

CASE STUDY

An Affordable Wastewater Treatment Solution for Commercial Properties

WIRIB TOURISM PARK, AUSTRALIA

Problem The cabins and store at the Wirib Tourism Park in the Northern Territory of Australia were served by an aerated wastewater treatment system (AWTS) that was aging, too small for peak flows, and unable to handle the high-strength sewage. This resulted in untreated wastewater being dispersed not far from a local creek, creating health and environmental risks. The territorial EPA issued a notice to the park custodians that they must address the failing AWTS or risk having the park closed.

Solution With plans to expand the park in the near future, the custodians needed a reliable system that could be installed in phases. Due to the project's remote location, they also needed a system that was easy to operate and could be monitored remotely. They contracted with ENVIRA Holdings, which chose to incorporate an Orenco® AdvanTex® Treatment System because it satisfied all requirements and could meet stringent treatment levels, despite high-strength wastewater and extreme variations in flow.

AdvanTex® Proves Its Reliability in the Outback

One of the most scenic places in Australia's Northern Territory, the Victoria River is also a good place to catch barramundi, a type of native sea bass known for its delicious, buttery flavor. As it makes its way to the Bonaparte Gulf, the river runs past Timber Creek, a very small town that's home to the Wirib Tourism Park.

The park offers a variety of overnight lodging, from camping spaces to cabins and motel rooms. Amenities include a swimming pool, communal kitchen, laundry facilities, showers, and bathrooms. The store sells food, ice, and bait.



The aerated wastewater treatment system at the Wirib Tourism Park was undersized, and when the system overflowed, this nearby creek was in danger of receiving untreated wastewater. An AdvanTex® AX100 Treatment System was part of the solution chosen by ENVIRA Holdings.

Commercial Market

Project Overview

TIMBER CREEK, AUSTRALIA



Design Parameters

- Phase 1:
 - Average daily flow: 4.5 m³/day (1,200 gpd)
 - Maximum daily flow: 9.0 m³/day (2,400 gpd)
- Phase 2: expected in 2018

Treatment Requirements

- 15 mg/L BOD₅
- 15 mg/L TSS
- Minimum 60% reduction TN
- Minimum 20% reduction TP
- 50 CFU/100mL E. coli
- 7-9 pH

Mean Filtrate Quality*

- 2.3 mg/L BOD₅
- 6.3 mg/L TSS
- 11 mg/L TN
- 2.1 mg/L TP
- 2 CFU/100mL E. coli
- 8.2 pH

Start-Up Date

- November 2016

Project Cost

- AUD \$135,800 + Goods & Services Tax (USD \$102,100)
- Includes primary and advanced secondary treatment

Primary Treatment

- Grease tankage: 3.0 m³ (795 gal.)
- Septic tankage: 18.3 m³ (4,835 gal.)

* Samples collected between January 23 and March 27, 2017 and analyzed by a third party.

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WIRIB TOURISM PARK, AUSTRALIA



The AdvanTex AX100 Treatment System provides high-quality secondary wastewater treatment. Treated effluent is then dispersed through an ENVIRA Integrated Transpiration System (ITS®), consisting of evapotranspiration beds (shown above, on the right) planted with select vegetation.

Travelers can also buy gas, which is especially important because Timber Creek is about halfway along the 515-km (320-mile) stretch of outback between the larger towns of Kununurra and Katherine.

The Wirib Tourism Park has been earmarked as an ongoing sustainability project and “secure food” initiative for local indigenous tribes, who rely on fish from a nearby creek as a source of food.

Unfortunately, the park’s existing AWTS was under-sized and couldn’t adequately treat the wastewater flows produced on-site, particularly during periods of high occupancy.

When the AWTS overflowed, the creek was in danger of receiving untreated wastewater. This meant that popular Victoria River fishing spots were also potentially exposed to contamination.

These smelly overflows not only caused negative health and environmental impacts but were also a cultural concern, because the area is part of a sacred aboriginal site. Local residents began to complain.

The Aboriginal Investment Group (AIG) serves as park custodian for the indigenous tribal owners. In August of 2014, AIG received a notice from the Northern Territory's Environmental Protection Agency (EPA) that the wastewater pollution of Timber Creek must stop or the park might have to be closed.

AIG began to search for a technology that would effectively fix the current problem and also provide an opportunity for future expansion.

