

MACRO-ALGAE Wastewater Treatment

Market segment	Wastewater, Food
Application market	Wastewater treatment, Fish & Aquaculture
Pumped medium	Algae, Industrial Wastewater
Pump product	Bearing frame
Country	Australia



Hidrostral supports sustainable wastewater treatment in groundbreaking macroalgae initiative

Burdekin Shire Council has embraced a forward-thinking and environmentally sustainable wastewater treatment solution by partnering with Pacific Bio's wastewater technology provider RegenAqua. The council pumps its wastewater to RegenAqua, which then uses the nutrient-rich water to cultivate algae in purpose-built bioreactors. This algae growth not only purifies the wastewater but also provides RegenAqua with a valuable by-product for multiple applications, including fertilizers, biofuels, vitamins, and other organic products. The process benefits both parties by reducing treatment costs for the council and generating a renewable resource for Pacific Bio. At the heart of this innovative system are **Hidrostral's Screw Centrifugal Pumps**, which are designed to handle the sensitive and complex materials involved in the process. These pumps play a crucial role in efficiently transferring algae throughout the system while maintaining high performance and reliability.

Hidrostral Pumping Solutions for Handling Delicate Algae and Thick Algal Biomass

The project presented several unique technical challenges that required a tailored pumping solution to ensure both efficiency and product integrity. **Hidrostral** pumps provided the ideal answer to these challenges, offering a seamless solution that meets the operational demands of the system. Here's a detailed look at the challenge, the solution, and the resulting benefits:



Managing Delicate Algae

The wastewater treatment system spans 3.3 hectares of bio-remediation ponds, where algae is cultivated. At the early nursery stage, the algae are extremely delicate, with long strands that are prone to damage during pumping. The pumps needed to transfer the algae from the nursery to the larger circulating ponds without breaking these fragile strands.

Handling Thick Algal Biomass

As the algae matures, they mix it with wastewater straight from the clarifier that includes bio-solids with a high chemical composition. This process stream, that can include thick and ropery solids, needs to be pumped from the ponds to the processing area for further treatment. However, the dense nature of the biomass posed a risk of clogging conventional pumps. The system required a robust pumping solution that could handle the large solids without blockages, ensuring continuous operation.

Innovative Solution for Precision Pumping of Sensitive and Heavy Materials



Hidrostal’s Low-Shear Force Screw Centrifugal Pumps

Hidrostal pumps were selected for their unique design and ability to handle both delicate and heavy materials. In the nursery stage, two **Hidrostal Screw Centrifugal Pumps** are used to gently transfer the newly formed algae into the large bioreactors. These pumps are equipped with low-shear force screw centrifugal impellers, which prevent the algae from being damaged during the transfer process. The pumps process the algae gently, preserving the long strands and maintaining the quality of the product.



Non-Clogging Pump Design for Algal Biomass

Once the algae are fully grown, four additional **Hidrostal Screw Centrifugal Pumps** take over to move the mature algae to the processing area. These pumps are designed with low-clogging properties, making them capable of handling large solids and rope-like materials without blockages. This ensures a reliable and efficient transfer of the algal biomass from the ponds to the processing stage, significantly reducing the risk of downtime due to pump failures.

Hidrostal Pumps Offer Tangible Benefits

In summary, **Hidrostal’s** specialized pumps are an integral part of this successful wastewater purification system. Their ability to handle delicate algae and thick algal biomass with minimal maintenance ensures the efficient, reliable, and sustainable operation of the process. This collaboration between Burdekin Shire Council, Pacific Bio, and **Hidrostal** is a prime example of how innovative pump technology can support both environmental and economic sustainability.

- ➔ Algae Quality: Gentle pumping preserves algae for Pacific Bio’s products
- ➔ Low Maintenance: Non-clogging design reduces blockages and downtime
- ➔ Efficiency: Reliable transfer ensures smooth wastewater treatment and algae production

Quantity of units sold	2 (1 st task) 4 (2 nd task)
Pump type	1 st task – D03R-EMT3R + DCM1X-G112Q 2 nd task – D04R-HMN3R + DCM1X-G112Q
Motor data	1 st task – IEC-frame size 112 / 3.0 kW / 4 pole 2 nd task – IEC-frame size 112 / 4.0 kW / 4 pole
Material combination	Cast iron pump body, Hidrohard wear parts and stainless steel impeller
Duty point	2 nd task – Flow : 28 liters per second / Head : 6 meters
In operation since	December 2024