

CASE STUDY

An Affordable Wastewater Treatment Solution for Commercial Properties

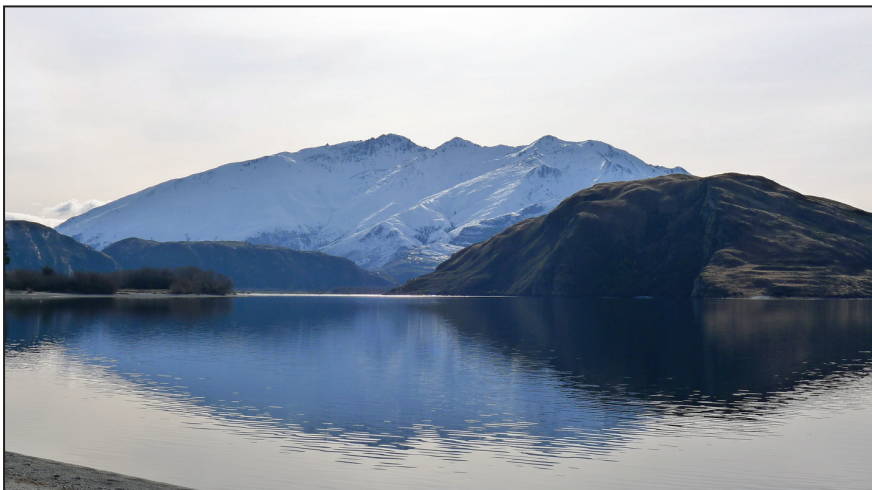
GLENDHU BAY HOLIDAY PARK, NEW ZEALAND

Problem The existing wastewater treatment equipment for the campground at Glendhu Bay Holiday Park was not meeting discharge requirements. Because its adjacent lake — Lake Wanaka — is a source of drinking water for the local region, a new system was needed that could consistently meet treatment requirements, despite variable flows and a cold climate, to ensure the water was safe for both recreation and consumption.

Solution The Queenstown Lakes District Council contracted Innoflow Technologies of Auckland to design and install a new wastewater treatment system for the park. Because of the need for an economical option that would reliably meet the given discharge limits while leaving only a small environmental footprint, Innoflow chose the Orenco® AdvanTex® AX-Max™ Treatment System, which is ideal for a variety of commercial applications with variable flows and waste strengths.

Preventing Contamination of a Vacation Spot — And Water Source

Although Wanaka, New Zealand might rightly be called a winter vacation destination, it also boasts many year-round activities, such as skydiving, hiking, fishing, and camping. Among the convenient camping



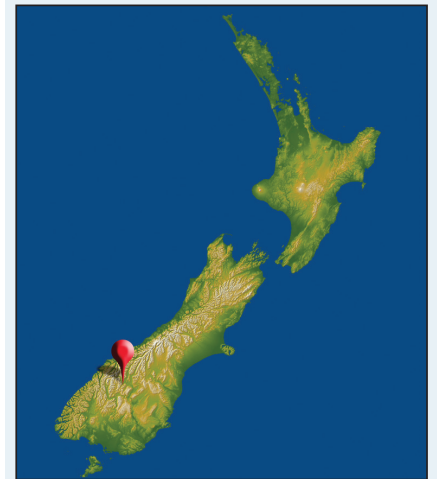
Glendhu Bay Holiday Park is situated on the shores of beautiful Lake Wanaka, New Zealand's fourth largest lake. The park has 400 campsites and lodging for 60.

facilities nearby is Glendhu Bay Holiday Park, located on a scenic bay towards the southern end of Lake Wanaka. Amenities include a boat ramp, playground, showers, bathrooms, and a communal kitchen. The park offers more than 400 individual campsites, in addition to cabins and accommodation at the lodge.

Commercial Market

Project Overview

GLENDHU BAY HOLIDAY PARK, NEW ZEALAND



Design Parameters

- 420 campsites plus lodging for 60 persons
- 100 m³/day (26,400 gpd) avg daily flow (peak season)
- 150 m³/day (39,500 gpd) max daily flow (peak season)

Treatment Requirements (Annual Mean)

- 20 mg/L cBOD₅
- 20 mg/L TSS
- 25 mg/L TN
- 100 CFU/100 mL E. coli

Effluent Quality (Jan-Dec, 2013)

- 5.3 mg/L cBOD₅
- 4.7 mg/L TSS
- 16.9 mg/L TN
- 0.3 mg/L NH₃-N
- 40 CFU/100 mL E. coli

Start-Up Date

- December 2011

Total Project Cost

- NZD \$1,322,000 + GST* (USD \$1,027,755)

* Goods and Services Tax

Funding Source

- Queenstown Lakes District Council

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GLENDHU BAY HOLIDAY PARK, NZ



Although Lake Wanaka offers many recreational activities — such as boating, fishing, and swimming — it is also a source of drinking water. Protecting this water from contamination was a driving factor in the decision to install an Orenco wastewater treatment facility.

