

Featured Investment: Bluewater Bio International

Design and marketing of an advanced biological solution for the treatment of wastewater

In March 2009, Aqua Resources Fund ("Aqua") announced its second investment of €4.8 million for up to approximately 15 percent of the fully diluted share capital of Bluewater Bio International (BBI) with the completion of the transaction announced on the 20 April 2009. This investment follows Aqua's joint venture with the Ranhill Group, announced in November 2008, to invest in water and wastewater operations in the People's Republic of China and Thailand.

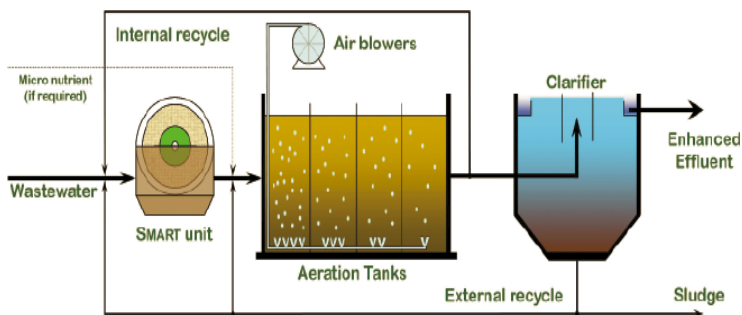
The investment in BBI brings a dynamic technology provider to Aqua's portfolio and is expected to have significant synergies with the Ranhill joint venture.

A proven and cost effective biological process

BBI provides a cost effective, advanced biological solution for the treatment of wastewater. BBI is involved at all stages of the process from plant design and costing through to installation, commissioning, employee training and ongoing operation and maintenance.

BBI's proprietary technology, the HYBACS (**Hybrid *Bacillus* Activated Sludge**) process, is increasingly regarded by a growing number of companies both in Europe and in the Middle East to be commercially superior to many existing treatment processes worldwide, across a wide range of treatment requirements.

The HYBACS Two Stage Process



As shown in the flow diagram, the HYBACS process consists of two biological treatment stages in series followed by clarification. The first biological treatment stage comprises rotating contactors called SMART units and the second stage comprises aeration tanks where HYBACS is applied. The process may be implemented with or without primary sedimentation.

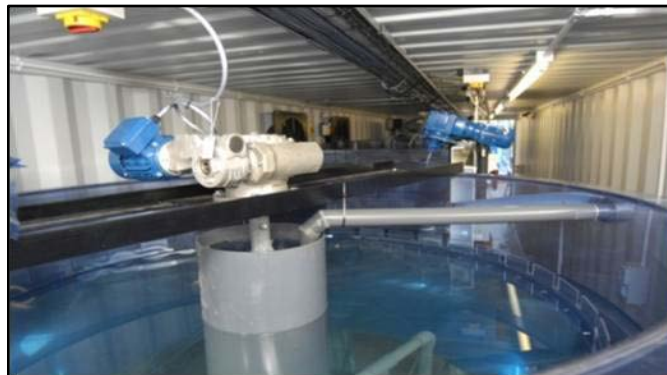
HYBACS, is a secondary treatment process that removes nitrogen and phosphorus from wastewaters as well as carbonaceous matter.

The HYBACS technology was originally developed in South Korea and has been deployed at 20 sites throughout the Far East where it is used for treating municipal and industrial wastewater, giving BBI valuable reference sites which give a highly visible showcase for the benefits of the process over the long term.

BBI's strategy is to focus on selling HYBACS technology to both the municipal treatment sector and to industrial customers and polluters of water. BBI provides a novel technology fundamentally different in many aspects from previous wastewater treatment technologies. It offers **cost-effective** solutions which provide immediate treatment and capital cost benefits, wastewater reuse potential and also the lifetime operational expenditure benefits of the HYBACS process.

The investment with BBI fits well with Aqua's strategy as it not only includes access to an attractive set of technologies focusing on wastewater treatment and water recycling, but also a very good geographic coverage with partnerships and clients in both Western and Eastern Europe as well as the Middle East.

BBI currently has a number of agreements with high profile, large organisations including Spain's Aqualia and Saudi Arabia's Nesma & Partners. Through these agreements BBI gains access to very high quality distribution networks and to project bids. BBI is currently part of a consortium with Aqualia, Nesma and its GCC partner Zero Waste, bidding on the 27 year contract for a new \$100 million sewage treatment plant to be constructed in Muharraq, Kingdom of Bahrain.



