CITY OF ARMADALE

MINUTES

OF **TECHNICAL SERVICES COMMITTEE** HELD IN THE **COMMITTEE ROOM**, ADMINISTRATION CENTRE, 7 ORCHARD AVENUE, ARMADALE ON **MONDAY, 3 FEBRUARY 2014 AT 7:00 PM.**

PRESENT:	Cr G Nixon (Chair) Cr R Butterfield Cr G A Best Cr K Busby Cr C Frost Cr M S Northcott Cr J A Stewart	
APOLOGIES:	Nil	
OBSERVERS:	Nil	
IN ATTENDANCE:	Mr K Ketterer	Executive Director Technical Services
	Mr P Lanternier	Manager Parks
	Mr J Gossmann	Manager Engineering & Design
	Mrs S McKellar	Minute Secretary
PUBLIC:	Nil	

*"For details of Councillor Membership on this Committee, please refer to the City's website – **www.armadale.wa.gov.au/your council/councillors**."*

DISCLAIMER

The Disclaimer for protecting Councillors and staff from liability of information and advice given at Committee meetings was not read as no members of the public were present.

DECLARATION OF MEMBERS' INTERESTS

Cr R Butterfield – Non Financial Interest – Additional Parking – Blackburn Reserve, Clifton Hills Primary School (Recommendation T5/2/14).

QUESTION TIME

Nil.

DEPUTATION

Nil.

CONFIRMATION OF MINUTES

RECOMMEND

Minutes of the Technical Services Committee Meeting held on 2 December 2013 be confirmed.

Moved Cr R Butterfield
MOTION CARRIED (7/0)

ITEMS REFERRED FROM INFORMATION BULLETIN

- **Outstanding Matters and Information Items**
  Various Items T-1
- **Monthly / Quarterly Departmental Reports**
  Technical Services Works Programme T-2
- **Australia Day 2014 Road Closure Times** T-11

Committee noted the information, and no further items were raised for discussion and/or further report purposes.

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3 FEBRUARY 2014

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1.1 - JULL SREET AND STREICH AVENUE - PROPOSED CARAVAN PARKING

WARD	:	MINNAWARRA
FILE No.	:	M/1208/13
DATE	:	10 December 2013
REF	:	SA
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- A request was made at the recent Minnawarra Progress Association Meeting for Technical Services to investigate the opportunity to create additional "vehicles with caravans" parking bays within the Armadale CBD.
- Following investigation, it is agreed that this provision is important to ensure that visitors to the Armadale Centre (including those with caravans) are not disadvantaged by a lack of legal parking.
- **Recommend:**

That Council approve the installation of the required parking restriction signage and minor modifications to the existing parking embayments along Jull Street and Streich Avenue, to create two new bus / caravan parking areas, as shown on Drawing No. 13-174 and Drawing No. 13-175.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

2. Enhanced Natural and Built Environments.
   2.5.1 Provide a safe and efficient movement network including local and arterial roads and associated infrastructure.

Legislation Implications

Assessment of legislation indicates that the following are applicable:

- Local Government Act 1995 – Schedule 9.1, Section 2.1.
- Road Traffic Act 1975 – Section 103.

Council Policy/Local Law Implications

General assessment of Policy/Local Law indicates that the following is applicable:

- Local Law relating to Parking Facilities.

Budget/Financial Implications

Anticipated cost to install required signage and carry out minor civil works to create two new bus / caravan embayments is $1,500. These costs can be accommodated within the Civil Works 2013/2014 Budget provisions.

Consultation

- Ranger Services.
- Armadale Tourist Centre.

BACKGROUND

At the recent Minnawarra Progress Association Meeting, a request was made by a caravan enthusiast, who is also an Armadale resident, to investigate the potential for increased parking provisions within close proximity to the Armadale CBD, for parking of vehicles with caravans. In addition, a further request was raised by the same Armadale resident to increase Ranger patrols along Jull Street, immediately fronting the Armadale Tourist Centre, where there is a section of existing caravan and bus parking, which is however used frequently by vehicles without caravans. The obvious consequence of this, as raised by the resident, is that due to their size, there can often be no available parking within the CBD for vehicles with caravans.

DETAILS OF PROPOSAL

Upon consideration of this request, it is agreed that there is a lack of this type of parking provision within the Armadale CBD. Further, it is considered essential that all visitors to this precinct, including tourists with caravans are not disadvantaged and have available parking to ensure that they don't simply "give up" trying to find a car park and travel elsewhere.

Technical Services Officers have investigated the potential for other parking areas within the Armadale CBD that could be created for caravan or bus parking, and which would not adversely impact on essential parking opportunities for other vehicles.

Two locations in particular have been identified, one immediately opposite the existing caravan / bus parking embayment along Jull Street fronting the McDonalds store, where there is currently no restriction on parking for standard vehicles. The other area is along Streich Avenue, immediately behind the Woolworths store, where there is an abundance of parking, which is quite often vacant for lengthy periods. Both of these proposed sites are illustrated on the attached two drawings (Drawing No. 13-174 and Drawing No. 13-175) (*Attachment 1.1.1*). These drawings also show both the proposed and existing parking restriction signage at these two locations.

It is considered that modifying these two parking embayment will not significantly disadvantage other motorists, however will importantly create additional parking opportunities for vehicles with caravans. In both cases there is very little work required to modify these areas to create bus / caravan bays, as the embayments already exist. Modification to existing lines, removal of some kerbing and installation of parking restriction signage are the only required works.

ANALYSIS

The City of Armadale is well known as a significant tourist hub and has many visitors daily to its Tourist Centre, located along Jull Street. Many of these tourists either stop in Armadale or use this location as a stopover on their way to another destination and quite often drive vehicles with caravans. There is an existing length of embayment along Jull Street, immediately adjacent to the Tourist Centre, which has been allocated to buses and caravans for a number of years. However, this designated parking area is frequently used illegally by motorists in vehicles only. On these occasions, parking for this length of vehicle is extremely limited within the CBD.

Since this concern was raised at the Minnawarra Progress Association Meeting, investigations have been carried out by Technical Services Officers and it can be confirmed that upon three visits to this section of Jull Street, illegal parking was noted on all occasions and in fact there was very limited space available for even one vehicle with a caravan.

It should also be noted that there are no other designated caravan parking embayements or bays within other areas of the Armadale CBD.

CONCLUSION

Based on investigations carried out following the request at the Minnawarra Progress Association Meeting to increase caravan parking within the Armadale CBD, it is agreed that additional provision for this type of vehicle should be provided. As such, it is recommended that Council approve the installation of the required signage and minor civil works to create the two additional parking embayments along Jull Street and Streich Avenue, as shown on the attached drawings.

In addition, an internal request will be made to the City's Manager Ranger Services to increase patrols along the length of Jull Street, adjacent to the Armadale Tourist Centre to infringe those motorists that park illegally in the existing bus / caravan embayments.

ATTACHMENTS

1. Streich Avenue and Jull Street - Caravan Parking Bays (Drawing No. 13-174 and Drawing No. 13-175).(Attachment 1.1.1)

T1/2/14 **RECOMMEND**

That Council approve the installation of the required parking restriction signage and minor modifications to the existing parking embayments along Jull Street and Streich Avenue, to create two new bus / caravan parking areas, as shown on Drawing No. 13-174 and Drawing No. 13-175.

Moved Cr K Busby
MOTION CARRIED (7/0)

1.2 - WATERWHEEL ROAD, BEDFORDALE - LOCAL AREA TRAFFIC MANAGEMENT

WARD	:	JARRAH
FILE No.	:	M/8/14
DATE	:	9 January 2014
REF	:	SF
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- The City has received a request to address speed concerns along Waterwheel Road, Bedfordale.
- No significant Local Area Traffic Management interventions are considered to be warranted.

- **Recommend:**

That Council:

1. Note the proposed improvements to be made to the Canns Road / Waterwheel Road intersection funded through the 2014/15 Blackspot Grant programme, for which approval is still to be finalised.
2. Support the submission of a 2015/16 Blackspot Grant application for the line marking on Waterwheel Road for the delineation of the road pavement and centre line.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

1. Community Wellbeing.
   1.2 Optimum quality of life for all citizens.
      1.2.4 Advocate and support equitable access to services and facilities for people with all abilities.

2. Enhanced Natural and Built Environments.
   2.1 Long term planning and development that is guided by a balance between economic, social and environmental objectives.

2.4 Attractive and user friendly streetscapes and open space.
2.4.1 Implement townscape, streetscape, and parkland improvements, to enhance the distinctive character of the City.
2.4.2 Maintain and improve where required, the quality, amenity and accessibility of open spaces.

Legislation Implications

General assessment of relevant legislation (e.g. Local Government Act) has not revealed any restrictions.

Council Policy/Local Law Implications

General assessment has not revealed any applicable Policies/Local Laws.

Budget/Financial Implications

The City has preliminary approval for a 2014/15 Blackspot Grant for Local Area Traffic Management (LATM) works along Canns Road, inclusive of the section of Waterwheel Road from Albany Highway to Canns Road. If successful, this Grant will cover 67% of the treatment cost for these works, and will be included in the 2014/15 budget deliberations.

Consultation

- Residents along Waterwheel Road, between Albany Highway and Canns Road, were recently consulted (December 2013) and all respondents (4 out of 7) were in favour of the installation of a Traffic Control device along this segment of road.
- Main Roads WA (MRWA).

BACKGROUND

The City has received a Councillor request to investigate speeding concerns along Waterwheel Road raised by local residents. Waterwheel Road is an open road, within a semi-rural environment, which is conducive to higher vehicular speeds. Waterwheel Road is only unkerbed between Canns Road and Benecula Circle.

ANALYSIS

Speed

Speed measurements and traffic counts have been taken along Waterwheel Road. The posted speed limit is 70km/h from Albany Highway to Avienmore Drive, which then changes to 50km/h from then on.

Traffic counts undertaken on Waterwheel Road were as follows:

	North of Benecula Circle	300m East of Canns Rd	100m West of Canns Rd
Posted Speed	70 km/h	70 km/h	70 km/h
Mean Speed	63.8 km/h	65.9 km/h	51.2 km/h
85th % Speed	73.1 km/h	75.6 km/h	61.2 km/h
Traffic Volume	1,281 vpd	1,641 vpd	1,930 vpd

When compared with other semi-rural roads throughout the City, speeds along Waterwheel Road are not abnormal, with the mean speeds well below the posted speed, and the 85th % speed not significantly higher than the posted speed. The majority of properties also have significant setbacks from the road with good sight lines from their cross-overs onto Waterwheel Road. Traffic volumes are considered to be normal for this rural environment.

Accidents

Review of the accident history shows 6 accidents in the past 5 years, as follows:

No	Type
2	Right / Thru
1	Thru / Left
1	Head on
1	Rear end
1	Left carriageway and hit object

These figures are unlikely to warrant any significant LATM interventions such as “traffic blisters”, road narrowing and speed humps. These are normally deemed inappropriate and considered unsafe in a 70km/h zone, and are not recommended. Minor works may however be warranted, and it is therefore recommended that the delineation of the road pavement via improved line markings be requested as part of a Blackspot Grant application for 2015/16.

COMMENT

Following a recent fatality on Canns Road, which intersects Waterwheel Road near Albany Highway, a safety audit on this route was performed. The audit results indicate limited improvements to the geometry and line marking along Canns Road, but also suggested improvements to the intersection of Canns Road with Waterwheel Road. This proposed improvement entails the installation of median islands at the intersection to control and guide traffic.

A Blackspot Grant application for 2014/15 has been submitted for the Canns Road works, and the initial evaluation of the project has been given preliminary approval by MRWA.

Therefore, while Waterwheel Road itself does not warrant any significant LATM measures being installed, the Canns Road / Waterwheel Road intersection improvements will perform the required function of calming traffic along the section between Canns Road and Albany Highway.

DETAILS OF PROPOSAL

It is therefore proposed, that in the case of this Waterwheel Road traffic calming request, that only limited measures be taken, being to submit a Blackspot Grant for 2015/16 for Waterwheel Road, for the installation of line marking along Waterwheel Road to delineate the road pavement and centre line.

CONCLUSION

Considering the measured speeds and accident statistics, the indications are that there are insufficient warrants for the installation of significant LATM measures on Waterwheel Road, and that only road pavement and centre line demarcation be recommended to be included in a Blackspot Grant application for 2015/16.

ATTACHMENTS

1. Waterwheel Road, Bedfordale - Location Plan (Attachment 1.2.1).

T2/2/14 **RECOMMEND**

That Council:

1. **Note the proposed improvements to be made to the Canns Road / Waterwheel Road intersection funded through the 2014/15 Blackspot Grant programme, for which approval is still to be finalised.**
2. **Support the submission of a 2015/16 Blackspot Grant application for the line marking along Waterwheel Road for the delineation of the road pavement and centre line.**

Moved Cr R Butterfield
MOTION CARRIED (7/0)

1.3 - YPRES ROAD, CAMILLO - OFF STREET CYCLEPATH

WARD	:	HERON
FILE No.	:	M/11/14
DATE	:	10 January 2014
REF	:	SF
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- A request was received to review traffic speeds and the provision of a shared path along Ypres Road, Camillo.
- Ypres Road was found to warrant application for a Blackspot Grant to install a shared path and Local Area Traffic Management treatments along its length.
- **Recommend:**

That Council include in the 2015/16 Blackspot Grant funding applications, the Local Area Traffic Management treatment of Ypres Road, Camillo, including the provision of a shared path.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

1. Community Wellbeing.
   - 1.2 Optimum quality of life for all citizens.
     - 1.2.4 Advocate and support equitable access to services and facilities for people with all abilities.

2. Enhanced Natural and Built Environments.
   - 2.1 Long term planning and development that is guided by a balance between economic, social and environmental objectives.
   - 2.4 Attractive and user friendly streetscapes and open space.
     - 2.4.1 Implement townscape, streetscape, and parkland improvements, to enhance the distinctive character of the City.
     - 2.4.2 Maintain and improve where required, the quality, amenity and accessibility of open spaces.

Legislation Implications

General assessment of relevant legislation (e.g. Local Government Act) has not revealed any restrictions.

Council Policy/Local Law Implications

General assessment has not revealed any applicable Policies/Local Laws.

Budget/Financial Implications

A shared path and Local Area Traffic Management (LATM) treatments along Ypres Road are estimated to cost $180,000. Should the City obtain Blackspot Grant funding for this work, 67% of the cost will be covered by the Grant, and will be considered in the budget deliberations at the appropriate time.

Consultation

Nil.

BACKGROUND

In November 2013, a Councillor request was received for a review of the safety aspects along the wide road reserve of Ypres Road, Camillo, with the specific reference for the inclusion of a cycle path on this route.

Ypres Road is a narrow 7.4m wide, 1km long road running from Westfield to Lake Road, in Camillo. The verges are consequentially relatively wide, with overhead power lines and a 1.8m concrete path existing on the southern side. The road carries approximately 2,200 vpd (2012), with 2.9% of these being classified as heavy vehicles. Speed measurements have recorded that the 85th % speed was 64.8 km/h, while the posted speed limit is 50 km/h.

Over the past 5 years there have been 14 reported crashes along the road, with a rough breakdown being:

- 3 - Losing control while turning into side road.
- 6 - Hitting another car while turning into or out of side road.
- 1 - Rear-end accident against turning vehicle.
- 4 - Miscellaneous (Hit object, run off road).

The nature of these accidents tends to confirm speed as a contributing factor.

DETAILS OF PROPOSAL

Ypres Road is listed as a cycle route within the City's Cyclepath Network Plan, as it provides a suitable mid-suburb link between Lake Road and Westfield Road, and is part the path network that links to the Kelmscott rail station.

Any Local Area Traffic Management (LATM) treatment of Ypres Road will need to address the speed and general high level of accidents. The accident history shows no specific trends, with causality being attributed to high speeds generally. As such, the most suitable process will be for the LATM treatments to constrain traffic, which in turn has been shown to reduce general speeds.

However, with the constriction of the road pavement, an incidental effect will be the limited space for cyclists. The provision of a separate shared path on the north side will adequately address this issue.

It is therefore recommended that LATM treatments should include both of the following:

1. Installation of a 1m wide red asphalt median, with occasional concrete median islands (possibly including tree plantings); and
2. Installation of a red asphalt shared path on the north verge of Ypres Road (on the opposite side from the existing footpath).

CONCLUSION

This project would most likely qualify for Black Spot funding and it is recommended that an application in this regard be included in the next round of grant applications. The recommended LATM treatments should provide an effective solution to improving safety for road users inclusive of cyclists.

ATTACHMENTS

1. Ypres Road, Camillo - Location Plan (Attachment 1.3.1).

Committee Discussion

A question was raised regarding the Black Spot grant funding application in the 2015/16 year being accessible following the local government amalgamations. It was explained to the Committee that the Black Spot grant funding is allocated to projects with the highest score and that the location of the project is irrelevant. It was confirmed that should the project qualify for Black Spot funding, the proposed amalgamation would have no impact on the accessibility of funding.

T3/2/14 **RECOMMEND**

That Council include in the 2015/16 Blackspot Grant funding applications, the Local Area Traffic Management treatment of Ypres Road, Camillo, including the provision of a shared path.

Moved Cr J A Stewart
MOTION CARRIED (7/0)

1.4 - CHALLIS PRIMARY SCHOOL PARKING PETITION

WARD	:	MINNAWARRA
FILE No.	:	M/12/14
DATE	:	10 January 2014
REF	:	SF
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- A petition has been received requesting the removal of rocks placed on the verge in Williams Road, preventing motorists from parking on the verge to collect their children from the Challis Early Childhood Education Centre (CECEC).
- A number of additional issues have been identified during the investigation into this request, mainly related to the lack of adequate parking to serve the needs of the CECEC, and road safety around the school.

- **Recommend:**

That Council:

1. Remove the rocks on the verge in Williams Road as requested by the petitioners.
2. Provide measures to prevent vehicles mounting the kerb in and around the intersection of Williams Road and Braemore Street.
3. Approach the Department of Education and the Challis Primary School to take measures to address the identified safety issues and parking requirements associated with the school operations and the Challis Early Childhood Education Centre.
4. The City commission an independent road safety audit in order to provide substantiation and instruction for the Black Spot application
5. Investigate the possibility of making a submission for Black Spot funding for improvements in the areas under the management of the City.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

1. Community Wellbeing.
   1.2 Optimum quality of life for all citizens.
      1.2.4 Advocate and support equitable access to services and facilities for people with all abilities.

2. Enhanced Natural and Built Environments.
   2.1 Long term planning and development that is guided by a balance between economic, social and environmental objectives.
   2.4 Attractive and user friendly streetscapes and open space.
      2.4.1 Implement townscape, streetscape, and parkland improvements, to enhance the distinctive character of the City.
      2.4.2 Maintain and improve where required, the quality, amenity and accessibility of open spaces.

Legislation Implications

General assessment of relevant legislation (e.g. Local Government Act) has not revealed any restrictions.

Council Policy/Local Law Implications

Assessment of Policy/Local Law indicates that the following is applicable:

- Local Laws that relate to parking & parking facilities.

Budget/Financial Implications

The recommended improvements/actions can be accommodated within the 2013/14 budget provisions. No provision has been made for any contribution towards a shared cost for any parking at this location.

Consultation

- Inter-Departmental.
- Department of Education.
- Challis Primary School.

BACKGROUND

Council received the following petition dated 26 November 2013:

"We the undersigned respectfully request that the Council: Support the parents/carers of children attending Challis Early Childhood Education Centre, parking on the verge area between 80 and 86 William Street and next to the school oval on corner of William and Braemore; By removing objects which will cause damage to vehicles or persons using the area during the hours of 8:15am – 9:15am and 2:15pm – 3:15pm on school days." (sic)

This petition essentially comprised of a request for the removal of objects (rocks) placed on the verge between Williams Road and the Challis Primary School (CPS). It has been assumed that this was undertaken by the adjoining resident to prevent ongoing use of the verge by parents parking on the verge during school drop off and pick up.

However, in investigating the petition, a number of issues more serious than that raised in the petition became evident, and in order to provide some context to these issues, the following is provided.

The CECEC was originally located on the school premises, in the area closer to the Lowanna Way access gate. The City provided and paid 50% of the cost of a parking area to serve the CECEC some years ago. This parking area provided for adequate parking and circulation space to address the needs of the CECEC. The school subsequently undertook relocation of the CECEC to the opposite side of the CPS complex, to an area at a significant distance from this existing parking and circulation area.

As a result, parents dropping off and collecting their children, now prefer to access the site through a gate in Braemore Street, and park on its verge – a closer option to access the CECEC. This has resulted in a significant number of vehicles parking along Braemore Street and Williams Road. This new site still requires parents to walk approximately 100m to the CECEC.

The staff parking area off Braemore Street is currently being redeveloped for additional facilities, and this has resulted in a reduction of available parking for teaching staff. The parking area originally provided for the benefit of the CECEC is now being used by teaching staff for parking, and is no longer available for other users.

The verge adjacent to the Braemore Street and Williams Road intersection is particularly attractive due to the shade provided by trees. Unfortunately, whilst this area can accommodate a number of vehicles, it has generated a safety issue from vehicles accessing and egressing in and around the intersection. Motorists currently access the Braemore Street verge via mounting the kerb in Williams Road. They then exit the verge off the kerb at random locations along Braemore Street, many making U-turns at the same time. This is clearly unacceptable, and a dangerous situation for all road users.

The attached Location Plan *(Attachment 1.4.1)* details the areas referred to in the above discussion.

COMMENT

Were a Department of Education (DoE) development application referred to the Technical Services Directorate in the normal manner, it would be a standard requirement to require suitable parking, access and circulation of school traffic both internally and externally. In this case there was no referral, and clearly no consideration of the impact of the relocation of CECEC, and other developments within the school property. Technical Services Officers have investigated the site, and believe the CECEC could still be provided with suitable parking, circulation and drop off zones, to meet requirements in this regard. Unfortunately, it would seem likely that some of their sporting oval may need to be sacrificed for this purpose.

In researching the above issues, the City became aware of a safety audit commissioned by the DoE, but the report has yet to be published. The draft report does however make it clear that there are a number of serious inadequacies related to circulation, parking provision and pedestrian movements – all of which would normally be required to be addressed as part of a new development application process. This draft report would confirm that the CPS and the DoE are aware of the safety issues on the site.

In an attempt to address some of these issues, the City is investigating whether Black Spot funding could be successfully applied for, even though directly related to the School development and activities. Should a Black Spot funding application be successful, then the City would request that the School or the DoE bear the 33% co-funding requirement.

DETAILS OF PROPOSAL

In order to address the immediate concerns raised in the petition, the solution is simple – remove the rocks placed on the verge.

This however, only provides for small relief and does not address the most urgent issues:

- The current unsafe usage of the road verge at the intersection of Braemore Street and Williams Road.
- The insufficient parking to meet the requirements of the Challlis Primary School and CECEC.
- The identified safety issues in and around the school property.

It is therefore proposed that the following actions be taken:

1. Remove the rocks on the verge in Williams Road.
2. Take measures to prevent vehicles accessing the road verge, at the intersection of Braemore Street and Williams Road in particular.
3. Notify the DoE and the Challis Primary School of the deficiencies in their parking practices identified in the observations made during the City's investigations, and request that they address these as soon as possible.
4. The City commission an independent road safety audit in order to provide substantiation and instruction for the Black Spot application.
5. The City make application for Black Spot funding to address safety issues on the public areas outside the school grounds, should any suggested improvements meet the funding warrants.

CONCLUSION

The recommended actions will address the concerns of the petitioners, but more serious issues are present, and need some form of action. These relate to the DoE and the CPS taking up their responsibilities, and providing suitable parking to safely operate an Early Childhood Education Centre.

Committee Discussion

It was noted that the City of Armadale has previously provided car parking to the School which is now being used as an overflow of staff parking.

Extensive discussions were had regarding the parking and safety issues in the vicinity of the School, as well as the disappointment in the Department of Education relating to their lack of action in addressing these. The recommendations were fully supported.

ATTACHMENTS
1. Challis Early Childhood Education Centre - Location Plan (Attachment 1.4.1).

T4/2/14 **RECOMMEND**

That Council:

1. **Remove the rocks on the verge in Williams Road as requested by the petitioners.**
2. **Provide measures to prevent vehicles mounting the kerb in and around the intersection of Williams Road and Braemore Street.**
3. **Approach the Department of Education and the Challis Primary School to take measures to address the observed parking practices and parking requirements associated with the school operations and the Challis Early Childhood Education Centre.**
4. **The City commission an independent road safety audit in order to provide substantiation and instruction for the Black Spot application.**
5. **Investigate the possibility of making a submission for Black Spot funding for improvements in the areas under the management of the City.**

Moved Cr K Busby
MOTION CARRIED (7/0)

~~*Councillor Butterfield disclosed that as a member of the Clifton Hills Primary School Board she has an association with this project. As a consequence, she advised that there may be a perception on the basis of her non-financial interests that her impartiality on the matter may be affected, but declared that she would set aside this association, consider the matter on its merits and vote accordingly.*~~

Amended at Full Council 10 February 2014

Cr Butterfield disclosed that she is a member of the Clifton Hills Primary School Board. As a consequence, she advised that there may be a perception on the basis of her non-financial interest that her impartiality on the matter may be affected, but declared that she would set aside this association, consider the matter on its merits and vote accordingly.

1.5 - ADDITIONAL PARKING - BLACKBURN RESERVE, CLIFTON HILLS PRIMARY SCHOOL

WARD	:	RIVER
FILE No.	:	M/48/14
DATE	:	24 January 2014
REF	:	KK
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- A parking shortfall to serve the Clifton Hills Primary School has been apparent for a number of years.
- The Blackburn Reserve has been used for informal parking, and has become degraded. The formalisation of the parking on Blackburn Reserve is proposed, to be funded 50% each between the Department of Education and the City.
- Additional parking on Butler Pass is also proposed, to be funded 100% by the Department of Education.
- The use of the Reserve under the current management order would have to be amended to accommodate the proposed parking.

- **Recommend:**

That Council:

1. Not approve formalised parking on Blackburn Reserve, and inform the Department of Education accordingly.
2. Enter into negotiations with the Department of Education to have a parking area provided on a portion of the school land suitable for the purpose of parking, and that the costs of such parking be borne between the Department and the City on a 50/50 basis.
3. That the Department of Education be informed that the use of the Reserve for informal parking will cease in June 2015 after which time the Reserve is to be rehabilitated to a park.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

1. Community Wellbeing.
   1.2 Optimum quality of life for all citizens.
      1.2.4 Advocate and support equitable access to services and facilities for people with all abilities.

2. Enhanced Natural and Built Environments.
   2.1 Long term planning and development that is guided by a balance between economic, social and environmental objectives.
   2.4 Attractive and user friendly streetscapes and open space.
      2.4.1 Implement townscape, streetscape, and parkland improvements, to enhance the distinctive character of the City.
      2.4.2 Maintain and improve where required, the quality, amenity and accessibility of open spaces.

Legislation Implications

General assessment of relevant legislation has not revealed any restrictions.

Council Policy/Local Law Implications

Assessment of Policy/Local Law indicates that the following is applicable:

- Local Laws that relate to parking & parking facilities.

Budget/Financial Implications

All works indicated can be accommodated in the 2013/14 budget provisions.

Consultation

- Department of Education.
- Clifton Hills Primary School.
- Inter-Departmental.

BACKGROUND

The parking difficulties around the Clifton Hills Primary School (CHPS) have been apparent for a number of years. These problems resulted in the City approving informal parking on Blackburn Reserve to the north of the school, which at that stage was planned to be a temporary arrangement.

This area however, has become associated with the school parking stock, and from that point of view has become a necessity.

In addition, the school has developed, whereby the parking area which in the past was used by parents to drop off and collect children on the school property, is now reserved for teacher use only. This has raised the need for parent parking around the school.

Council will also recall that during 2013, the City wrote to the Department of Education (DoE), requesting that they address the parking issues becoming apparent with the increase in student numbers associated with the popularity of independent schools.

DETAILS OF PROPOSAL

A number of investigations to accommodate sufficient parking around the school have been carried out, and of the many proposals generated, the most cost efficient, most practical and anticipated to generate the least traffic conflict and traffic congestion, was that the existing informal parking on Blackburn Reserve be formalised.

This proposed parking layout is depicted on Plan No. E13-136 (*Attachment 1.5.2*)

The DoE has also been consulted in this regard, and they have agreed to make a 50% contribution to the costs of the proposed parking area on Blackburn Reserve, to an amount of $100,000. They have further agreed to make a 100% contribution to additional parking provisions along Butler Pass, depicted on Plan No. E13-167 (*Attachment 1.5.3*), at a cost of $100,000.

The DoE has however stated, that should the parking on Blackburn Reserve not be approved, they would only be willing to contribute 50% to the cost of the parking on Butler Pass, to an amount of $50,000.

