21.5GL, although the annual licensed volume is 35GL. The quality of water from this aquifier is considered to be acceptable for potable water supply between Laanecoorie and Serpentine.

Position of Loddon Shire Council:

- Supports construction of Wimmera Mallee Pipeline to Korong Vale

	• Wants a guarantee that there will be sufficient water available from the pipeline for irrigation of recreational facilities in Wedderburn and Korong Vale • Supports emergency supply of water for recreational purposes in Wedderburn • Supports improved water quality and reliability for Tarnagulla, Laanecoorie, Bridgewater, Inglewood and Serpentine by Coliban Water • Supports a reticulated water supply for Newbridge • Supports connection of townships to Goulburn system where feasible • Wishes to spread risk of water shortages by seeking a range of water sources and connecting the water sources • Wants a commitment from Coliban Water that it will ensure that at least one recreational facility or area of open space in each town has access to sufficient water in recognition of the valuable role that sport and recreation plays in Loddon communities.
Loddon Shire Council Building Asset Management Plan (2009)	The purpose of Council's Building Asset Management Plan is to balance levels of service, community expectations and affordability of its assets and services. This Strategy identifies the level of service that Loddon Shire intends to provide to Recreation Buildings as part of its asset management strategy. It states that: "Council's investment in recreation buildings is limited to:- • annual allocations as per *Public Hall and Recreation Reserve Allocation Policy* • allocation of Community Grants as per *Community Grants Policy CS3* • allocation for approved Community plan Projects • 10% contribution by Council to grants for projects funded by State Government "Major and Minor Facilities Grants: discretionary interest free loans to Committees of Management by Council. Local contributions are to fully fund the difference between project cost and grants/Council contributions. Local contributions may include up to 50% funding from approved community planning Allocations". The strategy also states that Council will not invest in a recreation reserve building unless a master plan has already been prepared.
Climate Change Adaptation Plan – Loddon Shire (2009)	One of the key actions identified in this document is the need to assist the Loddon community to understand and adapt to climate change, through leading by example. By installing water saving measures at the sport and recreation sites identified in this funding application; by ensuring training sessions are held with committee of management members; and by ensuring that suitable media coverage is attained explaining why it is important to undertake such measures, it is hoped that the community will become more aware of the climatic changes occurring globally and will understand that there will be less water available for sport and recreation facilities (as well as agricultural pursuits) in the Loddon area in the future.

Water Options for Irrigation at Football Reserves within the North Central Football League (2009)	Recommendations for Donaldson Park include: • Introduce drought tolerant turf regime for the whole ground • Install sub-surface irrigation system • Undertake a detailed assessment to supplement the existing storm water system from Caravan Park / Skinners Flat Reservoir System • Install a groundwater bore (or use existing one) and desalinate if required • Use recycled water (volumetric charges are comparable to desalination of ground water).
CSIRO Water Availability in the Loddon-Avoca Report (2008)	The key findings of this report are: • Average surface water availability under the historical climate is 285 GL/year and under current development 32 percent is diverted for use. This is a high level of use. Current groundwater use is about 29 GL/year or 9 percent of total water use. • If the recent climate (1997 to 2006) were to continue, average surface water availability would be reduced by 50 percent and the volume of water diverted for use within the region would be reduced by 27 percent. • The best estimate of climate change by 2030 would reduce average surface water availability by 18 percent and would reduce the volume of water diverted for use within the region by 6 percent. • Future development of commercial plantation forestry and farm dams is expected to have only minor impacts on runoff. Groundwater extraction in the region is expected to approximately double by 2030 to be 59 GL/year.
Sustainable Water Practices for Sport and Recreation (Victorian Government) 2003	This document, produced by the Victorian Government, outlines a range of water efficiency measures suitable for implementation by sport and recreation clubs and organisations. It identifies: Processes to use less water • Change behaviour • Stop drips and leaks • Control pressure and restrict flow • Install automatic timers • Install automatic irrigation systems • Install water efficient products • Incorporate water efficient features in facility design Alternative sources of water • Rainwater run-off • Treated water • Ground water It also details a number of case studies where initiatives such as warm season grasses, re-use of boiler house pump cooling water, automated irrigation systems,

	sensors, onsite treatment of water, bores, treatment of effluent, conversion to more efficient water us appliances, use of reclaimed water, etc.
Coliban Water Schedule of Fees and Charges 2010-2011 (2010)	Coliban Water introduced a new schedule of fees and charges commencing June 2010. For the majority of towns (not including Mitiamo and Dingee) in Loddon Shire, the price of treated water for non-residential properties has increased to $2.0371 per kilolitre. The price of untreated water for the towns of Mitiamo and Dingee has increased to $0.7335 per kilolitre. These pricing increases will impact on the operational costs of recreation reserves within Loddon Shire.
Murray Darling Basin Guide to the proposed Basin Plan – Summary of Loddon Region (2010)	The Murray Darling Basin Authority has recently compiled the current limits for all forms of water extraction in the Murray-Darling Basin and is in the process of establishing new sustainable diversion limits (SDLs) for surface water and groundwater. The findings presented in the Guide to the Proposed Basin Plan, relevant to the Loddon Region include: • The ecology of the Loddon region is in extremely poor condition; • 42 key environmental assets have been identified in the Loddon region; • The environmental water requirements for the region have been estimated to be between 126 GL/y and 170 GL/y (an increase between 28 GL/y and 69 GL/y) • The SDL proposal for the Loddon region would require a reduction in the current long-term average surface water diversion limit from 185 GL/y to between 147 GL and 142 GL per year (reduction between 21% to 23%). • There are no reductions proposed for groundwater diversion limits in the Loddon region. • The Australian Government has committed to recovering sufficient water access entitlements to fully offset the impact of SDLs across the Basin including the Loddon region through a combination of purchasing entitlements in the market and investments in more efficient irrigation infrastructure. As a result there are likely to be no reductions in individual water entitlement holder allocations. The specific implications of this proposal for recreation reserves is unclear at this stage however it does indicate that there may be less chance of purchasing additional water entitlements in the future and potentially the availability of temporary water for purchase on the water market may be reduced and/or the price may rise significantly to do so. There will need to be a major emphasis on implementing actions that reduce the amount of water required at the reserves.

8.2 Summary of Community Engagement Outcomes

A key component of this strategy involved engaging with the Loddon community, particularly users of the reserves and Committees of Management.

Each sport and recreation club was individually contacted by telephone by the project team to hear first-hand about the project and its intended outcomes. Clubs were then forwarded a letter from Loddon Shire Council and a survey to seek details about operational aspects of clubs and any specific issues or development priorities related to water, turf or infrastructure. The response to the survey was excellent and the information provided was extremely useful in determining the current situation of clubs in terms of membership, turf management practices, water management practices and possible improvements.

