



LOW ENERGY LEACHATE TREATMENT SYSTEM: SYDNEY OLYMPIC PARK

ONE OF THE MOST INNOVATIVE LEACHATE TREATMENT
SOLUTIONS IN AUSTRALIA



Sydney Olympic Park Leachate System

CLIENT

Sydney Olympic Park Authority (SOPA)

PROJECT SUMMARY

The Water and Carbon Group was awarded the design and construct contract with ongoing operational and technical support for the Sydney Olympic Park Leachate Landfill Wastewater Treatment. This site was a highly contaminated landfill, where leachate presented a significant water treatment challenge. In most cases traditional treatment had proven to be extremely costly. The project was successfully completed August 2013.



Early establishment stage of wetland cells



Wilson Park leachate treatment plant

BACKGROUND

The Blaxland Common Landfill site covers an area of approximately 20ha within the world-class parkland precinct of Sydney Olympic Park. The landfill comprises domestic, commercial and industrial waste. Landfill leachate was being transported off-site for treatment at great expense. Given the public visibility of the site, the solution's aesthetic appeal was critical.

SOLUTION

In 2012, SOPA commissioned Water and Carbon Group to design and construct a low energy passive gravel and wetland-based treatment system to treat the high-ammonia leachate.

The multi-step process designed to deliver high levels of leachate treatment included the following:

- **Balance Tank** – to collect and balance the leachate flows and to provide preliminary aeration
- **Aeration Cascade** – a series of eight teardrop shaped concrete plates oxygenate the effluent and enable a visual check before it enters the gravel and wetland system
- **Gravel Media Cells** – to oxidise ammonia as the aerated effluent is distributed over the gravel/media cells and percolated vertically through the profile
- **Free Surface Wetland** – to provide a productive environment for microbial activity, contaminant absorption and sedimentation to complete the leachate treatment
- **Discharge Controls** – to monitor water quality and ensure objectives are met before allowing final discharge.

OUTCOMES

The system has created one of the most innovative leachate treatment solutions in Australia, providing:

- Treatment based on passive engineering/ecological systems to achieve very high levels of effluent quality
- Low energy use (power is only required for internal transfer pumps)
- No chemical use
- No sludge production
- Detoxification of leachate ammonia into inert nitrogen gas rather than transferring it to another waste-stream for off-site disposal.

Project design, construction and planting were completed in mid-2013. Once fully established, the system will treat the leachate to a final effluent quality that meets NSW EPA's environmental criteria for discharge to the environment and will enhance visual amenity, seamlessly integrating with the surrounding parkland environment. A live web cam facilitates remote monitoring.