COMMENT

The Blackburn Reserve is a Public Open Space under the management of the City, and the management order provides for the use of the area for “recreation”. This means that, for the intended use be amended to predominantly parking, the public use under the management order be amended, most likely to “Public Recreation and Parking”, and be approved by the relevant State Department. There is a defined process involved, including public advertising and comment to be obtained from adjoining landowners.

This process can unfortunately take up to 18 months, which will cause a substantial delay in implementing the parking provision. The consequences of this anticipated delay will have to be discussed with the DoE, and their willingness to still contribute to the funding of the parking areas confirmed.

ANALYSIS

The recommended parking provision in Blackburn Reserve and on Butler Pass provides much needed additional parking capacity for the school. It also provides for safe and efficient circulation of vehicles and formalises the parking. This will also serve to eliminate much of the illegal parking on verges and footpaths, which makes for a safer environment in general.

The Reserve is currently degraded due to the use of the area for parking over many years, and the formalisation of the parking will provide for the opportunity to return approximately one

third of the Reserve to a landscaped park, which is considered to be a much improved outcome when assessed against the current position.

OPTIONS

The City has the following options which can be considered:

1. The City approve the parking area as depicted on Plan No. E13-136, and obtain a 50% cost contribution from DoE, as well as the 100% funding for the parking area on Butler Pass, depicted on Plan No. E13-167 to an amount of $100,000.
2. The City not approve the parking on Blackburn Reserve, and obtain the 50% contribution from DoE for the parking along Butler Pass to an amount of $50,000.
3. The City not approve any parking in Blackburn Reserve nor on Butler Pass.

Option 1 is recommended, as this option gains the best traffic outcomes for the area, as well as for the school.

This recommended option is based on the assumption that the current use under the management order can be amended to that of "Public Recreation and Parking".

CONCLUSION

Considering all of the options, and weighing the benefits against the alternate of not providing the parking, it is recommended that the parking in both Blackburn Reserve and on Butler Pass be constructed and designed. With a contribution of $200,000 from the DoE out of a total cost of $300,000, this is considered the best outcome for the City.

ATTACHMENTS

1. Clifton Hills Primary School - Location Plan (Attachment 1.5.1).
2. Blackburn Drive - Plan No. E13-136 (Attachment 1.5.2).
3. Butler Pass - Plan No. E13-167 (Attachment 1.5.3).

RECOMMEND

That Council:

1. Approve the provision of formalised parking in Blackburn Reserve, as depicted on Plan No. E13-136, at a cost of $200,000, of which the Department of Education is to contribute $100,000.
2. Should the parking be approved:
   a. Pursuant to the 'Crown Land Administration and Registration Practice Manual' advertise the proposed amended reserve purpose, from "Public Recreation" to "Public Recreation and Parking". This advertising is to include sign posting the proposal on the reserve (including photographic evidence), local newspaper advertising, writing to landowners within 100m of the reserve and the advertising period being for a minimum period of 35 days.
   b. Seek support from the Department of Education and Department of Planning specifically, as well as other State Government Service Agencies.

c. If no objections are received during the advertising period, request the Minister of Lands authorise the proposed amended purpose of Reserve 33365 from "Public Recreation" to "Public Recreation and Parking".

3. Approve the provision of parking on Butler Pass as depicted on Plan No. E13-167, to an amount of $100,000, of which the Department is to conditionally contribute $100,000.

OR should the parking area on Blackburn Reserve not be approved:

1. Approve the provision of parking on Butler Pass as depicted on Plan No. E13-167, to an amount of $100,000, of which the Department is to conditionally contribute $50,000, and the City of Armadale is to contribute $50,000.

Committee Discussion

Extensive explanatory discussion was presented in relation to the parking issues surrounding Clifton Hills Primary School by the Executive Director Technical Services.

The alternate parking options were explained to the Committee, including the provision of a possible car park located on the School property with an access route through Blackburn Reserve. The Committee discussed this option and decided that Blackburn Reserve should not be utilised in any way as a car park or an access route to a car park.

The option of providing car parking bays along the verge of Connell Avenue was considered, however this option would be costly due to various services located along this road, as well as the adjoining steep slope of the verge.

The option of creating car parking located on the School property along Butler Pass was discussed and favoured by the Committee to be investigated further.

The general consensus of the Committee was to not allow formalised car parking on Blackburn Reserve and to rehabilitate the Reserve to a park. Therefore, the Committee determined to amend the recommendation provided with the following resolution for presentation to Council.

T5/2/14 **RECOMMEND**

That Council:

1. **Not approve formalised parking on Blackburn Reserve, and inform the Department of Education accordingly.**
2. **Enter into negotiations with the Department of Education to have a parking area provided on a portion of the school land suitable for the purpose of parking, and that the costs of such parking be borne between the Department and the City on a 50/50 basis.**
3. **That the Department of Education be informed that the use of the Reserve for informal parking will cease in June 2015 after which time the Reserve is to be rehabilitated to a park.**

Moved Cr K Busby
MOTION CARRIED (7/0)

2.1 - CITY OF ARMADALE GROUNDWATER USE REPORT 2012-2013

WARD	:	ALL
FILE No.	:	M/31/14
DATE	:	20 January 2014
REF	:	PL
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- The attached "City of Armadale Groundwater Use" Report for 2012/13 outlines the City's groundwater position for the "water year" commencing 1 July 2012, to 30 June 2013.
- The Report reflects the successful implementation of a range of strategies to manage groundwater use.
- **Recommend:**

That Council note the City of Armadale Groundwater Use Report 2012/13.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

1. Community Wellbeing.
   - 1.5 Sport, recreation, and leisure opportunities that contribute to community health and wellbeing.
     - 1.5.1 Provide and promote Council sport, recreation and leisure facilities.

2. Enhanced Natural and Built Environments.
   - 2.4 Attractive and user friendly streetscapes and open space.
     - 2.4.2 Maintain and improve where required, the quality, amenity and accessibility of open spaces.

Legislation Implications

General assessment of relevant legislation (e.g. Local Government Act) has not revealed any restrictions.

Council Policy/Local Law Implications

General assessment has not revealed any applicable Policies/Local Laws.

Budget/Financial Implications

The adoption of the recommendation contained in this report has no direct financial implication.

Consultation

- Intra-Directorate.

BACKGROUND

The City of Armadale Parks Services Department manages the use of groundwater and surface water within its irrigated parks and reserves under a Council adopted Groundwater Operating Strategy (GWL160738(5) 2009).

This strategy outlines the City's administrative requirements, operating rules, water quality monitoring regime, contingency plans and water use efficiency practices undertaken by the City to achieve irrigation water supply security and sustainability.

This Operating Strategy is currently being reviewed due to ongoing license amendments/transfers, increased allocations, new allocations in other water areas/draw points and updates to our current groundwater monitoring program. The revised Operating Strategy will be submitted to the Department of Water shortly for approval.

In this respect, the City compiles an annual "City of Armadale Groundwater Use" Report. The 2012/13 Report is attached for reference.

Currently the City holds ground and surface water abstraction licenses in the following groundwater areas as described in the table below:

Description	Licences	Number of Bores	Irrigated Area	Allocation (kilolitres)
Perth/Armadale GWL160738(10)	GWL160738(10)	56	93.9 Ha	703,780 kL
Jandakot - Wright GWL173290(1)	GWL 173290	3	9.86 Ha	76,125 kL
Perth - Golf Course GWL160868(1)	GWL 160868	2	8 Ha	60,000 kL
Canning Rv-Rushton SWL98823(4)	SWL 98823	1	6 Ha	45,000 kL
Leederville GWL 175895 (1)	GWL175895 (1)	1	5.72 Ha	42,433 kL
Unlicensed Bores (Non RIWI)	Not applicable	15	14.8 Ha	105,000 kL
TOTAL		**77**	**136.72**	**1,032,338**

The total irrigated area managed by the City of Armadale during the 'water year" 1 July 2012 to 30 June 2013, was approximately 136 hectares, with an annual water allocation of approximately 1032 mega litres (million litres). The breakdown of the irrigated area is shown in the above table.

Groundwater extraction east of Albany Highway and South Western Highway is from a non-proclaimed groundwater area and as such there is no requirement to license and monitor extraction or water quality. The City however, as part of its citywide Operating Strategy, has begun recording in most cases, cumulative abstraction and water quality data for these extraction points on an annual basis. It must be noted that metering throughout this water area is highly problematic due to extremely poor water quality and increased deterioration of mechanical equipment.

It must be noted that with increased development within the City, the annual licensed groundwater abstraction across all water areas does change regularly.

The City has recently received:

- 18 April 2013 - A revised Jandakot Perth Superficial License GWL173290 (2) with an amalgamated abstraction entitlement of 76,125kL detailing an additional water source location, Marseille Gardens Piara Waters (0.95Ha).

- 17 October 2012 - A revised Perth Superficial Swan License GWL 160738 (10) with a reduced amalgamated abstraction entitlement of 703,780kL detailing a reduction of the abstraction entitlement by 42,433kL as part of the relocation and relicensing of the Brookwood Estate Village Green bore, Lot 86 Bundoran App Hilbert.

- 19 October 2012 - A new Perth Leederville License GWL 175895 (1) was granted with an abstraction entitlement of 42,433kL Brookwood Estate Village Green bore, Lot 86 Bundoran App Hilbert.

COMMENT

The City prepares an annual "City of Armadale Groundwater Use" Report, in terms of the Operating Strategy, inclusive of annual monitoring outcomes as committed and reports the findings to the two regional Department of Water Offices that manage the greater Perth Swan Groundwater area and the Jandakot water area respectively. The Report is included as *Attachment 2.1.1*.

The City has collated the information for the "water year", 1 July 2012 to 30 June 2013, to comply with the terms and conditions of the GWL 160738 (5) Water Operating Strategy as detailed in *Attachment 2.1.1*.

In general, the monitoring commitments include the following quantity and water chemistry parameters:

- Quantity of water abstracted.
- Salinity (ppm).
- Static groundwater water level (m).
- pH.
- Vegetation condition adjacent to bore.
- Water analysis.

These monitoring parameters, some of which are new tests, assist the Parks Department in:

- Monitoring bore condition & decline;
- Developing and reviewing agronomic maintenance programs and construction specifications; and
- Assessing landscape proposals and the selection of appropriate landscape and irrigation infrastructure based on known local water quality issues.

All annual monitoring commitments have been achieved and form the basis for the annual "City of Armadale Groundwater Use" Report.

Groundwater abstraction for the "water year", 1 July 2012 until 30 June 2013, across all five (5) water areas throughout the City, is under the licensed abstraction allocation in the order of 8%.

Individually, abstraction licenses were under the abstraction allocation between 4% and 46% as indicated in the table below.

Licence Details	Entitlement (kL)	Abstraction (kL)	Variance (kL)
Perth/Armadale GWL160738(10)	703,780	678,279	<25,501
Jandakot - Wright GWL173290(1)	76,125	72,251	<3,874
Perth - Golf Course GWL160868(1)	60,000	54,933	<5,067
Canning Rv-Rushton SWL98823(4)	45,000	24,600	<20,400
Leederville GWL 175895 (1)	42,433	22,963	<19,470
Unlicensed Bores (Non RIWI)	105,000	95,529	NA
TOTAL	**1,032,338kL**	**948,555kL**	**<83,783kL**

The City has implemented a wide range of water use efficiency measures into its current irrigated reserve maintenance programs and continues to investigate and develop other water efficiency strategies, some of which have been outlined within the attached annual Groundwater Use Report 2012/13.

Importantly, the City maintains a strong relationship with the University of Western Australia, contributing funding to ongoing turf research and research into improved water use efficiencies through the Shenton Park Research Facility.

This new research, in conjunction with ongoing close monitoring and management of local groundwater use and early stage investigations by City Officers into improved turf surface design and construction techniques, should assist in maximising groundwater resource use efficiencies into the future.

CONCLUSION

The City has demonstrated that the measures taken to manage groundwater usage have been successfully implemented, and this has confidence in planning for future water demand management as the City expands.

ATTACHMENTS

1. City of Armadale Groundwater Use Report 2012/2013 (Attachment 2.1.1).

Committee Discussion

The Chair provided compliment to the Parks Department on the Groundwater Use Report, in particular noting that Cross Park has never looked better.

T6/2/14 **RECOMMEND**

That Council note the City of Armadale Groundwater Use Report 2012/13.

Moved Cr R Butterfield
MOTION CARRIED (7/0)

2.2 - VEHICLE ACCESS POLICY FOR CITY OF ARMADALE RESERVES

WARD	:	ALL
FILE No.	:	M/1137/13
DATE	:	22 November 2013
REF	:	PL
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- At the Council Meeting of 24 June 2013 the following matter was referred; *"That the matter of the possibility of a vehicle access policy for the City's reserves be referred to the Technical Services Committee."*
- Research has indicated that the current processes and practices are considered to be adequate.
- Unauthorised access to City reserves is not widespread and considered to be under good control.

- **Recommend:**

That Council retain the current administrative processes and procedures relating to the management and control of vehicular access to City reserves.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

2. Enhanced Natural and Built Environments.
   2.8 A natural environment and bushland that is sustained, enhanced and strengthened.
      2.8.1 Develop an appropriate policy and long term works programs to protect and enhance our bushland and natural environs under the City's control.

Legislation Implications

Assessment of the Local Government Act 1995 indicates that the following apply:

- Section 3.53(2) of the Local Government Act applies– Control of certain unvested facilities – *"A local government is responsible for controlling and managing every otherwise unvested facility within its district unless subsection (5) states that this section does not apply."*
- Section 3.54(1)(2) of the Local Government Act applies – Reserves under control of a local government – *"(1) If land reserved under the Land Administration Act 1997 is*

vested in or placed under the control and management of a local government, the local government may do anything for the purpose of controlling and managing that land that it could do under section 5 of the Parks and Reserves Act 1895 if it were a Board appointed under that Act to manage and control the land and for that purpose a reference in that section to a by-law is to be read as a reference to a local law. (2) Subsection (1) is subject to any express provision to the contrary made by an order under the Land Administration Act 1997 in respect of the land."

Council Policy/Local Law Implications

Assessment of the Local Government Property Local Law indicates that the following are applicable:

- Part 3 requires the public to have a permit to do things on local government property and what conditions can be attached to a permit.
- Part 4 Division 1 also deals with the behaviour or interference with local government property.
- Part 5 Division 2 deals with no entry to fenced or closed local government property.
- Local government property means anything except a thoroughfare –
  (a) Which belongs to the local government;
  (b) Of which the local government is the management body under the *Land Administration Act 1997;* or
  (c) Which as otherwise unvested facility within section 3.53 of the L*ocal Government Act 1995.*
- Planning Policy PLN2.7 – Environmental Management and Improvement Policy for Development of Constrained Land may also apply.

Budget/Financial Implications

The adoption of the recommendation contained in this report has no direct financial implication.

Consultation

- Inter-Directorate.

BACKGROUND

At the Council Meeting of 24 June 2013, the following Councillor referral was received; *"That the matter of the possibility of a vehicle access policy for the City's reserves be referred to the Technical Services Committee."*

The following information was provided in relation to this referral;

"The matter of private and/or company vehicles entering or accessing private properties via nature reserves has been raised by residents and environmental groups as a problem for the optimal management of the reserves, causing trampling and destruction of vegetation and possible spread of disease and weeds. It is requested that the City create a vehicle access policy which clearly stipulates whose vehicles may enter the reserves and under what circumstances."

This request is understood to have its origins in an incident where a private property owner was accessing his property by crossing a Council managed reserve. This activity was not permitted by nor known to City Officers. The inherent risks in permitting such an activity, are however recognised, and are as described in the Councillor information.

COMMENT

There is currently no Council Policy on the specific matter of accessing reserves for the purpose of accessing private properties abutting Council reserves. The current administrative arrangements and compliance protocols are however considered to be adequate to manage such incidents and requests.

Should a request be received for access across a reserve, the City applies the applicable administrative processes and practices in this regard, assesses the situation and either grants permanent access, grants temporary access or denies the request. Access permissions are usually conditioned by a key bond.

It is also recognised that there may be cases where restrictive covenants, (on the Deposited Plan under Notifications or on the Certificate of Title), Structure Plans or a Fire Management Plan for any property, may stipulate that there is restricted access or even that access is permitted, as dictated by each peculiar situation. These are however few.

Officers are of the view that vehicle access to Council owned or managed reserves should only be permitted on defined access roads and car parks. Exceptions to this are City service vehicles and emergency services vehicles. The current processes related to the management of access for private vehicles are considered to be adequate and working well.

It is also considered that the issue of private vehicles accessing City reserves is not widespread across the City and the existing procedure of bonding reserve access keys is considered effective in most cases. This practice is considered to be very successful, and there have been very few exceptions of unauthorised access.

Whilst consideration may be given to residents or businesses that wish to gain entry through a public reserve to access properties for deliveries or construction work, this is only granted after consent has been provided in writing, and the vehicle access path has been approved by the City.

A key bond is usually applied to gain entry to the reserve, of which bond is refunded once the key is returned and only following an inspection by the City to ensure that no damage has been done or debris left behind.

Residents and businesses usually apply for permission to access reserves for general deliveries, water cartage, building constructions, pool installation etc. while some residents have gained access to their property via a reserve for many years as a historical practice with a key being issued sometime in the past. In all these cases, the City takes all precautions to ensure that no damage is done to the reserve.

CONCLUSION

City Officers have investigated this request at length, and come to the conclusion that unauthorised vehicle access to Council owned or managed reserves is not widespread, and damage reported on only very few occasions. Access to City owned or managed reserves is recommended to be restricted primarily to Council vehicles and emergency service vehicles. Consideration is however, given to residents or businesses wishing to gain temporary access to a reserve, but only for a specific purpose where no alternative exists, and only after approval is granted by the City, and the bonding procedure has been implemented.

It is therefore recommended that the current processes and procedures relating to the management of vehicular access to reserves be retained.

ATTACHMENTS

There are no attachments for this report.

T7/2/14 **RECOMMEND**

That Council retain the current administrative processes and procedures relating to the management and control of vehicular access to City reserves.

Moved Cr R Butterfield
MOTION CARRIED (7/0)

3.1 - TENDER NO 2/14 - SUPPLY OF BRICK AND GRANITE PAVERS FOR THE JULL STREET MALL REDEVELOPMENT

WARD : ALL

FILE No. : M/57/14

DATE : 31 January 2014

REF : CM

RESPONSIBLE MANAGER : Executive Director Technical Services

In Brief:

- Tender No. 2/14 was recently called for the Supply of Brick and Granite Pavers for the Jull Street Mall Redevelopment.

- **Recommend:**

That with Tender No. 2/14 for the Supply of Brick and Granite Pavers for the Jull Street Mall Redevelopment, Council accepts the tender from Absolute Stone for the two (2) granite components only of the request for Tender at their tendered rate for an approximate total of $94,046.50, excluding GST.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

2. Enhanced Natural and Built Environments.
   - 2.4 Attractive and user friendly streetscapes and open space.
     - 2.4.1 Implement townscape, streetscape, and parkland improvements, to enhance the distinctive character of the City.
     - 2.4.2 Maintain and improve where required, the quality, amenity and accessibility of open spaces.
   - 2.5 Safe and efficient movement of goods, services and people.
     - 2.5.1 Provide a safe and efficient movement network, including local and arterial roads, and associated infrastructure.

Legislation Implications

Assessment of legislation indicates that the following apply:

- Section 3.57 *Local Government Act 1995* – Tenders for providing goods or services
- Division 2 *Local Government (Functions and General) Regulations 1996* – Tenders for providing goods or services

Council Policy/Local Law Implications

Assessment of Policy/Local Law indicates that the following is applicable:

- Council Policy ADM 19 – Procurement of Goods or Services.

Budget/Financial Implications

The costs associated with the award of this tender can be accommodated within the 2013/2014 budget.

Consultation

- Intra-Directorate.
- Business Armadale.

BACKGROUND

Tender No. 2/14 for the Supply of Brick and Granite Pavers for the Jull Street Mall Redevelopment was advertised in the Saturday, 11 January 2014 edition of 'The West Australian' newspaper, on the City's website and in a notice which was displayed on the Administration Centre, Armadale, Kelmscott and Seville Grove Libraries public notice boards.

Jull Street Mall plays a key role in the Armadale City Centre and has been the subject of a number of reports that have focused on the need to revitalise the area and encourage active community use.

In October 2012, Council requested that investigation be undertaken into future works and activities which would serve to revitalise the Jull Street Mall. A concept design plan and an activation plan were presented in February 2013 and in response, Council allocated funds in the 15 Year Financial Plan for implementation. Council also considered a report on the Jull Street Mall scope of works for Stages 1 and 2, and Council resolved to progress Stage 1 of the project, in January 2014.

DETAILS OF PROPOSAL

The tenderers were required to provide the materials and cartage to the City's designated location as described in the tender documents.

The tender covers the range of paving and brick products to be used in the implementation of the Jull Street Mall works, and include granite cobblestones and pavers, concrete pavers and clay pavers.

Council approval is sought to award Tender No. 2/14 for the Supply of Brick and Granite Pavers for the Jull Street Mall Redevelopment.

COMMENT

Analysis

The Tender closed at 2:00PM on Wednesday, 29 January 2014. One (1) tender submission was received from:

	Tenderer's OR Respondent's Name
1.	Absolute Stone

This one submission is a supplier of granite cobblestones and pavers, and only submitted prices for the granite components of the tender.

No tenders were received for the concrete and clay paving elements of the tender. Enquiries have however, shown that WALGA tenders do exist from which the City can procure these products.

Evaluation

An evaluation process was undertaken having specific regard to the following Qualitative Criteria:

- 5% - Relevant Experience.
- 5% - Key Personnel skills and experience.
- 5% - Tenderer's Resources.
- 5% - Demonstrated Understanding.
- 80% - Tendered Price.

Tenderer	Relevant Experience	Key Personnel	Tenderers Resources	Demonstrated Understanding	Sub Total	Tendered Price	Overall Total	Ranking
	5%	5%	5%	5%	20	80%	100	
Absolute Stone	3.17	3.00	3.17	3.84	13.18	80	93.18	1

CONCLUSION

Tender No. 2/14 for the Supply of Brick and Granite Pavers for the Jull Street Mall Redevelopment was recently invited with one (1) conforming tender being received and assessed by an evaluation panel against compliance and qualitative criteria.

Tenderers were invited to submit pricing for four (4) specified paving products consisting of two (2) varieties of Granite, Clay Brick and Concrete Pavers. Tenderers could price individual components of the request due to the diverse construction of the products requested.

The result was that the submission received from Absolute Stone represented the preferred tender to the City of Armadale with two (2) of the four (4) paving material items specified in this request for tender. The balance of the products can be obtained through the utilisation of the current WALGA tenders.

The evaluation panel therefore recommends that the contract to supply the two (2) specified granite paving items be awarded to Absolute Stone at a price of approximately $94,046.50, excluding GST.

ATTACHMENTS
There are no attachments for this report.

T8/2/14 **RECOMMEND**

That Council, with Tender No. 2/14 for the Supply of Brick and Granite Pavers for the Jull Street Mall Redevelopment, accepts the tender from Absolute Stone for the two (2) granite components only of the request for Tender, at their tendered rate for an approximate total cost of $94,046.50, excluding GST.

Moved Cr C Frost
MOTION CARRIED (7/0)

4.1 - CONFERENCE ATTENDANCE - INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA (IPWEA) STATE CONFERENCE - ESPLANADE HOTEL, FREMANTLE 11 - 13 MARCH 2014

WARD	:	ALL
FILE No.	:	M/15/14
DATE	:	13 January 2014
REF	:	KK
RESPONSIBLE MANAGER	:	Executive Director Technical Services

In Brief:

- Outline of proceedings for Institute of Public Works Engineering Australia (IPWEA) State Conference 2014 to be held 11-13 March, 2014 at the Esplanade Hotel, Fremantle.

- **Recommend:**

That Council:

1. Nominate Councillor Best as a delegate to the IPWEA State Conference 2014 to be held 11-13 March, 2014.
2. Note the attendance of Technical Services Officers as delegates to the IPWEA State Conference 2014 to be held 11-13 March, 2014.

Tabled Items

Nil.

Officer Interest Declaration

Nil.

Strategic Implications

4. Good Governance and an Effective Organisation.
   - 4.1 Good governance and leadership.
     - 4.1.1 Strengthen the governance role of Councillors by informing, resourcing, skilling and supporting their role.

Legislation Implications

General assessment of relevant legislation (e.g. Local Government Act) has not revealed any restrictions.

Council Policy/Local Law Implications

Assessment of Policies/Local Laws indicates that the following are applicable:

- Council Policy ADM3 – Conferences and Training.
- Council Policy EM1 – Reimbursement of Councillor's Expenses.

Budget/Financial Implications

Costs can be accommodated within the 2013/14 Annual Budget.

Consultation

- Intra-Directorate.

BACKGROUND

The annual IPWEA State Conference is the leading public works engineering event on the Western Australian calendar and is attended by leaders from government and industry, providing an innovative programme of presentations and technical papers. The Conference provides a great opportunity for business's to promote products and services to decision makers in the public works industry.

The objective of the WA State Conference is to build on the knowledge of public works professionals, provide updates on changes happening within – and related areas of – the industry, create opportunities for networking and, more generally, offer glimpses of an exciting future in the public works engineering sector. The broad range of topics and issues covered in the conference design reflect this purpose.

Being a local Conference, it is recommended that a Councillor be nominated to attend.

COMMENT

The 2014 Conference, titled "Create, Communicate, Deliver", will cover key issues including:

- Transport.
- Roads.
- Leadership.
- Urban Development.
- Leisure.
- Storm water.
- Parks & Environment.
- Research & Projects.
- Asset Management.

Keynote Presenters include:

- Eva Skira, Chairman of the Board, Water Corporation.
- Chris Hampton, IPWEA National CEO.
- Dr Jacinta Delhaize, University of Western Australia.
- Professor Lyn Beazley AO FTSM, Chief Scientist of WA.
- Menno Hennevel, Principal, Menno Henneveld Consulting.
- David Fyfe, Engineer, Bali Bombing Survivor & Motivational Speaker.
- Glenn Mitchell, Former ABC TV/Radio Leading Sports Broadcaster, Author & Speaker.
- Mr Athanasios (Arthur) Kryon, CEO, Town of Victoria Park.

The Conference covers the full spectrum of engineering functions performed by the Technical Services Directorate, and Councillors will benefit from the technical papers and discussion documents presented. A full 2014 IPWEA State Conference Programme is attached (*Attachment 4.1.1*).

Attendance costs, including full registration and sundry expenses are approximately $2,000.00 per person.

ATTACHMENTS
1. 2014 IPWEA State Conference Programme (Attachment 4.1.1).

T9/2/14 **RECOMMEND**

That Council:

1. **Nominate Cr G Best as a delegate to the IPWEA State Conference 2014 to be held 11-13 March, 2014.**
2. **Note the attendance of Technical Services Officers as delegates to the IPWEA State Conference 2014 to be held 11-13 March, 2014.**

Moved Cr R Butterfield
MOTION CARRIED (7/0)

4.2 - CONFERENCE ATTENDANCE - DIRECT ACTION POLICY SUMMIT 2014

A Councillor request was submitted at the City Strategy Meeting of 20 January 2014, for a report to be submitted to the Technical Services Committee, regarding the possible attendance of a City delegate to the Direct Action Policy Summit 2014, to be held 3-4 March 2014, at the Sydney Harbour Marriott, Circular Quay.

Officer Comment

Officers have read the Summit extracts, as well as the Green Paper, and have come to the following conclusions:

- The Green Paper seeks comment on the likely way in which the scheme will work in a number of key areas (e.g. competitive process for abatement projects, setting of 'baseline' emissions which will determine any future liability).
- The White Paper will take these comments into account and be released in April. This will include a lot more certainty over the operational mechanics of the scheme.
- It is not clear on how the Carbon Farming Initiative will fit into the new legislation.
- The keynote presenters attending the Summit have clearly been sourced from big businesses which have an interest in the carbon sequestration industry and it is questioned whether the local government sector will gain much from attendance at such a summit, at this early stage in the legislation development process.
- Further conferences are likely to emerge when the details are in a more finalised state.

In summary, the content proposed is considered to be less relevant to local government, especially in the context of the Green Paper, which is seeking input from the industry.

It is therefore recommended that attendance of a City delegate at this Summit not be considered, and that attendance at a similar conference rather be considered once the proposed new Carbon Tax legislation has reached a greater state of maturity.

ATTACHMENTS
There are no attachments for this report.

T10/2/14 **RECOMMEND**

That Council make no nomination for attendance at the Direct Action Policy Summit 2014.

Moved Cr R Butterfield
MOTION CARRIED (7/0)

COUNCILLORS' ITEMS

Amended at Full Council 10 February 2014

5.1 Dale Cottages – Service Requirements (Cr Busby)

Cr Busby raised the matter of service requirements at Dale Cottages.

T12/2/14 That Council refer the Councillor's item in regard to service requirements at Dale Cottages to the Technical Services Directorate for appropriate action.

