Victorian winery installs first In Situ Desalination system

Glenkara Winery, a major winery in western Victoria's Pyrenees region, is the first commercial operation in Australia to commission an In Situ Desalination (ISD) system.

In recent seasons, drought has reduced Glenkara's grape yields from 10 tonnes per hectare to less than one tonne. There is no water in the nearest river yet below the ground is a saline groundwater resource that is as large as Melbourne's biggest reservoir, the Thompson Dam (Source: DSE, Victoria). This aquifer system is recharged through long term rainfall. Properly managed, the aquifer will continue to provide a sustainable water supply irrespective of reduced rainfall patterns.

At Glenkara, a single ISD unit with eight inch reverse osmosis (RO) membrane elements is producing approximately 4KL/hour (100KL/day) of high quality water with Total Dissolved Solids (TDS) of 100mg/L from an aquifer containing brackish groundwater with 3200mg/L TDS.

This unit can produce up to 35 megalitres (ML) a year. If greater volumes of water are required, additional ISD units can be installed in a bore field configuration. The plan at Glenkara is to produce 200ML (200,000KL) a year at a cost that is significantly less than conventional desalination plants, and at 100% availability throughout the year.

Potential applications

ISD technology presents a modular, point-of-use solution to water supply problems where suitable aquifers exist.

The viability of communities, industries, agriculture and mining ventures is often limited by the availability of high quality water. In arid regions where the only available supplies are brackish groundwater, or in regions where existing groundwater supplies have become saline, ISD can provide a solution.

The ISD technology is ideally suited to provide a reliable, alternative irrigation water supply or to meet the high quality water needs of communities in regions where only low quality groundwater is available. Even in regions where desalination, usually of seawater, is extensively used, such as the Middle East, the ISD technology is expected to be very competitively priced.

There are numerous opportunities for Desaln8 to provide an alternative water supply to boost or fully replace existing supplies where suitable saline aquifers exist. They include:

- Communities where the reticulated fresh water supply is under pressure
- A full or partial supply to remote communities that currently do not have a nearby supply
- Replacing stressed irrigation supplies for high value agriculture and horticulture
- Sports grounds, race tracks, golf courses and similar venues
- Mining sites
- Defence forces operating in remote locations

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Meeting substantial water needs

Desaln8 has been able to bring the ISD technology to the market as a quality piece of equipment with a full range of performance data gained through numerous trials. The capital and operating costs of ISD are superior to those of conventional desalination technology and competitive with reticulated water where it is available. ISD has none of the considerable environmental issues associated with conventional above ground desalination and uses far less energy.

The advantages of installing Desaln8's ISD system are:

- its capital and operating costs
- modular configuration
- construction flexibility in the location,
- negligible footprint
- environmental superiority
- comprehensive aquifer studies and after-market service
- the lack of viable alternative technologies.

Triple bottom line performance

ISD technology offers affordable access to an essential resource in an environmentally sustainable way. A single unit uses less energy than it takes to air-condition an average home at a cost that is comparable to the current cost of domestic water. ISD operates completely below ground, has virtually no physical footprint, creates no waste and can be managed sustainably. ISD is also modular so that any number of units can be installed to meet changing needs.

About 'In Situ Desalination'

Desaln8'S ISD is an Australian developed technology that creates new high quality water from poor quality groundwater. The ISD system mimics the natural filtering process used by trees to draw up moisture.

The system consists of a reverse osmosis (RO) pressure vessel and a submersible pump which are placed directly into the underground aquifer. The low-cost, submersible pump supplies groundwater feed to the vessel, pressure for the RO process and enough power to lift the high quality water to the surface. The more concentrated residual stream is dropped deeper into the aquifer.

Around the world there are three million cubic miles of saline water and 2.5 million miles of fresh water stored beneath the ground (Source: US Geological Survey). Most of the saline groundwater is unusable without desalination and has been left alone for centuries.

Desaln8's ISD technology has already undergone six years of successful trials in Western Australia (under a COMET Grant), in Victoria (under a Commercial Ready Grant from the Commonwealth Government) and in India.

1 This trial at Katanning in the southern wheat belt of Western Australia operated with 4 x 4 inch RO membrane element in a bore some 20 metres below ground level. It treated brackish groundwater with a salinity level of nearly 10,000mg/L TDS, which is at the limit of the RO membranes used and produced 400L/hour of potable quality water with less than 500mg/L TDS.

2 In a trial in the Swan Valley, WA around 500L/hour of 150mg/L TDS water was produced from a brackish aquifer with salinity of 3500mg/L TDS. The trial used a 1.5KW pump, making power costs less than 20c/KL. This refutes the notion that RO treatment of brackish groundwater is power hungry.

3 At Glenkara Winery in Victoria's Pyrenees region, an ISD system with eight inch RO membrane elements is producing approximately 4KL/hour (or nearly 100KL/day) of high quality water with Total Dissolved Solids (TDS) of 100mg/L from an aquifer containing brackish groundwater with 3200mg/L TDS.

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