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***Submission on the Economic Regulation Authority's Draft Report
Inquiry into Pricing of Recycled Water in Western Australia (4 November 2008).***

This submission stems from our group's ongoing research studies of major golf clubs in country Western Australia; work funded by the Waste Management Authority.

The ERA's draft Report suggests principles suitable for pricing recycled water with which we largely agree. However, it does not emphasise the huge potential for use of recycled water in public open spaces. It quotes *The State Water Recycling Strategy* as including a target of 30 per cent water recycling by 2030 but does not highlight the fact that in 2008 regional water recycling is already far above that target.

The Report quotes a figure (on page 7) of 40 per cent for the proportion of wastewater which is recycled in regional areas. This is taken from the *State Water Recycling Strategy*. However, the figures provided separately in the Report for the total State and metropolitan wastewater available and wastewater recycled suggest that a figure closer to 50 per cent is recycled in regional areas (see Table below).

Calculation of per cent of Wastewater used in Regional Areas.

Those cells shaded in yellow contain figures provided in the report, from which the others are calculated.

| | GL wastewater available | per cent of total | GL wastewater used | per cent of wastewater used |
|--------------|-------------------------|-------------------|--------------------|-----------------------------|
| Metropolitan | 116 | 85 | 7 | 6 |
| Regional | 20 | 15 | 10 | 50 |
| Total State | 136 | 100 | 17 | 12.5 |

Whatever precise figures are used, they show that the regional areas already far exceed the target of 30 per cent water recycling by 2030. Yet the report does not examine the reasons why the use of recycled water is so much more successful in regional compared with the metropolitan areas.

The Report also states (on page 7) that 70 GL, or 3 per cent of all water, was used in WA in 2005 for public open space. This is a huge amount, close to half of all the wastewater available in the State. It reflects a large demand for water that does not need to be of potable quality and provides a large potential for increased use of recycled wastewater.

In the Report's Section 2.3, Scope for Additional Recycling, a number of potential recycling schemes are listed. The extension of use in public open space is not included in this list. In contrast, a quote, from the Water Corporation's Submission, is included on page 19 in the Report. It refers to the use of recycled water for watering ovals and golf courses as 'lower value uses' and implies that this is not in the best long term interest of communities.

We argue that the use of recycled water for public open space is indeed in the best long term interest of communities. Sport has a fine tradition in Australia and there is a good economic case, based on physical health benefits, for money to be spent on public open spaces. Sometimes there are environmental benefits as well. It should be noted that recent droughts in the Eastern States of Australia resulted in cancellation of many junior sport activities because ovals and sporting fields could not be watered. We agree with the ERA that customers, including communities, should be able to make their own decisions by a neutral auctioning process.

Use of recycled water in country Western Australia

While there are some significant regional industrial uses of recycled water (eg Albany tree farming and Kalgoorlie industry) our research shows that recycled water is most frequently used in the country regions for reticulation of public open space. Furthermore, there is also more scope in the country. This is in spite of the considerably greater use of recycled water in regional areas than the metropolitan area. Attachment 1 (a draft) provides information on major country golf clubs which use recycled water and others which are interested in using recycled water.

The Service Providers (shown in the Report's Table 2.1) which recycle 100 per cent of the wastewater do so mainly for use in public open space. Bridgetown, Derby, Dongara, Exmouth and Kalbarri are not listed in this table, yet the golf courses in those centres all use recycled water provided by the Water Corporation. Those centres are within the Shires of Bridgetown-Greenbushes, Derby-West Kimberley, Irwin, Exmouth and Northampton respectively.

A number of other major country golf clubs are interested in using recycled water on their golf courses. However, their operators have not been successful in obtaining supplies from the Water Corporation, several after more than 10 years of trying. They include the golf courses at Binningup, Collie, Donnybrook, Gingin, Jurien Bay, Margaret River and Northam, which are in the Shires of Harvey, Collie, Donnybrook, Gingin, Dandaragan, Augusta-Margaret River and Northam respectively.

The courses at Gingin, Jurien Bay and Northam have sand 'greens' while the other four have grass greens. Golf clubs which upgrade their courses, through reticulation of fairways and installation of grass greens, do so with significantly increased costs. However, they benefit by gaining improved playing facilities, higher memberships and attracting many more visiting golfers.

Because the State's second desalination plant is being built at Binningup the golf course there may be able to obtain water from the plant. If not, the wastewater treatment plant in the Kemerton Industrial Park, which is 7 kilometres distant from the course, may be able to supply recycled water. The course in Northam lies close to Shire of Northam Reserves, which are already supplied with recycled water.

Furthermore, Esperance and Geraldton both have two golf courses but only one in each centre is supplied with recycled water. The two which have not obtained recycled water are Pink Lake in Esperance and Spalding Park in Geraldton. The Report's Table 2.1 shows that only 35, 26 and 24 per cent of the wastewater in Northam, Esperance and Geraldton respectively is currently reused.