Project team members then met on site with representatives of all recreation reserves to outline the project in more detail, identify specific issues and to undertake a basic audit of each site. These meetings were well attended by club representatives and provided an excellent opportunity for two-way communication. Some of these meetings were attended by Loddon Shire Councillors and officers.

Additional meetings were held with club representatives when each master plan was at draft stage. These meetings allowed user groups to review their initial list of priorities and to gain an understanding of the best options in terms of water and turf management. The meetings were also used to provide details on how to implement the strategies and to provide information on improved turf management practices.

Due to time and budget limitations, the broader community was not consulted on their specific needs in relation to recreation reserves, however, each master plan identified key priorities listed in township community plans and other relevant plans and incorporated these into the master plans.

Other organisations contacted as part of the master planning exercise include water management authorities, Department of Sustainability and Environment and schools.

Specific community needs related to individual recreation reserves are included in detail in each master plan.

8.3 Drought Proofing Strategies for Turf Playing Surfaces

Without an adequate supply of water, the playing surface will quickly deteriorate and as a consequence the surface becomes unplayable and/or unsafe with a high potential for injuries. Closures will result in disruptions to organised sporting programs and competitions, reduced revenue to clubs and flow on effects to the community in terms of interaction and spirit. There is also huge financial cost for the restoration of these sporting surfaces.

There are several strategies that can assist in "drought proofing" sporting surfaces including:

- Warm season grasses
- Improved irrigation management
- Subsurface drip irrigation
- Synthetic surfaces
- Products to Assist with Water Retention & Water Repellency
- Remedial Works to Overcome Surface Hardness

The majority of these strategies are more applicable for sports fields than for bowling greens or tennis courts. Sports fields due to their size use significantly more water than a bowling green or tennis court.

In the Loddon Shire, all the bowling greens and tennis courts are already using warm-season grasses for their playing surfaces; and the nature of the respective sport requires the playing surface to be very uniform so irrigation application is also intensely monitored to ensure that only the necessary amount is applied.

With regard to the bowling greens, there is very little extra that can be done to optimise water that is not already being done. In general, excessive water use is not a common problem because of its adverse effect on the playing surface.

8.3.1 Warm Season Grasses

Warm-season grasses (couch grass or kikuyu grass) are more efficient water users and have better drought tolerance than the cool-season grasses such as ryegrass, fescue as well as Winter grass (Poa annua). Warm-season grasses when compared to cool-season grasses have;

- lower rates of evapotranspiration (i.e. require less water to maintain acceptable growth and quality)
- a deeper root systems that can explore a large soil volume for water (i.e. will survive for considerably longer periods of time as soil moisture levels decline)
- better recovery abilities following periods of low water availability
- are more tolerant to using lower quality water

Approximate sports field water use in Loddon is 9.9 ML/ha per year for cool season sports fields and 6.8 ML/ha per year for warm season sports fields. This equates to a saving of approximately 30% in water

use with warm season grasses compared to cool season grasses. If the sports field is not being actively used over summer then the water savings may even be greater.

Another advantage of warm season grasses is that without an adequate supply of water (e.g. under water restrictions), sports surfaces consisting predominantly of cool season grasses will lose cover, become tufty, have excessive hardness and often become unsafe. Warm-season grasses have a greater capacity to maintain good density and have a creeping growth habit that is less likely to become tufty during periods of extreme heat and low rainfall.

Due to the cold winters and frosts experienced in this region the reserves may need to be over-sown in autumn with ryegrass to provide a suitable surface for winter use (i.e. football and soccer).

Over seeding will improve the durability and quality of the reserves and provide colour during winter with the introduced grass stressed out during the following summer. The warm season grasses will provide a dense cover and improved drought and heat tolerance over the summer period while the ryegrass will provide a winter surface and prevents the warm season grasses from wearing out during the cooler months when it is not actively growing.

8.3.2 Improved Irrigation Management

It is essential that irrigation of grassed surfaces is efficient with the water applied uniformly so that there is minimal wastage through runoff and deep drainage.

Manual irrigation systems (e.g. quick couplers, hand moved sprinklers etc.) tend to be highly inefficient and waste significant quantities of water. Upgrading to a properly designed automatic system is the best way to improve irrigation efficiency. A good quality irrigation system design needs to take into account the turf water requirements, the soil types, micro-climates, site function, site layout and water supply. The installation of an automatic irrigation system in a sports field will cost about $45,000 per hectare.

Existing irrigation systems need to be audited to ensure they are operating efficiently (i.e. have good uniformity and distribution) and effectively (i.e. suitable pressure). In terms of irrigation design it is essential that any new design has a calculated Distribution Uniformity that is greater than 85%. In terms of actual performance in the field, measured Uniformity should be greater than 75%.

Regular maintenance of the system is also essential and irrigation schedules should also be checked to see if they are appropriate for each area. Proper scheduling (i.e. timing) of irrigation is critical in preventing over-watering. An efficient irrigation system will replenish the plant root zone to the desired level, when it is needed.

Ideally irrigation needs to occur during cooler periods with low evaporation and under calm conditions to prevent drift. It is also important to minimise the potential for human contact when using recycled water. Automatic irrigation systems can be programmed to operate during the hours of darkness. With manual systems that need to be used during work hours it is preferable to irrigate early in the morning.

Other strategies to consider include modifying water usage by:

- Differential watering across an oval with the central area receiving more than boundary areas;
- Reducing the area of water application on large ovals, and subsequently reducing play area;
- Installation of subsurface drip irrigation systems into appropriate sports fields

These strategies will impact on the quality of the turf cover, with a flow-on impact on the potential usage levels of the area. Their implementation will require changes to existing irrigation systems and future system design should take this into account.

From an operational view, the following guidelines should be followed for any turf area:

- water at night or early morning;
- do not water during the day, or in windy weather;
- only apply sufficient water to wet to the depth of the grass root system; watering deeper than the roots is wasteful
- it is better to split a watering schedule into short periods on the one night rather than one long period e.g. 3 x 10 minutes is better than 1 x 30 minutes;
- deep, spaced watering is better than shallow watering every night;
- adjust irrigation periods to match needs on the field, e.g. longer watering where turf is stressed due to wear or at higher parts of field.

8.3.3 Subsurface Drip Irrigation

An alternate method of irrigating turf areas is subsurface drip irrigation (SDI) which has been used in agriculture for many years and is now starting to be used for grassed sports surfaces. SDI involves closely spaced runs of irrigation drip-lines that are buried beneath the surface. The depth and placement of the drip-line depends on the soil type and turf water requirements. Water moves by capillary action through the soil and forms a continuous wetted layer at the root zone.