EXECUTIVE DIRECTOR TECHNICAL SERVICES REPORT

Nil.

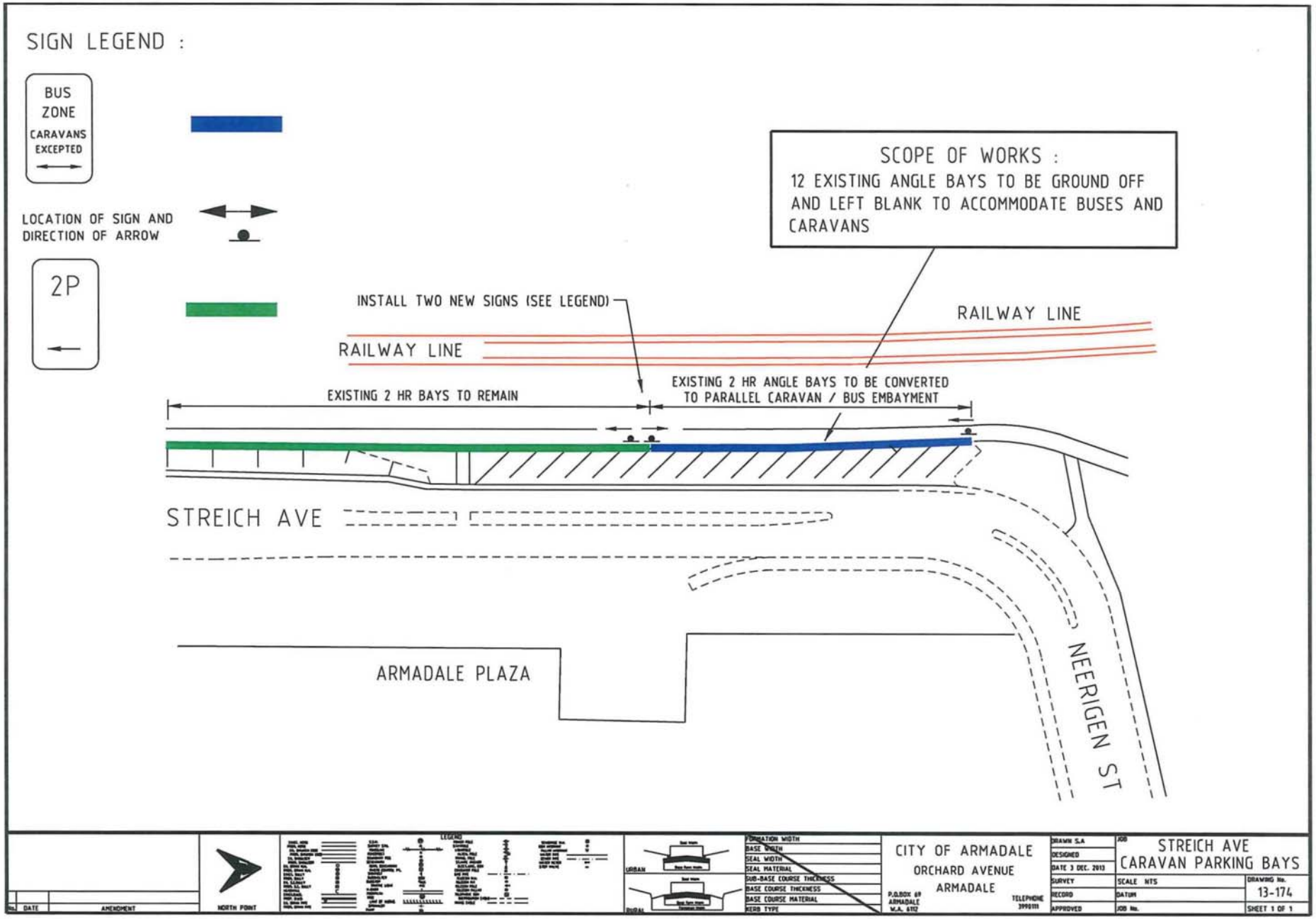
MEETING DECLARED CLOSED AT 8.06pm

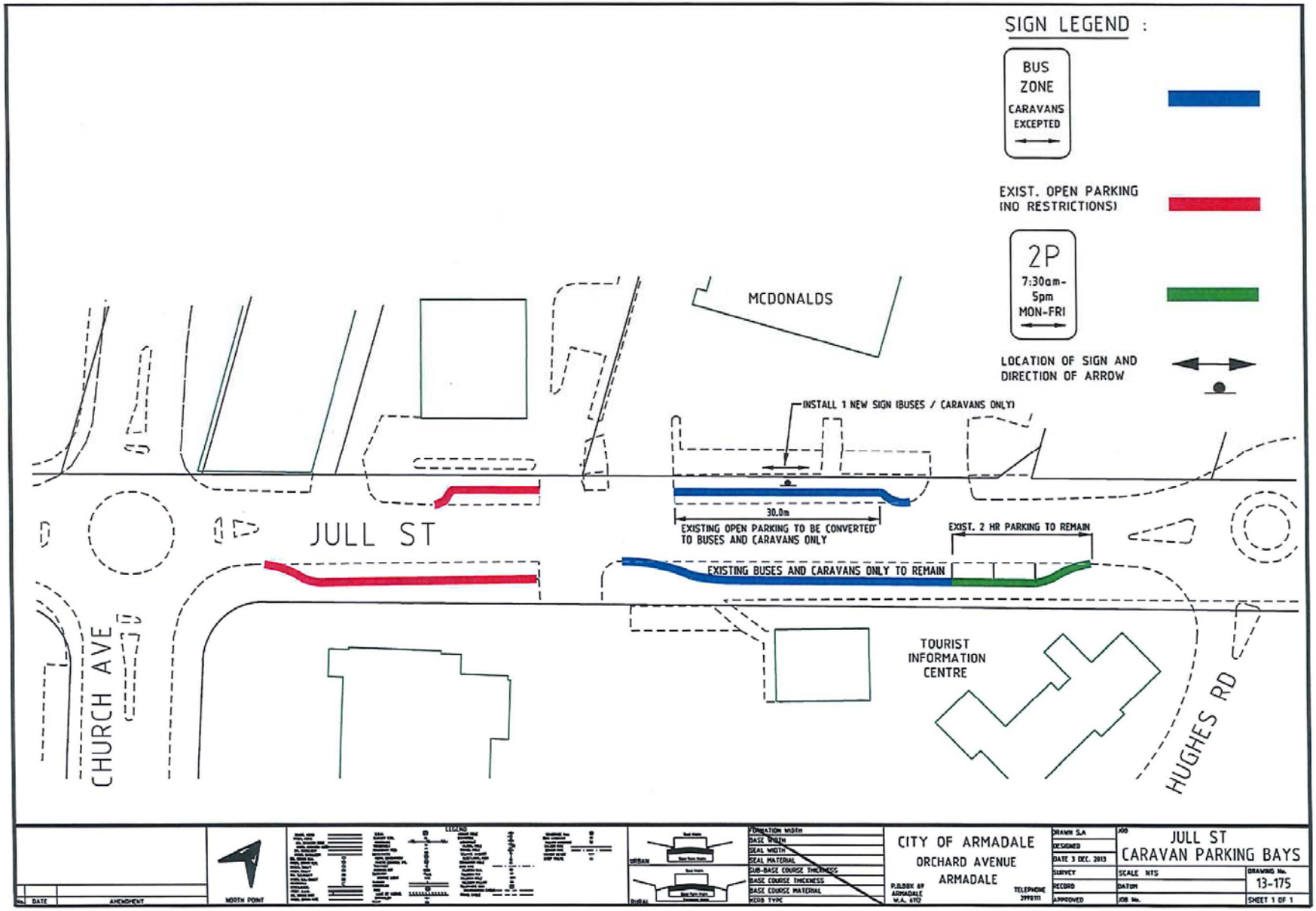
TECHNICAL SERVICES COMMITTEE

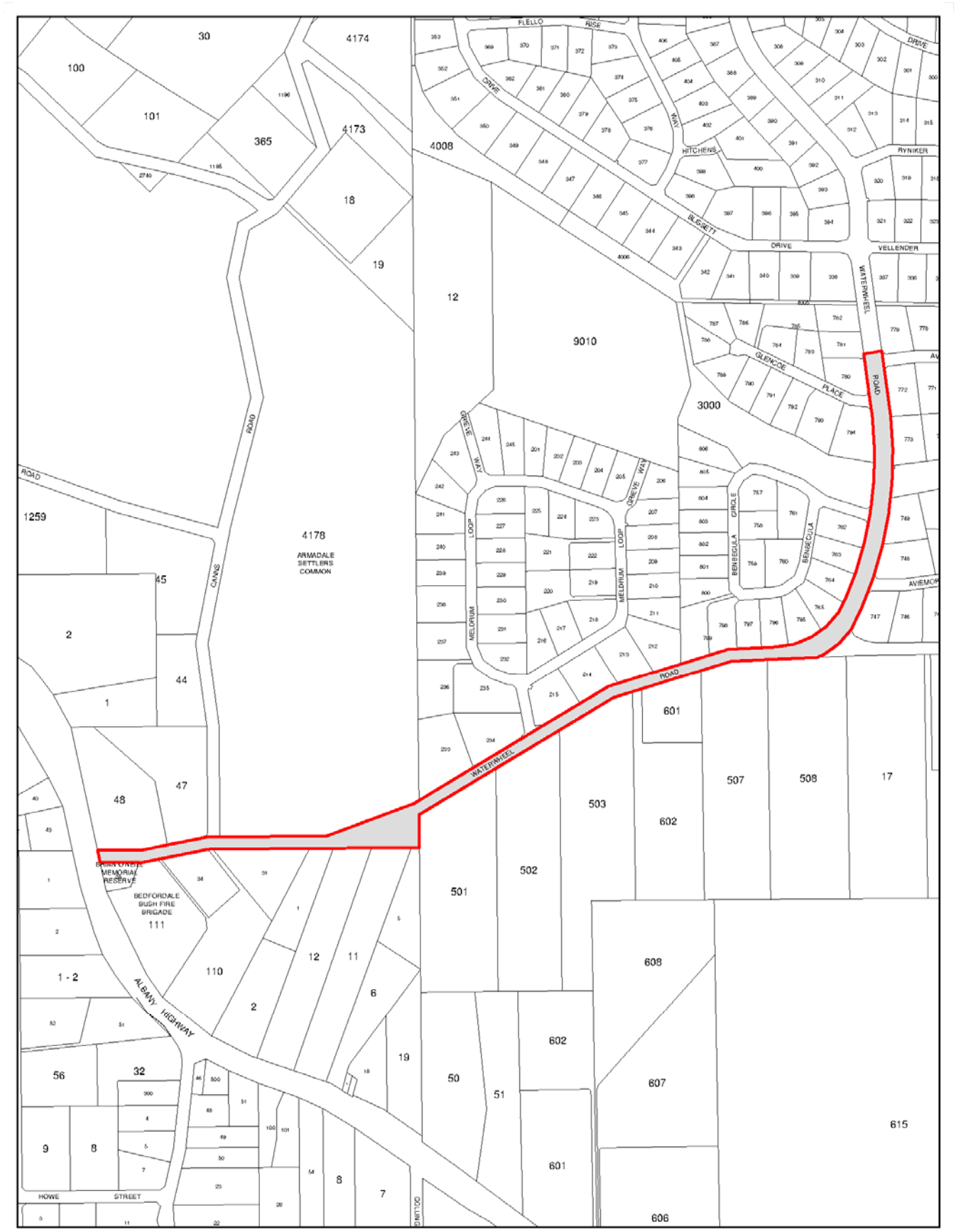
SUMMARY OF "A" ATTACHMENTS

3 FEBRUARY 2014

ATT NO.	SUBJECT	PAGE
1.1	**JULL SREET AND STREICH AVENUE - PROPOSED CARAVAN PARKING**	
1.1.1	Streich Avenue and Jull Street - Caravan Parking Bays (Drawing No. 13-174 and Drawing No. 13-175).(Attachment 1.1.1)	42
1.2	**WATERWHEEL ROAD, BEDFORDALE - LOCAL AREA TRAFFIC MANAGEMENT**	
1.2.1	Waterwheel Road, Bedfordale - Location Plan (Attachment 1.2.1).	44
1.3	**YPRES ROAD, CAMILLO - OFF STREET CYCLEPATH**	
1.3.1	Ypres Road, Camillo - Location Plan (Attachment 1.3.1).	45
1.4	**CHALLIS PRIMARY SCHOOL PARKING PETITION**	
1.4.1	Challis Early Childhood Education Centre - Location Plan (Attachment 1.4.1).	46
1.5	**ADDITIONAL PARKING - BLACKBURN RESERVE, CLIFTON HILLS PRIMARY SCHOOL**	
1.5.1	Clifton Hills Primary School - Location Plan (Attachment 1.5.1).	47
1.5.2	Blackburn Drive - Plan No. E13-136 (Attachment 1.5.2).	48
1.5.3	Butler Pass - Plan No. E13-167 (Attachment 1.5.3).	49
2.1	**CITY OF ARMADALE GROUNDWATER USE REPORT 2012-2013**	
2.1.1	City of Armadale Groundwater Use Report 2012/2013 (Attachment 2.1.1).	50
4.1	**CONFERENCE ATTENDANCE - INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA (IPWEA) STATE CONFERENCE - ESPLANADE HOTEL, FREMANTLE 11 - 13 MARCH 2014**	
4.1.1	2014 IPWEA State Conference Programme (Attachment 4.1.1).	75


SIGN LEGEND :
BUS ZONE CARAVANS EXCEPTED
LOCATION OF SIGN AND DIRECTION OF ARROW
2P
SCOPE OF WORKS :
12 EXISTING ANGLE BAYS TO BE GROUND OFF AND LEFT BLANK TO ACCOMMODATE BUSES AND CARAVANS
INSTALL TWO NEW SIGNS (SEE LEGEND)
RAILWAY LINE
RAILWAY LINE
EXISTING 2 HR BAYS TO REMAIN
EXISTING 2 HR ANGLE BAYS TO BE CONVERTED TO PARALLEL CARAVAN / BUS EMBAYMENT
STREICH AVE
ARMADALE PLAZA
NEERIGEN ST
CITY OF ARMADALE
ORCHARD AVENUE
ARMADALE
STREICH AVE
CARAVAN PARKING BAYS
SCALE NTS
DRAWING No. 13-174
SHEET 1 OF 1


SIGN LEGEND :
BUS ZONE CARAVANS EXCEPTED
EXIST. OPEN PARKING (NO RESTRICTIONS)
2P 7:30am-5pm MON-FRI
LOCATION OF SIGN AND DIRECTION OF ARROW
MCDONALDS
INSTALL 1 NEW SIGN (BUSES / CARAVANS ONLY)
30.0m
EXISTING OPEN PARKING TO BE CONVERTED TO BUSES AND CARAVANS ONLY
EXIST. 2 HR PARKING TO REMAIN
EXISTING BUSES AND CARAVANS ONLY TO REMAIN
JULL ST
CHURCH AVE
TOURIST INFORMATION CENTRE
HUGHES RD
CITY OF ARMADALE
ORCHARD AVENUE
ARMADALE
JULL ST
CARAVAN PARKING BAYS
13-175



LOCATION PLAN

Waterwheel Road
Bedfordale

DATE 21 January 2014 - REVISION 14.01

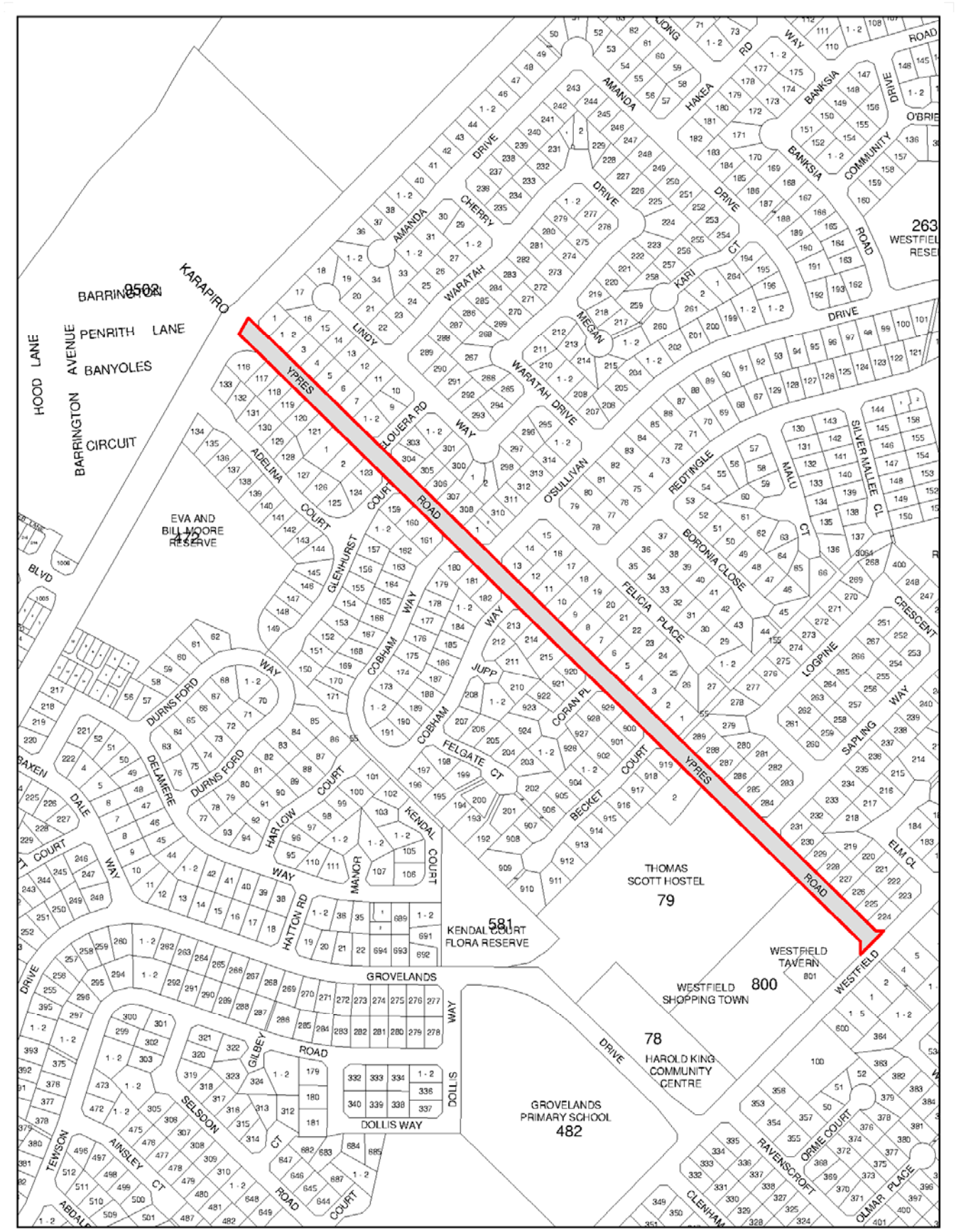
75 0 75 150m

SCALE 1 : 7500

Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2012). Aerial photograph supplied by Landgate, Photomaps by NearMap.

CITY OF Armadale

P:\AutoCAD\Agenda_Drawings\201401 January\Ypreal\Ypres.dwg, 21/01/2014 9:14:32 AM



LOCATION PLAN

Ypres Road
Camillo

DATE 17 January 2014 - REVISION 1401

50 0 50 100m

SCALE 1 : 5000

Based on information provided by and with the permission of the Western Australian Land Information Authority (trading as Landgate (2012). Aerial photograph supplied by Landgate, Photomaps by NearMap.

CITY OF Armadale

P:\AutoCAD\Agenda_Drawings\201401 January\Ypres\Ypres.dwg, 17/01/2014 12:52:43 PM

LOCATION PLAN
Challis Early Childhood Education Centre
Braemore St, Seville Grove
DATE 29 January 2014 - REVISION 1401

15 0 15 30m

SCALE 1 : 1500

Based on information provided by and with the permission of the Western Australian Land Information Authority (trading as Landgate (2012). Aerial photograph supplied by Landgate, Photomaps by NearMap.

CITY OF Armadale

LOCATION PLAN

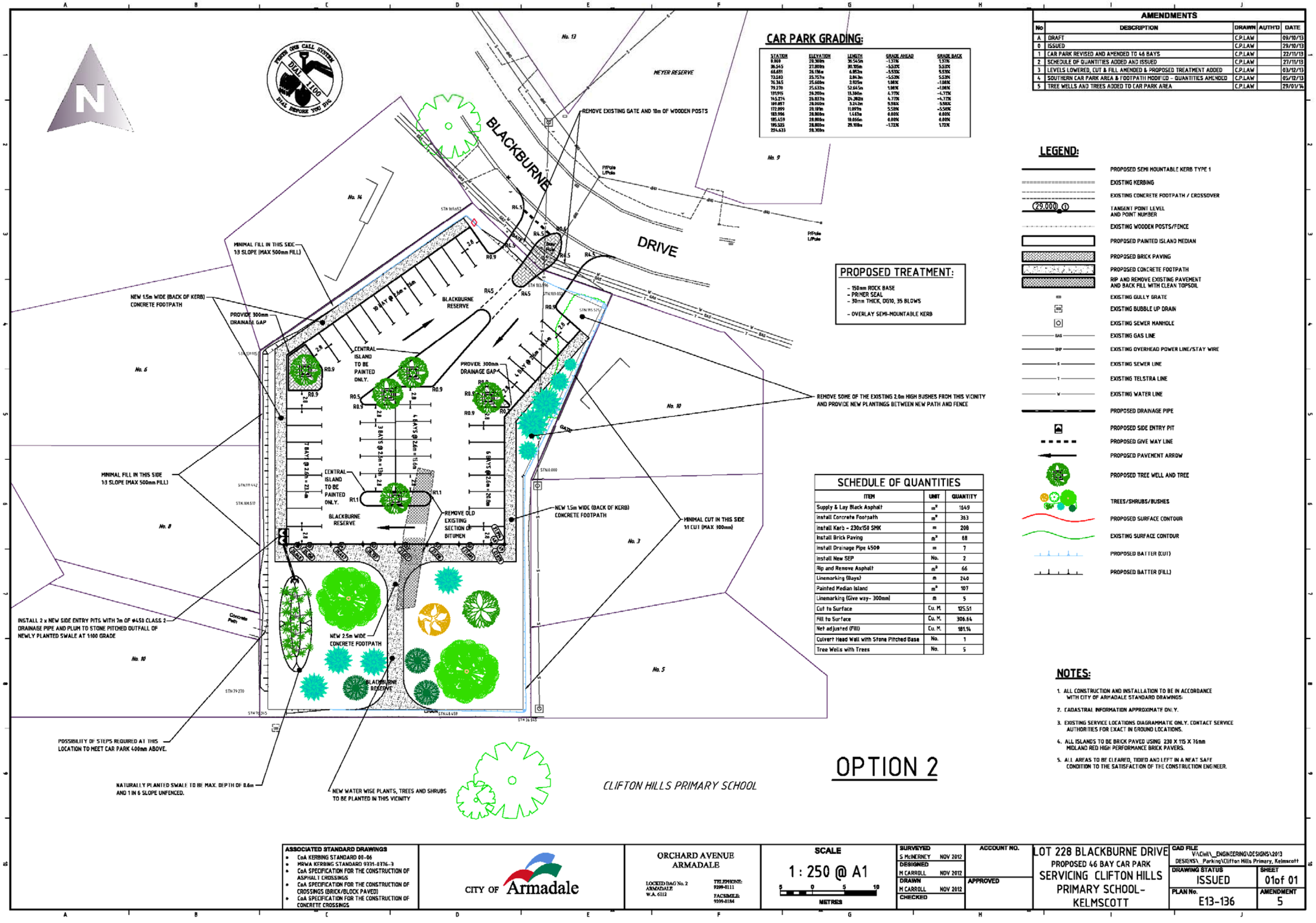
CLIFTON HILLS PRIMARY SCHOOL
BUTLER PASS, KELMSCOTT
DATE 28 January 2014 - REVISION 1401

15 0 15 30m

SCALE 1 : 1500

Based on information provided by and with the permission of the Western Australian Land Information Authority (trading as Landgate) (2012). Aerial photograph supplied by Landgate, Photomaps by NearMap.

CITY OF Armadale



CAR PARK GRADING:

STATION	ELEVATION	LENGTH	GRADE AHEAD	GRADE BACK
0.000	28.308m	36.545m	-1.37%	1.37%
36.545	27.808m	30.105m	-3.32%	3.32%
66.651	26.156m	6.852m	-5.55%	5.55%
73.503	25.757m	2.843m	-5.53%	5.53%
76.345	25.668m	2.925m	1.06%	-1.06%
79.270	25.632m	52.645m	1.06%	-1.06%
131.915	26.200m	13.340m	4.77%	-4.77%
145.274	26.837m	24.382m	4.77%	-4.77%
169.657	28.000m	3.242m	5.98%	-5.98%
172.899	28.193m	11.097m	5.59%	-5.59%
183.996	28.808m	1.453m	0.00%	0.00%
185.459	28.808m	10.066m	0.00%	0.00%
195.525	28.808m	29.108m	-1.72%	1.72%
224.633	28.308m			

PROPOSED TREATMENT:

- 150mm ROCK BASE
- PRIMER SEAL
- 30mm THICK, DG10, 35 BLOWS
- OVERLAY SEMI-MOUNTABLE KERB

SCHEDULE OF QUANTITIES

ITEM	UNIT	QUANTITY
Supply & Lay Black Asphalt	m^2	1649
Install Concrete Footpath	m^2	363
Install Kerb - 230x150 SMK	m	208
Install Brick Paving	m^2	68
Install Drainage Pipe 450ø	m	7
Install New SEP	No.	2
Rip and Remove Asphalt	m^2	66
Linemarking (Bays)	m	240
Painted Median Island	m^2	107
Linemarking (Give way- 300mm)	m	5
Cut to Surface	Cu. M.	125.51
Fill to Surface	Cu. M.	306.64
Net adjusted (Fill)	Cu. M.	181.14
Culvert Head Wall with Stone Pitched Base	No.	1
Tree Wells with Trees	No.	5

AMENDMENTS

No	DESCRIPTION	DRAWN	AUTH'D	DATE
A	DRAFT	C.P.LAW		09/10/13
0	ISSUED	C.P.LAW		29/10/13
1	CAR PARK REVISED AND AMENDED TO 46 BAYS	C.P.LAW		22/11/13
2	SCHEDULE OF QUANTITIES ADDED AND ISSUED	C.P.LAW		27/11/13
3	LEVELS LOWERED, CUT & FILL AMENDED & PROPOSED TREATMENT ADDED	C.P.LAW		03/12/13
4	SOUTHERN CAR PARK AREA & FOOTPATH MODIFIED - QUANTITIES AMENDED	C.P.LAW		05/12/13
5	TREE WELLS AND TREES ADDED TO CAR PARK AREA	C.P.LAW		29/01/14

LEGEND:

- PROPOSED SEMI MOUNTABLE KERB TYPE 1
- EXISTING KERBING
- EXISTING CONCRETE FOOTPATH / CROSSOVER
- 29.000 (1) TANGENT POINT LEVEL AND POINT NUMBER
- EXISTING WOODEN POSTS/FENCE
- PROPOSED PAINTED ISLAND MEDIAN
- PROPOSED BRICK PAVING
- PROPOSED CONCRETE FOOTPATH
- RIP AND REMOVE EXISTING PAVEMENT AND BACK FILL WITH CLEAN TOPSOIL
- EXISTING GULLY GRATE
- EXISTING BUBBLE UP DRAIN
- EXISTING SEWER MANHOLE
- EXISTING GAS LINE
- EXISTING OVERHEAD POWER LINE/STAY WIRE
- EXISTING SEWER LINE
- EXISTING TELSTRA LINE
- EXISTING WATER LINE
- PROPOSED DRAINAGE PIPE
- PROPOSED SIDE ENTRY PIT
- PROPOSED GIVE WAY LINE
- PROPOSED PAVEMENT ARROW
- PROPOSED TREE WELL AND TREE
- TREES/SHRUBS/BUSHES
- PROPOSED SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED BATTER (CUT)
- PROPOSED BATTER (FILL)

NOTES:

1. ALL CONSTRUCTION AND INSTALLATION TO BE IN ACCORDANCE WITH CITY OF ARMADALE STANDARD DRAWINGS.
2. CADASTRAL INFORMATION APPROXIMATE ONLY.
3. EXISTING SERVICE LOCATIONS DIAGRAMMATIC ONLY. CONTACT SERVICE AUTHORITIES FOR EXACT IN GROUND LOCATIONS.
4. ALL ISLANDS TO BE BRICK PAVED USING 230 X 115 X 76mm MIDLAND RED HIGH PERFORMANCE BRICK PAVERS.
5. ALL AREAS TO BE CLEARED, TIDIED AND LEFT IN A NEAT SAFE CONDITION TO THE SATISFACTION OF THE CONSTRUCTION ENGINEER.