The open pricing principles that the ERA suggests should make it easier for these potential users. Many other country golf clubs could no doubt be added to the list.

WA Country Golf Clubs which use recycled water (the list may not be complete)

| Golf Course | Holes | Members (approx) | Greens Type | Local Government | Current Water Source(s) | Distance to wastewater plant (km) | Year of RW supply | Service Provider for RW | Per cent of wastewater reused |
|------------------------|-------|------------------|-------------|---------------------------|-----------------------------|-----------------------------------|-------------------|-------------------------|-------------------------------|
| Bridgetown Golf Club | 18 | 60 | grass | Bridgetown-Greenbushes | RW | <1 | 2008? | WC | |
| Broome Golf Club | 18 | 120 | grass | Broome | RW | <1 | | WC | 100 |
| Busselton Golf Club | 18 | 600 | grass | Busselton | RW (also has GW licence) | 4 | | WC | 19 |
| Derby Golf Club | 9 | 50 | grass | Derby-West Kimberley | RW | <1 | | WC | |
| Dongara Golf Club | 18 | 110 | grass | Irwin | RW + GW | <1 | 2000? | WC | |
| Esperance Golf Club | 18 | 140 | grass | Esperance | RW (32%) + GW (68%) | 2.5 | | WC | 26 |
| Geraldton Golf Club | 18 | 350 | grass | Geraldton (City) | RW supplemented by GW | <1 | | WC | 24 |
| Goldfields Golf Course | 18 | n/a | grass | Kalgoorlie-Boulder (City) | course is being constructed | | | KB | 43 |
| Hannans Golf Club | 18 | 230 | sand | Kalgoorlie-Boulder (City) | RW (limited to 14 fairways) | | | KB | 43 |
| Kalbarri Golf Club | 18 | 80 | grass | Northampton | RW + GW | <1 | | WC | |
| Kalgoorlie Golf Club | 18 | 110 | sand | Kalgoorlie-Boulder (City) | RW (limited to 5 fairways) | | | KB | 43 |
| Karratha Country Club | 18 | 110 | sand | Roebourne | RW | | | WC | 93 |
| Manjimup Country Club | 18 | 100 | grass | Manjimup | RW | <1 | | WC | |
| Murdoch Park | 18 | 100 | sand | Exmouth | RW (limited to 4 fairways) | <1 | | WC | |

WA Country Golf Clubs which are interested in using recycled water (the list is not complete)

| Golf Course | Holes | Members (approx) | Greens Type | Local Government | Current Water Source(s) | Distance to wastewater plant (km) | Years water sought | Service Provider for RW | Per cent of wastewater reused |
|--------------------------|-------|------------------|-------------|------------------------|----------------------------|-----------------------------------|--------------------|-------------------------|-------------------------------|
| Binningup Country Club | 9 | 80 | grass | Harvey | GW | 7 | | WC | |
| Collie Golf Club | 18 | 150 | grass | Collie | GW (close to Collie River) | 2 | | WC | |
| Donnybrook Country Club | 18 | 110 | grass | Donnybrook-Balingup | GW | 5 | | WC | |
| Gingin Golf Club | 18 | 60 | sand | Gingin | GW | | 17 | WC | |
| Jurien Bay Golf Club | 18 | 70 | sand | Dandaragan | GW | 1.2 | | WC | |
| Margaret River Golf Club | 18 | 350 | grass | Augusta-Margaret River | GW | 5 | 10 | WC | |
| Northam Country Club | 18 | 110 | sand | Northam | GW | 4 | 12 | WC | 35 |
| Pink Lake Country Club | 18 | 100 | grass | Esperance | GW | 4 | | WC | 26 |
| Spalding Park Golf Club | 18 | 220 | grass | Geraldton (City) | GW | 4 | | WC | 24 |

Key: RW = Recycled Water
GW = Ground Water

WC = Water Corporation
KB = Kalgoorlie-Boulder (City)

- Notes:
1. The distance between a water treatment plant and the closest part of the golf course is shown in kilometres.
 2. Information on annual volumes of water used, prices paid and quotas set for the golf clubs have not been included.
 3. Most, if not all, of the golf clubs allow and encourage visitors to play on their courses. That is in addition to their club members.

Use of recycled water in the Perth Metropolitan Area

There is scope for much greater use of recycled water for public open space in the metropolitan area. To our knowledge, only two of the 55 golf courses in the Perth-Mandurah area use recycled water. The first course is at the Mandurah Country Club in Halls Head, Mandurah, where the irrigation water is pumped from a superficial aquifer into which the Water Corporation discharges treated wastewater. We note that mention is made of trialling recycled water on golf courses and other public open space in the City of Mandurah's submission to the Inquiry. In 2004 the course at the El Caballo Resort, west of Northam, obtained supplies of recycled water from an abattoir and not from a wastewater treatment plant.

The Corporation supplies recycled water, from the Shenton Park Wastewater Treatment Plant, for use on the McGillivray Oval in Shenton Park. It should be noted that there are other major areas of public open space, including four golf courses, which are located within three kilometres from the plant. The courses are Cottesloe, Lake Claremont, Nedlands and Wembley, the last named having 36 holes.

