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WATER CORPORATION

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5 August 2013

Dr Paul Vogel
Chairman,
Environmental Protection Authority
Locked Bag 33 Cloisters Square
PERTH WA 6850

Dear Dr Vogel,

RE: PERTH GROUNDWATER REPLENISHMENT SCHEME REFERRAL UNDER S38 OF THE *ENVIRONMENTAL PROTECTION ACT 1986*

The Water Corporation is pleased to submit the Environmental Protection Authority's (EPA) Referral Form and supporting documentation in relation to the Water Corporation's proposed 7 and subsequently 14 Gigalitre per year (GL/yr) Perth Groundwater Replenishment Scheme (GWRS).

Please note this letter forms a companion document to and therefore should be read in conjunction with the attached EPA Referral Form and supporting documentation.

Historical Background and Benefit

Reduced rainfall and changes in rainfall patterns in the south west of Western Australia have significantly impacted traditional water sources (dams and shallow aquifers) to the Integrated Water Supply Scheme (IWSS) and which supplies metropolitan Perth and the wider Goldfields and Agricultural Region.

In 2011, the Minister for Water endorsed the Water Corporation's "*Water Forever – Whatever the Weather*" strategy: a ten-year plan to drought-proof Perth and avoid the need to take water from environmentally sensitive areas of the Gnangara Mound. This strategy committed to:

- continuing to improve water use efficiency, while preserving an outdoor lifestyle and enabling continued growth of Perth and Western Australia;
- expanding seawater desalination capacity to offset declining inflows to dams;
- replenishing the deeper aquifers with recycled water via groundwater replenishment;
- transferring groundwater abstraction for public drinking water supplies to the deeper aquifers to protect the groundwater environment and secure Water Corporation's groundwater supplies; and
- using wastewater recycling as a resource for industry, public open spaces and agriculture.

Significant progress has been made in delivering these commitments, including:

- increasing abstraction from the deeper aquifers;
- expanding the Southern Seawater Desalination Plant, increasing the total volume of water contributed from desalination to 145 GL/yr (in excess of 50 per cent of current annual demand);

- working closely with the State Government, stakeholders and the community to reduce water use from 191 kilolitres per person per year (kL/pp/yr) in 2001 to 135kL/pp/yr in 2012: a 29 per cent reduction; and
- sustaining water recycling for irrigation of public open space (such as sporting ovals) and for commercial and industrial purposes.

Implementation of the Perth GWR Scheme will complete the ten-year strategy, avoiding the need to take water from environmentally sensitive areas of the Gnangara Mound and contributing significantly to the State's water recycling target of 30 per cent by 2030.

Groundwater Replenishment Trial

The Groundwater Replenishment Trial was run by Water Corporation and overseen by the State's regulatory agencies; Department of Health (DoH), Department of Water (DoW), and Department of Environmental Regulation (DER), formerly the Department of Environment and Conservation (DEC).

The Trial was successfully completed on 31 December 2012, and:

- Demonstrated that advanced water treatment will reliably and consistently produce water which meets all health and environmental guidelines;
- Enabled development of appropriate policy and regulation for future GWR Schemes by the DoH, DoW and DEC; and
- Delivered a comprehensive communications strategy involving regular briefings to Government, regulators, key health and environment stakeholders and extensive community engagement including a visitor's centre and outreach program.

In undertaking their assessment of groundwater replenishment as a sustainable water source, the DoH, DEC and DoW have advised that:

- The Groundwater Replenishment Trial delivered adequate information to develop policy and regulation for groundwater replenishment and which is referred to as the GWR Regulatory Framework.
- Subject to undergoing the approval process outlined in the GWR Regulatory Framework, groundwater replenishment from Beenyup can be regulated effectively to provide a safe sustainable water source option for Perth.

Copies of the agencies evaluation of the Trial and groundwater replenishment as a future water source are provided in Appendix 2 of the attached S38 Referral form.

Groundwater replenishment was positively received and publicly supported by all sides of politics.

The Community support for groundwater replenishment remained steady throughout the Trial at between 70 and 76 per cent.

The Proposal

The Water Corporation believes, for the reasons outlined in the following paragraphs, that the proposed Perth GWRS does not require formal assessment. The project and the associated environmental impacts can be adequately managed under Part V of the *Environmental Protection Act 1986* (EP Act) and other existing conditions and permissions.

