Overview
The decade long drought and water restrictions have placed significant pressure on sports facilities throughout Melbourne. Faced with uncertain climate and high community growth, local councils, usually responsible for maintaining these facilities, have struggled to do so sustainably. Councils are increasingly looking into alternative water servicing strategies, independent of the potable water supply, to sustainably address their current and future water needs for these facilities.

City West Water (CWW) has been partnering with councils in investigating and implementing a number of alternative water projects to supply ‘fit-for-purpose’ water to public open space (active sports fields, parks and gardens). A whole of water cycle approach is taken in developing these schemes. While these projects generally involve simple technology, their development comes with many challenges from a technical, organisational, statutory and financial perspective.

This paper presents the Brimbank Integrated Water Project and discusses how CWW and Brimbank City Council (BCC) partnered to implement two stormwater harvesting schemes. The innovative partnership model developed to improve the viability of the project will be explained as well as the challenges and learnings along the way.

Acknowledgements
The scheme is being implemented with support from the Federal Government’s Department of Sustainability, Environment, Water, Population and Communities’ (DSEWPAC) 2010 National Urban Water and Desalination Plan, and from the State Government’s Department of Sustainability and Environment’s (DSE) Vision for Werribee Plains’ funding program.

In addition to the project partners CWW and BCC, the development of the scheme has required the collaboration of many stakeholders including Melbourne Water, DSEWPAC, DSE and local community groups.

1. Introduction
In 2006, Brimbank City Council (BCC) approached City West Water (CWW) to discuss the viability of an alternative water supply to service Keilor Public Golf Course. The site is the Council’s largest water user and uses an average of 66 million litres of water per annum for irrigation. At the time, Melbourne was already under Stage 3 water restrictions and water authorities were planning for what would become the longest and driest drought on record. The western suburbs of Melbourne, with their comparatively low average rainfall, were particularly hard hit by these water restrictions.

CWW was already investigating and developing large alternative water schemes to service new residential and commercial estates in the West Werribee area including the Werribee Employment Precinct Project, using recycled water from the Western Treatment Plant (WTP). However, the ability to supply recycled water to other areas located remotely from WTP, such as the Keilor Public Golf Course, was deemed impractical. Consideration was thus given to more localised solutions such as stormwater and sewage harvesting and treatment.

CWW saw this collaboration with BCC as a great project demonstration opportunity not only for BCC but also to other councils across the region. Councils are among CWW’s top 200 water users with the majority of their water consumption resulting from the irrigation of open space (sports
fields, golf courses and public parks). The irrigation of these open spaces does not require potable water quality thus creating a great opportunity for an alternative water source to be used.

2. Purpose of the Partnership

To achieve a more holistic outcome in the Keilor Public Golf Course investigation with BCC, CWW proposed that its scope be expanded to include assessments of other sites within the Keilor region, which also included most of Council’s significant recreational sites. A feasibility study, jointly funded by CWW and BCC, was thus initiated. The study identified a total of 13 alternative water project options. Using a multi-criteria assessment method, the projects were ranked and the top three were selected for further investigation. These were the Keilor Public Golf Course, Green Gully Reserve and Keilor Park Recreation Reserve stormwater harvesting schemes, which together made up the Brimbank Integrated Water Project (BIWP).

One of the main challenges with Council implementing the BIWP was the implementation costs of these three schemes, requiring substantial capital investment upfront. Limited expertise with the construction and operation of certain components of the schemes such as pump stations and long pipelines was another challenging factor that. From the Council perspective, these were overcome through the partnership with CWW in contributing capital funding and providing engineering support to the project. The challenge for CWW was attributed to the novelty of the schemes and the requirement for clarity surrounding the role of CWW in these types of schemes. The combined social, environmental and financial benefits expected from these schemes were quite obvious and well aligned with both CWW’s and BCC’s vision to promote the development of sustainable communities. This provided the momentum for both organisations to resolve the challenges and see the projects implemented.

3. The Project Implementation Strategy

Before CWW and BCC could collectively commit further to progress the investigation of the BIWP it was essential that a framework be established. This framework stipulated how the partnership would work, from the design and planning stage through to construction and operation of the individual schemes.