Due to the park’s remote location and the lack of skilled maintenance personnel in the area, AIG needed a highly reliable onsite wastewater treatment solution that was robust, easy to operate and maintain, and financially sustainable.



Highly reliable and easy to operate, the AdvanTex AX100 was the best solution for this remote area that lacked skilled maintenance personnel.

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An Innovative Solution

ENVIRA Holdings of Darwin offered the winning proposal: an innovative design that called for the existing AWTS to be converted into primary septic tanks followed by an Orenco® AdvanTex® AX100 Treatment System for secondary treatment and filtration. And an Orenco Biotube® pump vault would be installed so that the primary-treated wastewater could be pumped to the new treatment system.

The pump vault houses the filter, the pump, and the float switches. The Biotube filter consists of 3-mm (1/8-in.) mesh, which prevents the discharge of any larger solids. Orenco's lightweight effluent pump is made of stainless steel and engineered plastics. It has a life expectancy of more than twenty years.¹

The AdvanTex AX100 unit provides advanced secondary wastewater treatment by means of a highly efficient, lightweight textile that has large surface area and void space. Primary-treated wastewater is distributed over the textile in micro-doses throughout the day. This ensures an unsaturated environment while maximizing treatment performance.



Because AdvanTex units can be installed in phases, the park will easily be able to expand its wastewater treatment capabilities in the future. Photo courtesy of ENVIRA Holdings.

Following AdvanTex treatment, effluent is dispersed through an ENVIRA Integrated Transpiration System (ITS®), a phytoremediation system using evapotranspiration beds planted with select vegetation. Any water not taken up through evapotranspiration or root uptake is routed through a disinfection unit and then dispersed via subsurface drip irrigation.

Because the AdvanTex system is modular, the initial capital cost of this upgrade was minimized. Start-up occurred in November of 2016.

Each quarter, ENVIRA staff visit the site to perform maintenance, and they monitor the system remotely year-round via Orenco's SCADA-compatible TCOM™ telemetry control panel.

According to Matt McKennarley, the system designer and installer, "ENVIRA was extremely impressed with the robustness of the AX100 textile filter and the engineering and quality of the Orenco solutions. Furthermore, utilizing the Biotube pump vault made retrofitting the existing AWTS a relatively simple refit."



Treatment media in the AdvanTex AX100 is a uniform, engineered textile, which is readily serviceable and allows significantly higher loading rates than traditional recirculating gravel or sand filters.

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Steve Smith, CEO of the AIG, said, “With complex issues affecting our caravan park, ENVIRA Holdings listened carefully ... and after consultation, came back with some innovative approaches to solving these problems.

“The rest was easy, as they designed a two-stage approach to accommodate [our] budget, commissioned their rigorous, risk-based engagement process, and dealt with the regulators managing the approval processes.

“They built the treatment system in such a way that allowed the park to continue trading whilst construction was being undertaken, which was extremely important to our business.

“With remote monitoring and quarterly maintenance and sampling visits, ENVIRA is ensuring 100% compliance and operation of the system for years to come.”



The installation of the new AdvanTex Treatment System was planned so that the Wirib Tourism Park could remain open throughout the process. AdvanTex technology can treat high-volume commercial flows in very compact spaces. Photo courtesy of ENVIRA Holdings.

Covering an area of approximately 13,000 km² (5,000 square miles), the Wirib Tourism Park is home to red-rimmed cliffs, plunging gorges, and ancient Boab trees. And now, thanks to an innovative design that includes an AdvanTex Wastewater Treatment System, the park can continue serving all those passing through the outback on Highway 1 who need a place to rest and rejuvenate.

¹ As seen in the Elkton, Oregon, effluent sewer system.

Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of October, 2017.

Commercial Market

Secondary Treatment

- (1) AdvanTex AX100 unit and 11 m³ (2,905 gal.) recirculation tankage

Tertiary Treatment

- UV disinfection

Dispersal

- An integrated transpiration system consisting of evapotranspiration beds planted with select vegetation, followed by drip irrigation

Monitoring and Control

- Orenco Controls™ TCOM™ telemetry panel with SCADA compatibility

Designer and Installer

- ENVIRA Holdings

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– **Steve Smith, CEO**
Aboriginal Investment Group

For more information about effluent sewers, Orenco Sewers™ and AdvanTex® Treatment Systems, contact Orenco Systems®, Inc.

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