OPTION 2

ASSOCIATED STANDARD DRAWINGS
- CoA KERBING STANDARD 00-06
- MRWA KERBING STANDARD 9331-0376-3
- CoA SPECIFICATION FOR THE CONSTRUCTION OF ASPHALT CROSSINGS
- CoA SPECIFICATION FOR THE CONSTRUCTION OF CROSSINGS (BRICK/BLOCK PAVED)
- CoA SPECIFICATION FOR THE CONSTRUCTION OF CONCRETE CROSSINGS

CITY OF Armadale

ORCHARD AVENUE
ARMADALE
LOCKED BAG No. 2
ARMADALE
W.A. 6112
TELEPHONE: 9399-0111
FACSIMILE: 9399-0184

SCALE
1 : 250 @ A1
5 0 5 10
METRES

SURVEYED	S McINERNEY	NOV 2012
DESIGNED	M CARROLL	NOV 2012
DRAWN	M CARROLL	NOV 2012
CHECKED		

ACCOUNT NO.

APPROVED

LOT 228 BLACKBURNE DRIVE
PROPOSED 46 BAY CAR PARK
SERVICING CLIFTON HILLS PRIMARY SCHOOL- KELMSCOTT

CAD FILE: V:\CIVIL_ENGINEERING\DESIGNS\2013 DESIGNS_Parking\Clifton Hills Primary, Kelmscott

DRAWING STATUS	SHEET
ISSUED	01of 01
PLAN No.	AMENDMENT
E13-136	5

AMENDMENTS				
No	DESCRIPTION	DRAWN	AUTH'D	DATE
1.4	PREVIOUS DESIGN OPTION	C.P.LAW		22/11/13
5	ISSUED FOR CONSTRUCTION	C.P.LAW		16/01/14

CLIFTON HILLS PRIMARY SCHOOL

CLIFTON STREET

BUTLER PASS

BOLGER GARDENS

ENSIGN DALE

No. 40

MOVE SCHOOL SIGN TO 0.5m FROM BACK OF NEW PATH.

REMOVE EXISTING PARKING PROHIBITION SIGN

REMOVE EXISTING PARKING PROHIBITION SIGN

BRICK PAVE AROUND LIGHT POLE & INSTALL REFLECTIVE TAPE MARKINGS TO HIGH-LIGHT POLE.

REMOVE 44m OF KERB

REMOVE 126m OF CONCRETE FOOTPATH

REMOVE 70m OF KERB

No. 44

No. 27

No. 2

No. 1

LOW VOLTAGE TRANSFORMER

LOW VOLTAGE UNDERGROUND DISTRIBUTION CABLE

PROPOSED TREATMENT:

- 150mm ROCK BASE
- PRIMER SEAL
- 30mm THICK BLACK ASPHALT, DG10, 35 BLOW
- FOOTPATH 100mm THICK, 25MPA CONCRETE
- OVERLAY SEMI-MOUNTABLE KERB

SCHEDULE OF QUANTITIES

ITEM	UNIT	QUANTITY
Supply & Lay Black Asphalt	m^2	234
Install 2.5m (Wide) Concrete Footpath	m^2	320
Install Kerb - 230x150 SMK	m	120
Install Brick Paving	m^2	16
Linemarking (Bays)	m	55
Remove Existing Kerb	m	114
Remove 2.5M Wide Concrete Foot Path	m^2	315

LEGEND:

- PROPOSED SEMI MOUNTABLE KERB TYPE 1
- EXISTING KERBING
- EXISTING CONCRETE FOOTPATH / CROSSOVER
- EXISTING LIGHT POLE
- EXISTING WOODEN POSTS/FENCE
- PROPOSED BRICK PAVING
- PROPOSED CONCRETE FOOTPATH
- EXISTING GULLY GRATE
- EXISTING SIGN
- EXISTING GAS LINE
- EXISTING UNDER GROUND POWER LINE
- EXISTING SEWER LINE
- EXISTING TELSTRA LINE
- EXISTING WATER LINE
- EXISTING TREES/SHRUBS/BUSHES
- EXISTING SURFACE CONTOUR
- DESIGN SURFACE CONTOUR
- DESIGN SURFACE BATTER GRADE 1:6 FILL

NOTES:

1. ALL CONSTRUCTION AND INSTALLATION TO BE IN ACCORDANCE WITH CITY OF ARMADALE STANDARD DRAWINGS.
2. CADASTRAL INFORMATION APPROXIMATE ONLY.
3. EXISTING SERVICE LOCATIONS DIAGRAMMATIC ONLY. CONTACT SERVICE AUTHORITIES FOR EXACT IN GROUND LOCATIONS.
4. ALL ISLANDS TO BE BRICK PAVED USING 230 X 115 X 76mm MIDLAND RED HIGH PERFORMANCE BRICK PAVERS.
5. ALL AREAS TO BE CLEARED, TIDIED AND LEFT IN A NEAT SAFE CONDITION TO THE SATISFACTION OF THE CONSTRUCTION ENGINEER.

ASSOCIATED STANDARD DRAWINGS

- CoA KERBING STANDARD 00-06
- MRWA KERBING STANDARD 9331-0376-3
- CoA SPECIFICATION FOR THE CONSTRUCTION OF ASPHALT CROSSINGS
- CoA SPECIFICATION FOR THE CONSTRUCTION OF CROSSINGS (BRICK/BLOCK PAVED)
- CoA SPECIFICATION FOR THE CONSTRUCTION OF CONCRETE CROSSINGS

CITY OF Armadale

ORCHARD AVENUE
ARMADALE

LOCKED BAG No. 2
ARMADALE
W.A. 6112

TELEPHONE: 9399-0111
FACSIMILE: 9399-0184

SCALE
1 : 250 @ A1
5 0 5 10
METRES

SURVEYED	S McINERNEY	NOV 2012
DESIGNED	C.P.LAW	NOV 2012
DRAWN	C.P.LAW	NOV 2012
CHECKED		

ACCOUNT NO.
PRIVATE WORKS

APPROVED

BUTTLER PASS
PROPOSED 16 PARALLEL EMBAYMENTS
SERVICING CLIFTON HILLS PRIMARY SCHOOL - KELMSCOTT

CAD FILE
Consult_E13-167-5-Issued - Butler Pass, Kelmscott - Parking.dwg

DRAWING STATUS	SHEET
ISSUED	1 of 1
PLAN No.	AMENDMENT
E13-167	5

CITY OF ARMADALE

2012-2013 GROUNDWATER USE REPORT

B Sofield
Senior Technical Officer –Parks

TRIM PR/R/4

BACKGROUND

Currently the City of Armadale Parks Services department manages the use of groundwater and surface water within it's irrigated parks and reserves under a Council adopted Groundwater Operating Strategy GWL160738(5) 2009.

This strategy outlines the City's administrative requirements, operating rules, water quality monitoring regime, contingency plans and water use efficiency practices undertaken by the City to achieve irrigation water supply security and sustainability.

This Operating Strategy is currently being reviewed due to ongoing licence amendments/transfers, increased allocations, new allocations in other water areas/draw points and updates to our current groundwater monitoring program. The revised Operating Strategy will be submitted to the Department of Water for approval.

Currently the City holds ground and surface water abstraction licences in the following areas:

Perth –Superficial Swan GWL 160738(9) City of Armadale	(703,780 kL)
Perth –Superficial Swan GWL 160868(1) Golf Course	(60,000kL)
Canning River –Middle Canning SWL 98823- Rushton	(45,000kL)
Jandakot – Perth Superficial Swan Wright GWL 173290(1)	(76,125kL)
Perth Leederville CAW175896 (1)	*(42,433kL)*

Groundwater extraction east of Albany Highway and South Western Highways is from a non-proclaimed groundwater area and as such there is no requirement to licence and monitor extraction or water quality. The City however as part of it's citywide Operating Strategy has begun recording in most cases, cumulative abstraction and water quality data for these extraction points on an annual basis. It must be noted that metering throughout this water area is highly problematic due to extremely poor water quality and increased deterioration of mechanical equipment.

The city has recently received-

- 18th April 2013 a revised Jandakot Perth Superficial Licence GWL173290 (2) with an amalgamated abstraction entitlement of 76,125kL detailing an additional water source location, Marseille Gardens Piara Waters (0.95Ha).

- 17 October 2012 a revised Perth Superficial Swan Licence GWL 160738 (10) with a reduced amalgamated abstraction entitlement of 703,780kL detailing a reduction of the abstraction entitlement by42,433kL as part of the relocation and relicensing of the Brookwood Estate Village Green bore, Lot 86 Bundoran App Hilbert.

- 19th October a new Perth Leederville licence GWL 175895 (1) was granted with an abstraction entitlement of 42,433kL Brookwood Estate Village Green bore, Lot 86 Bundoran App Hilbert.

REGIONAL REPORTING OFFICES

The City reports it's annual monitoring commitments to two regional offices for the greater Perth Swan Groundwater area and the Jandakot area respectively.

Swan Avon Region
Victoria Park Regional Office
7 Ellam St
Victoria Park
Perth WA
6100
08 6250 8000
bala.balakumar @water.wa.gov.au

Kwinana Peel Region
Kwinana Peel Regional Office
107 Breakwater Parade
Mandurah Ocean Marina
PO Box 332
Mandurah WA 6210
08 9550 4222
kwinanapeel@water.wa.gov.au

GROUND AND SURFACE WATER ABSTRACTION MONITORING GROUNDWATER REPORT 2012/13

The City of Armadale has collated the following information for the 'Water Year" 30th June 2012 until the 30th June 2013 (Water year) to comply with the terms and conditions of the GWL160738 (5) Water Operating Strategy.

(This report is to be presented to the Department of Water no later than 31st August each year.)

The monitoring commitments listed below, have been achieved and form the basis for the annual report.

CITY OF ARMADALE MONTITORING COMMITMENTS.

Monitoring Parameters	Frequency	Time	Achieved
Quantity of water abstracted	Monthly	1st Day of Month	✓
Salinity (ppm)	Annually	May	✓
Static Water levels (m)	Annually	May	✓
pH	Annually	May	✓
Vegetation Condition adjacent to Bore	Annually	April	✓
Water Analysis – Minnawarra Lake (inc pH, EC, nitrate, ammonium, total N, phosphate & total P)	Annually	April	Water sample collected 15th August 2013

CITY OF ARMADALE GROUNDWATER ENTITLEMENT SUMMARY 2012-13

The total irrigated area managed by the City of Armadale is approximately 136 hectares, with a total annual water allocation of approximately 1032 mega litres (million litres). The breakdown of the irrigated area is shown in the table below. Description	Licences	Number of Bores	Irrigated area	Allocation (kilolitres)
Perth –Armadale RIWI	GWL160738(10)	56	93.9 Ha	703,780 kL
Jandakot (Wright) RIWI	GWL 173290	3	9.86 Ha	76,125 kL
Perth Golf Course RIWI	GWL 160868	2	8 Ha	60,000 kL
Canning River RIWI	SWL 98823	1	6 Ha	45,000 kL
Leederville	GWL175895 (1)	1	5.72 Ha	42,433 kL
Parks (unlicensed) NOT RIWI	Not applicable	15	14.8 Ha	105,000 kL

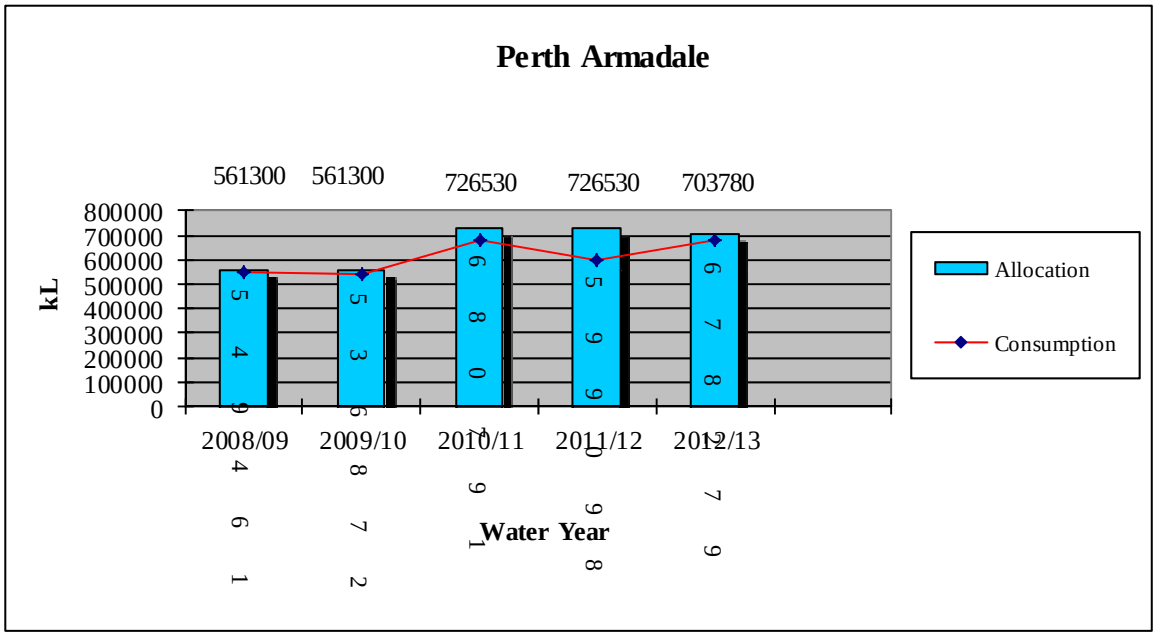
TOTAL	**77**	**136.72**	**1,032,338**

1. TOTAL ABSTRACTION DOES NOT EXCEED ENTITLEMENT

- Perth/Armadale GWL 160738 (10) has an allocation of 703,780kL
- Jandakot GWL Wright 173290 within GW Area Jandakot has an allocation of 76,125kL.
- Leederville GWL175895 (1) has an allocation of 42,433kl.
- Perth/Armadale Golf Course GWL 160868 has an allocation of 60,000kL
- Canning River SWL C (Rushton Park) has an allocation of 45,000kl

Perth -Armadale (Amalgamated)

Groundwater abstraction from (GWL160738 (10)) Perth /Armadale totalled 678,279kL against an allocation of 703,780kL. The figure represents abstraction at **96%** of allocation.



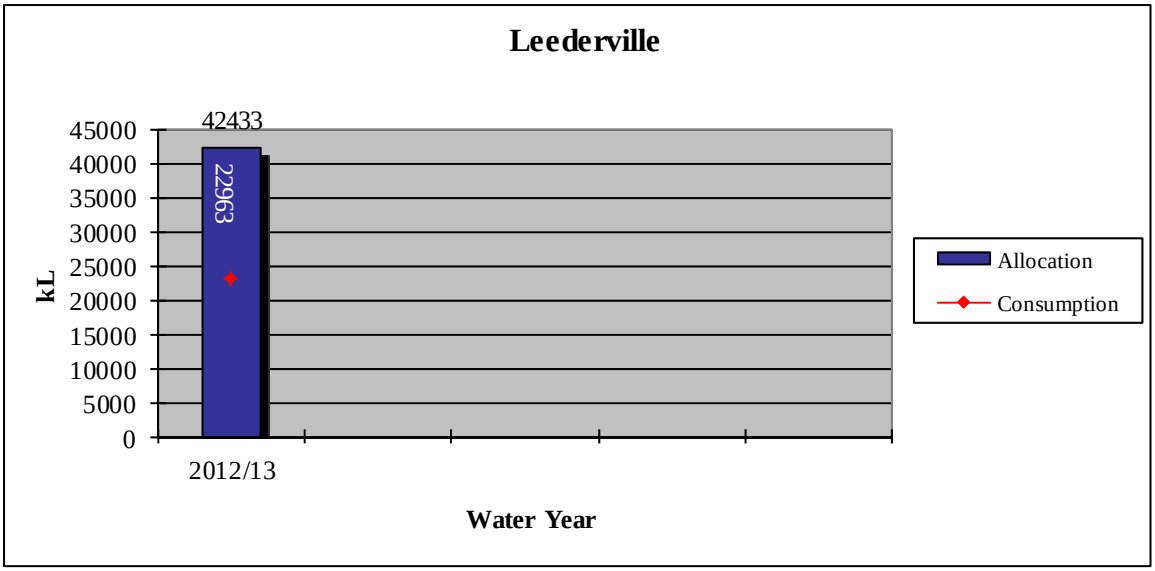
The reduction in total abstraction as noted on the licence from 2011/12 to 2012/13 was attributable to the re-licencing of a bore located at Lot 6 Bundoran App Hilbert (Brookwood Estate) within the Leederville Aquifer and subsequent removal from the Perth Armadale licence.

Whilst the overall amalgamated abstraction was 4% lower than the entitlement, with twenty two (22) sites reporting abstraction under the allocated entitlement and seventeen (17) sites in this water area exceeded their localised abstraction entitlement.

Notably the bores supplying Minnawarra Park (Dale & Abbey) exceeded allocation by (63.6ML), Morgan Park (>14ML), John Dunn Oval (>28ML) impacted most heavily on localised consumption.

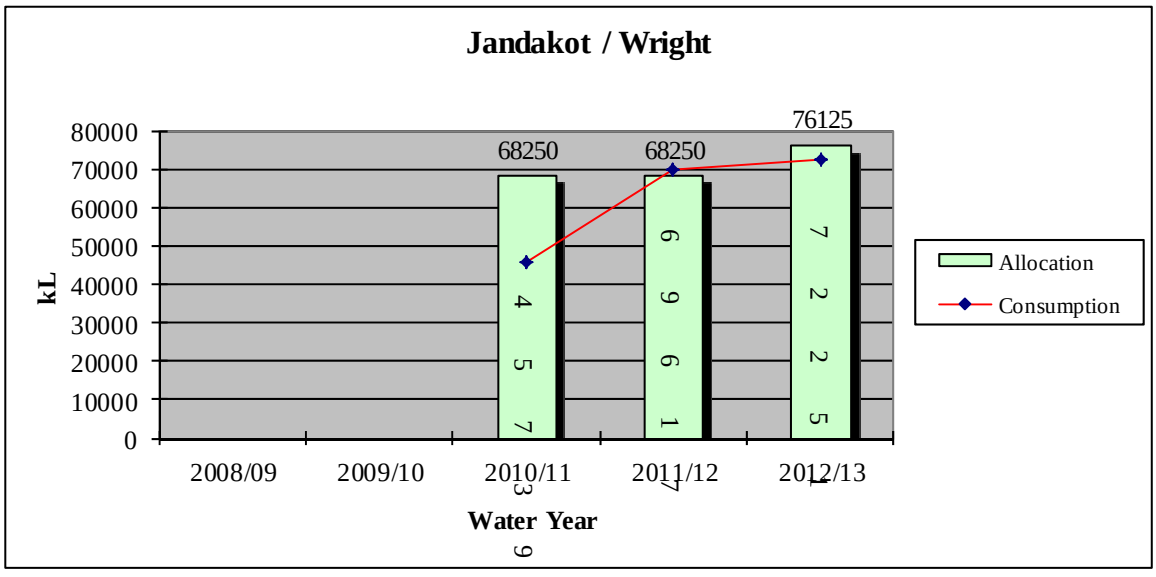
Leederville

Ground water abstraction from (GWL175895 (1)) Leederville totalled 22,963kL against an allocation of 42,433 kL. The figure represents abstraction at 54% of allocation.



Jandakot

Ground water abstraction from (GWL173290 (2)) Wright totalled 72,251kL against an allocation of 76125 kL. The figure represents abstraction at **95%** of allocation.



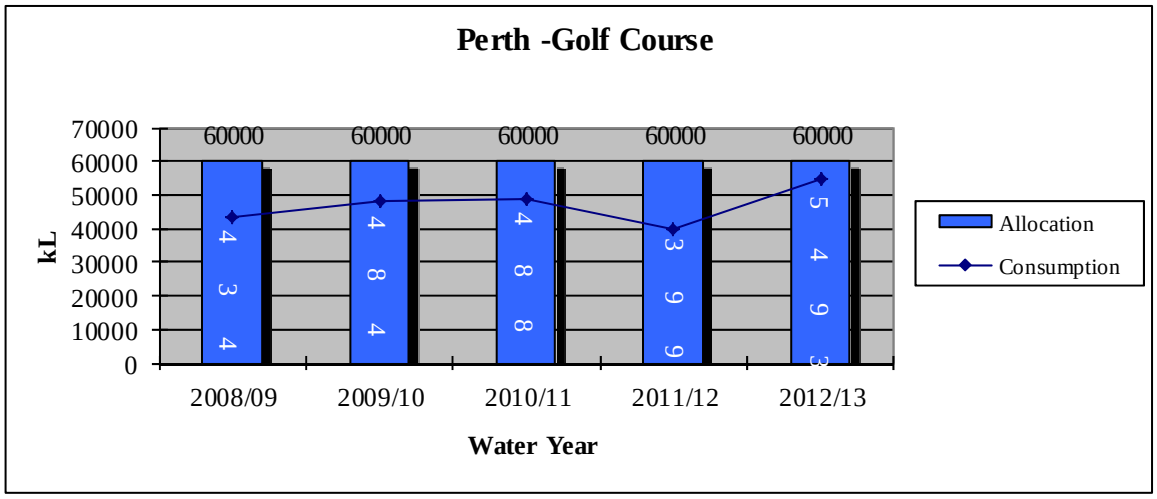
The increase to total licenced abstraction was attributable to the City receiving the transfer of a licence from Warrigal Developments (Marseille Gardens -7,875kL)

The City has recently included updated contract sub-clauses in new maintenance contracts for Estates POS throughout the City advising contractors that irrigation scheduling and

programming will be coordinated by the City of Armadale and water budgeting processes applied.

Perth-Golf Course

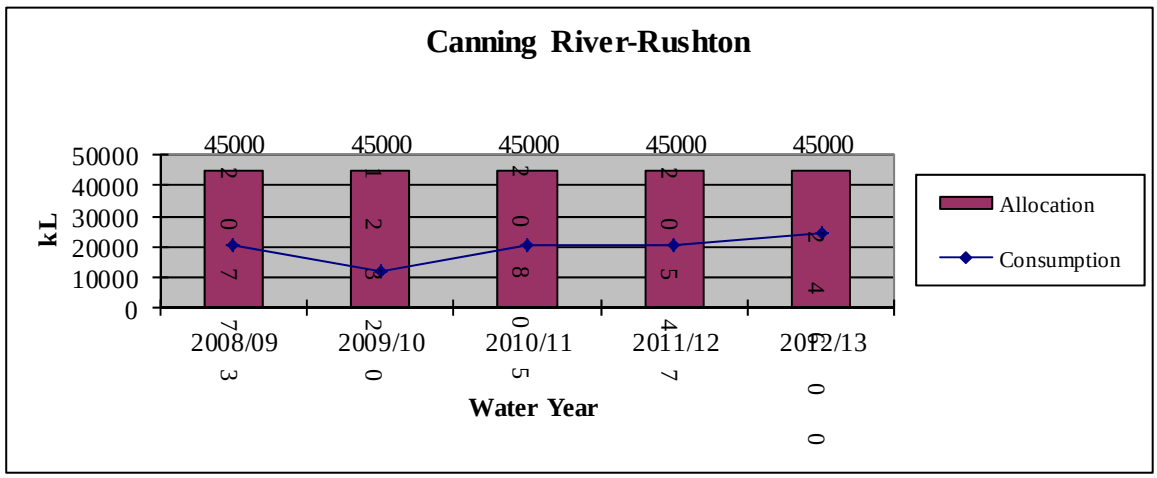
Ground water abstraction from (GWL160868 (1)) Armadale Golf Course totalled 54,933kL against an allocation of 60,000kL. This figure represents abstraction at **91%** of allocation.



The City of Armadale is in the early planning stages of a golf course redevelopment project in the 2013/14 budget year including the replacement of the existing inefficient irrigation system and new groundwater treatment system as well as renewing some turf playing surfaces. It is anticipated the redevelopment of the golf course irrigation system and course layout will require an amendment to the current licenced abstraction in future years.
The Licensee and Golf Course Greenkeeper at Armadale Golf Club manage irrigation application via a part automatic and part manual irrigation system. There are significant management limitations within this system in terms of application and distribution efficiency. Abstraction under the allocated entitlement has been a trend for at least the last five (5) years of monitoring due to these inefficiencies coupled with good water budgeting process by the lessee.

Canning River - Rushton

Ground water abstraction from (SWL98823 (4)) Rushton Park totalled 24,600kL against an allocation of 45,000kL. This figure represents abstraction at **54%** of allocation.



ABSTRACTION vs. ENTITLEMENT SUMMARY 2012/13

LICENCE DETAILS	ENTITLEMENT (kL)	ABSTRACTION (kL)	VARIANCE (kL)
Perth/Armadale GWL160738(10)	703,780	678,279	<25,501
Jandakot -Wright GWL173290(1)	76,125	72,251	<3,874
Perth-Golf Course GWL160868(1)	60,000	54,933	<5,067
Canning Rv-Rushton SWL98823(4)	45,000	24,600	<20,400
Leederville GWL 175895 (1)	42,433	22,963	<19470
Unlicensed Bores (Non RIWI)	105,000	95,529	NA
TOTAL	**1,032,338kL**	**948,555kL**	**<83,783kL**

CURRENT WATER USE EFFICIENCY STRATEGIES

- In the 2012/13 water use year the City of Armadale renewed one aging inefficient irrigation system at Cross Park as part of continually improving irrigation system performance and efficiencies and to meet or exceed industry standards for Coefficient of Uniformity (CU) and Distribution of Uniformity (DU).

LOCATION	Original CU%	Renewed CU%	Original DU%	Renewed DU%
John Dunn Memorial	66%	91.1%	46%	87.2%
Palomino Park	?	91.4%	?	87.2%
Cross Park	69	83%	66	72%
INDUSTRY STANDARD	**>85%**		**>75%**	

  Whilst CU and DU analysis confirmed on this occasion the system failed to meet industry standard by a mere 2%-3% there was a marked improvement from the existing efficiency measures taken of the old system.

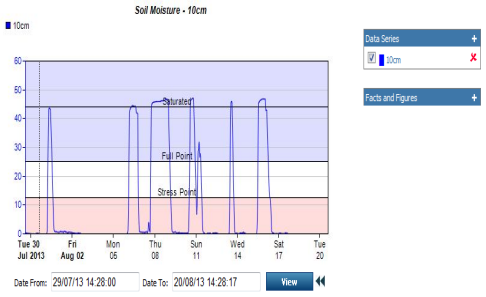
- In 2011 the City engaged Sports Turf Technology to assist with the development of the "GUM" Water Management Program. Whilst the City has not fully integrated the GUM software to develop site specific water budgets for POS irrigation, our records indicate the City's current irrigation programming and close management by Parks Supervisors is returning good water use efficiency outcomes.
  A review of the existing manual collection of groundwater abstraction meter readings and GUM program integration is under way to establish "best value" use of current funding used to outsource that work in order to establish if funding can be diverted into more meaningful projects to further improve water use efficiency.

- In the 2012/13 water year City Parks Services staff integrated the use of subsoil water retaining polymers and liquid wetting/retaining agents to forty (40) hectares of active sporting grounds with the poorest performing irrigation systems or lowest

typical groundwater supply to increase water use efficiency and improve surface performance through Summer.

- In the 2012/13 financial year Council approved the replacement of the ageing inefficient irrigation system at Cross Park Reserve (2ha) as well as three irrigation 90,000lt water storage tanks at Cross Park, Springdale Oval and Karragullen Oval

- Soil moisture monitoring systems have been installed under the turf surfaces at Frye Park Kelmscott and Cross Park Roleystone with additional units to be installed throughout the City's Active Sporting Ovals over the next 2 to 4 years.



- In the 2012/13 financial year Council approved the replacement of nine (9) new bore and tank pumps to the consideration of $50,000.

FUTURE WATER USE EFFICIENCY STRATEGIES

- **Irrigation Maintenance Staff**

  With the increasing urban development within the existing City of Armadale boundaries and an estimated population growth to 100,000 residents by 2025, the City has considered the impact of this expansion on current groundwater management principals through it's Workforce Planning.
  As part of that plan the City has budgeted for an additional Irrigation Fitter in the 2013/14 Budget to assist the current Irrigation Maintenance Team consisting of three personnel.
  As part of this new position there will be one role reclassification to a higher level to assist the City with continued improvement in irrigation system maintenance, development and forward planning.

- **IMMS Irrigation Management & Monitoring Software.**

  The City has installed Hunter's Irrigation Management & Monitoring Software (IMMS) PC-based software package. All new irrigation systems as well as existing systems are being equipped and retrofitted with Hunter local controllers providing an interface linkage back to the central control system.
  Ongoing development of this centralised control system will be a key component of improving water use efficiency throughout the City.