DEC has confirmed in the letter dated 20 June 2013 (Appendix 2 of the attached S38 Referral Form) that "*Based on the successful performance of the Trial AWRP* (Advanced Water Recycled Plant), *the emissions and discharges from the Perth GWRS – Stage 2A project are considered to be insignificant and is unlikely to impact the environment.*"

Further to this, the DEC also advised "*that the project can be managed through works approval and licence under Part V of the Environmental Protection Act*".

The Perth GWRS will take secondary treated wastewater (TWW) from the Beenyup Wastewater Treatment Plant (WWTP) and further treat via advanced water treatment process; ultrafiltration, reverse osmosis and ultraviolet disinfection, before recharging to the confined Leederville aquifer at a depth of 120 - 220m and Yarragadee aquifer at a depth of 380 – 750m in an area that is remote from drinking water abstraction bores.

The Site

The proposed Perth GWRS will be located within the Water Corporation's Beenyup site, Lot number 8278, Ocean Reef Road, Craigie. It is bounded by the Mitchell Freeway to the east, Ocean Reef Rd to the north, the residential suburb of Craigie to the west and an area of bushland to the south.

The Beenyup site is approximately 83 hectares (ha) of Crown Land (reserve number 28921) vested to the Water Corporation. The site includes the WWTP (approximately 16.5 ha), commercial property (approximately 5 ha), Bush Forever Site 303 (24.5 ha) and other remnant bush areas.

The infrastructure required for the Perth GWRS; an Advanced Water Recycling Plant (AWRP), Leederville and Yarragadee Recharge Bores and associated monitoring bores, is proposed to be built entirely within the Beenyup site, on the cleared land located immediately north of the existing Beenyup WWTP (refer Figure 1 Site Locality inS38 Referral Form).

Regulatory Control

The Perth GWRS is a prescribed premise under Part V of the EP Act being a *Category 54 Sewage facility premises* which will be subject to the requirements of a works approval and subsequent licence conditions regulating its operation.

The Inter Agency Working Group developed the GWR Regulatory Framework as part of the Trial. The framework defines the requirements for the approval and ongoing regulation of a GWR scheme, using existing statutory processes where possible, and following national guidelines to assess aspects that were unique to groundwater replenishment.

Water Corporation, DoH, DEC and DoW have committed to following the approvals process described in the GWR Regulatory Framework for the Perth GWRS. This work has already commenced as described in the section below "Aquifer Response to Recharge".

Aquifer Response to Recharge

The environmental values of the receiving environment (Leederville and Yarragadee aquifers) and associated water quality guidelines that the recycled water must meet have been identified by the DEC, DoW and DoH in accordance with the GWR Regulatory Framework. These environmental values recognise current and future uses of the water and include providing water for public drinking water supplies, industry, and primary industry and recognise the cultural and spiritual value of the water. It did not include water to protect aquatic ecosystems or recreational and aesthetics due to the confined and remote nature of the aquifers.

The Water Corporation has demonstrated via a risk assessment process that the AWRP can sufficiently treat TWW to produce recycled water which consistently and reliably meets

the water quality guidelines applied to the receiving aquifers. The outcomes of this risk assessment have been presented to the DoH, DEC and DoW in April 2013.

In their assessment of the risk assessment, the DEC has advised that "*the risk assessment demonstrates that the proposed advanced water recycling processes, management systems and procedures will result in a low risk of recharging up to 14GL/yr of recycled water to the Leederville and Yarragadee aquifer, adequately protecting the environmental values*".

Terrestrial Ecology

It is anticipated that the GWRS and associated infrastructure will be located, where practicable, within existing cleared areas of the Beenyup site. It is expected that less than 1 hectare of native vegetation will be cleared for the proposed works. More importantly no clearing will be undertaken within the adjacent Bush Forever site and provisions to minimise clearing of native vegetation will be imposed to reduce the ecological footprint of the proposal. (Refer Figure 1 in the attached S38 Referral Form).

Marine Ecology

The Beenyup WWTP treats and discharges 120 megalitres per year of TWW to the Marmion Marine Park at Ocean Reef through the Ocean Reef Ocean Outfall. The Perth GWRS proposal will further treat the TWW using an AWRP and return the waste stream to the ocean outlet.

The Ocean Reef Ocean Outlet is comprehensively monitored through the voluntary PLOOM Program, the results of which demonstrate that the Environmental Quality Criteria (EQC) for Ecosystem Integrity and Primary Contact Recreation are met in the vicinity of the Ocean Reef Ocean Outlets. These results indicate that the disposal of TWW to the ocean 1.5 km west of Ocean Reef is having no detectable adverse effects on marine water quality, or to marine flora and fauna.

Furthermore, exceedances of the EQC for Seafood Safe for Human Consumption were restricted to within 250 m of the diffuser. As there is no aquaculture within 250 m of the diffuser and no known harvesting of shellfish 1-2 km from the shoreline, the exceedances in this instance were not considered to represent a significant risk to human health. It was therefore considered that the EQO for Seafood Safe for Human Consumption is met.

The Water Corporation proposes to develop the Perth GWRS in two stages to produce up to 14 GL/yr. Modeling of combined Beenyup WWTP and AWRP waste streams for three different production rates against the base case of there being no AWRP has concluded that:

- The higher contaminant concentrations of the post-recycling discharge are largely offset due to decrease in flow resulting in increasing dilution;
- The EPA (2005) High Protection guideline (99% species protection) is met for the 95th percentile concentrations of contaminants of concern (ammonium, copper and zinc) under both pre-recycling discharge and post-recycling discharge stages;
- The ARWP process significantly reduces pathogen counts in the ocean discharge having a net benefit with regard to pathogen concentrations after discharge to the ocean compared to the existing discharge; and
- The AWRP will not alter the total nutrient loads discharged to Ocean Reef and nutrient concentrations after initial dilution will not change under typical conditions.

Therefore Water Corporation believes that this proposal for an AWRP up to 14 GL/yr will not cause a significant change to the current operation of and impacts from the Ocean Reef Ocean Outlets in the marine environment, hence not requiring formal assessment.

However, Water Corporation recognises that development recycled water scheme beyond 14 GL/yr may involve changes to the current performance and will require the establishment of LEPA/HEPA boundaries and a formally mandated Monitoring and Management Plan. Accordingly, any future proposal beyond 14GL/yr will be referred to the EPA and Water Corporation commits to undertake the studies necessary to inform the delineation of the ecological protection zones and Monitoring and Management Plans for the ultimate capacity at that time.

Social Impacts

No Aboriginal heritage sites of significance will be impacted, and no native title issues arise.

There are no European heritage sites within the Beenyup site boundary and outlet pipe corridor.

Water Corporation has conducted extensive community and stakeholder consultation dating back to 2005 with respect the Groundwater Replenishment Trial and future GWRS.

The Groundwater Replenishment Trial's community and stakeholder engagement strategy employed the "two-step" communication theory of informing opinion leaders first and then continuing to inform the broader community. In order to build trust, the strategy was primarily based on a "face to face" approach, rather than relying solely on mass communication methods. These activities were supported by advertising, media relations and other traditional public relations tools where appropriate. Mechanisms for consultation included, but were not limited to:

- presentations and briefings to over 160 stakeholder groups including representatives from health, environment, community and indigenous groups, Local and State government agencies and Members of Parliament;
- showing over 7,400 adults and school children through the Advanced Water Recycling Plant and the Visitors Centre located at the Trial site;
- regular updates via a quarterly newsletter, a dedicated website for groundwater replenishment and use of other social media;
- advertising in community newspapers and providing media releases;
- presenting at community forums; and
- quarterly water quality reporting to the community via the GWR website.

This approach consistently received positive feedback, with stakeholders and community members engaging in discussion and actively seeking more information.

Regular research using a number of methods has been undertaken to monitor community support for groundwater replenishment, which has remained steady at between 70 and 76 per cent.

Water Corporation believes that the Perth GWRS proposal can be managed under Part V of the Environmental Protection Act, and through the implementation of the GWR Regulatory Framework. As such, the Water Corporation believes the proposal does not require formal assessment under Part IV of the *Environmental Protection Act 1986*.

If you have any queries regarding this proposal, please do not hesitate to contact Melissa Ee Harrison (Melissa.EeHarrison@watercorporation.com.au) or 9420 2879.

Yours sincerely

Rupert Duckworth
EIA AND APPROVALS MANAGER

Attachments: S38 Referral Form
Figures
Appendices
DVD (for digital copy of the documents)