The lake is not only enjoyed for recreational pursuits, but is also a source of drinking water for the surrounding areas. Consequently, ensuring the purity of Lake Wanaka is a major concern. But there was a risk of contamination from the park's old and failing wastewater systems.

Even though each of the park's bathroom and shower facilities had its own septic tank, the tanks were quite old and many of them were too small to meet current levels of usage. During the peak summer season, several of the tanks would routinely fail, and effluent would overflow the trenches. Bad odours were common, as was the need for pump-outs.



Completely pre-packaged and built inside a durable, insulated, fiberglass tank, an AX-Max™ unit is easy to ship—either by truck, rail, or cargo container.

Needed:

High-Performing System With Low Costs

The Queenstown Lakes District Council (QLDC) solicited tenders for the project, seeking an effective wastewater solution that could also offer low, whole-life costs. Based on a solid track record of meeting performance requirements while keeping costs down, Innoflow Technologies, based in Auckland, was awarded the contract.

Total project cost was NZD \$1,322,000 + GST (Goods and Services Tax) ... just a little more than \$1 million in U.S. dollars. The project involved replacing all but one of the campground's existing septic tanks, as well as linking the new interceptor tanks to an Orenco effluent sewer, which transports the liquid effluent to a central wastewater treatment



The facility features five Orenco® AX-Max units that employ the AdvanTex® recirculating media filter technology. AdvanTex units produce high-quality effluent with substantial reduction of nutrients, making them well-suited for any project with strict discharge limits.

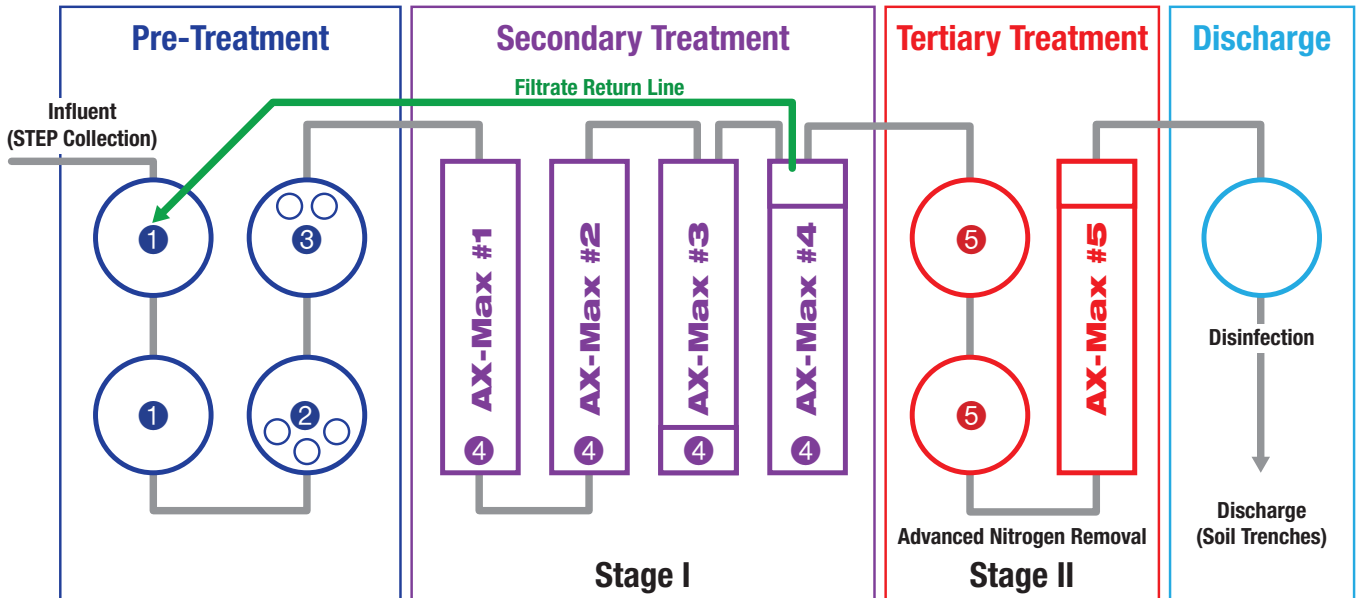
plant. These watertight interceptor tanks provide passive primary treatment of the wastewater by retaining solids, which are naturally digested, and by reducing the organic strength of the effluent prior to being pumped to the secondary treatment facility.