- **Water Storage- Minnawarra Lake**

  Minnawarra Lake is used for the control of seasonal stormwater inflow via the Neerigen Brook as well as receiving local road network drainage.
  The lake importantly acts as the primary source and storage of irrigation water for the Armadale Central Business District during Summer and is artificially maintained via two superficial bores (Dale & Abby Rd) when stormwater inflow ceases.

  The lake contains a considerable amount of accumulated sediments and sludge, which needs to be removed in order to improve the stormwater control and retention as well as irrigation water storage and water quality parameters required for the irrigation of the CBD area.
  Apex Envirocare (AEC) were contracted to undertake a survey of the lake measuring at regular intervals the overall water depth and the sediment depth. This was done using a boat, AEC personnel and a sludge "determinator".

  From the results of the survey it can be seen there are a lot of areas where the sediment is 700-1100mm deep, which is substantial, considering the lakes is estimated to be only 2500mm deep.
  A working estimate indicates there is an average depth of 700-800mm sediment across the pond which is equivalent to about 2,500m^3 of sediment.

It is determined that a reduction in sedimentation in the order of 2500m^3 will increase lake depths, improve water quality, restore the constructed storage capabilities (mass) proportionately and reduce water column heating and evaporation losses.

The City is currently preparing a report for these dredging works for Council consideration with works proposed to commence January 28 2015 to 1st April 2015.

2. STATIC WATER LEVELS

This level of monitoring has been problematic for the City with intermittent data captured over the last 4 years. The "air line" method is currently utilised for determining static water levels but has been problematic particularly on older bores or bores with poor water quality whereby air tubes become blocked giving either no reading or false readings.
In 2011/12 data was collected from only 40 sites and this year only 46 of a total 77 sites returned draw down readings due to failing equipment, blocked tubing or for unknown reasons.

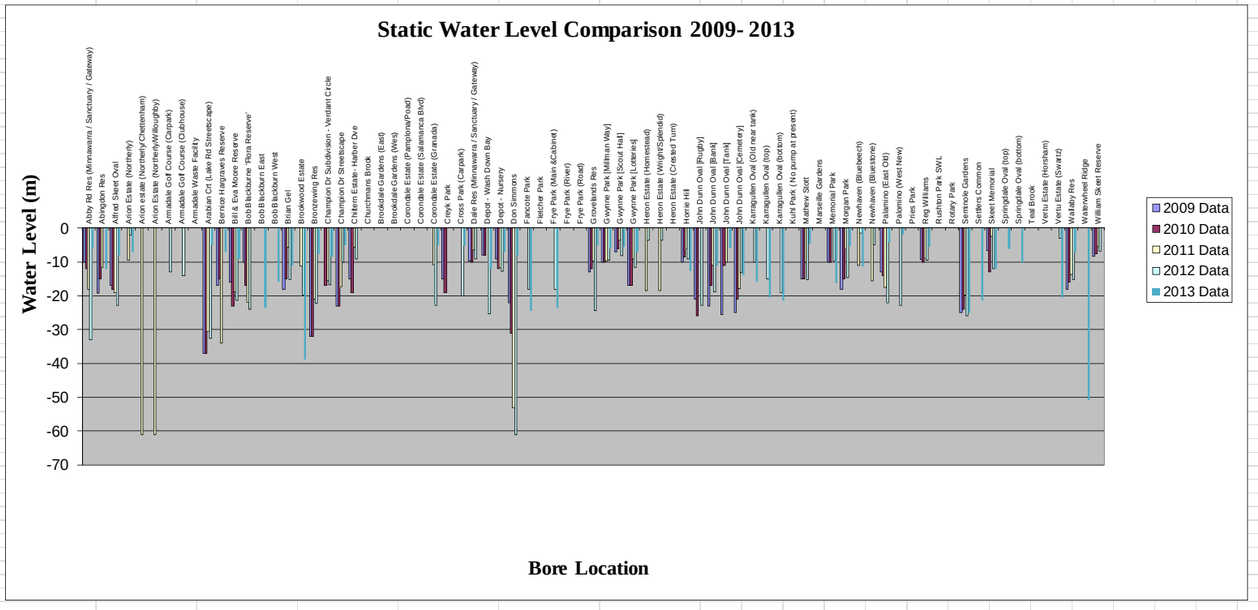
Where at least two concurrent years data has been collected (2012 & 2013), the results indicate that nine (9) sites had a downward variance in the static water level of more than 5 meters from previous years and of that nine, two (2) sites had a variance in the static water level of more than 10 meters from the previous years.
Adversely nineteen (19) sites have had an increase in the static water level of more than 5 metres up to 27.6 metres from previous years.

There remains a significant issue with the quality of data capture in this area and we are investigating other collection methodology (ultrasonic/electric sensors) to improve future data capture vital for ongoing monitoring and reporting.

From the information gathered it is difficult to make any determination on the historical trend of static water table levels throughout the City. Improving measuring equipment will improve data integrity and assist with future interpretation and reporting

RESERVE / BORE LOCATION	Static Water Level April 2009 (Mtrs)	Static Water Level April 2010 (Mtrs)	Var 9-10	Static Water Level April 2011 (Mtrs)	Var 10-11	Static Water Level April 2012 (Mtrs)	Var 11-12	Static Water Level April 2013 (Mtrs)	Var 12-13
Abby Rd Res (Minnawarra / Sanctuary / Gateway)	-10	-12	-2	-18	-6	-33	**-15**	-6.0	27
Abingdon Res	-19.3	-15	4.3	-11.6	3.4	0	**11.6**	-12.0	-12
Alfred Skeet Oval	-17	-18	-1	-19	-1	-22.8	**-3.8**	-8.0	14.8
Arion Estate (Northerly)	0	0	0	-9.4	-9.4	-2.1	**7.3**	-7.0	-4.9
Arion estate (Northerly/Chettenham)	0	0	0	-61	-61	0	**61**	0.0	0
Arion Estate (Northerly/Willoughby)	0	0	0	-61	-61	0	**61**	0.0	0
Armadale Golf Course (Carpark)	0	0	0	0	0	-13	**-13**	0.0	0
Armadale Golf Course (Clubhouse)	0	0	0	0	0	-14	**-14**	0.0	0
Armadale Waste Facility	0	0	0	0	0	0	**0**	0.0	0
Arabian Crt (Lake Rd Streetscape)	-37	-37	0	-30.4	6.6	-32.6	**-2.2**	-5.0	27.6
Bernice Hargraves Reserve	-17	-15	2	-33.9	-18.9	0	**33.9**	-7.0	-7
Bill & Eva Moore Reserve	-16	-23	-7	-18.8	4.2	-21.3	**-2.5**	-9.0	12.3
Bob Blackburne 'Flora Reserve'	-10	-17	-7	-21.9	-4.9	-24	**-2.1**	0.0	0
Bob Blackburn East	0	0	0	0	0	0	**0**	-23.5	-23.5
Bob Blackburn West	0	0	0	0	0	0	**0**	-15.8	-15.8
Brian Gel	-18	-15	3	-5.7	9.3	-15.2	**-9.5**	-11.0	4.2
Brookwood Estate	0	0	0	-11.2	0	-19.8	**-8.6**	-38.8	-19
Bronzewing Res	-32	-32	0	-21	11	-22.2	**-1.2**	-7.6	14.6
Champion Dr Subdivision - Verdant Circle	0	-17	-17	-15.5	1.5	-16.7	**-1.2**	-8.5	8.2
Champion Dr Streetscape	-23	-23	0	-17.3	5.7	-10	**7.3**	-5.0	5
Chiltern Estate- Harber Dve	-15	-19	-4	-5.7	13.3	-9.1	**-3.4**	0.0	0
Churchmans Brook	0	0	0	0	0	0	**0**	0.0	0
Brookdale Gardens (East)	0	0	0	0	0	0	**0**	0.0	0
Brookdale Gardens (Wes)	0	0	0	0	0	0	**0**	0.0	0
Corondale Estate (Pamplona/Poad)	0	0	0	0	0	0	**0**	0.0	0
Corondale Estate (Salamanca Blvd)	0	0	0	0	0	0	**0**	0.0	0
Corondale Estate (Granada)	0	0	0	-10.8	-10.8	-22.8	**-12**	-5.0	17.8
Creyk Park	-15	-19	-4	0	19	0	**0**	0.0	0
Cross Park (Carpark)	0	0	0	0	0	-20	**-20**	-5.1	14.9
Dale Res (Minnawarra / Sanctuary / Gateway)	-9.6	-10	-0.4	-6.4	3.6	-9.1	**-2.7**	0.0	9.1
Depot - Wash Down Bay	-8	-8	0	0	8	-25.3	**-25.3**	-12.0	13.3
Depot - Nursery	-9	-12	-3	-11.5	0.5	-12.8	**-1.3**	-7.0	5.8
Don Simmons	-22	-31	-9	-53	-22	-61	**-8**	-8.0	53
Fancote Park	0	0	0	0	0	-18	**-18**	-24.5	-6.5
Fletcher Park	0	0	0	0	0	0	**0**	0.0	0
Frye Park (Main &Cabinet)	0	0	0	0	0	-18	**-18**	-23.5	-5.5
Frye Park (River)	0	0	0	0	0	0	**0**	0.0	0
Frye Park (Road)	0	0	0	0	0	0	**0**	0.0	0
Grovelands Res	-13	-12	1	-9.7	2.3	-24.3	**-14.6**	-5.0	19.3
Gwynne Park [Millman Way]	-10	-10	0	-9.7	0.3	-9.4	**0.3**	-6.0	3.4
Gwynne Park [Scout Hall]	-6.9	-6.1	0.8	-3.6	2.5	-8.2	**-4.6**	-5.6	2.6
Gwynne Park [Lotteries]	-17	-17	0	-9.1	7.9	-11.6	**-2.5**	-7.0	4.6
Heron Estate (Homestead)	0	0	0	-18.5	-18.5	-3.6	**14.9**	0.0	0
Heron Estate (Wright/Splendid)	0	0	0	-18.5	-18.5	-3.6	**14.9**	0.0	0
Heron Estate (Crested Turn)	0	0	0	0	0	0	**0**	0.0	0
Horrie Hill	-10	-8.5	1.5	-6.1	2.4	-9.1	**-3**	-12.7	-3.6
John Dunn Oval [Rugby]	-21	-26	-5	0	26	-22.8	**-22.8**	0.0	0
John Dunn Oval [Bank]	-23	-17	6	-11	6	-18.9	**-7.9**	-11.0	7.9
John Dunn Oval [Tank]	-25.5	-11	14.5	-10	1	0	**10**	-6.0	-6
John Dunn Oval [Cemetery]	-25	-21	4	-17.9	3.1	-13.1	**4.8**	-14.0	-0.9
Karragullen Oval (Old near tank)	0	0	0	0	0	-10	**-10**	-15.8	-5.8
Karragullen Oval (top)	0	0	0	0	0	-15	**-15**	-20.4	-5.4
Karragullen Oval (bottom)	0	0	0	0	0	-19	**-19**	-21.4	-2.4
Kuhl Park (No pump at present)	0	0	0	0	0	0	**0**	0.0	0
Mathew Stott	-15	-15	0	-10	5	-15.2	**-5.2**	-4.5	10.7
Marseille Gardens	0	0	0	0	0	0	**0**	0.0	0
Memorial Park	-10	-10	0	0	10	-9.7	**-9.7**	-16.3	-6.6
Morgan Park	-18	-15	3	-6	9	-14.6	**-8.6**	-5.3	9.3
Newhaven (Bluebeech)	0	0	0	-10.9	-10.9	-1.5	**9.4**	-11.2	-9.7
Newhaven (Bluestone)	0	0	0	-15.5	-15.5	-4.8	**10.7**	0.0	0
Palamino (East Old)	-13	-14	-1	-17.4	-3.4	-22	**-4.6**	-4.0	18
Palomino (West New)	0	0	0	0	0	-22.8	**-22.8**	-2.0	20.8
Pries Park	0	0	0	0	0	0	**0**	0.0	0
Reg Williams	-9.3	-10	-0.7	-8.8	1.2	-9.4	**-0.6**	-5.6	3.8
Rushton Park SWL	0	0	0	0	0	0	**0**	0.0	0
Rotary Park	0	0	0	0	0	0	**0**	0.0	0
Seminole Gardens	-25	-24	1	-19.8	4.2	-26	**-6.2**	-25.0	1
Settlers Common	0	0	0	0	0	0	**0**	-21.4	-21.4
Skeet Memorial	-6.6	-13	-6.4	-2.4	10.6	-12	**-9.6**	-12.0	0
Springdale Oval (top)	0	0	0	0	0	0	**0**	-6.1	-6.1
Springdale Oval (bottom)	0	0	0	0	0	0	**0**	-10.2	-10.2
Teal Brook	0	0	0	0	0	0	**0**	0.0	0
Vertu Estate (Horsham)	0	0	0	0	0	0	**0**	0.0	0
Vertu Estate (Swartz)	0	0	0	0	0	-3	**-3**	-20.4	-17.4
Wallaby Res	-18	-16	2	-13.7	2.3	-15.2	**-1.5**	-7.0	8.2
Waterwheel Ridge	0	0	0	0	0	0	**0**	-50.9	-50.9
William Skeet Reserve	-8.3	-7.5	0.8	-5.5	2	-6.7	**-1.2**	0.0	0

No of Sites where SWL lowered more than 5m	No of Sites where SWL rose more than 5m	Insufficient Data
9	19	39



3. SALINITY

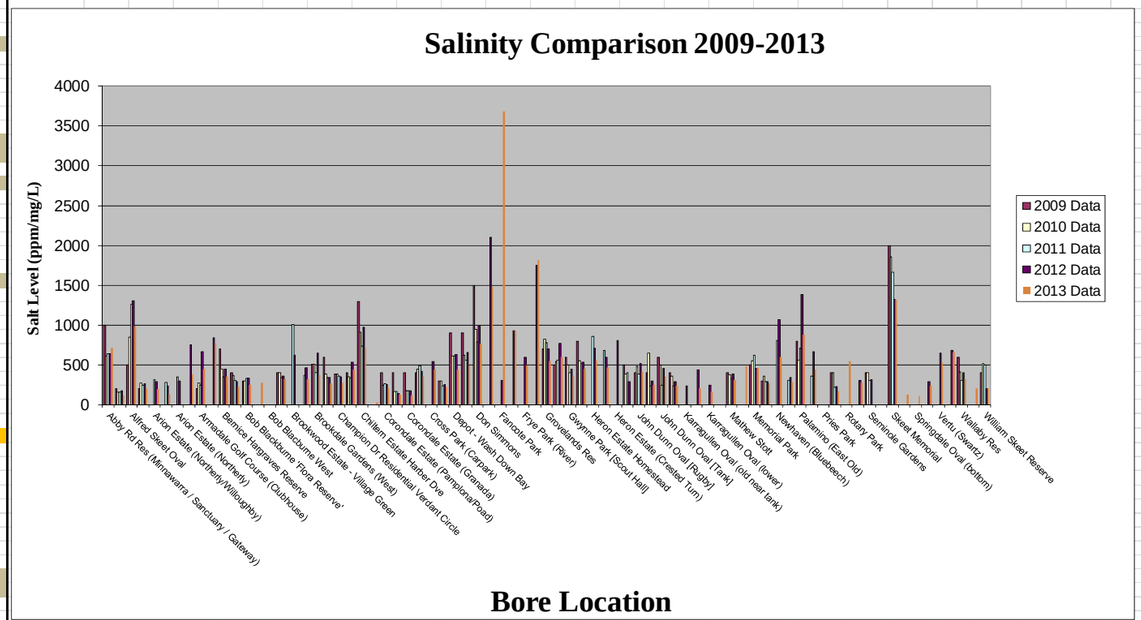
This level of monitoring has been problematic for the City with intermittent data captured in past years. In this 2012/2013 reporting year the City continued to engage private consultants to undertake sampling and chemical analysis of groundwater, measuring Electrical conductivity (Ec) through a NATA accredited laboratory in accordance with the National Water Quality Management Strategy and AS/NZS (1998a): Australian/New Zealand Standard AS/NZS 5667.1:1998. Water Quality Sampling & Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples.

Sampling was extended from fifty (50) sites in 2011/12 to seventy seven (77) sites in 2012/13.

Where at least two concurrent years data has been collected (2012 & 2013), the NATA results indicate that fifty five (55) of seventy seven (77) sites tested had reduced salinity by up to 614mg/L (Fletcher Park) and conversely six (6) sites had an increase in salinity by up to 3375mg/L (Fancote Park) when compared to the NATA results from last year.

Given the recent change to groundwater chemical analysis being undertaken by a NATA laboratory and the high potential that internal sampling practices may have compromised past results, it is difficult to establish any negative trends with respect to groundwater salinity. Ongoing NATA laboratory testing will improved data integrity and will assist with better interpretation of results in the future.

RESERVE / BORE LOCATION (Guidelines <1000mg/L)	Salt Level April 2009 (ppm)	Salt Level April 2010 (ppm)	Var 09-10	Salt Level April 2011 (ppm)	Var 10-11	Salt Level April 2012 (ppm) NATA	Var 11-12	Salt Level April 2013 (mg/L) NATA	Var 12-13	No Sites >1000 ppm/mg/L	Insufficient Data
										1	16
Abby Rd Res (Minnawarra / Sanctuary / Gateway)	1000	610	-390	640	30	637	-3	715	78		
Abingdon Res	200	160	-40	160	0	178	18	115	-63		
Alfred Skeet Oval	500	850	350	1260	410	1304	44	990	-314		
Arabian Crt (Lake Rd Streetscape)	200	270	70	250	-20	263	13	209	-54		
Arion Estate (Northerly/Willoughby)	0	0	0	320	320	291	-29	198	-93		
Arion Estate (Northerly/Chettenham)	0	0	0	280	280	239	-41	137	-102		
Arion Estate (Northerly)	0	0	0	350	350	302	-48		-302		
Armadale Golf Course (Carpark)	0	0	0	0	0	*752*	752	385	-367		
Armadale Golf Course (Clubhouse)	200	270	70	250	-20	*667*	417	456	-211		
Armadale Waste Facility	0	0	0	0	0	*840*	840	770	-70		
Bernice Hargraves Reserve	700	450	-250	350	-100	445	95	357	-88		
Bill & Eva Moore Reserve	400	370	-30	310	-60	291	-19	220	-71		
Bob Blackburne 'Flora Reserve'	300	300	0	330	30	333	3	247	-86		
Bob Blacburne East	0	0	0	0	0	0	0	280	280		
Bob Blacburne West	0	0	0	0	0	0	0		0		
Brian Gel	400	400	0	340	-60	360	20	319	-41		
Brookwood Estate - Village Green	0	0	0	1010	1010	*624*	-386		-624		
Brookdale Gardens (East)	0	0	0	370	370	469	99	324	-145		
Brookdale Gardens (West)	510	510	0	400	-110	648	248	374	-274		
Bronzewing Res	600	390	-210	340	-50	340	0	264	-76		
Champion Dr Residential Verdant Circle	390	390	0	360	-30	352	-8	275	-77		
Champion Dr Streetscape	400	350	-50	330	-20	534	204	440	-94		
Chiltern Estate Harber Dve	1300	910	-390	740	-170	976	236	715	-261		
Churchmans Brook Entry	0	0	0	0	0	0	0	36	36		
Corondale Estate (Pamplona/Poad)	400	250	-150	260	10	257	-3	203	-54		
Corondale Estate (Salamanca Blvd)	400	170	-230	170	0	144	-26	132	-12		
Corondale Estate (Granada)	400	180	-220	180	0	179	-1	115	-64		
Creyk Park	400	450	50	490	40	424	-66	357	-67		
Cross Park (Carpark)	0	0	0	0	0	*540*	540	445	-95		
Dale Res (Minnawarra / Sanctuary / Gateway)	300	300	0	240	-60	256	16	225	-31		
Depot - Wash Down Bay	900	610	-290	610	0	630	20	445	-185		
Depot - Nursery	900	620	-280	560	-60	656	96	500	-156		
Don Simmons	1500	950	-550	790	-160	987	197	770	-217		
Fletcher Park	**0**	**0**	**0**	**0**	**0**	**2099**	**2099**	**1485**	-614		
Fancote Park	**0**	**0**	**0**	**0**	**0**	***310***	**310**	**3685**	3375		
Frye Park (Main-Cabinet)	0	0	0	0	0	*930*	930	935	5		
Frye Park (River)	0	0	0	0	0	*600*	600	495	-105		
Frye Park (Road)	**0**	**0**	**0**	**0**	**0**	***1750***	**1750**	**1815**	65		
Grovelands Res	700	820	120	780	-40	703	-77	550	-153		
Gwynne Park [Millman Way]	500	540	40	560	20	771	211	605	-166		
Gwynne Park [Scout Hall]	600	500	-100	400	-100	447	47	352	-95		
Gwynne Park [Lotteries]	800	550	-250	520	-30	536	16	456	-80		
Heron Estate Homestead	0	0	0	860	860	706	-154	559	-147		
Heron Estate (Wright)	0	0	0	680	680	600	-80	467	-133		
Heron Estate (Crested Turn)	0	0	0	0	0	807	807	*0*	-807		
Horrie Hill	500	390	-110	400	10	290	-110	*0*	-290		
John Dunn Oval [Rugby]	400	480	80	390	-90	516	126	418	-98		
John Dunn Oval [Bank]	400	650	250	240	-410	300	60	247	-53		
John Dunn Oval [Tank]	600	500	-100	250	-250	454	204	352	-102		
John Dunn Oval [Cemetery]	400	360	-40	240	-120	287	47	242	-45		
Karragullen Oval (old near tank)	0	0	0	0	0	*240*	240	0	-240		
Karragullen Oval (top)	0	0	0	0	0	*440*	440	203	-237		
Karragullen Oval (lower)	0	0	0	0	0	*250*	250	165	-85		
Kuhl Park (No pump at present)	0	0	0	0	0		0	0	0		
Mathew Stott	400	380	-20	330	-50	387	57	313	-74		
Marseille Gardens	0	0	0	0	0	0	0	484	484		
Memorial Park	500	550	50	620	70	460	-160	462	2		
Morgan Park	300	360	60	290	-70	287	-3	264	-23		
Newhaven (Bluebeech)	**0**	**0**	**0**	**810**	**810**	**1069**	**259**	605	-464		
Newhaven (Bluestone loop)	0	0	0	310	310	346	36	286	-60		
Palamino (East Old)	**800**	**560**	-240	**710**	**150**	**1384**	**674**	880	-504		
Palomino (West New)	0	0	0	360	360	669	309	445	-224		
Pries Park	0	0	0	0	0	0	0	0	0		
Reg Williams	400	400	0	220	-180	226	6	170	-56		
Rotary Park								550			
Rushton Park SWL	0	0	0	0	0	*308*	308	280	-28		
Seminole Gardens	400	400	0	310	-90	312	2	0	-312		
Settlers Common	0	0	0	0	0	0	0	0	0		
Skeet Memorial	**2000**	**1860**	-140	**1660**	-200	**1327**	-333	**1320**	-7		
Springdale Oval (top)	0	0	0	0	0	0	0	132	132		
Springdale Oval (bottom)	0	0	0	0	0	0	0	110	110		
Teal Brook	0	0	0	0	0	292	292	242	-50		
Vertu (Swartz)	0	0	0	0	0	652	652	528	-124		
Vertu (Horsham)	0	0	0	0	0	682	682	660	-22		
Wallaby Res	600	410	-190	310	-100	403	93	324	-79		
Waterwheel Ridge	0	0	0	0	0	0	0	203	203		
William Skeet Reserve	400	520	120	500	-20	204	-296	203	-1		



4. ACDITY/ALKALINITY

This level of monitoring has been problematic for the City with intermittent data captured over the last 3 years. In this 2012/2013 reporting year the City continued to engage private consultants to undertake sampling and chemical analysis of groundwater measuring acidity and alkalinity (pH) through a NATA accredited laboratory in accordance with the National Water Quality Management Strategy and AS/NZS (1998a): Australian/New Zealand Standard AS/NZS 5667.1:1998. Water Quality Sampling & Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples.

Where at least two concurrent years data has been collected (2012 & 2013), the NATA results indicate that forty four (44) sites indicated stability of a decrease in the pH and conversely twenty two (22) sites indicated an increase in pH.
One site sites indicated an increase or decrease in pH by +- 1.0 point.

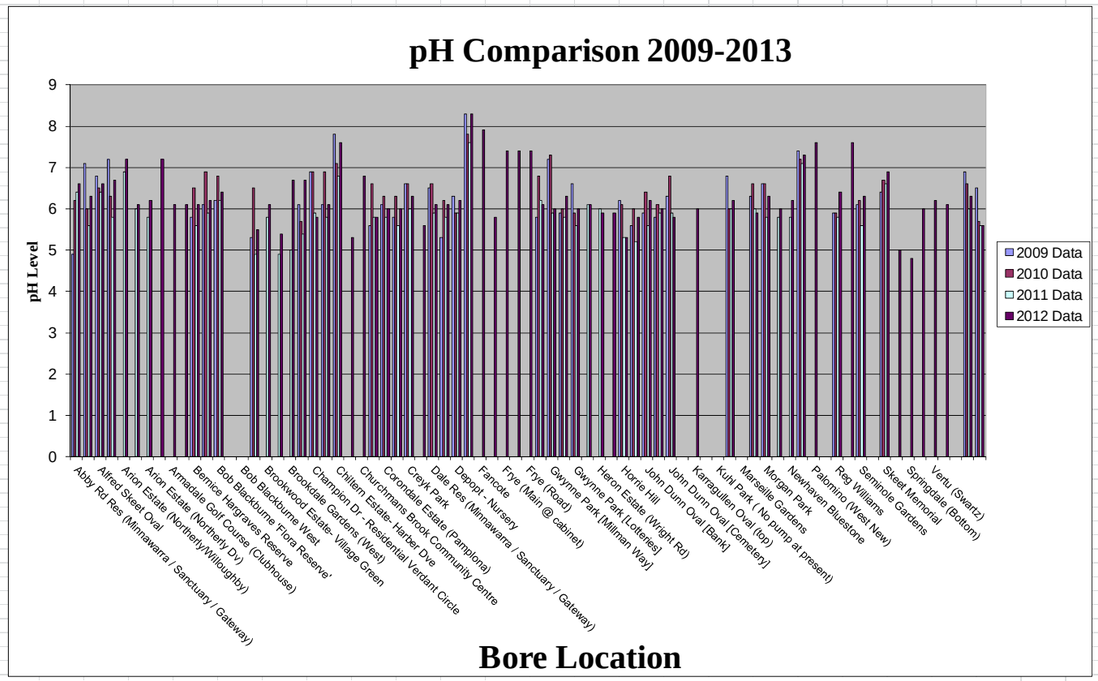
Given the recent change to groundwater chemical analysis being undertaken by a NATA laboratory and the high potential that internal sampling practices may have compromised past results, it is difficult to establish any negative trends with respect to groundwater acidity or alkalinity. Ongoing NATA laboratory testing will improved data integrity and will assist with better interpretation of results in the future.