It is a highly efficient method of irrigating and water savings of up to 40% over sprinkler systems have been claimed as there is minimal evaporation or run-off. Other benefits compared to traditional sprinkler systems include reduced vandalism, no risk of tripping on pop ups sprinklers, the ability to irrigate while sport is being played and they are less sensitive to pressure differences.

SDI can be retrofitted into existing sports field turf surfaces and perform best in heavy soils (e.g. clays and clay loams). SDI is not compatible with subsurface drainage systems as water moves into the drain before plants can access it. Flow sensors are essential to monitor system operation and detect leaks. The system must also operate continuously to prevent the soil from drying out. Overhead irrigation is required when establishing new turf, especially warm season grasses and for applying / watering with some pesticides, wetting agents and fertilisers. Where recycled water is used, it removes risk of contact with effluent allowing lower classifications of water to be used without risk.

Approximate installation costs are $50,000 to $60,000 per hectare. Note although the principles of SDI watering are good in theory there are a number of practical limitations in the field and universal adoption of this technique is not anticipated.

SDI irrigation is not suitable for retrofitting into bowling greens due to the disruption to surface levels and uniformity of grass cover.

A major problem with any SDI system is the potential damage that will occur to the buried pipes by the normal deep aeration works that are required as part of normal maintenance programs.

8.3.4 Synthetic Surfaces

The main reasons generally given for installing a synthetic surface are:

- Climatic (drought, water restrictions etc.): difficulty in providing adequate natural grass surfaces
- Usage: synthetic surface can sustain significantly higher use than grassed surfaces and are less affected by the weather conditions
- Maintenance: synthetic surfaces require lower ongoing maintenance than a natural turf surface

Another advantage of a synthetic sports surface (and hard surfaces such as netball courts) is that they can be used to collect water (surface runoff and drainage) following rainfall and this can be used to irrigate adjacent turf areas, nearby trees and garden beds or used for cleaning the facility.

The type of synthetic surface used depends on the sports to be played.

- **Football, Soccer & Rugby:** Third generation long pile carpets were introduced in the late 1990's. They have a long pile length (35mm to 65mm) and are filled with a combination of sand and rubber granules. A rubber shock pad may also be installed under the carpet (and is a requirement for some sports). These surfaces are primarily designed for soccer and rugby use and many have been accredited by the sports governing bodies. There have been several installations in Australia in schools and community facilities. The installation cost will vary depending on the situation and a full sized synthetic soccer pitch (0.8 ha) will cost approximately $550,000 and a 1.6 ha football field approximately $1.1 million (i.e. $700,000 per hectare).

  There are several multi-purpose synthetic surfaces available which allow for one area to be utilised for several sports (e.g. hockey, tennis, soccer and a variety of other sporting activities). These surfaces are generally have a shorter pile length (20 – 30mm) and are filled to within 5 - 8 mm of the tips of the fibre with fine sand. Due to the multi-purpose nature of the surface there are compromises in the surface performance for each sport. These multi-purpose surfaces are more suitable for use in schools.

  Synthetic Standards have been developed for soccer, rugby, AFL football & cricket.

Synthetic wickets are commonly used in most grades of cricket except for the top division which play on turf wickets. Wickets consist of a concrete foundation covered with a synthetic carpet. Synthetic wickets need to be covered with soil or a synthetic mat on grounds that are used for winter sports (soccer, Australian Rules football, rugby etc.). "All Season" covers are now available that can be used for cricket during summer and allow winter sports to be played over them without the need to be covered with soil. The cost of installing a synthetic wicket is around $20,000.

- **Hockey:** Synthetic hockey pitches have been around since the mid 1970's. There are three main surface types; water based, sand dressed and sand filled pitches. Top level hockey is played primarily on water-based pitches where water cannons are required to reduce the friction on water based pitches (pre match and at half time). The approximate cost for hockey pitches range from $300,000 (sand filled) to $600,000 (water based). Grass hockey fields are not used for regular competition and tend to be only found in some schools and rural areas.

- **Bowls:** Synthetic bowling surfaces were introduced in the late 1970's and early 1980's. There are two main types of synthetic surfaces used for outdoor bowls being a sand filled synthetic grass and non-sand filled synthetic carpet. Some concerns with synthetic greens include faster green speed, excessive and uneven draw and reduced player comfort (i.e. a hard, hot and glary surface). Synthetic bowling greens cost in the vicinity of $150,000.

- **Tennis:** The general trend is for lawn tennis courts to be replaced with alternate surfaces due to the high cost of maintenance. Alternate surfaces include en-tout-cas, clay, asphalt/concrete, plexipave and other synthetic surfaces. It should be noted that en-tout cas courts require irrigation prior to their use (settle dust, maintain surface integrity etc.) but lower quality water can be used instead. The cost for resurfacing a tennis court is approximately $50,000.

Maintenance: A synthetic surface requires a lower investment in time and cost for maintenance than a natural turf surface. Synthetic surfaces are not maintenance free and appropriate maintenance is of vital importance if the surface is to continue to perform, be safe and durable. Even when the surface is not used it still requires maintenance so as not to deteriorate and reduce life expectancy. Annual maintenance costs range from $20,000 - $25,000 for a soccer pitch and up to $40 – 45,000 for an oval.

Longevity / Surface replacement: Synthetic surfaces need to be replaced every 8 to 12 years however the shock pad will last for several surface replacements with only minor repair works.

Issues with Synthetic Surfaces: Some disadvantages of synthetic surfaces are that they are expensive to install compared to natural turf and there can be issues with player comfort (hardness, friction, radiant heat etc.) and playing quality (ball-roll and rebound) especially if they are not adequately maintained. Synthetic surfaces require regular maintenance (i.e. they are not maintenance free) and they have a finite life span and need to be replaced (8 -10 years).

They are also costly to repair following damage (vandalism) and wear patches can develop in heavily trafficked areas. There are also potential health issues with body fluids (spittle, blood, sweat etc.), bird droppings & animal faeces / urine. Environmental concerns include the potential leaching of contaminants (zinc, heavy metals) from rubber infill (shredded tyres) and the issue of disposal of the old carpet and infill when the surface is replaced. Other concerns are that they are not "natural" and most sportsmen have a preference to play on natural turf.

8.3 .5 Products to Assist with Water Retention & Water Repellency

There are several products available that can assist with improving the soil's water holding capacity and reducing water repellency.