BBI HYBACS Pilot with Severn Trent in the UK

BBI is conducting a pilot plant study with Severn Trent, the LSE listed, UK regulated water utility. The full scale automatic pilot plant was constructed in the past 6 months and is currently in operation at Severn Trent's wastewater treatment works near Birmingham. Results of the pilot study are expected towards the end of 2009. A further pilot study is to be installed at an Aqualia wastewater treatment facility in Avila, Spain during 2009.

Significant CAPEX, OPEX and footprint reduction in time of tightening budgets

The HYBACS process is applicable to a wide range of wastewater types, from municipal sewage to strong industrial wastewaters and successfully treats industrial wastewaters with extremely high levels of contamination and, irrespective of wastewater type and strength, produces high quality effluents.



Smart Units, Tongbok Wastewater Treatment Plant, South Korea

Key to the performance of the HYBACS process is the predominance in the biomass of species from the *Bacillus* family of bacteria. The process is designed and operated so that the population of *Bacilli* is encouraged to grow within the biomass of the treatment system. *Bacilli* are versatile in that they can destroy a wide range of substrates and prolific in that the rate of destruction of the substrates is comparatively in average higher than other sludge treatment processes.

The HYBACS process can reduce plant capital expenditure by up to 20% on a greenfield site, and by up to 50% in the case of a retrofit of an existing plant, compared to like-for-like nutrient removal wastewater treatment technologies. It also offers very substantial savings in operating expenditure, with up to a 50% reduction in plant electrical consumption, and up to a 100% reduction in the consumption of phosphorus-removing chemicals, both being key OPEX drivers.

In addition, with up to a 50% reduction in plant footprint requirement, HYBACS can be used to upgrade an existing plant to deliver nutrient removal performance without the need to increase the size of the existing plant, a critical feature in today's highly urbanised society.

Table 1: Ranking of technologies with regard to costs and footprint size

Type of plant	Assumed method of P removal	OPEX	CAPEX	Ease of upgrading existing plants	Footprint
HYBACS System	Biological	2	3	2	3
Activated sludge	Biological	3	3	3	4
Biological aerated flooded filter ('BAFF')	Chemical	3	4	4	2
Membrane biological reactor	Biological	5	3	3	2
Percolating Filtration	Chemical	1	5	5	5

Note: Larger ranking means higher cost, or footprint.

The HYBACS process has OPEX and footprint advantages over activated sludge and similar CAPEX values. The reduced OPEX arises because Stage 1 of the treatment removes about 40% of the organic load from the wastewater but consumes very little electricity. Those methods with the lowest OPEX typically have very high CAPEX and require a large footprint, whilst those with a smaller footprint are usually more expensive to build and to run.

As water utilities across the world look to reduce their OPEX and CAPEX budgets but still strive to improve performance at their wastewater treatment plants, HYBACS will become an even more attractive solution given its advantages over even its closest rival.

<p>About FourWinds Capital Management</p> <p>FourWinds is a specialist in global commodities and natural resources with products investing across energy, metals, agriculture, timber, water, waste, and alternative energy.</p> <p>FourWinds Capital Management (UK), Ltd. 105 Wigmore Street, London W1U 1QY United Kingdom Tel: + 44 20 7518 7970</p> <p>FourWinds Capital Management (HK) Ltd. Level 8, Two Exchange Square 8 Connaught Place, Central, Hong Kong Tel: + 852 2297 2475</p> <p>Website: www.FourWindsCM.com Email: info@fourwindscm.com</p>	<p>Fundamentals of Aqua Resources Fund</p> <p>Listing date: 24th July 2008</p> <p>Ordinary shares outstanding: 72,464,340</p> <p>Latest adjusted NAV (31 March 2009): EUR 0.9479</p> <p>Number of investments/countries/continents: 2 / 3 / 2</p>
<p>About the Fund</p> <p>Aqua Resources Fund Limited is an LSE-listed investment fund (H20) managed by FourWinds Capital Management, investing in the full value chain of global water. The strategy combines direct investments in projects, companies, and infrastructure across water-related business areas. www.AquaResourcesFund.com</p>	

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