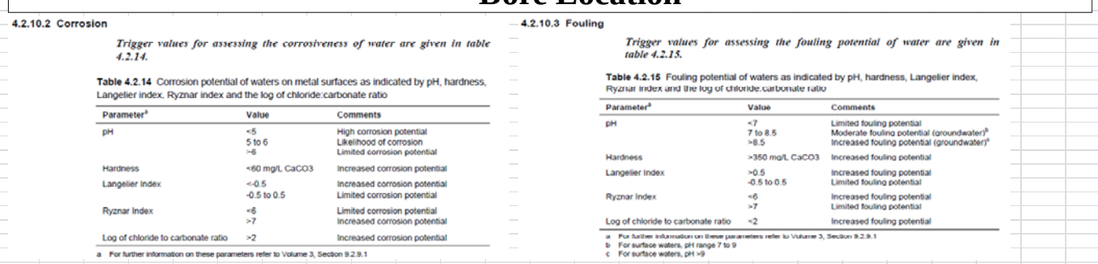
RESERVE / BORE LOCATION (Guidelines-pH 6.0-8.0)	pH Levels April 2009	pH Levels April 2010	Var 09-10	pH Levels April 2011	Var 10-11	pH Levels April 2012 NATA	Var 11-12	pH Levels April 2013 NATA	Var 12-13
Abby Rd Res (Minnawarra / Sanctuary / Gateway)	4.9	6.2	1.3	6.4	0.2	6.6	-0.2	6.4	-0.2
Abingdon Res	7.1	6	-1.1	5.6	-0.4	6.3	-0.7	6.3	0
Alfred Skeet Oval	6.8	6.5	-0.3	6.4	-0.1	6.6	-0.2	6.6	0
Arabian Crt (Lake Rd Streetscape)	7.2	6.3	-0.9	5.8	-0.5	6.7	-0.9	6.8	0.1
Arion Estate (Northerly/Willoughby)	0	0	0.0	6.9	6.9	7.2	-0.3	6.4	-0.8
Arion Estate (Northerly/Chettenham)	0	0	0.0	6	6	6.1	-0.1	6.4	0.3
Arion Estate (Northerly Dv)	0	0	0.0	5.8	5.8	6.2	-0.4	6.2	0
Armadale Golf Course (Carpark)	0	0	0.0	0	0	7.2	-7.2	6.9	-0.3
Armadale Golf Course (Clubhouse)	0	0	0.0	0	0	6.1	-6.1	6.6	0.5
Armadale Landfill Facility	0	0	0.0	0	0	6.1	-6.1	6.1	0
Bernice Hargraves Reserve	5.8	6.5	0.7	5.6	-0.9	6.1	-0.5	5.8	-0.3
Bill & Eva Moore Reserve	6.1	6.9	0.8	5.9	-1	6.2	-0.3	6	-0.2
Bob Blackburne 'Flora Reserve'	6.2	6.8	0.6	6.2	-0.6	6.4	-0.2	6.2	-0.2
Bob Blackburne East	0	0	0.0	0	0	0	0	6.1	0
Bob Blackburne West	0	0	0.0	0	0	0	0		0
Brian Gel	5.3	6.5	1.2	4.9	-1.6	5.5	-0.6	6.5	1
Brookwood Estate- Village Green	0	0	0.0	5.8	5.8	6.1	-0.3	6.5	0.4
Brookdale Gardens (East)	0	0	0.0	4.9	4.9	5.4	-0.5	5.7	0.3
Brookdale Gardens (West)	0	0	0.0	5	5	6.7	-1.7	5.7	-1
Bronzewing Res	6.1	5.7	-0.4	5.4	-0.3	6.7	-1.3	6.3	-0.4
Champion Dr - Residential Verdant Circle	6.9	6.9	0.0	5.9	-1	5.8	0.1	5.8	0
Champion Dr Streetscape	6.1	6.9	0.8	5.8	-1.1	6.1	-0.3	6	-0.1
Chiltern Estate- Harber Dve	7.8	7.1	-0.7	6.8	-0.3	7.6	-0.8	7.4	-0.2
Churchmans Brook Entry	0	0	0.0	0	0	5.3	-5.3	5.3	0
Churchmans Brook Community Centre	0	0	0.0	0	0	6.8	-6.8	6.8	0
Corondale Estate (Granada)	5.6	6.6	1.0	5.8	-0.8	5.8	0	6.1	0.3
Corondale Estate (Pamplona)	6.1	6.3	0.2	5.8	-0.5	6	-0.2	6.4	0.4
Corondale Estate (Salmanaca)	5.8	6.3	0.5	5.6	-0.7	6	-0.4	6.9	0.9
Creyk Park	6.6	6.6	0.0	6	-0.6	6.3	-0.3	6.1	-0.2
Cross Park	0	0	0.0	0	0	5.6	-5.6	5.6	0
Dale Res (Minnawarra / Sanctuary / Gateway)	6.5	6.6	0.1	5.9	-0.7	6.1	-0.2	6.5	0.4
Depot - Wash Down Bay	5.3	6.2	0.9	5.8	-0.4	6.1	-0.3	6.1	0
Depopt - Nursery	6.3	5.9	-0.4	5.9	0	6.2	-0.3	6.1	-0.1
Don Simmons	8.3	7.8	-0.5	7.6	-0.2	8.3	-0.7	8.1	-0.2
Fancote	0	0	0.0	0	0	7.9	-7.9	7.9	0
Fletcher Park	0	0	0.0	0	0	5.8	-5.8	5.8	0
Frye (Main @ cabinet)	0	0	0.0	0	0	7.4	-7.4	7.4	0
Frye (River)	0	0	0.0	0	0	7.4	-7.4	7.4	0
Frye (Road)	0	0	0.0	0	0	7.4	-7.4	7.2	-0.2
Grovelands Res	5.8	6.8	1.0	6.2	-0.6	6.1	0.1	5.8	-0.3
Gwynne Park [Millman Way]	7.2	7.3	0.1	5.9	-1.4	6	-0.1	6	0
Gwynne Park [Scout Hall]	5.9	6	0.1	5.8	-0.2	6.3	-0.5	6.1	-0.2
Gwynne Park [Lotteries]	6.6	5.9	-0.7	5.6	-0.3	6	-0.4	6.1	0.1
Heron Estate Homestead	0	0	0.0	6.1	6.1	6.1	0	6.5	0.4
Heron Estate (Wright Rd)	0	0	0.0	6	6	5.9	0.1	6.2	0.3
Heron Estate Crested Turn	0	0	0.0	0	0	5.9	-5.9	5.9	0
Horrie Hill	6.2	6.1	-0.1	5.3	-0.8	5.3	0	5.3	0
John Dunn Oval [Rugby]	5.6	6	0.4	5.2	-0.8	5.8	-0.6	5.7	-0.1
John Dunn Oval [Bank]	5.9	6.4	0.5	5.6	-0.8	6.2	-0.6	6.1	-0.1
John Dunn Oval [Tank]	5.8	6.1	0.3	5.9	-0.2	6	-0.1	6.2	0.2
John Dunn Oval [Cemetery]	6.3	6.8	0.5	5.9	-0.9	5.8	0.1	6.1	0.3
Karragullen Oval (old near tank)	0	0	0.0	0	0	0	0	5.4	0
Karragullen Oval (top)	0	0	0.0	0	0	6	-6	6	0
Karragullen Oval (lower)	0	0	0.0	0	0	0	0		0
Kuhl Park (No pump at present)	0	0	0.0	0	0	0	0		0
Mathew Stott	6.8	6	-0.8	6	0	6.2	-0.2	5.9	-0.3
Marseille Gardens	0	0	0.0	0	0	0	0	6.3	0
Memorial Park	6.3	6.6	0.3	6	-0.6	5.9	0.1	6.3	0.4
Morgan Park	6.6	6.6	0.0	5.8	-0.8	6.3	-0.5	6.1	-0.2
Newhaven Bluebeech	0	0	0.0	5.8	5.8	6	-0.2	6.3	0.3
Newhaven Bluestone	0	0	0.0	5.8	5.8	6.2	-0.4	6.4	0.2
Palamino (East Old)	7.4	7.2	-0.2	7.1	-0.1	7.3	-0.2	7.3	0
Palomino (West New)	0	0	0.0	0	0	7.6	-7.6	7.4	-0.2
Pries Park	0	0	0.0	0	0	0	0		0
Reg Williams	5.9	5.9	0.0	5.8	-0.1	6.4	-0.6	6.3	-0.1
Rushton SWL	0	0	0.0	0	0	7.6	-7.6	7.4	-0.2
Seminole Gardens	6.1	6.2	0.1	5.6	-0.6	6.3	-0.7	6.3	0
Settlers Common	0	0	0.0	0	0	0	0		0
Skeet Memorial	6.4	6.7	0.3	6.6	-0.1	6.9	-0.3	6.8	-0.1
Springdale (Top)	0	0	0.0	0	0	5	-5	5	0
Springdale (Bottom)	0	0	0.0	0	0	4.8	-4.8	4.8	0
Teal Brook	0	0	0.0	0	0	6	-6	6.3	0.3
Vertu (Swartz)	0	0	0.0	0	0	6.2	-6.2	6.6	0.4
Vertu (Horsham)	0	0	0.0	0	0	6.1	-6.1	6.4	0.3
Waterwheel Ridge	0	0	0.0	0	0		0	6.6	0
Wallaby Res	6.9	6.6	-0.3	6	-0.6	6.3	-0.3	6.3	0
William Skeet Reserve	6.5	5.7	-0.8	5.6	-0.1	5.6	0	5.8	0.2

2012 No Sites >1.0ph point	Insuffcient Data	Sites <6.0pH
1	10	16

Critical Sites <5.5pH
5

Critical Sites >7.5pH
9





4.2.10.2 Corrosion

Trigger values for assessing the corrosiveness of water are given in table 4.2.14.

Table 4.2.14 Corrosion potential of waters on metal surfaces as indicated by pH, hardness, Langelier index, Ryznar index and the log of chloride:carbonate ratio

Parameter[a]	Value	Comments
pH	<5 5 to 6 >6	High corrosion potential Likelihood of corrosion Limited corrosion potential
Hardness	<60 mg/L CaCO3	Increased corrosion potential
Langelier index	<-0.5 -0.5 to 0.5	Increased corrosion potential Limited corrosion potential
Ryznar Index	<6 >7	Limited corrosion potential Increased corrosion potential
Log of chloride to carbonate ratio	>2	Increased corrosion potential

a For further information on these parameters refer to Volume 3, Section 9.2.9.1

4.2.10.3 Fouling

Trigger values for assessing the fouling potential of water are given in table 4.2.15.

Table 4.2.15 Fouling potential of waters as indicated by pH, hardness, Langelier index, Ryznar index and the log of chloride:carbonate ratio

Parameter[a]	Value	Comments
pH	<7 7 to 8.5 >8.5	Limited fouling potential Moderate fouling potential (groundwater)[b] Increased fouling potential (groundwater)[c]
Hardness	>350 mg/L CaCO3	Increased fouling potential
Langelier index	>0.5 -0.5 to 0.5	Increased fouling potential Limited fouling potential
Ryznar Index	<6 >7	Increased fouling potential Limited fouling potential
Log of chloride to carbonate ratio	<2	Increased fouling potential

a For further information on these parameters refer to Volume 3, Section 9.2.9.1
b For surface waters, pH range 7 to 9
c For surface waters, pH >9

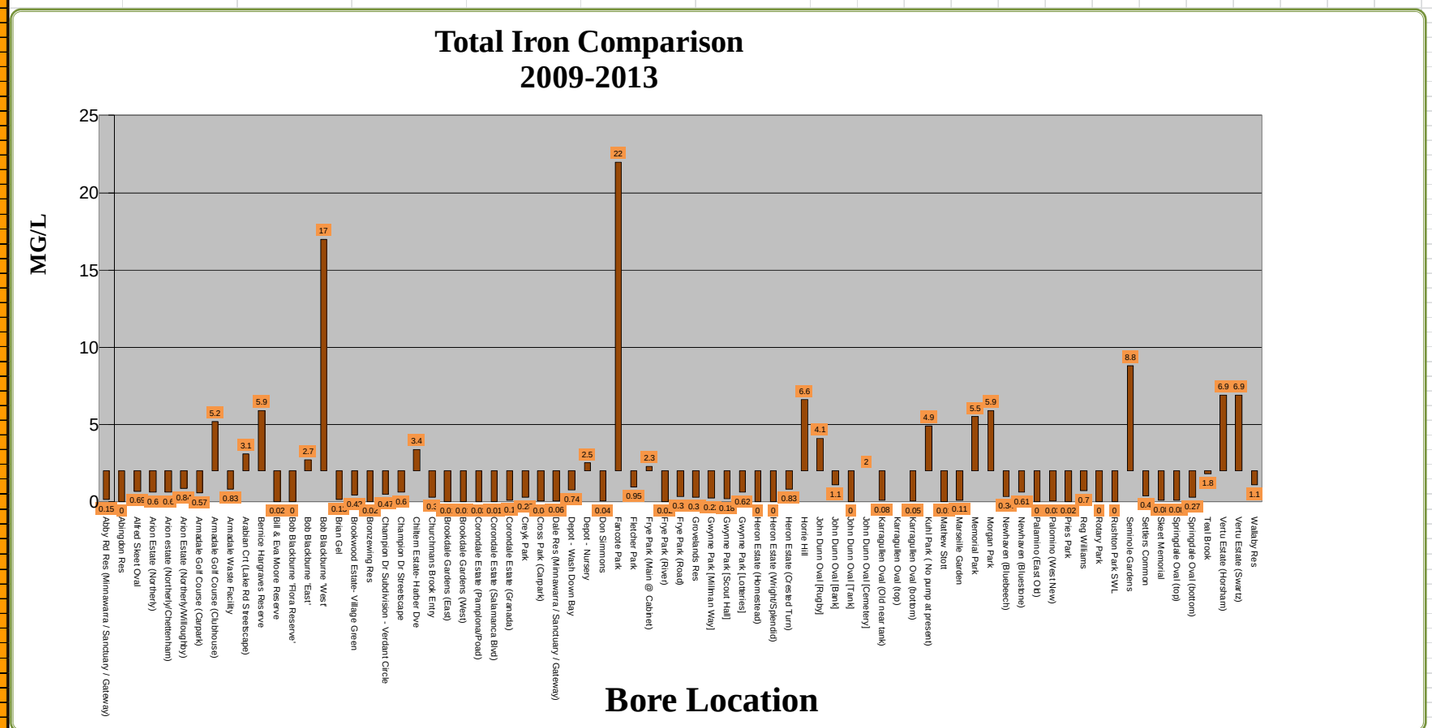
5. TOTAL IRON

In this 2012/2013 reporting year the City engaged private consultants to undertake sampling and chemical analysis of groundwater measuring Total Iron through a NATA accredited laboratory in accordance with the National Water Quality Management Strategy and AS/NZS (1998a): Australian/New Zealand Standard AS/NZS 5667.1:1998. Water Quality Sampling & Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples.

As this is the first year of wide scale monitoring of total iron in the City's irrigation water no comparable data is available, however there were twenty three (23) sites that exceeded the guidelines with readings up to 22mg/L.

Given the recent change to groundwater chemical analysis being undertaken by a NATA laboratory and the high potential that internal sampling practices may have compromised past results, it is difficult to establish any negative trends with respect to groundwater acidity or alkalinity. Ongoing NATA laboratory testing will improved data integrity and will assist with better interpretation of results in the future.

RESERVE / BORE LOCATION (Guidelines <1mg/L)	Total Iron 2013	Total Sites Exceeding Guidelines (1mg/L)	Critical Sites Exceeding Short Term Guidelines (10mg/L)
		23	2
Abby Rd Res (Minnawarra / Sanctuary / Gateway)	1.5		
Abingdon Res	2.3		
Alfred Skeet Oval	0.15		
Arion Estate (Northerly)	0		
Arion estate (Northerly/Chettenham)	0.69		
Arion Estate (Northerly/Willoughby)	0.6		
Armadale Golf Course (Carpark)	0.6		
Armadale Golf Course (Clubhouse)	0.84		
Armadale Waste Facility	0.57		
Arabian Crt (Lake Rd Streetscape)	5.2		
Bernice Hargraves Reserve	0.83		
Bill & Eva Moore Reserve	3.1		
Bob Blackburne 'Flora Reserve'	5.9		
Bob Blackburne 'East'	0.02		
Bob Blackburne 'West'	0		
Brian Gel	2.7		
Brookwood Estate- Village Green	17		
Bronzewing Res	0.13		
Champion Dr Subdivision - Verdant Circle	0.42		
Champion Dr Streetscape	0.02		
Chiltern Estate- Harber Dve	0.47		
Churchmans Brook Entry	0.6		
Brookdale Gardens (East)	3.4		
Brookdale Gardens (West)	0.3		
Corondale Estate (Pamplona/Poad)	0.01		
Corondale Estate (Salamanca Blvd)	0.01		
Corondale Estate (Granada)	0.02		
Creyk Park	0.01		
Cross Park (Carpark)	0.1		
Dale Res (Minnawarra / Sanctuary / Gateway)	0.28		
Depot - Wash Down Bay	0.04		
Depot - Nursery	0.06		
Don Simmons	0.74		
Fancote Park	2.5		
Fletcher Park	0.04		
Frye Park (Main @ Cabinet)	22		
Frye Park (River)	0.95		
Frye Park (Road)	2.3		
Grovelands Res	0.02		
Gwynne Park [Millman Way]	0.32		
Gwynne Park [Scout Hall]	0.31		
Gwynne Park [Lotteries]	0.22		
Heron Estate (Homestead)	0.18		
Heron Estate (Wright/Splendid)	0.62		
Heron Estate (Crested Turn)	0		
Horrie Hill	0		
John Dunn Oval [Rugby]	0.83		
John Dunn Oval [Bank]	6.6		
John Dunn Oval [Tank]	4.1		
John Dunn Oval [Cemetery]	1.1		
Karragullen Oval (Old near tank)	0		
Karragullen Oval (top)	2		
Karragullen Oval (bottom)	0.08		
Kuhl Park (No pump at present)			
Mathew Stott	0.05		
Marseille Garden	4.9		
Memorial Park	0.01		
Morgan Park	0.11		
Newhaven (Bluebeech)	5.5		
Newhaven (Bluestone)	5.9		
Palamino (East Old)	0.34		
Palomino (West New)	0.61		
Pries Park	0		
Reg Williams	0.03		
Rotary Park	0.02		
Rushton Park SWL	0.7		
Seminole Gardens	0		
Settlers Common	0		
Skeet Memorial	8.8		
Springdale Oval (top)	0.4		
Springdale Oval (bottom)	0.08		
Teal Brook	0.08		
Vertu Estate (Horsham)	0.27		
Vertu Estate (Swartz)	1.8		
Wallaby Res	6.9		
Waterwheel Ridge	6.9		
William Skeet Reserve	1.1		



9. The following iron concentrations indicate groundwater suitability for various uses:

Use of water	Guideline value for iron (milligrams/ litre)	References
Aesthetic or recreation	0.3	2a
Aquaculture (fresh or marine)	Less than 10	2a
Drinking water or food processing	0.3 (based on aesthetic factors)	2c
Ecosystems (eg in ponds)	No recommendation	2a
Irrigated vegetation	10 (for applications under 20 years); 0.2 (long term)	2a
Industry (steam)	Range one to 0.01 (based on steam pressure)	2d
Industry (cooling)	<0.5	2d
Industry (textiles)	<0.1	2d
Stock drinking water	Not generally toxic	2a

Note: For References, see Appendix A, Reference 2

6. ABSTRACTION HAS NOT ALTERED THE SURROUNDING ENVIRONMENT

There have been no changes to the condition of the surrounding environment around each abstraction location from the previous year.

RESERVE / BORE LOCATION	GWL	LOCATION	VEGETATION CONDITION		
			Description	Condition 2009	Condition 2010
Abby Rd Res (Minnawarra / Sanctuary / Gateway)	160738	Forrest Rd	Open Space, hard dry ground	Poor	Poor
Abingdon Res	160738	Abingdon Crt	Open grasslands free draining soil	Good	Good
Alfred Skeet Oval	160738	Armadale Rd	Green turf with free draining soil and limestone track to bore	Good	Good
Arabian Crt (Lake Rd Streetscape)	160738	Arabian Crt	Medium density bushland with blue metal track to bore	Poor	Poor
Arion Estate	160738	Northerly Dve	Irrigated turf/garden bed small shrubs	Good	Good
Arion Estate	160738	Northerly Dve	Irrigated turf/garden bed small shrubs	Good	Good
Arion Estate	160738	Northerly Dve	Irrigated turf/garden bed small shrubs	Good	Good
Armadale Landfill		Hopkinson Rd	Irrigated turf	Good	Good
Bernice Hargraves Reserve	160738	Grasmere Way	Green turf surrounds with 1 x 6m tree approx 3m from bore	Good	Good
Bill & Eva Moore Reserve	160738	Lake Rd	Green turf with free draining soil with medium density bush within 3m of bore	Good	Good
Bob Blackburn 'Flora Reserve'	160738	Champion Dr	Natural medium density bushland (No large trees)	Good	Good
Bob Blackburn East	160738	Challis Rd	Grass Sand Multiple large trees within 20 meters		
Bob Blackburn West	160738	Challis Rd	Grass Sand		
Brian Gel	160738	Regina Rd	Green turf surrounds with 1x 10m tree approx. 5m from bore	Good	Good
Brookwood Estate- Village Green	160738	Rowley Rd	irrigated gardens in road verge	Good	Good
Bronzewing Res	160738	Bronzewing Crt	Green turf surrounds with 5 x 5m tree approx 3m from bore	Good	Good
Champion Dr Verdant Circle	160738	Verdant Circuit	Mulched garden bed with ground covers and small shrubs	N/A	Good
Champion Dr Streetscape	160738	Champion Dr	Sandy open space with groups of trees approx 10m from bore	Medium	Medium
Chiltern Estate Harber Drive	160738	Harber Dr	Sand clay soil, no vegetation within 10m	Poor	Poor
Chiltern Estate - Brookdale Gardens East	160738	Massell Way	Mulched garden bed with ground covers	N/A	Good
Chiltern Estate - Brookdale Gardens West	160738	Massell Way	Mulched garden bed with ground covers	Good	Good
Corondale Estate Pamplona	160738	Pamplona / Poad	Mulched garden bed with scattering of trees approx 5m from bore	Medium	Medium
Corondale Estate Salamanca	160738	Salamanca Blvd	Irrigated turf no trees within 20m of bore	Medium	Medium
Corondale Estate Granada	160738	Granada Loop	Irrigated turf no trees within 15m of bore	Medium	Medium
Creyk Park	160738	Waltham Rd	Sandy open area with small tree 2m from bore	Poor	Poor
Dale Res (Minnawarra / Sanctuary / Gateway)	160738	Armadale Rd	Sand clay soil, no vegetation within 20m	Poor	Poor
Depot - Wash Down Bay	160738	Owen Rd	Sandy clay with tufts of lovegrass, no trees, hard surfaces in close proximity	Medium	Medium
Depot - Nursery	160738	Owen Rd	Surrounded by road base, one tree approx 10m from bore	Medium	Medium
Don Simmons	160738	Tijuana Rd	Green turf surrounds with medium sized bushes approx 5m from bore	Good	Good
Fletcher Park	160738	Moore St	Paddock small Jarrah trees 15m from bore	Good	Good
Grovelands Res	160738	Grovelands Dr	Green turf surrounds with groups of trees approx 10m from bore	Good	Good
Gwynne Park [Millman Way]	160738	Townley St	Gravel area with several large trees approx 5m from bore	Medium	Medium
Gwynne Park [Scout Hall]	160738	Townley St	Gravel area with rows of large trees approx 5m from bore	Medium	Medium
Gwynne Park [Lotteries]	160738	Townley St	Sandy area with medium sized trees approx 5m from bore	Medium	Medium
Heron Park Homestead	160738	Welcome Meander	Irrigated turf	Good	Good
Heron Park Lakes Wright/Splendid	160738	Wright Rd	Irrigated turf	Good	Good
Heron Park Crested Turn	160738	Crested Turn	Irrigated turf	Good	Good
Horrie Hill	160738	Mauslil Way	Irrigated turf with no trees within 20m of bore	Medium	Medium
John Dunn Oval [Rugby]	160738	Third Ave	Irrigated turf with no trees within 20m of bore	Good	Good

John Dunn Oval [Bank]	160738	Third Ave	Sandy area with 2 x 5m trees approx 5m from bore	Poor	Poor
John Dunn Oval [Tank]	160738	Third Ave	Clay area with 2x 10m trees approx 10m from bore	Poor	Poor
John Dunn Oval [Cemetery]	160738	Third Ave	Irrigated turf adjacent to a poor quality bushland.	Poor	Poor
Kuhl Park (No pump at present)	160738	Westfield Rd	No bore constructed to date	N/A	N/A
Mathew Stott	160738	Minneola Rd	Irrigated turf with 3 x 10m trees approx 10m from bore	Medium	Medium
Memorial Park	160738	Orchard Av	Irrigated turf	Good	Good
Morgan Park	160738	Tomah Rd	Irrigated turf	Good	Good
Palomino	160738	Palomino PL	Sandy dry area with 3x 5m trees approx 3m off bore and blue metal track approx 5m from bore	Poor	Poor
Palomino	160738	Palomino PL	Sandy dry area with 3x 5m trees approx 3m off bore and blue metal track approx 5m from bore		
Reg Williams	160738	Numulgi St	Irrigated turf with 1 x 15m tree approx 5m from bore	Medium	Medium
Rotary Park	160738	James St	Mulch Area/Large Trees within 20 meters		
Seminole Gardens	160738	Seminole Gdns	Irrigated turf	Good	Good
Skeet Memorial	160738	Fisher Crt	Irrigated turf with several trees approx 10m from bore	Medium	Medium
Teal Brook	160738	Dunn Close	Irrigated Turf	Good	Good
Vertu Estate Swartz	160738	Swartz	Garden bed with small shrubs	Good	Good
Vertu Estate Horsham	160738	Horsham Cr	Irrigated turf	Good	Good
Wallaby Res	160738	Honeyeater RTT	Irrigated turf with several medium sized trees approx 5m from bore	Medium	Medium
William Skeet Reserve	160738	Weld St	Sandy area with 2 x 5m trees approx 5m from bore	Poor	Poor

RESERVE / BORE LOCATION	GWL	LOCATION	VEGETATION CONDITION		
			Description	Condition 2009	Condition 2010
Newhaven	173290	Bluestone Loop	Turf garden with small trees and lake 5 metres away.	Good	Good
Newhaven	173290	Bluebeech Way	Irrigated turf garden small shrubs	Good	Good
Marseille Gardens Newhaven	173290	Wright Rd	Irrigated turf	Good	Good

RESERVE / BORE LOCATION	GWL	LOCATION	VEGETATION CONDITION		
			Description	Condition 2009	Condition 2010
Armadale Golf Course	160868	Carpark	Surrounded by loose gravel	Good	Good
Armadale Golf Course	160868	Clubhouse	Located near clubhouse several medium trees	Good	Good

RESERVE / BORE LOCATION	SWL	LOCATION	VEGETATION CONDITION		
			Description	Condition 2009	Condition 2010
Rushton Park	98823	Canning River	Located in Canning River Lower Oval	NA	NA

RESERVE / BORE LOCATION	GWL	LOCATION	VEGETATION CONDITION		
			Description	Condition 2009	Condition 2010
Cross Park A	NA	Jarrah Rd	Road reserve-surrounded by small trees	Good	Good
Cross Park B	NA	Cricket Net	Irrigated turf- REDUNDANT	Good	Good

Churchmans Brook Entry Statement North	NA	Waterwheel Rd	Gravel Small trees & Shrub	Good	Good
Fancote Park	NA	Page Rd	Irrigated Turf 2 large eucalypts within 5 metres	Good	Good
Frye Park (Main)	NA		Carpark island surrounded by gravel.	Good	Good
Frye Park (River)	NA		Vacant land paddock	Good	Good
Frye Park (Road)	NA		Vacant land paddock	Good	Good
Karragullen Oval (1Tank)	NA		amongst native bush trees and understory	Good	Good
Karragullen Oval (2)	NA		irrigated turf/gravel trees within 10metres	Good	Good
Karragullen Oval (3 Top end)	NA		irrigated turf/gravel trees within 10metres	Good	Good
Pries Park	NA		Road reserve surrounded by gravel-REDUNDANT	Good	Good
Settlers Common	NA		Trees surrounding bore	Good	Good
Springdale Oval (Top)	NA		Open gravel area	Good	Good
Springdale Oval (Bottom)	NA		Open gravel area	Good	Good
Waterwheel Ridge	NA		Open gravel area	Good	Good

MINNAWARRA LAKE WATER QUALITY MONITORING

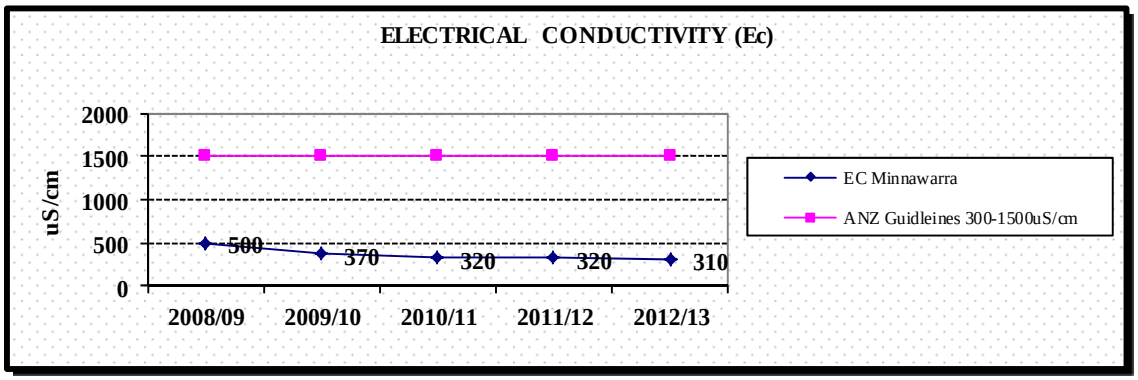
The water quality in Minnawarra Lake has not altered significantly from the previous years results.
It must be noted that this year's testing regime was undertaken in August 2013 and not April as historically has been the case.
There was significant stormwater inflow into the lake at the time of testing in August, potentially altering the source and nature of the water body when compared to the artificially filled lake environment typically tested at the end of the Summer irrigation season.

The City intended to use earlier sampling results taken in March 2013 as part of the lake dredging feasibility study however the testing environment within the sediment layers reported significantly different results from previous year's surface testing samples and further surface samples were taken and analysed in time for this report.