- **Wetting Agents:** There are many wetting agents available on the market that can be used to reduce the water repellency of dry soils (hydrophobicity) and improve water penetration. They are available in granular and liquid formulations which can be applied with spreaders and boom sprayers respectively. Their effective life ranges from one month to three or four months and will maximise irrigation and any rainfall. The typical cost for applying a wetting agent ranges from $200 to $400 per hectare up to $1,000 per hectare for the premium long lasting products.

- **Fytofoam:** Fytofoam is a liquid resin concentrate that is introduced into the root zone of turf areas. Once introduced into the soil it expands and hardens into a stable, lightweight foam which absorbs water and nutrients and allows roots to grow through it. Fytofoam can hold around 60% water by volume and can be re-saturated. Water is released gradually for plant uptake and the Fytofoam also reduce compaction in the root zone. It is biodegradable and its effects can last for up to 10 years. Fytofoam can be incorporated into existing fields by slit injection and does not require the sports field to be taken out of play. It can be applied as a layer and rotary hoed in just prior to turfing, sprigging or seeding during construction or re-construction of a sports field.

- **Sanoplant:** Sanoplant is a blend of silicate based stone powders that like any soil particle has the ability to retain water around its surface. The commercial material has been treated to allow the particles to store about 16 times its own weight of water in a form that is available to plants. Any more water in the profile is able to drain out through the normal pore spaces in the root zone layer.

  Sanoplant increases the plant available water quantity by decreasing the quantity of drainage water. This also results in the soluble nutrients in the soil solution being held in the root zone and kept available to the plants. Thus a triple benefit is gained: less water is lost through drainage; fewer nutrients are leached out of the profile; and there is reduction nutrients moving into the nearby waterways.

Currently Sanoplant can only be incorporated into the soil profile at construction, but development work is underway to allow for injection into an existing soil profile.

8.3.6 Remedial Works to Overcome Surface Hardness

Fine textured soils (i.e. soils that have a high silt and clay content) are prone to water logging and compaction resulting in excessively soft surfaces following rainfall and excessively hard surfaces in summer.

Sports fields become hard due to low rainfall / water restrictions, hot weather and a subsequent reduction in grass cover. Surface hardness refers to the ability of a surface to absorb impact energy and influences both player performance and player safety. Hard surfaces can cause jarring of limbs, muscle soreness and increases the risk of injury from falls while a soft surface can cause footing problems as well as player fatigue.

Surface hardness is of great importance for sports such as football, soccer and rugby where there is player interaction and considerable running and also for grass athletic tracks. It is of lesser importance for sports such as cricket, baseball and softball.

Surface hardness is dependent on several factors including extent of grass cover, thatch level, soil type, soil conditions such as compaction and moisture levels and turf management practices.

Sports fields can also become hard from traffic (compaction, overuse etc.) with the high use areas generally having poor grass cover and being more compacted than the rest of the sports field. The hardest areas on a sports field are the centre, goal squares, in front of the pavilion and under the lights (training).

Other sports fields have less issues with hardness due to them being constructed from lighter textured soils (sandier) which are less prone to compaction or they have a greater component of warm season grasses (couch and kikuyu) which are more efficient water users and have better drought tolerance.

Surface hardness can be reduced by:

- Irrigation (and rainfall), which will soften the surface.

- Raising the mowing height of cool season sports fields so that there is more grass to absorb impact. However it is important that you do not raise the height too much as this will reduce turf density meaning that there will be fewer shoots close to the surface. As the leaf blades are worn away there are less growing points for recovery and bare areas are likely to result.

- Mechanical remedial action such as slicing, coring and verti-draining will open up the profile so that water can move into the soil rather than run off. Remedial action followed by topdressing will provide some loose material at the surface that has not been compacted. This not only reduces surface hardness but improves turf growing conditions.

- Over seeding to increase turf density. Turf biomass is an important factor in modifying surface hardness and also assists in regulating soil moisture levels. The hardest spots on a sports field are generally those where the turf is thin and on a hot summer day the soil bakes and becomes very hard.

- The application of wetting agents over summer will assist with water penetration as well as reducing the effects of dry patch. During winter the application of gypsum to heavy soils (i.e. gypsum responsive soils) will improve soil structure, water infiltration and turf growing conditions.

These activities need to be incorporated into an integrated turf management program and will improve grass health and durability as well as reduce water requirements.

It is common for sports fields to be very compacted in front of change rooms due to excessive use, particularly for practice or training sessions. Training routines should be spread around the field rather than being conducted in one area, and goal kicking drills should be held at the further goal to help reduce wear stresses.

8.4 Alternative Water Sources, Water Quality & Storage Options

The demand for water is outstripping supply in many parts of the country due to an increasing population and below average rainfall. Consequently there has been a major drive for the turf industry to become less reliant on potable (drinking) water for irrigation and to use alternative water sources. There are three main alternative sources of water;

- Treated effluent (recycled water) which is taken from discharge lines from sewerage treatment plants and is available in various levels of quality (i.e. classes). The greater the levels of treatment, the better the quality of water but the greater its cost. The use of treated effluent requires negotiation with a range of authorities including the local water company, Environmental Protection Agency and health department.

- Stormwater reuse / water harvesting operates by collecting water from a stormwater drain or from hard surfaces such as roofs and car parks. The water is stored, treated and then pumped in to the irrigation system. A key advantage of stormwater is its availability and the relatively simple regulatory requirement governing its use. Disadvantages to stormwater are the reliability of supply and the requirement for large storages to provide irrigation during low rainfall periods.

- Groundwater (bore water) is water stored in underground aquifers. Its use requires the location of a suitable aquifer on site, an extraction licence and the construction of a bore.

Other potential water sources include using waste water from a nearby industrial site, backwash from a swimming pool, recycling water from the sub-surface drainage system of an existing turf facility etc.

Water Quality: The quality of alternate water sources can vary and some will not be suitable for use. Water quality can impact on various aspects of turf management, including turf vigour, soil structure, fertiliser requirements, and irrigation scheduling. Its quality will vary depending on the source (e.g. sewage treatment plants, stormwater run-off etc.) and often on the time of year (seasonal fluctuations).

The major water quality limitations are likely to be:

- Salinity, resulting in increased soil salt levels and associated damage. Even if salt concentrations are not high enough to cause soil problems, saline irrigation water can also cause foliage scorching when applied with overhead sprinklers.
- Loss of soil structure, especially in fine-textured soils, associated with the use of water with a high level of dissolved sodium.
- Excessively high or low pH.
- Nutrient imbalances.
- Toxicity from high levels of dissolved nutrients or other chemicals.
- Risks associated with microbiological or other biological contaminants.

Therefore it is essential that comprehensive testing is undertaken to determine the water's suitability and to understand any management implications for its use (e.g. use of sub optimal quality water on heavy soils (i.e. poor drainage))

There are also stringent guidelines and regulations governing the use, treatment and storage of alternate water sources to safeguard public health and safety. It will be difficult in an unfenced park to restrict public access following irrigation if there is a withholding period.

Table 1 sets out some guidelines for quality indicators that should be assessed when considering an alternative water source (ANZECC 1992 Australian Water Quality Guidelines for Fresh and Marine Waters). Of these, the issues related to salinity and sodium balance are likely to be the most important.

Table 2: Preferred ranges of water quality parameters (mg/L unless otherwise indicated)

Quality issue	Preferred range	Comment
Salinity (measured as EC in uS/cm)	0-280	Low salinity water suited for use in most situations except very poorly drained soils.
	280-800	Medium salinity water with few restrictions if soil is reasonably drained and some leaching occurs.
	800-2,300	High salinity and not to be used on poorly-drained soils. Leaching required and salt tolerant plants usually needed.
	2,300-5,500	Very high salinity water. Only for well-drained soils, tolerant plants and constant monitoring.
	<5,500	Extremely high salinity. Only considered for occasional emergency use in mild weather.
Sodium	<70	> 70 increases risk of foliage damage if used in overhead sprinklers

Quality issue	Preferred range	Comment
Chloride	<140 mg/L (general use)	<100 mg/L for use with overhead sprinklers
Sodium Absorption Ratio (ratio of sodium to calcium and magnesium)	<5	Few problems. Calcium may be needed if used continually
	5-15	Increasing risk of soil structural damage in clay soils. This would lead to reduced drainage rates and salinity unless calcium added. Requires regular soil monitoring.
	>15	Almost unusable but calcium can be added if salinity is low.
pH	4.5-9	Acid or alkaline water can change soil pH if used constantly
Alkalinity (mg CaCO3/L)	< 150	Will make soil alkaline with continued use.
Ca/Mg ratio	2:1 – 5:1	Mg imbalance if too low
Boron	<0.5	No problem
	0.5-2	Increasing problems
	>2	Unsuitable for use
Ammonium	<10	As a rule of thumb, plants take up N and P in a ratio of around 4:1. In irrigation water that contains nutrients, the ratio of these elements should not depart too far from this.
Nitrate	<44	
Phosphate	<3	
Nitrite	<0.01	

Other options: that have been considered by sporting organisations include:

- **Collecting water from clubroom roofs**: Unfortunately in most situations with large areas of grass, e.g. sportsfields, the concept of collecting run-off is not really feasible and only provides a 'feel good' benefit to the owner of the facility.

  The pavilion may have a roof area of 400m2 and therefore you will only collect 400L of water for every 1mm of rainfall. The oval will require between 150,000L to 200,000L of water per hectare per week depending on the time of the year. Hence the quantity of water collected from a pavilion's roof is only of minor significance.

- **Carting water:** Many clubs have considered buying water and carting it to keep the turf alive. In many cases this is impractical due to the quantity of water required every week. Given that a water tanker can hold 20,000L you will need between 7 and 10 tankers per week per hectare to satisfy an oval's water requirements. The end cost of this strategy is quite high and only warranted in extreme cases.

  Another consideration is the damage the tankers will cause to the playing surface. Tankers weigh in excess of 20 tonne when full and can crush in-ground drainage lines, destroy sprinkler heads, cause further compaction and leave wheel ruts. It is also likely that there will be damage to the surface contours, particularly at the entry and exit points.

If water is to be carted, the best option is to unload it into collection tanks that are connected to the existing irrigation system for distribution on to the oval. However, these tanks and pipes must be isolated from the existing 'Mains Water Input' to provide a 'backflow prevention' break; and a pump will be required of sufficient capacity to effectively utilise the existing irrigation system.

- **Water storage:** An important part of many alternative water schemes is the provision of storage. The volume of storage required will depend on the situation. For example whether:

    - **Storage is only required between irrigations:** This type of storage is generally required when a bore or recycled water pipeline cannot meet the instantaneous demand of the irrigation system. A storage volume of 50 kL/ha should be sufficient to supply an irrigation rate of 15 mm/week in such situations. The installed cost of a tank of this size would be in the range of $15,000 to $20,000.

    - **Storage between periods of average rainfall:** This type of storage is typical of stormwater re-use systems. Based on expecting the storage to be refilled on average once a month by natural rainfall, a storage volume of 0.6 ML/ha would typically be required to provide an irrigation rate of 15 mm/week.

    - **Storage during extended dry periods:** This type of storage takes advantage of stormwater captured during the winter period or balancing recycled water production over an extended period. Based on having to irrigate a minimum of 3 months without rainfall, a storage volume of 1.85 ML/ha would typically be required to provide an irrigation rate of 15 mm/week.

The lowest cost method of storage is the construction of an earthen storage (e.g. a dam, ornamental lake or wetland). This type of storage has public safety issues and during summer may be empty due to draw down and evaporation and this may not be aesthetically pleasing. Another option is a storage tank constructed from cast in-situ concrete and buried. A round tank with 3m high walls with 1ML storage will have a diameter of 20m and with 2ML storage will have a diameter of 30m. Tanks of this size are large civil constructions and will entail significant cost, in excess of $400,000 for a 1ML tank.

A shallow storage facility can be constructed using a modular type storage system (e.g. Rainstore, Atlantis, VersiTanks etc.). An impermeable membrane is placed around the sides and base of a hole and the modules are fitted together to create the storage facility. The storage modules are covered with a permeable geo-textile and soil is placed over the top (300 – 500mm depth) which can be planted with turf or small landscape plants. A 1 ML modular system installed will cost approximately $450,000. The size of a 1 ML modular system will be a little less than half the size of an Olympic size pool (50m x 25m x 2m deep = 2.5 ML).

Other costs that need to be considered with any of the above storage options are a pumping system and possibly some form of treatment / filtration which could cost in excess of $100,000.

Irrigation Best Practice

Every irrigation program should comply with 'best practice' principles otherwise wastage will occur. In terms of irrigation design it is essential that any new design has a calculated Distribution Uniformity that is greater than 85%. In terms of actual performance in the field, measured Uniformity should be greater than 75%. If these uniformity levels cannot be achieved then the system needs to be replaced.

From an operational view, the following guidelines should be followed:

- water at night or early morning;
- do not water during the day, or in windy weather;
- only apply sufficient water to wet to the depth of the grass root system; watering deeper than the roots is wasteful
- it is better to split a watering schedule into short periods on the one night rather than one long period e.g. 3 x 10 minutes is better than 1 x 30 minutes;
- deep, spaced watering is better than shallow watering every night;
- adjust irrigation periods to match needs on the field, e.g. longer watering where turf is stressed due to wear or at higher parts of field.