The schematic on the next page shows the layout for the secondary and tertiary treatment systems designed by Innoflow. The chart below it details the total tankage for the new system, from septic tankage thru pre-treatment, secondary treatment, tertiary treatment, and discharge tankage.

For secondary treatment, the facility features four Orenco AdvanTex® AX-Max™ units, each completely-integrated, fully-plumbed, and compact. Like all AdvanTex Treatment Systems, the AX-Max is a recirculating media filter that produces outstanding effluent quality and significant nutrient removal.

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Wastewater Treatment System Layout



Wastewater Treatment System Tankage

STEP Collection		Tank Quantity	Tank Volume, m ³ (US gal.)	Total Volume, m ³ (US gal.)
STEP Collection	Manager's House	1	4.5 (1200)	4.5 (1200)
	Bathroom/Shower Facilities			
	Ablution Block A	1	32 (8500)	32 (8500)
	Ablution Blocks B, C-E, F	6	23 (6100)	138 (36,600)
	Ablution Block G	2	55 (14,500)	110 (29,000)
	Grease Tankage	2	7 (1850)	14 (3700)
Dump Stations	3	4.5 (1200)	13.5 (3600)	
Pre-Treatment				
①	Anoxic Tankage	2	55 (14,500)	110 (29,000)
②	Pre-Treatment Tankage	1	55 (14,500)	55 (14,500)
③	Clarifier Tankage	1	55 (14,500)	55 (14,500)
Secondary Treatment (Stage I)				
④	Recirculation Tankage	4	34 (9080)	136 (36,320)
Tertiary Treatment (Stage II)				
⑤	Post-Anoxic Tankage	2	55 (14,500)	110 (29,000)
⑥	Recirculation Tankage	1	34 (9080)	34 (9080)
Dispersal				
⑦	Discharge Tankage	1	55 (14,500)	55 (14,500)

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GLENDHU BAY HOLIDAY PARK, NZ



Hallett disinfection units for tertiary treatment.

For tertiary treatment, a fifth AX-Max is used as a polishing unit, followed by ultraviolet disinfection and land treatment (dispersal) with subsurface pressurized distribution lines.

New Treatment Plant Performs

The system was installed in the fall of 2011 and started-up in December — which is the height of summer, “down under.” Rob Potts, engineering consultant to the QLDC, commented, “The project was commissioned in time and has performed fully to expectations even though it was brought near to full peak load very soon after the performance verification testing. The

Queenstown Lakes District Council is very pleased with the finished product and results to date.”

Ken Gousmett, project manager for the QLDC, said that “The new system is a great environmental benefit for the park users and the Wanaka Community. The performance of both the Orenco wastewater treatment system and Innoflow Technologies, system designer/installer, was excellent.” And Gavin Gray, campground manager at the time the system came online, commented that “We are very pleased with the whole collection system and treatment plant Innoflow has installed. The entire plant is so unobtrusive that people don’t realize what has changed.” For the manager, however, the changes were quite tangible — no more smells and no need for peak season pump-outs!

While enjoying the natural beauty of the area, Glendhu Bay’s many visitors appreciate the conveniences of the campground facilities without ever being aware of the sophisticated wastewater system that makes it all possible. And that is just the way it should be.



Whether installed above or below the ground, the sand-colored AX-Max units emit no odor or sound and thus draw no attention from passersby.

Commercial Market

Engineer, Installer, Operator

- Innoflow Technologies, Inc.

Primary Treatment (STEP Collection)*

- 15 tanks, 284 m³ (75,025 gal.)

Pre-Treatment*

- 5 tanks, 220 m³ (58,118 gal.)

Secondary Treatment*

- 4 Orenco AX-Max units, 34 m³ (9,080 gal.)
- Stage 1
 - ~ 2 AX-Max 250-35
 - ~ 2 AX-Max 225-35

Tertiary Treatment*

- Advanced nitrogen removal:
 - ~ 2 post-anoxic tanks, 110 m³ (29,000 gal.)
 - ~ 1 Orenco AX-Max 225-35 polishing unit, 34 m³ (9,080 gal.)
- Disinfection:
 - ~ 4 ultraviolet disinfection units

Dispersal*

- 1 tank, 55 m³ (14,500 gal.)
- Land treatment: subsurface pressurized distribution lines

Controls

- Orenco TCOM remote telemetry control panel

* See Tankage Chart, p. 3, for details

For more information about Orenco® Effluent Sewers and AdvanTex® Treatment Systems in New Zealand and Australia, contact Innoflow Technologies, Distributor, at 09 426 1027.



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