ELECTRICAL CONDUCTIVITY

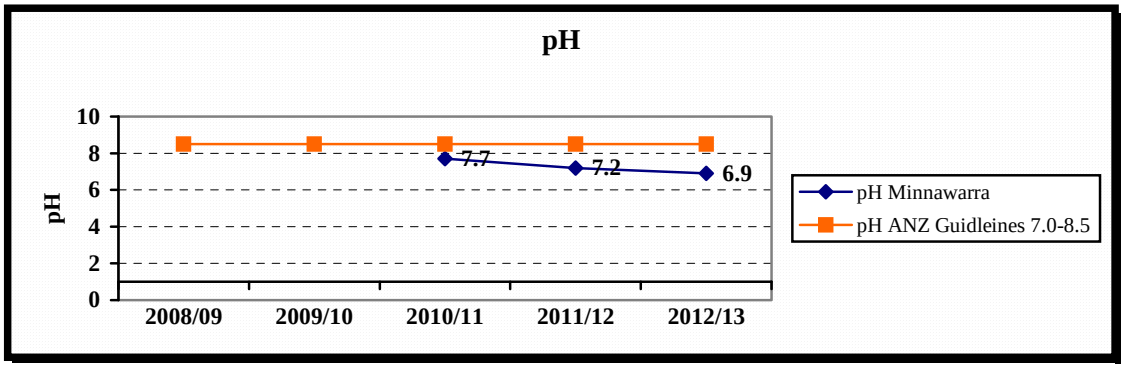
Ec is 310µS/cm and is low compared with ANZ Guidelines for Fresh & Marine Water Quality 2000 (SW Aust Wetlands) 300-1500µS/cm.

Ec levels have reduced to 310µS/cm over the last three (3) years of reporting and in a downward to stable trend.



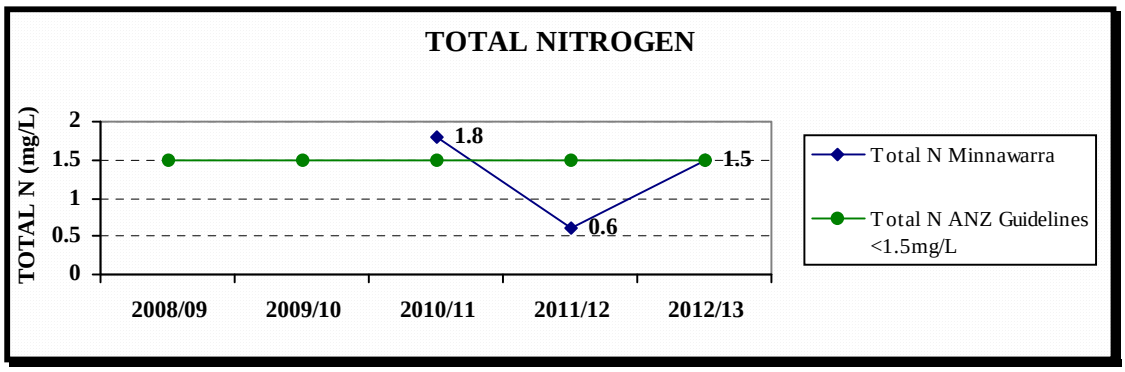
ACIDITY/ALKALINITY

pH is 6.9 and is optimum compared with ANZ Guidelines for Fresh & Marine Water Quality 2000 (SW Aust Wetlands) 7.0-8.5 and marginally lower than the previous year's reporting.



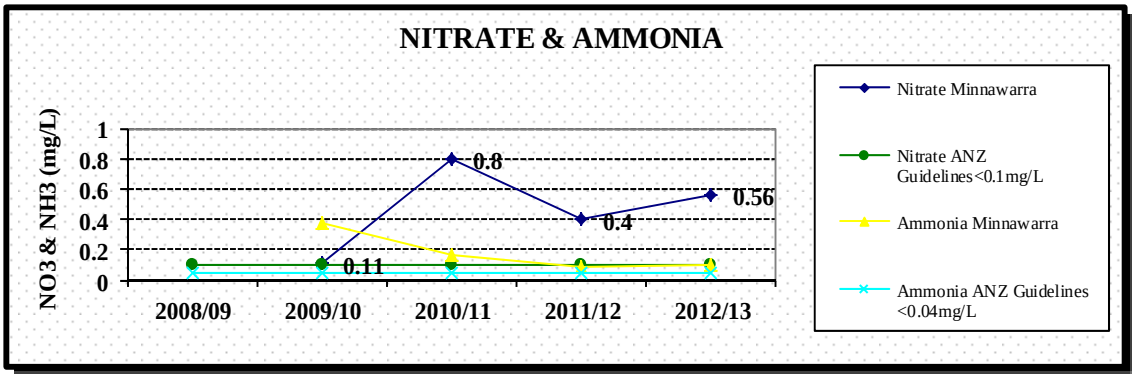
TOTAL NITROGEN

Total Nitrogen is reported as <2mg/l and is difficult to consider when compared with ANZ Guidelines for Fresh & Marine Water Quality 2000 (SW Aust Wetlands) <_1.5mg/L.



NITRATE & AMMONIA

Nitrate is high at 0.56mg/L compared with ANZ Guidelines for Fresh & Marine Water Quality 2000 (SW Aust Wetlands) <_0.1mg/L but is considerably higher than previous years reporting.
Ammonia is high at 0.10 mg/L compared with ANZ Guidelines for Fresh & Marine Water Quality 2000 (SW Aust Wetlands) _< 0.04mg/L but is slightly higher than previous years reporting.

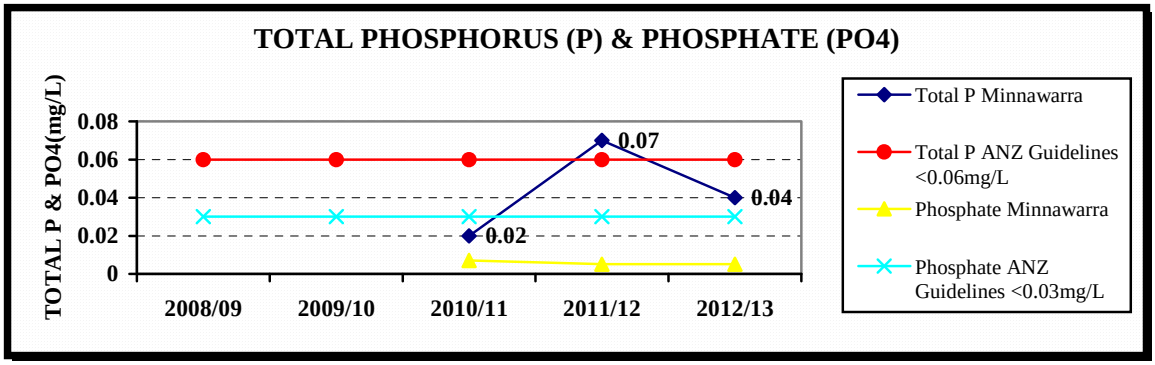


These fluctuations in the nitrate and ammonia levels which may be attributed to the lakes function as a drainage basin and the potential impact from land management practices further upstream or an increase in materials coming from the surrounding road network.

TOTAL PHOSPHORUS

Total Phosphorus is 0.04mg/L and is low when compared with ANZ Guidelines for Fresh & Marine Water Quality 2000 (SW Aust Wetlands) <_0.06mg/L and is moderately lower than last year's recordings.

These fluctuations in the Total Phosphorus levels may be attributed to the lakes function as a drainage basin and the potential impact from land management practices further upstream or an increase in materials coming from the surrounding road network.



PHOSPHATE (PO_4)

Phosphate is <0.005 and is non detectable when compared with ANZ Guidelines for Fresh & Marine Water Quality 2000 (SW Aust Wetlands) <_0.03mg/L.
These fluctuations in the Total Phosphorus levels may be attributed to the lakes function as a drainage basin and the potential impact from land management practices further upstream or an increase in materials coming from the surrounding road network.

LABRATORY REPORTS

mpl Laboratories
Part of the Envirolab Group ENVIROLAB GROUP
16 - 18 Hayden Court, Myaree, Western Australia
PO Box 4023 Myaree BC, Western Australia
Tel: +61 8 9317 2505 / Fax: +61 8 9317
email: laboratory@mpl.co
www.envirolabservices.co
Envirolab Services (WA) Pty Ltd ABN 53 140 0

Client:
Sports Turf Technology
PO Box 91
Como
WA 6952

Attention: Marie Egan

CERTIFICATE OF ANALYSIS 139345

Sample log in details:

Your Reference:	**Minnawarra**
No. of samples:	1 Water
Date samples received:	15/8/13
Date completed instructions received:	15/8/13
Location:	

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by:	16/08/13
Date of Preliminary Report:	Not Issued
Issue Date:	16/08/13

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Tests not covered by NATA are

denoted with *. Results Approved

By:

Sandra Garcia
Assistant Laboratory Manager

MPL Reference: 139345
Revision No: R 00

Miscellaneous Inorganics		
Our Reference:	UNITS	139345-1
Your Reference	----------	Minnawarra Lake
Date Sampled	----------	15/08/2013
Type of sample		Water
Date prepared	-	15/8/13
Date analysed Electrical	-	15/8/13
Conductivity water pH in	µS/cm	310
water	pH Units	6.9
Total Nitrogen (Total N)	mg/L	<2
Nitrate as N Ammonia	mg/L	0.56
as N	mg/L	0.10
Total Phosphorus (Total P)	mg/L	0.04
Phosphate as P	mg/L	<0.005

SPORTS TURF TECHNOLOGY

TO:	**Brad Sofield**	**FROM:**	**Ken Johnston**
Company:	**City of Armadale**	**Ref:**	**ACC020**
Phone:		**Phone:**	**9367 3568**
Fax:		**Fax:**	**9367 2843**
Date:	**20/6/13**	**Pages:**	**1 of 3**

RE: **Bore water analysis**

Introduction

Water samples were collected from 68 bores during the first two weeks of June 2013 and sent to MPL Laboratories for the analysis of pH, Electrical Conductivity and Total Iron.

Results

Bore	pH	Electrical Conductivity (µ/cm)	Salinity* (mg/L)	Total Iron (mg/L)
Guidelines	**6.0-8.0**	**<1800**	**<1000**	**<1.0**
Alfred Skeet	6.6	1800	990	0.15
Arion Estate Northerly	6.4	360	198	0.6
Arion Estate Northerly Cheltenham	6.4	250	137	0.69
Armadale GC Carpark	6.9	700	385	0.6
Armadale GC Clubhouse	6.6	830	456	0.84
Churchman Brook Centre	6.8	110	60	0.05
Churchman Brook Entry Statement	5.3	66	36	0.6
Heron Estate Homestead	6.5	1000	550	0.18
Heron Estate Wright Rd	6.2	850	467	0.62
Vertu Estate Horsham	6.4	1200	660	0.27
Vertu Estate Swartz	6.6	960	528	1.8
Karragullen	5.4	300	165	0.08
Karragullen 3	6	370	203	2
Marseille Gardens	6.3	880	484	4.9
Memorial Park	6.3	840	462	0.01
Newhaven Bluebeech	6.3	1100	605	5.5
Newhaven Bluestone	6.4	520	286	5.9
Skeet Memorial	6.8	2400	1320	8.8
Waterwheel	6.6	370	203	6.9
William Skeet	5.8	370	203	1.1
Abbey Rd	6.4	1300	715	1.5
Armadale waste facility	6.1	1400	770	0.57
Bob Blackburn east	6.1	510	280	0.02

Bob Blackburn flora	6.2	450	247	5.9
Brookdale Gardens east	5.7	590	324	3.4
Brookdale Gardens west	5.7	680	374	0.3
Bronzewing	6.3	480	264	0.13
Chiltern Estate Harber	7.4	1300	715	0.47
Corondale Estate Granada	6.1	210	115	0.02
Corondale Estate Pamplona	6.4	370	203	<0.01
Corondale Estate Salamanca	6	240	132	0.01
Dale Res	6.5	410	225	0.28
Depot Nursery	6.1	910	500	0.06
Depot Wash-down	6.1	810	445	0.04
Don Simmons	8.1	1400	770	0.74
Fletcher	5.8	2700	1485	0.04
Gwynne (Lotteries)	6.1	830	456	0.22
Gwynne (Millman Way)	6	1100	605	0.32
Gwynne (Scout Hall)	6.1	640	352	0.31
Reg Williams	6.3	310	170	0.03
Rotary	6	1000	550	0.02
Teal Brook	6.3	440	242	0.08
Wallaby	6.3	590	324	6.9
Arabian Ct	6.8	380	209	5.2
Abingdon	6.3	210	115	2.3
Palomino Old	7.3	1600	880	0.34
Palomino New Bore	7.4	810	445	0.61
Frye Pk - River Bore	7.4	900	495	0.95
Frye Pk Bore	7.2	3300	1815	2.3
Frye Pk Cabinet Bore	7.4	1700	935	22
Rushton Pk	7.4	510	280	0.7
John Dunn Cemetery	6.1	440	242	1.1
John Dunn Rugby	5.7	760	418	0.83
Springdale Top	5	240	132	0.4
Springdale Bottom	4.8	200	110	0.08
John Dunn Bank	6.1	450	247	6.6
John Dunn Tank	6.2	640	352	4.1
Cross Park	5.6	810	445	0.1
Creyk	6.1	650	357	<0.01

Champion Dr - Verdant Circuit	5.8	550	302	0.42
Champion Dr - Streetscape	6	800	440	0.02
Grovelands	5.8	1000	550	0.02
Matthew Scott	5.9	570	313	0.05
Fancote Park	7.9	6700	3685	2.5
Bryan Gell	6.5	580	319	2.7
Bernice Hargreaves	5.8	650	357	0.83
Bill and Eva Moore	6	400	220	3.1
Morgan	6.1	480	264	0.11

*** Salinity is calculated from the Electrical Conductivity using the standard conversion factor of 0.55**

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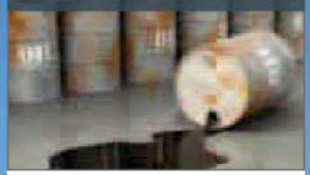

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WA STATE CONFERENCE 2014

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Dear Members and Friends

The IPWEA-WA Division's Conference Committee is proud to present the 2014 State Conference.

With this comes the invitation to you – and your colleagues – to register for this event which is themed "Create, Communicate, Deliver" – a reflection of what we do as public works professionals in every area of our work and responsibility serving the community at large.

We are doing things a little different this year. As an incentive for more country and regional members to attend, we have not only reduced the registration fees – since they will have to bear travel and accommodation costs – but also the dates of the Conference. In previous years, we have had our conferences running from Wednesday through Friday, with the Gala Dinner on the last day. This, unfortunately, has precluded a number of delegates from outside the metropolitan area to skip the Gala Dinner to return home to be with their families over the weekend. So, in order to encourage more of them to attend, we have shifted the conference dates from Tuesday, March 11 through Thursday, March 13 with the Gala Dinner on that Thursday evening.

Being a trial run, we are hopeful that this will prove popular with our country and regional members – since we would like them to feel truly inclusive in all our celebrations.

For the second year running, we are also offering Early Bird discounts for individual registrations. This will last until February 7 – after which date full registration fees would apply. As such, I would like to encourage you to register early in order to take advantage of the reduced fees. (Please note, however, that the Early Bird fee is not applicable to shared registrations.)

In choosing your conference streams, extended versions of the synopses are available on the on-line version of the conference brochure.

The objective of the WA State Conference is to build on the knowledge of public works professionals, provide updates on changes happening within – and related areas of – the industry, create opportunities for networking and, more generally, offer glimpses of an exciting future in the public works engineering sector. The broad range of topics and issues covered in the conference design reflect this purpose.

There are still some small bits in the conference programme that are yet to be finalised. You can stay updated anytime by keeping an eye on the Conference website ***http://www.cvent.com/d/d4q918.***

On behalf of the Organising Committee and the Executive of IPWEA-Western Australia, I would like to thank our sponsors and exhibitors for their continued support to the Institute and this Conference in particular.

Being labelled as 'THE engineering conference in WA', it is our pleasure to invite you to participate in this event – and we look forward to welcoming you on March 11.

.....
Alan Millard
2014 Conference Committee Chair

The Early Bird Rate will be valid from Monday 8 December 2013 to Friday 7 February 2014.

Standard Rates from Friday 7 February to Friday 28 February 2014

Registration Closes Friday 28 February 2014

CONFERENCE COMMITTEE

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City of Subiaco

Tom Stacey
Dept. of Transport

Ian Barker
Perth Airport

Tracey Pearce
City of Wanneroo

Taryn King
City of Nedlands

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KEYNOTE PRESENTERS

Professor Lyn Beazley *AO FTSE*
Chief Scientist of Western Australia

Professor Beazley was appointed Chief Scientist of Western Australia in 2006 to advise the Western Australian Government on science, innovation and technology. She has extensive experience serving on advisory bodies, including the Federal Government's Bionic Vision Australia and the State Government of Western Australia's Technology and Industry Advisory Council. Professor Beazley was awarded Officer of the Order of Australia in 2009 and made a Fellow of the Australian Academy of Technological Sciences and Engineering later that year. In 2011, she was inducted into the inaugural Western Australian Women's Hall of Fame. Professor Beazley is a Fellow of the Australian College of Educators and a Companion of Engineers Australia.

Eva Skira *MBA (Geneve), BA (1st Hons), FAICD, FAIM, Life Member FINSIA*
Chairman of the Board, Water Corporation

As a former executive in banking and finance, Eva Skira held positions as an economist and finance professional in corporate banking, institutional stockbroking, capital markets and derivatives. She joined the Commonwealth Bank as a graduate and subsequently worked with BZW Australia, a stockbroking subsidiary of Barclays Bank. Her clients included major Australian and Asian institutions.

Subsequently, Eva has had significant experience as a Board Member of various business, industry, professional, education, cultural and community organisations.

David Fyfe
2002 Bali Bombing survivor & Motivational Speaker

David is a humble and unassuming survivor of the 2002 Bali bombings which claimed the lives of over 200 people including 88 Australians.

His presentation uses examples of recovering from near death to living a full life, and the similarities linking this to developing and maintaining strength within any corporate and sporting culture.

His presentation encompasses:
- Coping with change
- Resiliency and overcoming adversity
- Taking control and owning situations.
- Success by taking one step at a time.
- Importance of maintaining a vision of the future.

Dr. Jacinta Delhazie
Dr Jacinta Delhazie was the 2008 Western Australian Science Student of the Year
Doctoral Candidate, UWA

Dr Jacinta Delhaize was the 2008 Western Australian Science Student of the Year and has recently completed a PhD at The University of Western Australia node of the International Centre for Radio Astronomy Research, better known as ICRAR. For the past few years she has been mapping hydrogen gas in the early Universe by combining weak signals from thousands of individual galaxies and stacking them together. ICRAR is a joint venture between Curtin University and The University of Western Australia providing research excellence in the field of radio astronomy.

Menno Henneveld
BE (Civil) UWA, Post Grad Dip Admin (Curtin), PMP
Hon FIEA, FATSE, FAICD, FCSIA, FCILT
Principal, Menno Henneveld Consulting

Menno was appointed Commissioner of Main Roads Western Australia in 2002, providing ten years of leadership for the State's $1.7 billion/annum road agency. Over this period the agency successfully delivered more than $6 billion of road infrastructure projects, $5.5 billion of road services with responsibility for managing the State's 18,000km and $42 billion road network.

Prior to his involvement with the road transport industry, Menno had an extensive career in the Water Industry in WA, providing Senior Executive leadership across a range of functional areas.

He has held many international, national and State positions, and recent achievements include: WA Professional Engineer of the Year, and National Professional Engineer of the Year for 2012, Engineers Australia; Awarded the inaugural Dr Ken Michael Gold Medal for outstanding service and commitment to Public Works Engineering in WA; Achieved International Silver standard and overall best performing organisation by Main Roads at the Australian Business Excellence Awards 2011.

Glenn Mitchell
Former ABC TV/radio Leading Sports Broadcaster/ Author & Mental Health Speaker

For more than two decades from early 1990 to 2011, Glenn Mitchell lived a life that many envied. As a sports commentator for the ABC, and married to fellow broadcaster, Karen Tighe, he travelled the world covering elite level sport.

During his tenure with the national broadcaster he commentated on four Olympic and four Commonwealth Games and called over 190 international cricket matches, covering 12 overseas tours. Back home, he commentated more than 900 AFL and WAFL games, was the host of the iconic SATURDAY SPORTSTALK, and commentated on myriad sports.

But all through this period, Glenn was a sufferer of mental illness. In late 2006 he finally realised he needed medical help for his condition. Thus started a long and complex journey of self-analysis and various medications as he endeavoured to overcome his illness.

Chris Champion
MBA (Geneve), BA (1st Hons), FAICD, FAIM, Life Member FINSIA
National CEO, IPWEA

Chris Champion has 30 years experience in Local Government and 13 years in Association Management.

He took up the position of Chief Executive Officer of the Institute of Public Works Engineering Australasia (IPWEA) in the year 2000. For the 12 years prior to this, he was Director of Engineering Services in western Sydney.

IPWEA is recognised internationally as leaders in the implementation of sustainable approaches to infrastructure asset management and financial planning.

Athanasios (Arthur) Kyron
Chief Executive Officer Town of Victoria Park

MEANING OF LIFE?
For the Town of Victoria Park to develop in a way that keeps its unique and quirky edge, by embracing the new and connecting with the old we will keep life in the community.

Arthur has worked in various State Government Departments and established and run his own businesses. In 1987 he was selected in the Executive Development Year in the State Public Service where he participated in senior executive placements.

Arthur's background in Social Welfare makes him passionate about community development and he views local government as the foundation to a strong and proud community.

DAY ONE: TUESDAY 11 MARCH 2014

8.00am 8.30am	**REGISTRATIONS AND COFFEE**	
8.30am 9.00am	**WELCOME & OFFICIAL OPENING**	Welcome, Housekeeping by MC John Ambrose Welcome to Country Welcome from Alan Millard, Conference Convenor Welcome from City of Fremantle Mayor, Brad Pettitt
9.00am 9.45am	**KEYNOTE PRESENTATION**	**Bringing Our Stakeholders Along on the Journey** Eva Skira, Chairman of the Board, Water Corporation
9.45am 10.30am	**KEYNOTE PRESENTATION**	**Create, Communicate, Deliver: Parallels for IPWEA & Public Works Professionals** Chris Champion, IPWEA National CEO *The conference theme is equally relevant to IPWEA as it is to public works professionals. Parallels and connections will be drawn between the Institute and our professional lives. A reason for our existence as a professional body is ensuring relevance to our careers and daily work lives.*
10.30am 11.00am	**MORNING TEA**	

CONCURRENT SESSION ONE

THEME	TRANSPORT	URBAN DEVELOPMENT	REGIONAL ISSUES
11.00am 11.30am	**Local Area Traffic Management and Cycling – Getting it Right** **Presenter:** Edward Rose, Pedestrian and Cycling Coordinator, Main Roads WA *As part of the Western Australia Bicycle Network Plan a review of LATM was undertaken to ensure that bicycle riders were not adversely affected by these measures. Various situations were looked at to determine the best practice that should be applied.* *This presentation will discuss the results of the investigation and which measures have been beneficial for all road users including bicycle riders and those that have created or exasperated problems for bicycle riders.*	**Changes and Challenges Occurring in Perth** **Presenter:** UDIA *This presentation will provide information from the development industry perspective of the changes and challenges that are occurring in Perth.*	**Coastal Erosion Studies** **Presenter:** Glenn McCormack, Environmental Engineer, Damara *This presentation will cover the recently completed Coastal Erosion Studies covering the Back Beach (Indian Ocean shoreline) and the Koombana Bay Erosion, which has potential to take out the Dolphin Discovery Centre and other adjoining infrastructure.* *Presented on behalf of the City of Bunbury*
11.30am 12.00pm	**Town of Victoria Park Integrated Movement Network Strategy** **Presenters:** Anthony Vuleta, Director Renew Life, Town of Victoria Park & Chris Swiderski, Manager, Transport and Land Use Planning, WorleyParsons Consulting *The Town of Victoria Park completed the development of its Integrated Movement Network Strategy (IMNS) in mid-2013 after a year's development and nearly two years in planning.* *The IMNS is a successful example of how Local Authorities can be progressive within the planning process and be leaders rather than be reactive to key strategic issues that are increasingly critical in the Perth Metropolitan Region. Experiences and outcomes can be taken from the IMNS process and applied throughout the Metropolitan Region by Local Authorities.*	**Predicting Seasonal Variation and Mounding of Groundwater in Shallow Groundwater Systems** **Presenter:** Kelly Norris, Consultant Engineer, Essential Environmental *This presentation will examine key influences on shallow groundwater systems, current capabilities of our purpose built software, and through inspection of selected case studies; how application of a unique software solution can facilitate a deeper understanding of processes involved and the theoretical performance of management systems.*	**Deconstruction of the Bunbury Jetty** **Presenters:** Jason Gick, Manager Engineering, City of Bunbury & Peter Doust, Senior Engineer, MP Rogers & Associates *The jetty construction in 1864 transformed Bunbury from a small country town into a bustling Port and was extended numerous times over the next 100 years. In 1982 the jetty was closed as a working entity. The City of Bunbury accepted responsibility for the jetty in 1995 and subsequently expended more than $1m in maintaining the structure between 1998 and 2011 when legal advice resulted in the jetty's permanent closure.* *This presentation will cover the 4 million dollar deconstruction of the Bunbury Jetty, including managing the challenges created by the public, stakeholder and regulatory bodies expectations.*

12.00pm
12.30pm

MAX Light Rail Project
Presenter: Dave Thomas, MAX Project Director, Dept. of Transport

The project has some interesting challenges which will be addressed including; What are the major risks for the project?; How is the project dealing with the utility services?; How do we gain the support of our key stakeholders?; What are the legislative requirements?; How will the light rail interact with the local infrastructure networks like roads, cycle ways and footpaths?; and Where do you build a depot area to store and maintain the fleet?

This presentation will introduce the proposed new light rail system set to power Perth's public transport into the future. It will explain the need, first stage alignment and likely timeframe for procurement, implementation and operation and how to keep on track!

Design with Nature - The Path Less Travelled
Presenter: Markus Botte, Manager Technical Services, City of Gosnells

The urban development industry has embraced and implemented various Water Sensitive Urban Design (WSUD) projects, with the understanding that this may lead to improved amenity, safety and enhanced liveability outcomes as well as minimisation of development costs.

This presentation presents a critical review of current "business as usual" approaches to urban development and suggests ideas for developing alternative methods that may be able to sustainably deliver Greenfield urban growth in a constrained setting.

Local Government Structural Change to Achieve Major Infrastructure Development
Presenter: Geoffrey Shoemark, CP Eng., Dip Eng., Grad Dip Local Government Eng., Fellow IPWEA, Member Eng.Aust.

"The productivity of the nation is tied to the health of the Pilbara Region and the productivity of the region is tied to the liveability", Karratha 2020 Vision and Community Plan, 2009, Shire of Roebourne.

This presentation will address the challenges that confronted the Shire of Roebourne in 2009 when it embarked on a very challenging program of facility infrastructure development within the local authority. This presentation will also outline how successful the creation of the Strategic Projects Department was, and the policies, administrative processes and systems that were developed to effectively manage a program which was valued in the order of $150 million, and how they were implemented to produce a very successful outcome after four years.

12.30pm
1.30pm

LUNCH

THEME	TRANSPORT	PARKS & ENVIRONMENT	RESEARCH & PROJECTS
1.30pm 2.00pm	**Traffic Forecasting for Local Government Planning Using the Main Roads Regional Operations Model** **Presenters:** Richard Isted, Senior Transport Modeller, SKM & Wesley Soet, Transport Modelling Manager, Main Roads Western Australia *The Regional Operations Model (ROM) developed and maintained by Main Roads is a useful, easily accessible tool for local government planners that can be used for forecasting traffic on the district distributor level road networks.* *This presentation looks at the different outputs that can be obtained from ROM, and which are the most applicable to different forecasting situations. Additionally, consideration to appropriate methods for adjusting forecasted traffic volumes with respect to current traffic volumes (often referred to as pivot point or incremental approaches to forecasting) and changes in public transport accessibility is discussed.*	**Licensing Reform – What does the future hold?** **Presenters:** Margaret Dunlop, Senior Consultant & Bart Downe, Senior Consultant, Strategen *The word 'reform' is on everyone's lips right now. From overhaul of the water licensing system to the splitting of the Departments of Environment and Conservation, a period of change is upon us, with consequences for local government and land development sectors.* *This presentation addresses the changes that may impact these sectors from: The review of groundwater and surface water licensing and allocations proposed under the Securing Western Australia's Water Future (SWAWF) process; and the Overhaul of the DER licensing system through the REFIRE (Re-engineering For Industry Regulation and Environment) program.*	**Recycling Asphalt** **Presenters:** Scott Chatwin, Director, Asphalt Recyclers Australia *This presentation will cover research on recycling asphalt and the quality of product through the use of 100% Hot Asphalt which has been tested in the UK and is being implemented in Australia.*
2.00pm 2.30pm	**Road Design for Motorcyclists** **Presenter:** Dr Paul Roberts, Team Leader, Safe Systems, ARRB Group *In 2009 the WA Road Safety Council supported a series of Motorcycle & Scooter Action Group Forums (MSSAG). The intent was to address increasing trends in motorcycle and scooter involvement in serious crashes.* *As part of the safe system approach it is important to design and build a forgiving road environment for all road users.* *This presentation will detail the process of how Main Roads WA, in conjunction with ARRB Group and the Motorcycle Riders Association, developed the Instructional DVD to make roads motorcycle friendly and showcase selected content.*	**Conceptual Site Models (CSM) and Their Use in Contaminated Site Investigation, Management, and Future Development** **Presenter:** David James, Senior Environmental Engineer, Cardno *A conceptual site model (CSM) is an invaluable tool in the planning process that shows the connection between contamination sources, receptors (site users) and exposure pathways between those sources and receptors.* *This presentation will detail the use of CSM in a general senses and its use in communicating contaminated site characteristics.*	**Meeting the Demand for a High Quality Sand Resource in Western Australia** **Presenters:** David Cooling, Global Refining Residue Technical Manager, Alcoa World Alumina. *The extraction of alumina from bauxite produces a high volume by-product which is typically stored in secure impoundments adjacent to the alumina refinery.* *This presentation outlines investigations into re-processing the coarse residue fraction to produce a valuable, high quality resource for the recreational, land development and construction sectors where current sand resources are limited.*

2.30pm 3.00pm	**Combining Improvements to Cycling Infrastructure and Travel Behaviour Change Techniques through the Connecting Schools Grant Program** **Presenter:** Jade Lam Sin Cho, Transport Planner, Depart. of Transport WA *This presentation will explore the unique structure of the Western Australian Bicycle Network (WABN) Plan and the Connecting Schools Grant Program and the integration of the roles of each party in funding, administering infrastructure improvements and compulsory travel behaviour change techniques, the types of projects that were funded, lessons learnt from the first round of the program and whether the desired travel behaviour change was achieved.*	**Eric Singleton Bird Sanctuary Wetland Restoration Project** **Presenters:** Simon Cleary, Senior Water Resources Manager & Priscilla Fortier, Civil & Environmental Engineer, GHD & Jeremy Maher, Environmental Coordinator, City of Bayswater *The City of Bayswater and Swan River Trust developed the Local Water Quality Improvement Plan (LWQIP) for the Bayswater Brook to improve the ecological function and community enjoyment of this waterway. A key action of this plan was the Eric Singleton Bird Sanctuary (ESBS) wetland restoration project.* *This presentation will present the policy environment, key design considerations, challenges and innovations along with details of construction progress, which will have begun around the time of the conference.* *Project Partners – Swan River Trust, DEC, Water Corporation*	**Cockburn Sound Coastal Alliance - An Approach to Assessing Coastal Vulnerability and Value at Risk** **Presenter:** Douglas Vickery, Manager Infrastructure Services, City of Cockburn *This presentation addresses how a group of local governments have teamed with state and federal agencies and have taken on this task. It details the journey taken by the Alliance, the knowledge gained and the obstacles encountered to achieve the outcomes to date. The presentation provides an opportunity to reflect on the challenges (potentially common to other coastal regions) faced by local government authorities lacking in-house coastal engineering expertise to come to understand the behavior of complex coastal systems, particularly when existing data is limited.*
3.00pm 3.30pm		**AFTERNOON TEA BREAK**	
3.30pm 5.00pm	**PLENARY SESSION**	**LOCAL GOVERNMENT REFORM: THE WA EXPERIENCES** Presenters: Anthony Vuleta, Director Renew Life, Town of Victoria Park; Doug Pearson, Director Technical Services, City of Bayswater; Gary Stevenson, CEO, City of Perth; Lyn Russell, CEO, City of Canning, Graeme Mackenzie, CEO, City of Fremantle; and Tony Brun, former CEO, City of Greater Geraldton	
5.00pm	**CLOSE OF SESSIONS**		
5.00pm 6.00pm	**SUNDOWNER & OFFICIAL OPENING OF THE INDUSTRY EXHIBTION**		

DAY TWO: WEDNESDAY 12 MARCH 2014

7.30am 8.30am		**REGISTRATIONS AND COFFEE**
8.30am 9.30am	**WELCOME & OFFICIAL OPENING**	Welcome, Housekeeping by MC John Ambrose President's Address, Doug Pearson, President, IPWEA WA Platinum sponsor address The Hon. A (Tony) J Simpson MLA, Minister for Local Government; Community Services; Seniors & Volunteering The Hon. David Templeman MLA, Shadow Minister for Local Government & Community Services
9.30am 10.00am		**MORNING TEA**
10.00am 10.45am	**KEYNOTE PRESENTATION**	**From WA to the Edge of the Universe and Back Again** Dr Jacinta Delhaize, University of Western Australia *When completed in 2024, the SKA will be the world's largest and most sensitive radio telescope. Thousands of high-tech dishes and millions of static antennas will spread over two continents, Australia and Africa. With its enormous collecting area and wide field of view, the SKA will have 50 times the sensitivity and 10,000 times the survey speed of today's best instruments. It will be unlike any other scientific instrument and will require revolutionary new technology in fields such as high performance computing and manufacturing techniques. The project is led by the SKA Organisation, headquartered near Manchester in the United Kingdom. It consists of ten member countries: Australia, Canada, China, Germany, Italy, Netherlands, New Zealand, South Africa, Sweden and the United Kingdom.* *In this talk Dr Jacinta Delhaize will provide an overview of the groundbreaking Square Kilometre Array radio telescope along with an update of where the project is currently at and what to expect in the near future.*
10.45an 11.30am	**KEYNOTE PRESENTATION**	**Challenges and Opportunities to Engineer a Better Western Australia** Professor Lyn Beazley AO FTSE, Chief Scientist of Western Australia *As Chief Scientist of Western Australia, I was privileged to witness just how major a contribution engineers, in the Public and private sectors, make to our great State. So many aspects on our lives depend on engineering expertise for major infrastructure and other programs in key areas such as water, environment, agriculture, energy, transport and human health. Our future on this amazing planet depends on getting these things right. Not least of the challenges will be to ensure that we reach out to enthuse our brightest and best young people, both young women and men alike, to train as engineers and harness the opportunities open to them.*
11.30am 12.15pm	**KEYNOTE PRESENTATION**	**Doing More with Less - Best value outcomes from Road Infrastructures spending** Menno Henneveld, Principal, Menno Henneveld Consulting *Local Government road infrastructure comprises the assets or road network needed to provide people with access to economic and social facilities and services. These infrastructure facilities generally have high capital costs, are time consuming to plan and build; have a long life, are durable and have low operating costs. They often have economic, environmental and social benefits that are not fully recovered by user charges.* *This presentation considers the major issues facing road network managers in Local Government. One of these issues is inadequate funding for effective asset management. This may adversely affect the sustainability of the road network. The presentation touches on the manner in which better sustainable outcomes can be achieved within the resource constraints facing road network managers in local government.*
12.15pm 1.15pm		**LUNCH**

CONCURRENT SESSION ONE

Theme	COASTAL ISSUES	STORMWATER	ROADS	REGIONAL ISSUES
1.15pm 1.45pm	**The Value of Coastal Monitoring in Responding to the Challenges of Sea Level Rise and Coastal Management** **Presenter:** Dr Neil Carroll, Manager Marina and Waterways, City of Mandurah *Mandurah's coastline consists mainly of sandy and limestone perched beaches and are highly valued by the community. The sandy beaches display an ongoing trend of erosion which is reducing the buffer between the ocean and adjacent infrastructure.* *This presentation will outline the methods that have been adopted to monitor the beaches.*	**Music Modelling and WSUD** **Presenter:** Changeeka Jayakody, Design Engineer, Engineering & Technical Services, City of Canning *This presentation will cover the: importance of treatment of the first flush and the sort of material that should be removed from the stormwater; Various elements that should be used in treatment of stormwater including Buffer strips, bio retention, swales, and other various elements; Modelling of various elements in MUSIC (water quality model); Assumptions based in the Rainfall runoff model of MUSIC; Calibration of rainfall runoff parameters; and Model used in estimating the reduction of pollutants in MUSIC.*	**Asphalt Pavements For Life** **Presenter:** Bevan Sullivan, National Technical Manager, Fulton Hogan *This presentation will provide information on the current position of a long term study involving AAPA/ARRB/ Austroads and involves the testing of asphalt mixes from all states and territories in Australia, comparing characteristics. Results are being checked and verified with the National Centre for Asphalt Technology, NCAT in the USA.*	**Asset Management and the Rural Council - An Unexpected Journey** **Presenter:** Gavin Harris, Director Engineering Technical Services, Shire of Esperance *This presentation is about one rural Councils journey of discovery from the unknown to the known and how the Shire of Esperance went about its asset management journey.*

1.45pm 2.15pm	**WA Department of Transport - Coastal Zone Monitoring, Management, Infrastructure and Grant Funding** **Presenter:** Karl Ilich, Coastal Engineer, WA Dept. of Transport *The Department of Transport (DoT) collects, analyses, archives and distributes information and data relating to the coastal environment in Western Australia. This information is primarily used to plan, design, build, maintain and manage maritime facilities across the state.* *This presentation summarises DoTs role in coastal management and the provision of coastal infrastructure around the state.*	**Innovative Storm Water Management, Water Harvesting initiatives including recharging the Aquifer as a solution to Shenton Park Flood Mitigation** **Presenter:** Kumar Vadivale, Manager Infrastructure Services, Kanwal Singh, Principal Engineer, & James Hambly, Coordinator Integrated Transport, City of Subiaco *This presentation will cover the City of Subiaco's commission of a study by a consultant to investigate the entire catchment contributing towards Shenton park and develop options and ways of controlling the flooding, and the implementation of Preventative measures which were implemented in the stage 1 as emergency works to deviate the stormwater away from the valley along Austin street, Arthur Street, Rosalie street, Hensman Road, Henry Street and William Street.*	**Achieving Engineering Accuracies Using Mobile Laser Scanning** **Presenters:** John Nolan, Manager Geospatial & Gavin Taylor, Senior Civil Engineer & Business Development Manager, McMullen Nolan Group *In 2009 we identified a need for high accuracy corridor surveys and began developing a Mobile Laser Scanning System that has recently resulted in a custom developed, built for purpose MLS vehicle – Cirrus.* *This presentation explains how we can comply with the various Local Government and Main Roads Authorities standards across Australia whilst using MLS as the nominated project solution. The future of 3D Laser Scanning will be discussed, including a live demonstration of ground breaking pointcloud viewing software.*	**Challenges and Opportunity of Local Government Councils** **Presenter:** Anup Paudel, Manager Technical Services, Town of Port Hedland *This presentation is about where Local Government could be in next 20-25 years and how the changing technology, diversity and expectations of the people in the community may shape the LG councils in Australia and will encouage the LG councils in the Australia to think forward to deliver the better services to meet the higher expectation of the people. It will point out the strategy the LG councils should adopt to change itself according to the time and expectations of the people in the community.*
2.15pm 2.45pm	**Planning on a Marina? – Let the Business Case Lead the Process** **Presenters:** Clinton Doak, Senior Engineer & Mick Rogers, Senior Principal, MP Rogers & Associates PL *A new marina must have both planning and environmental approvals. These consider a wide range of issues including safe operations and navigation; impacts on the marine ecosystem; water quality; ocean storm surge; sediment dynamics; seagrass wrack dynamics; and climate change.* *This presentation will cover and discuss the key issues for a few marinas and small boat harbours will be presented and discussed.*	**Implementation of the Small Rainfall Event Management Criteria for the Achievement of Water Sensitive Urban Design - How Are We Travelling?** Presenter: Bill Till, Supervising Engineer, Urban Water Management, Department of Water *In June 2011, the Water Sensitive Urban Design – Brochure Series were published to provide more accessible and targeted information for designers and asset managers of stormwater management infrastructure. How are the recommended stormwater management approaches being applied?* *Join us for a brief presentation on stormwater management approaches, including the criteria for managing small rainfall events, followed by a discussion amongst conference delegates about the application of these approaches.*	**Title to be Advised** **Presenter:** James O'Grady, Civil Engineer, Uretek Ground Engineering *The Uretek method is used to compact solid beneath structures and roadways. This presentation will include an overview of the Uretek method, some recently completed road, drainage and building projects in Australia and an overview of the technologies being used by Uretek to remediate soils below structures in the Christchurch recovery.*	**Esperance Waterfront Project** **Presenter:** Gavin Harris, Director Engineering Technical Services, Shire of Esperance *This presentation will outline the Esperance Waterfront Project, a $60 million 4 stage redevelopment of arguably the best foreshore in Western Australia, and how the Shire of Esperance took the lead role and is currently managing the single biggest project it has ever attempted.*
2.45pm 3.15pm	**AFTERNOON TEA BREAK**			
3.15pm 5.00pm	**PLENARY**	**The Changing Lay of the Land** The Hon. John Day MLA, Minister for Planning; Culture & The Arts Followed by a Panel Discussion, chaired by Doug Pearson, President, IPWEA WA, comprising of Reece Waldock, Director-General for Transport; Paul Rosair, Director-General for Regional Development; Cliff Weeks, Director-General for Aboriginal Affairs and Paul Lakey, President, UDIA WA.		
5.00pm	**CLOSE OF SESSIONS**			
5.00pm 6.30pm	**NETWORKING SUNDOWNER**			
7.00pm 10.00pm	**NETWORKING DINNER – SPONSORED BY BORAL**			

DAY THREE: THURSDAY 13 MARCH 2014

8.00am 8.45am **REGISTRATIONS AND COFFEE**

8.45am 9.00am **WELCOME TO DAY 3**

9.00am 9.45am **KEYNOTE PRESENTATION**

Life Changing Events: Dealing with Change
David is a Bali Bombing Survivor & Motivational Speaker
David was in the wrong place at the wrong time: on the 12th October 2002, David survived the devastating bomb attacks in Bali. David was inside Paddy's Bar when a suicide bomber walked in and set off a backpack bomb just metres from where he was standing. Despite being severely injured, he managed to get outside just as a second much larger bomb detonated outside the Sari Club across the road.

David has made an amazing recovery and will talk about how he has moved on with his life and applied all he has learned about overcoming the physical and mental challenges to the corporate and sporting world and how is in, as he terms it, "the best place in his life".

9.45am 10.15am **KEYNOTE PRESENTATION**

Mental Health – It's Everyone's Business
Glenn Mitchell, Former ABC TV/Radio Leading Sports Broadcaster, Author & Speaker
In a motivating, inspiring, informative and entertaining presentation Glenn will share his journey with mental illness, from denial, to action and recovery. Learn some of Glenn's stress management techniques and discover how to implement real work/life balance skills that have lasting results.

10.15am 10.45am **MORNING TEA**

CONCURRENT SESSION ONE

THEME	LEADERSHIP	INNOVATION	ASSET MANAGEMENT	LEISURE
10.45am 11.15am	**Using Innovation and Leadership to Influence, Create and Sustain positive Organisational Culture in the post GFC era** **Presenter:** Jon Bilson, Regional Manager - WA/SA, ARRB Group *With an emphasis on the important role of innovation, this presentation will focus on what is required of leaders to be effective in developing and maintaining positive corporate culture in today's fluctuating economy. Drawing on the results of recent global research, this presentation focuses on how organisations can re-think their approach to leadership and how they can use innovation to impact positive cultures that will ultimately create, communicate and deliver success.*	**Creating Value Through Productivity** **Presenter:** John Taya, Executive Director Organisational Development, Main Roads Western Australia *This presentation will cover the Main Roads 2020 Strategy which has a focus on creating value, efficiency, a sustainable future and confidence to take on challenges, as well as outlining the outcomes of the productivity approach which have already shown: Effective resource allocation to work of the highest value to Main Roads and the community; Value for money by delivering work with the best mix of resources, cost and quality; and Innovation through finding new ways to fill needs, balancing corporate impact and effort.*	**Wealth Custodianship – Beyond Asset anagement** **Presenter:** Andrew Bruce BE MBA FIEAust FIPWEA FAIM *Wealth Custodianship is the highest duty of all Boards and is the duty of caring – i.e. managing and maintaining the value of the organisation's assets to perform each and every designated task. This duty requires a full understanding of the physical, financial and investment requirements of keeping assets at the necessary capacity to deliver the designated services on a continuous basis.*	**Solar Heating of the Bunbury Swimming Pool** **Presenter:** Richard Duke, City of Bunbury *This presentation will cover the solar heating of the Bunbury Swimming Pool, which was the largest solar heating project in WA when it was completed last year.*
11.15am 11.45am	**Keeping the Flame Alive** **Presenter:** John Ambrose, Executive Manager, IPWEA WA *The greatest challenge supervisors and managers face each day is Managing People – their Human Capital. As the most valuable resource any organisation has, people are its greatest asset – and, sometimes, its biggest liability. Engineers, in particular, find it very challenging – because they are trained to work on the basis that two-plus-two add up to four and all the laws of physics and chemistry are both absolute and accurate.* *This presentation will focus on how to train a good engineer to manage people well – and what you have is the best CEO in the business!*	**Taking the Design Team Forward** **Presenter:** Terence Pailing, Former Manager Engineering Design, City of Stirling *As the Manager Engineering Design at the City of Stirling, Terence was able to meet the challenge his Director issued for all construction projects listed on a budget in July to be fully designed and issued for construction by 31 December the previous year. In this presentation, Terence will describe how a combination of People, Planning, Processes, Project management and Performance management helped to achieve this enviable target.*	**Asset Management on the iPad and iPhone** **Presenter:** Hein Aucamp, Director, WA Integrated Asset Management *This presentation will address the following: The growth of mobile computing (and indeed social media) in Asset Management; Issues in choosing between Android and iOS (iPad and iPhone) development; Capabilities of the Apple devices that are suited to Asset Management; Dedicated Apps vs Web-based solutions; User expectations for mobile solutions; An overview of the development process; A demonstration of available functionality that he has programmed and other items of interest.*	**Development of the Karratha Leisureplex – A One Stop Regional Leisure Facility** **Presenter:** Geoffrey Shoemark, CP Eng., Dip Eng., Grad Dip Local Government Eng., Fellow IPWEA, Member Eng.Aust. *This presentation will aim to explain the process of extensive forward planning that ensured a functional cost effective design at a realistic cost that has now created a benchmark leisure facility that can be used as an example for similar growing regional and outer metropolitan local governments. Additionally as part of the development, lessons have been learned that can be passed on and used in any sized leisure and sporting infrastructure development.*

11.45am 12.15pm	**Leading while learning** **Presenter:** Kim Sedgwick, National Chair, Young IPWEA & Operation Manager Systems, ARRB *The best thing about Leadership is that it is not defined by how old you are, you can be a solid leader at any age. The balance which you have to achieve being a young leader is ensuring that you are learning as much as you can from those around you, and acknowledging the fact that you do not know all the answers whilst maintaining the respect of your teams. Being a successful leader is playing to people's strengths and acknowledging gaps, filling the gaps with people who have the strengths. As a young leader in a technical organisation, acknowledging weaknesses and ensuring that the teams are supported work to their full potential is the main focus. Leading by providing guidance and working through issues can be more effective in achieving goals than directing a team in their every movement. Kim's presentation focuses on the challenges and successes she has had in being a leader early in her career.*	**Innovation and Digital Technologies driving Organisational Transformation** **Presenter:** Daniela Mattheys, Executive Director Industry & Innovation, Dept. of Commerce *Two significant global transformational trends are shaping the way in which governments, industry and communities operate. The first involves a global shift in social and economic practices, driven by innovative digital technologies and trends including cloud computing, immersive visualisation, mobility, social media and Big Data. The second is the adoption of innovation to realise more efficient, productive and cost effective products or processes and more sustainable organisational practices. Increased access to information through digital technology will lead to better service delivery, forecasting, engineering and urban design outcomes, but only if we challenge existing paradigms and the way in which we do things.*	**Lifecycle Modelling using dTIMS for Assets other than Roads** **Presenter:** Dale Hughes, Asset Management Team Leader, Talis Consultants *This presentation will outline how as part of the ROMAN II package, tools such as dTIMS have been readily recognised to model the future requirements of road networks. What is often not recognised is that the system can be configured to cater to most asset classes. The same approach applied to road networks, in that with the development of an appropriate model that will determine how and under what circumstances an asset will deteriorate, can be applied to any asset class.*	**Adventure World** **Presenter:** Chris Stimson, Maintenance & Engineering Supervisor, Adventure World *This presentation will provide information on one of Perth's most popular theme parks and family destinations during summer, including design of the venue, maintenance of the gardens and infrastructure, water usage: recycled water and the volume used*
12.15pm 1.15pm		**LUNCH**		
1.15pm 1.45pm	**PLENARY SESSION**	**The Muses of Art and Local Government** Arthur Kyron, CEO, Town of Victoria Park *Art in local government can be a controversial topic; so it should be. Artistic expression is an indication of the advancement of the culture of a community and nation. It is an expression of maturity and change. The growth of art in the community signalled the golden age of Greece; championed by the 9 muses in Greek mythology art is expressed by way of nine themes. The muses were brought to life to disremember the evil and relieve the sorrows. Artistic expression has been synonymous with advances of many nations over time. In this age of economic rationalism and cutbacks, local government needs to bring to life the muses of art. Victoria Park Council has seen the importance of art and has invested many thousands of dollars in advancing the expression of art in the community; this paper tells you why and how it has worked.*		
1.45pm 2.15pm	**BEST PAPER PRESENTATION**	**Details of this presentation will not be released until the day.**		
2.15pm 2.30pm	**NATIONAL**	UPDATE		
2.30pm 2.45pm	**YOUNG IPWEA**	UPDATE		
2.45pm 3.00pm	**CONFERENCE WRAP**	IPWEA State President		
3.00pm	**CLOSE**			
6.00pm 6.30pm	**PRE DINNER DRINKS**			
6.30pm Midnight	**GALA DINNER AND AWARDS NIGHT** Music By: *Three Merry Gentlemen and Nearly Famous, Entertainment: Peter Rowsthorn*			

SOCIAL PROGRAM

Tuesday 11 March 2014

Networking Drinks in the Exhibition Area
5.00pm – 6.00pm
Join us for drinks and refreshments in the Exhibftion Area.
See the products and services available in the industry from leading suppliers to our industry.

Wednesday 12 March 2014

Networking Drinks in the Exhibition Area
4.15pm – 5.30pm

Poolside BBQ Networking Dinner
Sponsored by Boral
7.00pm – 10.00pm
After a long day of conferencing, you are invited to join us for a BBQ dinner.

Unwind and relax in the pool area with a drink and BBQ dinner. Take a dip in the pool or relax in the spa and catch up with your colleagues in an atmosphere designed for good yet relaxed networking opportunities.

Tickets for partners attending the BBQ dinner are available for purchase.
Cost: $120 each including GST.

Thursday 13 March 2014

Pre-dinner Drinks
6.00pm – 6.30pm
Join us before the Gala Dinner for pre-dinner drinks and networking between 6.00pm and 6.30pm.

Gala Dinner
6.30pm – Midnight
Gala Dinner Attire: Formal/Black Tie

Put on your best outfit and your dancing shoes to join us for the annual Gala Dinner at 6.30pm.

Finish the Conference off with this opportunity to catch up with colleagues and industry leaders over a delicious three course meal and drinks while listening to a range of beautiful background music provided by the Three Merry Gentlemen.

The Awards Night to honour individuals within the industry will also be included as part of the Gala Dinner.

Once the formalities of the evening are over, entertainment will be provided by comedian Peter Rowsthorn and the band Nearly Famous, who are back by popular demand to play music guaranteed to get you up on the dance floor.

The Gala Dinner is the perfect way to end the 2014 State Conference so be sure to book early so you don't miss out.

Tickets for partners attending the Gala dinner are available for purchase.
Cost: $145 each including GST.

IPWEA WA ENGINEERING EXCELLENCE AWARDS

The following awards will be presented during the conference dinner on Thursday 13 March 2014.

Applications are open for the IPWEA WA Engineering Awards for Excellence. For an application form, please visit the IPWEA website: www.ipwea.asn.au or contact the Conference Organiser, Cathy Higgs via events@ipwea.asn.au

FJ BRYANT OUTSTANDING SERVICE AWARD

This award recognises outstanding service to the Institute of Public Works Engineering (WA) on behalf of an individual or organisation.

GK WATTERS LOCAL GOVERNMENT ENGINEERING EXCELLENCE AWARD

This award recognises excellence in the design and construction of local government engineering projects and is one cif the few opportunities local government engineering has to achieve peer recognition in Western Australia.

BEST CONFERENCE PAPER AWARD

Awarded to the best conference paper presented at the annual conference. The paper is assessed on technical merit, contribution to the advancement of knowledge for IPWEA members and presentation.

INNOVATIVE PRACTICE IN TRAFFIC SAFETY MANAGEMENT AWARD

This award is made by IPWEA (WA) to recognise the use of innovative practices in the field of traffic safety and management on behalf of an individual or organisation. Innovation and cost effectiveness are major determinants in the judging of this award.

EXHIBITORS

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Cardno BSD Consultants
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Talis Consultants
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Institute of Public Works Engineering Australasia
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Global Synthetics
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Sylvania Lighting Australasia
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Super Sealing
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Cubic Solutions Pty Ltd T/A ADS Pipe
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W: www.adswater.com.au

Landmark Products Limited
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Templug International
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Dial Before You Dig
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E: krushton@1100.com.au
W: http://1100.com.au

McMullen Nolan Group
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W: www.mcmullennolan.com.au

EXHIBITION FLOOR-PLAN

Booth	Company	Booth	Company	Booth	Company	Booth	Company
1	Roads 2000	9	Booth Currently Available	17	Global Synthetics	25	Booth Currently Available
2	Dial Before You Dig	10	Sylvania Lighting Australasia	18	Cardno	26	Landmark Products
3	Booth Currently Available	11	ADS Pipe	19	Cyndan	27	Humes Water Solutions
4	Booth Currently Available	12	IPWEA	20	Cyndan	28	McMullen Nolan Group
5	Booth Currently Available	13	Booth Currently Available	21	SuperSealing	29	Tails Consultants
6	Catering Station	14	Booth Currently Available	22	BP Bitumen/BP Australia	30	Templug International
7	Booth Currently Available	15	Catering Station	23	DrainPave	31	Booth Currently Available
8	Booth Currently Available	16	Geofabrics Australasia Pty LTd	24	Booth Currently Available	32	Booth Currently Available

GENERAL INFORMATION

VENUE INFORMATION
The conference will be held in the Southern Cross Ballroom at the Esplanade Hotel on the corner of Marine Terrace and Essex Street, Fremantle.

Plenary sessions will be held in the Sirius Room of the Southern Cross Convention Centre. The Exhibition will be on display in the Orion and Pleiades Rooms. Concurrent Sessions will be held in the King Sound Room, Admiralty Gulf Room and Prince Regent Room. See notice boards on the day for particular session locations.

REGISTRATION DESK
The registration desk will be serviced each day of the conference at the times shown in the program.

SPEAKER PREPARATION
All speakers are reminded to check through their presentations in advance of their time slot. Please check with the registration desk for room locations or technical assistance.

DRESS CODE
Smart casual is suggested for all conference sessions.
Black Tie/Formal attire is suggested for the Gala Dinner.

MESSAGES
A notice board will be in the registration area for messages to delegates. Urgent messages may be telephoned to the registration desk on 9432 4000, extension 510.

SMOKING POLICY
For the comfort and health of all attendees, the Esplanade Hotel is a non-smoking venue.

MOBILE TELEPHONES
As a courtesy to speakers, mobile telephones are to be turned off within the lecture rooms during all sessions.

NAME BADGES
Each attendee of the conference will be issued a name badge at registration. The badge is the official pass and must be worn at all times.

TAXIS
Swan Taxis 13 13 30

TRANSPORT
Trains depart from the Fremantle Station, a short walk from the Esplanade Hotel approximately every 15 minutes. Bus and timetable information can be obtained by telephoning 13 62 13

PARKING INFORMATION
Low cost parking is available at the Italian Club across the road from the hotel, and street parking is also available.

Discounted parking is also available to conference delegates in the Collie Street Carpark immediately behind the hotel. Ask for a discount pass from the conference registration desk.

ACCOMMODATION
Due to the change in ownership of the Esplanade Hotel, special client online booking service facilities are no longer provided. Delegates will need to make accommodation bookings directly with the hotel over the phone as per the details below.

Please remember to mention that you will be attending the IPWEA 2014 State Conference so that you receive the discounted accommodation rate.

Please be aware that a credit card is required at the time of booking and will be debited for the accommodation.

Bookings can be made direct with the hotel by:
Phone: (08) 9432 4000
Email: reservations_esplandefremantle@rydges.com

REGISTRATIONS NOW OPEN ONLINE, SEE IPWEA WEBSITE FOR DETAILS: WWW. IPWEA.ASN.AU