8.5 Little Lake Boort

8.5.1 General Description

Little Lake Boort, a 72 hectare open freshwater wetland is situated in Lake View St, Boort. The lake is used for water skiing, bird watching, fishing and passive recreation (walking, picnicking, etc).

The lake is located on Crown Land and managed by a Loddon Shire appointed Committee of Management. This designation requires that the wetland is managed for recreation, nature conservation, scientific study, water supply and drainage.

Little Lake Boort has been included in the Loddon Shire's drought proofing sports ovals project to review the need for additional water and associated infrastructure to be sourced for the lake. A full facility audit, recreation master plan, turf audit and water audit was not included as part of the scope of this assessment.

Information for this assessment has been sourced from the following:

- Discussions with Little Lake Boort Committee of Management;
- Discussions with G-MW
- Review of the North Central Catchment Management Authority (NCCMA) report on Little Lake Boort Environmental Watering Plan, July 2010, prepared for the Northern Victoria Irrigation Renewal Project (NVIRP).

8.5.2 Water Supply System

The capacity of Little Lake Boort is 935 ML. There is no surrounding catchment to the lake and as such the lake relies on water delivered via the Pyramid-Boort Irrigation System, which it is connected to. The lake requires approximately 600 ML per year to counter evaporation.

Water is supplied through the Pyramid-Boort Irrigation System via a number of sources[12]:

• Operational outfalls (160 ML - 1997/98 to 2007/08 average);

• Water right owned by the Loddon Shire (290 ML/year);

• Borrowed water from G-MW (up to 300 ML/year);

• Channel drainage water (up to 100 ML/year);

[12] *Little Lake Boort Environmental Watering Plan,* North Central Catchment Management Authority, July 2010.

• Parked water from G-MW (up to 200 ML/year); and

• Purchasing additional water on the G-MW temporary trade market (delivered)

In addition, opportunities exist to harvest Loddon River floodwater (approximately 170 ML/day) via the no. 3 channel.

Currently, two users have existing diversion licences from Little Lake Boort. The Boort Lawn Tennis Club and Boort Bowling Club have diversion licences permitting the extraction of 2.5 ML and 2 ML, respectively, from the wetland[13]. However, it is understood that these licences have not been used in some time as they have an alternative supply through the Loddon Shire piped supply from the Boort no.3 channel that also services Nolan's Park & the Caravan Park.

8.5.3 Infrastructure Requirements

An assessment of irrigation requirements for Little Lake Boort was recently undertaken by the NCCMA as part of the Northern Victorian Irrigation Project (NVIRP)[14]. The assessment revealed the following:

"Little Lake Boort is currently maintained as a permanent open freshwater wetland, with top-ups generally provided via the irrigation system at a rate of 20 ML/day. The capacity of the existing infrastructure is limited to 80 ML/day at the automated regulator which, if operating at full capacity, would allow the wetland to be filled in approximately 12 days (assuming no losses and adequate capacity is available in the no. 3 channel). The current delivery infrastructure is considered adequate to deliver the desired water regime and no infrastructure upgrades are required as part of NVIRP.

However, minor upgrade options to improve operational management of Little Lake Boort delivery infrastructure could be undertaken to increase the flows that can be released into the wetland from 80 – 100 ML/day to 100 ML/day. These involve:

• Undertaking an investigation to clarify the capacities of each structure (no. 3 channel, outfall channel, regulator and siphon). Estimated cost $3,000 (Hillemacher and Ivezich 2008).

• Upgrading the regulating structure to allow a delivery rate of 100 ML/day to match the reported capacity of the no. 3 channel. Estimated cost $20,000 (Hillemacher and Ivezich 2008)."

8.5.4 'Drought Proofing' Little Lake Boort

As there are already a number of options for Little Lake Boort to obtain water, particularly with a recent commitment by the Victorian Government to provide the lake with a 300 ML environmental water right, there are no specific recommendations provided to enable Little Lake Boort to become 'drought proof'.

[13] *Little Lake Boort Environmental Watering Plan,* North Central Catchment Management Authority, July 2010.
[14] *Little Lake Boort Environmental Watering Plan,* North Central Catchment Management Authority, July 2010.

The Committee of Management should continue to assess the water required for the lake on a year-by-year basis and look to obtain water through their various options as required.

8.6 Loddon Shire Swimming Pools

8.6.1 General Description

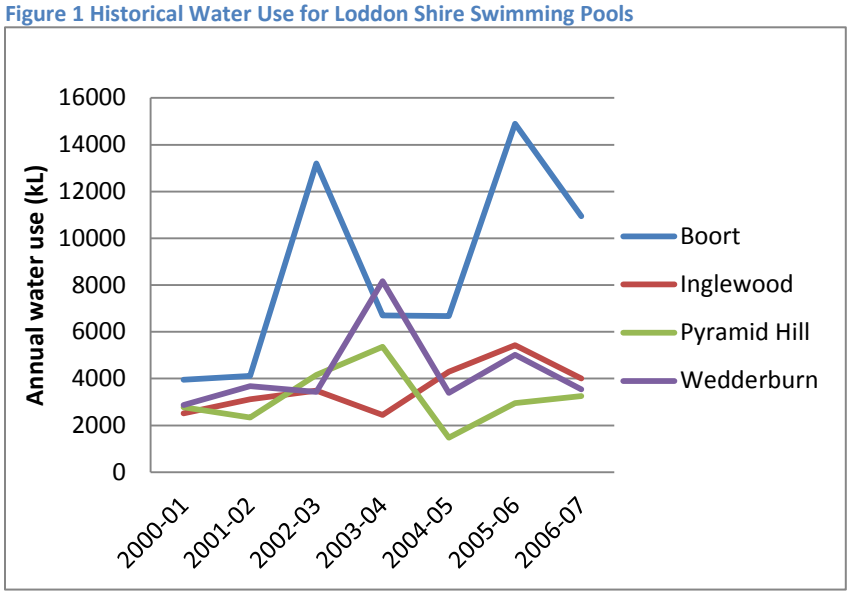
There are five swimming pools in Loddon Shire which are located in the towns of Boort, Inglewood, Mitiamo, Pyramid Hill and Wedderburn. These pools are owned and operated by Loddon Shire. Water Management Action Plans were developed for the five swimming pools in 2006 and the majority of recommended actions have been implemented over the last four years. These include:

- Installation of low flow water showers and taps;
- Installing rainwater tanks to collect roof water and directing the water to the pools in winter;
- Changing the management regime to keep pools full during off season rather than emptying them as had been done in the past;
- Installing backwash recycling systems which enables backwash water to be used to irrigate and maintain lawns;
- Improving the existing filtration systems; and
- Repairing leaks where leaks are detected and the repairing process is feasible.

8.6.2 Historical Water Use

Water consumption data was provided by Loddon Shire for four of the five swimming pools – Boort, Inglewood, Pyramid Hill and Wedderburn. Annual water use from 2000/01 to 2006/07 is shown in Figure 1. Water consumption data was not provided for Mitiamo swimming pool as it is filled using river water and is not metered.

Figure 1 Historical Water Use for Loddon Shire Swimming Pools



8.6.3 Water Management Recommendations

Because of much of the work that has already been implemented at each swimming pool over the last five years, there is little more that can be done to improve the water management of these facilities. The following actions have been recommended:

- Continue to complete the actions specified in the 2006/2001 swimming pool water management action plans;
- Purchase and install a thermal pool blanket for Boort, Inglewood and Pyramid Hill swimming pools. It is estimated that almost 1ML of potable water will be saved each year for each pool through reduced evaporation achieved by installing a thermal pool blanket (at a cost saving of $2,000). The pool blanket has the added advantage of maintaining a higher temperature in the water of around 2 degrees Celsius, thereby creating a more comfortable swimming temperature and extending the swimming pool season; and
- Undertake weed control and promotion of the existing warm-season grass cover of recreational lawn areas.

8.7 Cost Benefit Analysis of Water Related Actions

A cost-benefit analysis was undertaken for each action recommended by recreation facility. The analysis provides an indication of the level of capital and maintenance costs compared with the level of improvement to security of supply and efficient use of water for each action. This may assist Loddon Shire and individual sports clubs prioritise the implementation of actions.

Table 2 Criteria rating table for cost-benefit analysis of water management actions

Criteria	✓✓	✓	x	xx
Capital Cost	Minimal capital cost	Capital cost between $5,000-$20,000	Capital cost between $20,000-$80,000	Capital cost greater than $80,000
Maintenance Cost	Minimal annual maintenance/operational cost	Some annual maintenance / operational costs but able to be included in annual budget	High annual maintenance / operational costs	Very high annual maintenance / operational costs
Impact on the level of security of supply for the facility	The improvement is such that the facility is now considered 'drought proof'	Substantial improvement to the security of supply for the facility	Small improvement to the security of supply for the facility	Minimal improvement to the security of supply for the facility
Impact on the ability to effectively and efficiently use water required at the facility	Very large improvement to the effective and efficient use of water at the facility	Substantial improvement to the effective and efficient use of water at the facility	Small improvement to the effective and efficient use of water at the facility	Minimal improvement to the effective and efficient use of water at the facility

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
Bears Lagoon Tennis Club	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Upgrade current sprinkler system to an in-ground system to improve irrigation efficiency	✓	✓	x	✓✓	12	
	Install water storage tanks to enable storage of donated water carted in from farmers or Loddon Shire	✓	✓	✓	xx	10	No maintenance in infrastructure but potentially high operational cost of carting water.
Boort Bowls, Croquet & Tennis Complexes	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Install sub-meters and implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Replace the pump from the No. 3 Channel and the pump and sprinkler heads of the Croquet irrigation system	✓	✓	xx	✓✓	11	
	Investigate feasibility of using Boort Swimming Pool backwash for irrigation of the Croquet grounds	NA	NA	NA	NA	NA	Investigation required before cost-benefit analysis can be undertaken
	Upgrade Bowling Club toilets and Tennis Club taps and showers to water efficient fixtures	✓	✓✓	xx	✓	11	

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
	Need to install an additional tank at the bowls club to allow it to harvest more rainwater and reduce reliance on potable water	✓	✓✓	x	✓	12	
Boort Park	Develop a water allocation agreement for key sports facilities during restriction periods.	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process.	✓✓	✓	x	✓✓	13	
	Install rainwater tanks to collect roofwater from club house and use for toilet flushing, cleaning and other non-drinking purposes.	✓	✓✓	xx	✓	11	
	Upgrade toilets, showers and taps to water efficient fixtures.	✓✓	✓✓	xx	✓	12	
Bridgewater Bowls Club	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Replace the front bowls green (closest to Main St) with synthetic turf to reduce water use and increase access to the bowling green year round and include a stormwater harvesting collection system	xx	xx	✓	✓	8	
	Purchase an additional tank for storage of water	✓	✓✓	✓	xx	11	
Bridgewater Recreation Reserve	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement an ongoing water use monitoring and reporting program	✓✓	✓	x	✓✓	13	

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
	Resurface and re-grade the oval and plant with warm season grasses	x	✓✓	✓	✓	12	
	Irrigation specialist to assess the current system and provide recommendations to either upgrade or replace the system	NA	NA	NA	NA	NA	Feasibility assessment needs to be undertaken first before cost-benefit analysis can be undertaken
	Implement the recommendations provided by the irrigation specialist	✓✓	✓	x	✓✓	13	
	Proceed with the development of a groundwater source at the Recreation Reserve. This includes confirming the water quality, location, obtaining the construction licence, transferring an existing licence to extract groundwater, installing the bore and pump.	x	✓	✓✓	x	11	
	Asses the need to purchase and install a rainwater/storm water harvesting system which collects runoff from the netball courts as a back up emergency water supply.	NA	NA	NA	NA	NA	Feasibility assessment needs to be undertaken first before cost-benefit analysis can be undertaken
Calivil Recreation Reserve	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Need to investigate the sinking of a bore to provide an alternative source of water for the Recreation Reserve	NA	NA	NA	NA	NA	Feasibility assessment needs to be undertaken first before cost-benefit analysis can be undertaken
	Need to consider converting existing netball courts to shared courts so that they can be used by tennis (4 courts for tennis) to reduce water use	✓	✓	✓✓	x	12	

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
	Need to install a new irrigation system to reduce water use	x	✓	x	✓	10	
Donaldson Park	Calculate the yield of the old town water supply system and put in place a water allocation process.						
	Develop and implement an ongoing program of works for Skinners Flat Reserve and Caravan Park dam including de-silting the storages and cleaning out the catch drains.						
	Investigate potential for stormwater harvesting from Nardoo Creek	NA	NA	NA	NA	NA	Investigation required before cost-benefit analysis can be undertaken
	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Resurface and re-level sports ground and install warm season grasses to reduce water use and costs	✓	✓✓	x	✓✓	13	
	Replace two grass tennis courts with two synthetic (hard) tennis courts with lights to reduce water use and to provide for year round tennis.	xx	x	✓	✓	9	
	Review potential to use recycled water from the Wedderburn Sewerage Reclamation Plant	NA	NA	NA	NA	NA	Not currently feasible, but should be discussed with Coliban Water again in 5 years time.
Inglewood Bowls Club	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Install a new pump for the irrigation system to allow a larger volume of water to be dispersed to the turf	✓	✓✓	x	✓✓		

