



Above: Ozone Reserve filtration system

OZONE RESERVE GROUNDWATER IRON FILTRATION SYSTEM



To irrigate the greenspace across the Perth CBD and surrounding areas requires a significant irrigation distribution network.

Irrigation water supply is sourced from an artesian groundwater bore located within Langley Park capable of 38 litres per second (LPS). Groundwater is pumped directly through a groundwater filtration system located within Ozone Reserve to removed dissolved iron and then stored in Lake Vasto for irrigation purposes.

An irrigation pump station capable of around 240 (LPS) pressurises the mainline and provides up to 500,000 KI of groundwater to irrigate 66 hectares of greenspace and parks from the heritage listed Stirling Gardens in the west, along Riverside Drive to Langley Park and east towards Queens Gardens, Point Fraser and the Causeway.

During 2016 the previous groundwater treatment system failed and was bypassed sending untreated groundwater into Lake Vasto. As a result, iron staining of City infrastructure occurred, and the visual amenity of Lake Vasto was impacted.

The previous groundwater treatment system was a chemical based system, dosing Sodium Hydroxide for pH

correction and Potassium Permanganate to oxidise the dissolved Ferrous (Fe) contained within the groundwater. The resultant flocculant was then filtered from the water prior to delivery into Lake Vasto.

During 2017 the City of Perth released a tender for the replacement of the existing chemical treatment system. The tender specifications called for the supply installation and commissioning of a non-chemical groundwater filtration system capable of filtering groundwater at a flow of 38LPS with an iron content of 20PPM, ensuring that the maximum residual level of iron in the water delivered into Lake Vasto had an iron content of less than 0.3PPM.

Demolition works of the existing groundwater treatment system commenced in October 2017. The installation of the non-chemical groundwater filtration system was undertaken by Elliotts Irrigation with these works being completed in February 2018.

A six x 60-inch modular tank system was engineered with independent remote control and monitoring capabilities allowing the ability to monitor flowrates through each unit. Lake level is also monitored allowing a comprehensive 24-hour 7 day a week overview of system operation and performance.

Computer graphing and trending is carried out over each module along with metering and total water usage allowing the City to compare trends and usage over the future months and years of operation.

The system was also designed to have zero water wastage, during backwash and rinse cycles all water is returned to Lake Vasto via a concrete backwash tank which is compartmentalised to allow the dissolved iron to drop out as it flows through the backwash tank.

The City's state of the art groundwater filtration system came online in early February 2018 with current water quality data showing the iron content to be 0.0PPM.

The annual maintenance budget for the previous chemical

treatment system including the purchase of chemicals was \$131,164.00 per annum. The proposed maintenance cost of the new non-chemical groundwater filtration system is estimated to be \$15,000.00 per annum.

Due to the reduced maintenance cost, it is estimated that the capital replacement cost of \$545,890.00 will be recouped in savings within the next 5 years. The useful life of the filtration system is expected to exceed 15 years. The net cost savings over a 15-year useful life period are approximately \$1,700,000.00

Removing chemicals from the process ensures improved safety outcomes for City staff and contractors and provides significant environmental benefits.



Above: Lake Vasto - January 2018



Above: Lake Vasto - April 2018

BORE WATER IRON REMOVAL



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