3.1. Project Characteristics

The characteristics of the individual schemes were studied both from BCC’s and CWW’s perspectives. The findings were as follows:

- The capital costs of the schemes ranged from $2m to $3m. As these schemes were to be implemented outside of the CWW Water Plan, CWW would be unable to fund them through its regulated revenue streams. So, each scheme over its project life would have to pay for itself.
- Without external funding the schemes would potentially be more expensive than drinking water options.
- When assessed in a holistic manner, considering a Triple Bottom Line approach, net positive outcomes could be realised compared to remaining on the drinking water supply option.

3.2. Principles of the Partnership

Based on the characteristics of the projects, an effort was made to develop some principles upon which the partnership would operate. The parties came up with four principles:

Principle 1 – Cost Recovery

CWW would normally only contribute towards the design, construction and operation of the assets owned by CWW. All costs associated with CWW assets would be recovered though a fixed annual fee (for capital and fixed operational costs) and a volumetric fee (for the variable operational costs) over a 25-year period. The variable operational costs would comprise the electricity cost associated with transferring and treat water.

CWW would also design and construct Council assets as part of their works, leading to improved project delivery efficiencies. In these situations, Council would reimburse CWW upfront for all
costs associated with the design and construction of their assets.

**Principle 2 – Asset Ownership**

CWW were comfortable in ownership of assets with which it is familiar, typically pipes and pumps. Ownership of these assets also introduced efficiencies in their maintenance, as CWW already owns and maintains traditional water supply infrastructure in the area. BCC were comfortable in ownership of the water diversion works, the storage system and the irrigation reticulation system. A schematic demonstrating this for the Green Gully Reserve scheme is shown in Figure 1.

**Figure 1: Asset ownership schematic for Green Gully Reserve**

**Principle 3 – Business Agreement**

A business agreement was developed to specify the responsibilities of each party in constructing and operating the schemes. CWW would mainly be responsible for transferring stormwater to the storage when available and required. BCC would be required to use the water in a responsible manner. The agreement would also cover commercial arrangements for each party, such as the payment of charges.

**Principle 4 – Ongoing Management**

All projects would need to follow relevant guidelines. Management plans, such as Environmental Improvement Plans or Scheme Management Plans, were developed. CWW assisted council to develop and implement these plans though provision of expertise and training.

3.3. **Partnership Framework**

Before significant works were underway, the partnership was formalized through a Memorandum of Understanding, outlining how BCC and CWW would work together to develop the schemes. This included strategies for sharing of costs for the planning and design stages, preparing business cases and financing the project construction and operation. A schematic outlining the framework is shown in Figure 2.

**Figure 2: BCC-CWW Partnership Framework**

The endorsement of the framework depended largely on how comfortable each party was with the proposed financing model for the construction and operation of the scheme. The approach involved working within council’s budget capacity while applying the above asset ownership principle. This led to CWW being a partner in implementing two of the BiWP schemes (the Keilor Public Golf Course and Green Gully Reserve schemes) whereas the implementation and ownership of the Keilor Park Recreation Reserve remained completely under Brimbank’s responsibility with support from CWW on the design.

This framework also provided for a sharing of the financial risks associated with the design and planning investigations. The financial viability of the schemes from BCC’s perspective relied on the ability to secure adequate external funding while some of the design and planning investigations had to be completed prior. These investigations were undertaken through 50-50 cost sharing arrangement before securing external funding.
4. Case Studies

4.1. Keilor Public Golf Course

The Keilor Public Golf Course scheme (KPGC) is a stormwater harvesting scheme developed to irrigate BCC’s 18-hole Keilor Public Golf Course in Keilor North. Stormwater will be harvested from a 148-ha catchment and transferred to 7-megalitre storage via a 3.2km pipeline. The site is Council’s largest water user with an estimated average irrigation water demand of 66 million litres per annum. The KPGC scheme is expected to harvest up to 55 million litres of stormwater annually. Treatment of the stormwater will include gross pollutant removal and settling of suspended solids. A scheme concept is shown in Figure 3.

Figure 3: Schematic of KPGC stormwater scheme

4.2. Green Gully Reserve

The Green Gully Reserve (GGR) scheme is a stormwater harvesting scheme developed to irrigate the Green Gully Reserve sports fields. It is Council’s second largest recreational site and has an estimated irrigation water demand of 59 million litres per annum. The scheme is expected to meet on average 71% (41 million litres of treated stormwater) of the site’s irrigation water demand. Stormwater will be diverted from two separate drains – one draining a 240-hectare catchment and the other a smaller catchment of 80 hectares which is owned and managed by Council (see Figure 4). The larger drain is owned and managed by Melbourne Water (the metropolitan catchment management authority).