Consideration might be given to supplying recycled water to public open space along the Mosman Peninsula. In such a situation the courses at Cottesloe, Sea View and Mosman Park Golf Clubs and Lake Claremont Public Golf Course could be included. The Sea View and Mosman Park Golf Clubs have become concerned about the long term viability (quantity and quality) of their groundwater supplies. Given their proximity to the coast and the Swan River, increasing salinisation is a problem..

Sewer mining

Since 110 GL of wastewater are discharged annually into the Indian Ocean from the metropolitan area, there is significant potential in Perth for obtaining recycled water through sewer mining (Attachment 2). This would be especially so on public space, including golf courses, close to the Water Corporation's sewer trunk lines. A small, water recycling plant could be located on most golf courses. Plant benefits would include lower cost, greater energy efficiency and more rapid treatment of wastewater.

Stormwater Use

According to the Department of Water's Stormwater Management Manual <http://portal.water.wa.gov.au/portal/page/portal/WaterManagement/Stormwater/StormwaterMgtManual>

"Stormwater management aims to build on the traditional objective of local flood protection by having multiple outcomes, including improved water quality management, protected ecosystems, and liveable and attractive communities." and "A combination of approaches is encouraged, including 'at-source' infiltration, non-structural methods such as maintenance of structural controls and training of practitioners, use of more natural water body systems, and structural methods such as swales and infiltration basins."

Golf courses are usually good sites for the use of stormwater collected locally. They usually have sufficient space for the location of small dams, reservoirs and sumps. Furthermore, water quality can be improved, if necessary, through use of 'reed-bed' systems. Water features add to the attractiveness of courses. They are generally managed by community oriented people with a wide range of experience and skills.

The Northam Country Club is interested in the possibility of obtaining and storing stormwater, harvested from nearby residential developments, for use on its course.

Several country courses already use stormwater. The Augusta Golf Club's use of stormwater, described below, is a case of best practice. The Club is not connected to mains water. The 18 holes golf course is located on the Leeuwin Ridge which, being comprised of limestone, is not suitable for groundwater bores. About 10 years ago the Club built two small reservoirs, between the third and fifth fairways, to store stormwater harvested from off the clubhouse, sheds and adjacent sealed areas (parking bays and roads). The water is gravity fed 450 metres through pipes to the reservoirs (Images 1 and 2), which are lined with neoprene. This supply has been used to water tees and surrounds to the sand 'greens' during the summer and autumn months.



Image 1. Southern water reservoir. The clubhouse roof is visible at right on the horizon.



Image 2. Northern water reservoir showing neoprene lining and lowered water supply.

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Sewer Mining

Relationship between third-party access and sewer mining

http://epress.anu.edu.au/troubled_waters/mobile_devices/ch07s03.html

Sewer mining is defined as the process of tapping into a sewer (before or after it reaches the sewage-treatment plant) and extracting the sewage so that it can be treated in a separate treatment facility and put to another use as recycled water (Sydney Water, *How to Establish a Sewer Mining Operation*, May 2006).[14]

Although the production and supply of recycled water could be undertaken by the sewerage service provider, sewer mining is normally associated with third-party access by persons who either use the recycled water for their own purposes or supply it to others. In that sense, sewer miners are a subset of a wider class, known as third-party access seekers. Sewer miners engage in sewer mining by virtue of a contractual agreement with the public water infrastructure owner (for example, Sydney Water).

To date, sewer miners have established sewer-mining operations either over or adjacent to the sewer main on their own land. They have recycled the sewage at that venue and then piped the recycled water to the point of usage.[15] Several schemes of this nature are located on golf courses, where there is a demand for the product and enough space to build sewer-mining operations sufficiently distant from residents.[16]

<http://www.sydneywater.com.au/savingwater/recyclingandreuse/RecyclingAndReuseInAction/SewerMining.cfm>

The NSW Government's Metropolitan Water Plan encourages the private sector to implement innovative solutions to secure Sydney's water supply, particularly by recycling.

- Kogarah Council - Kogarah Council became the first council in Sydney to pilot sewer mining. Up to 125 million litres of recycled water will be produced each year to irrigate parks, playing fields and the Beverley Park Golf Course.
- Pennant Hills Golf Club - Pennant Hills Golf Club's Water Reclamation Plant produces up to 100 million litres of recycled water each year to irrigate the golf course. This sewer mining project was the first of its kind for a privately run golf club in Australia. Previously, the course relied on drinking water for irrigation.

Further sewer mining schemes are being developed by Ku-ring-gai Council (including the Gordon Golf Course), Macquarie University, North Ryde Golf Club, Canterbury Race Course, Sydney Airport and the Sydney CBD.

The Water Recycle Group Australia Pty Ltd is a business, with headquarters in Canberra, which describes the many benefits of sewer mining on their website <http://www.waterrecycle.com.au/sewermining.htm>