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
	Assess feasibility of connecting to the Inglewood Old Town Reservoir and source funding for pipeline construction if feasible.	NA	NA	NA	NA	NA	Feasibility assessment needs to be undertaken first before cost-benefit analysis can be undertaken
Inglewood Recreation Reserve	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Calculate the yield of the Old Inglewood Reservoir and put in place a water allocation process.	✓✓	✓	x	✓✓	13	
	Develop and implement an ongoing program of works for the Old Town Reservoir including de-silting the storage and cleaning out the catch drains.	✓	x	✓✓	x	11	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Need to install a new irrigation system to allow more efficient use of water	x	✓	x	✓	10	
	Need to upgrade the oval and plant with warm season grasses to reduce water use and provide a better playing surface	✓	✓✓	x	✓✓	13	
Korong Vale Bowls and Tennis	Implement an ongoing water use monitoring and reporting program	✓✓	✓	x	✓✓	13	
	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Develop a formal agreement between the bowls and tennis club on shared use of water.	✓✓	✓	✓✓	xx	12	
	Purchase and install a rainwater/storm water harvesting system which includes a 100 kL tank, storm water collection pit and pump and associated plumbing works.	x	✓	x	x	9	
	Upgrade irrigation system of Korong Vale Bowls	x	✓	x	✓	10	

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
	Club						
	Replace two lawn tennis courts with synthetic hard courts incorporating appropriate drainage design to enable storm water collection and reuse.	xx	x	✓	✓	9	
Market Square Reserve	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Liaise with Loddon Shire and Donaldson Park to ensure Skinners Flat / Caravan Park Dam water supply system is improved and a formal water sharing arrangement is in place.	NA	NA	NA	NA	NA	
	Need to install more sprinklers so that the whole ground is covered (not just the turf wicket area)	✓	✓	xx	✓	10	
Mitchell Park Recreation Reserve	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Set up an agreement with Loddon Shire to access a set volume of water from the Loddon Shire's Pyramid Hill-Boort Irrigation water share.	✓✓	✓✓	✓✓	xx	13	
	Purchase and install a 100kL water tank to collect rainwater from clubhouse and use for toilet flushing and other non drinking building purposes.	✓	✓✓	xx	✓	11	

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
	Seek advice from an irrigation expert regarding an upgrade or replacement of the existing irrigation system	NA	NA	NA	NA	NA	Advice from irrigation specialist required first before a cost-benefit analysis can be undertaken.
Newbridge Recreation Reserve	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Install an in-ground automated irrigation sprinkler system to decrease water use; decrease amount of time spent watering; and improve condition of the ground.	x	✓	x	✓✓	11	
	Liaise with Coliban Water on potential for recycled water option if the proposal to provide a reticulated sewage system to the town goes ahead.	NA	NA	NA	NA	NA	
Mitiamo Recreation Reserve	Develop an agreement with the MRWS to access water from the proposed pipeline and install rainwater tank (100 kL storage), pump and pipe for on-site distribution.	✓	✓	✓✓	✓	13	
	Assess the need to supplement the water supply (depending on the outcomes of the MRWS agreement) with stormwater runoff from the new netball / tennis hard courts and implement a stormwater harvesting system.	NA	NA	NA	NA	NA	Feasibility assessment needs to be undertaken first before cost-benefit analysis can be undertaken
	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Decommission all 5 lawn tennis courts and construct 2 new shared netball / tennis courts (which meet Netball Victoria standards).	xx	x	✓✓	✓✓	11	
	Relocate the two tanks near the tennis courts to the buildings and connect to the roof for toilet flushing.	✓	✓✓	xx	✓	11	
	Replace single flush toilets and high flow showerheads and taps with water efficient fixtures.	✓	✓✓	xx	✓	11	
	Improve the existing irrigation system on the sports oval and replace the pump.	x	✓	x	✓	10	
Pyramid Hill Bowls and Tennis Centre	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Set up an agreement with Loddon Shire to access a set volume of water from the Loddon Shire's Pyramid Hill-Boort Irrigation water share.	✓✓	✓	✓✓	xx	12	
	Develop two synthetic tennis courts with lights to reduce water usage and to provide year round tennis opportunities for the community	x	x	✓	✓✓	11	
	Install an in-ground irrigation system to eliminate the need for flood irrigation and to more effectively irrigate the tennis courts	✓	✓✓	xx	✓✓	12	

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
Serpentine Recreation Reserve	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Upgrade irrigation system so that it is fully automated	✓	✓	x	✓✓	12	
	Purchase and install a storage tank and associated pipework to connect to the new pipeline. Tank size and other details will need to be determined once the pipeline design and supply is confirmed by G-MW.	xx	✓	✓✓	✓	11	
	Re-level, laser and resurface sports ground oval to create a more uniform playing surface	x	✓✓	xx	✓✓	11	
	Replant sports oval with warm season grasses to reduce water use	✓	✓✓	x	✓✓	13	
	Upgrade inefficient water fixtures (toilets and taps)	✓✓	✓✓	xx	✓	12	
Serpentine Tennis and Bowls	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Purchase and install a storage tank and associated pipework to connect to the new pipeline. Tank size and other details will need to be determined once the pipeline design and supply is confirmed by G-MW.	x	✓	✓✓	x		

Recreation Reserve	Water Management Action	Capital Cost	Maintenance / Operational Cost	Impact on security of supply for the facility	Impact on efficient water use at facility	Rating of action for specific recreation reserve	Comment
Winzar Recreation Reserve	Develop a water allocation agreement for key sports facilities during restriction periods	✓✓	✓	✓✓	xx	12	
	Implement a formal water use monitoring and annual reporting process	✓✓	✓	x	✓✓	13	
	Consider purchasing a permanent water allocation of 4 ML to assist with irrigation of sports fields or opt to rely on the purchase of temporary water from the market on an as required basis.	✓	✓	✓✓	x	12	
	Need to review the adequacy of the tennis courts sprinkler system and replace or upgrade the sprinkler system if required.	x	✓	xx	✓	9	
Swimming Pools	Purchase and install pool covers for Boort, Inglewood and Wedderburn swimming pools	xx	✓	x	✓✓	10	