Figure 4: Schematic of GGR stormwater scheme

4.3. Design and Planning

Different approaches were used for the design investigation of the GGR and KPGC schemes. The value of CWW as a partner was critical during the construction of the KPGC scheme. When federal funding was secured for the overall BIWP, a major road upgrade project (the Calder Freeway-Kings Road Interchange) was underway within the KPGC project area. This was deemed an opportunity for the scheme in regards to obtaining approval from Vic Roads to work within the project area. Using CWW’s internal design resources and experiences were able to fast-track the detailed design of affected components of the scheme (i.e. 2.3km of the pipeline), leading to a significant collaboration outcome with Vic Roads where they were able to use their contractor to install the 2.3km pipeline. CWW were also able to take advantage of Vic Roads’ planning approvals for the interchange project, which included significant management of native vegetation and cultural heritage.
4.4. Scheme Financing

The benefit of the partnership is mostly revealed through the financing strategy developed to guarantee the successful implementation of the schemes. Through joint efforts in seeking external funding, federal funding was secured in 2010 from the Department of Sustainability, Environment, Water, Population and Community’s Stormwater Harvesting Projects funding program and the State Government’s Department of Sustainability and Environment’s Vision for Werribee Plains funding program.

The success of this submission can be mainly attributed to the partnership model, which collectively showed greater organisational skills and capabilities in implementing the schemes than either single organisation.

4.5. Collaborative planning

The delivery of projects demonstrating high environmental performance has been central to the implementation of the BIWP. The nature of the individual schemes and the characteristics of their locations meant that significant consideration to biodiversity and cultural and heritage issues would be necessary. The bringing together of BCC’s and CWW’s experience and expertise resulted in more robust assessments and recommendations and improved management of the project planning risks. For example a voluntary Cultural Heritage Assessment was prompted for the GGR scheme which later revealed the presence of significant aboriginal artifacts within the project area. The design was reviewed accordingly and additional construction control measures were identified to progress the project, which otherwise could have led to significant interruption to the project during construction.

Both the GGR and KPGC schemes are part of the Maribyrnong River system which is long known for its poor environmental health. This, together with the novelty of the scheme, resulted in significant consultation to secure the stormwater diversion approvals from the water catchment authority (Melbourne Water). CWW provided significant design support to BCC in consulting and negotiating with Melbourne Water on the preferred schemes designs. Comprehensive water balance modeling was undertaken to come up with designs that not only had minimal impact on environmental flows during low flow events but also reduced the existing impacts of high flow events on the receiving waterway.

4.6. Scheme Construction

The construction stage of the schemes revealed a number of challenges which if dealt with by Council in isolation could have potentially impacted upon the original scope of the schemes or even their overall viability. An important issue was the increase in the project cost estimates from originally approved amounts at the construction tender stage. While great efforts were made to accurately determine the project costs external factors such as the market pressure at the time of tendering played a role in increasing project costs. To reduce the impact on BCC, CWW proposed to make further contributions upfront to accommodate these increases and recover the costs through the annual fees as per the partnership principle.

4.7. Business Agreement

Continuous communication on the principles of the partnership to internal teams proved to be an important factor that contributed to the overall success of the schemes, especially as the project progressed from design to construction and the different set of experts required to have input into the project. This was particularly evident during the review of the proposed business agreements between CWW and BCC for the operation of the schemes. As legal teams were becoming involved in the projects there was a tendency to overly focus on individual business risks at the expense of the partnership principles. The project managers played a critical role in guiding the legal discussion in line with the partnership principles. For example there were dividing views on how the commercial risks associated with force majeure events should be distributed between BCC and CWW.

5. Results and Conclusion

BIWP will deliver water in a cost effective manner which will achieve significant potable water substitution in a low energy, sustainable manner.

The project’s success can be attributed to the all the achievements to date under the partnership established between BCC and CWW. Construction of GGR scheme is about 80% complete and KPGC 60% complete with both schemes due for completion by December 2012. This partnership model is also being used across a number of
similar types of projects with other councils across CWW service area.

The development of the scheme has required the collaboration of many stakeholders including Melbourne Water, the Wirundjeri registered aboriginal party, DSEWPAC, DSE and local community groups.

To date CWW is involved in an additional nine stormwater harvesting schemes with four other councils whereby a similar partnership model has been established. Overall these schemes are expected to replace over 450 million litres of potable water annually.

While developing the partnership involved significant consultation and planning upfront the benefits gained have been far more significant.

References: