

# WATER DESALINATION REPORT

The international weekly for desalination and advanced water treatment since 1965

Volume 46, Number 9

1 March 2010

## Caribbean

### VEOLIA APPARENT LOW BIDDER IN ARUBA

Four design/build bids for Water-En Energiebedrijf (WEB) Aruba's 24,000 m<sup>3</sup>/d (6.3 MGD) SWRO were opened publicly last week and are now under review. The prices were:

- Veolia Water: \$37.5 million
- GE Water: \$44.5 million
- IDE Technologies: \$47.5 million
- Consolidated Water: \$54 million

The prices include equipment installation and commissioning, and a beach well intake with cartridge filter pretreatment. The RO must produce very low TDS potable water to facilitate blending with the high purity distillate from the existing MSF evaporators.

Not only does the project represent another step away from Aruba's 79-year thermal desalination technology tradition, it is the first time that WEB will use beach well seawater intakes. WEB currently operates one 8,000 m<sup>3</sup>/d (2.1 MGD) SWRO using an open ocean intake that has experienced some operating problems. It is speculated that the unit will eventually switch to a beach well intake.

WEB is expected to sign a contract with the successful bidder by the end of the first quarter.

## Caribbean

### ONE SMALL STEP...

Trinidad and Tobago's Water and Sewerage Authority (WASA) is understood to have signed a contract with the Desalination Company of Trinidad & Tobago (Desalcott) that will result in an expansion of the Point Lisas SWRO plant from its current 24 MIGD (28.8 MGD) capacity to 40 MIGD (48 MGD). No further details are yet available, and Desalcott appears to be negotiating with at least three companies to undertake the expansion.

Despite Trinidad's continued water supply shortage, Desalcott had to shut down a portion of the Point Lisas SWRO plant to complete some required maintenance work last week. With up to 50 percent of the plant's capacity off-line, WASA took out full page advertisements in newspapers to notify customers that it would further ration water supplies that had already been cut back due to the ongoing drought.

Meanwhile, WASA is expected to announce the bidders who are prequalified to participate in its upcoming seawater desal initiative by mid-March. At stake are up to four SWRO projects with a combined production capacity of 65 MIGD (78 MGD), which are to be delivered within three years.

In other WASA news, *WDR* has learned that Sharon Taylor has resigned her general manager of projects position and will be replaced by former WASA board member Stacy Dillon.

**How big is it really?** — Regular *WDR* readers may have noticed that the capacity listed above for the Point Lisas Plant is not consistent with all the other stories they have read about the project. The plant's production capacity has been variously listed from 24 MIGD – the minimum average monthly contracted production – to 26 MIGD (31 MGD) – the size listed in *DesalData.com* – to as high as 30 MIGD (36 MGD) as listed by GE Water (Ionics), the plant supplier and co-owner. Local Trinidad newspapers regularly report the plant to have even higher capacities.

Although the plant can, and frequently does, operate at a capacity of 30 MIGD, its 'official' capacity – that is, the capacity on which the 23-year take-or-pay water contract is based – is actually 24 MIGD.

## Company News

### JAPANESE EPC GETS JV PARTNERS

Ebara Corporation has announced that Mitsubishi and JGC have each acquired a one-third share of its wholly owned subsidiary, Ebara Engineering Services. The move marks a formalization of a joint venture process that actually started three years ago.

Ebara Engineering Service (EES) – a sister company of Ebara's pump group – was originally established in 1956 as Ebara-Infilco, a 50:50 joint venture between Ebara and the US-based Infilco Inc. EES consolidated Ebara's EPC and O&M business in 2006.

"EES has more than 250 water and wastewater O&M projects around Japan. In response to Veolia Water's aggressive entry into the Japanese market in 2002, EES began working with Mitsubishi and JGC. Although EES continued to serve the Japanese market, it was never successful in obtaining international EPC or O&M projects. This new partnership

expects to be able to change that,” said Kazunari Yoshimura, president of Global Water Japan.

Although the newly restructured entity may be more successful in pursuing international business, it will be interesting to watch how EES’s corporate culture adjusts to becoming an entity of three equal partners.

Meanwhile, Yoshimura told *WDR* that Hitachi has also agreed to establish a new alliance with Toray Industries to jointly pursue business in the Middle East, Asia and North America. Hitachi Plant Technology and Toray have enjoyed a strong relationship within the Japanese market where Toray currently supplies membranes for Hitachi’s MBR systems.

The announcements signal Japan’s new strategy to become a bigger player in the global water sector by leveraging the capabilities of its disparate group of engineering and manufacturing companies.

In yet another announcement last week, Tokyo’s Metropolitan Government announced that it would promote the capabilities of its Tokyo Water Service Corporation and Tokyo Sewerage Service Corporation. The companies will provide the services of their staff of more than 4,000 engineers to assist other Asian countries with the design and operations of water and wastewater plants.

## Technology

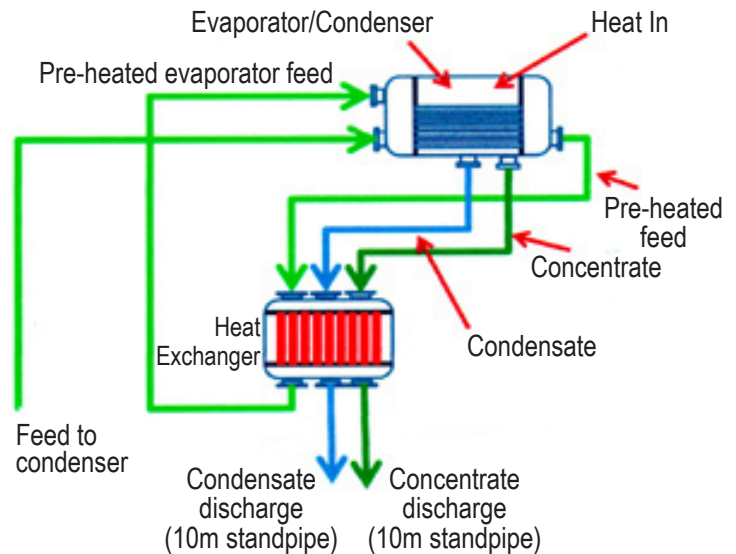
### NEW EVAPORATIVE PROCESS INTRODUCED

Last week’s announcement of a new desalination system developed at New Mexico State University (NMSU) was accompanied with all the hype of a world-changing event. Headlines copied straight from the press releases – even in some water industry publications – shamelessly declared the “breakthrough technology” would “revolutionize desalination”. Some stories referred to it as a “zero-emission technology” and a “paradigm shift”.

As most desalters might imagine, the real story is much more modest, but the process certainly seems to have some merit.

At the heart of the system is a technology developed by an NMSU research team led by Dr Nirmala Khandan. It uses a 10m (33 ft) standpipe to maintain the process vacuum by sealing it from the atmosphere, eliminating the need for a vacuum pump. Because the evaporator operates in a deep vacuum, a low-grade solar or waste heat can provide the necessary energy.

US-based Sterling Water LLC acquired the rights to the technology in January and is in the process of commercializing it. Sterling president Tom Leggiere told *WDR* that technology’s strength lies in its simplicity. “The



*Evaporator Process Flow Diagram*

system is not designed to provide the potable water needs of large urban populations; instead, it is intended to serve the needs of people in rural areas and under-developed countries who do not have access to clean water, nor the capital or expertise to invest in and operate a more traditional desalination system.”

Leggiere envisions commercial units would have production capacities of 1 to 2 m<sup>3</sup>/d (264 to 528 GPD). It makes sense to think small with a process like this. Working in a deep vacuum means huge specific vapor volumes, making it difficult to avoid friction (temperature) loss in vapor spaces. Other issues – including air in-leakage and low heat flux that can cause uneven heat distribution and poor non-condensable gas sweeping – are much more manageable to address on small units.

Sterling’s Qatar-based CEO George Forbes told *WDR* that units should be available within the next twelve months and there are no capital cost estimates currently available.

*WDR*’s  $C_{DR}$  rating for this technology is 6.5.

## Japan

### JDA HOLDS ANNUAL FORUM IN TOKYO

This year’s Japan Desalination Association (JDA) conference was held in February at Tokyo’s Toshi Center. Dr Totaro Goto, who retired as managing director of Japan’s Water Reuse Promotion Center last year, attended the event and filed this report for *WDR*:

The event was held under the joint auspices of the Association of Membrane Separation Technology of Japan and guest speakers included GHD Australia’s Gary Crisp, ACWA Power Saudi Arabia’s Paddy Padmanathan and Professor Shichang Wang from China’s Tianjin University.

Nitto Denko's Hiroshi Iwahori chaired the initial presentations, the first of which was given by Masayuki Tanimoto of Japan Bank of International Cooperation (JBIC). Mr Tanimoto described JBIC's mission to promote overseas development and improve the international competitiveness of Japanese industries. He also explained the company's FACE initiative to mobilize private capital and the \$5 billion LIFE initiative to support environmental investments in developing countries.

Mitsui's Koichi Wakana then explained his company's global infrastructure projects and its investment portfolios in Mexico, Qatar, Thailand, Turkey and the UAE.



*Panel discussion. From left: Isao Takekoh, Hiroshi Iwahori, Masayuki Tanimoto, Dr Masaru Kurihara*

Isao Takekoh of Sumitomo chaired a panel discussion with Dr Masaru Kurihara, the president of the JDA, and all of the speakers. During the discussion, Mr Tanimoto noted that JBIC considers co-finance to be very important because long-term financing has become more difficult.

Dr Kurihara closed the panel discussion with a review of recent advances in membrane technology.

## California IPR AND DPR HEALTH GUIDELINES PROPOSED

Every year, California discharges almost 4 million acre-feet (3,571 MGD; 13.5 million m<sup>3</sup>/d) of wastewater into the Pacific Ocean – more than the State Water Project delivers to the Bay Area, the Central Valley and Southern California. In February 2009, the State Water Resources Control Board unanimously adopted a resolution to increase the use of recycled water in the state by at least 1 million AFY by 2020 and at least 2 million AFY by 2030.

To help achieve that goal, State Senator Fran Pavley – who chairs the Senate's Natural Resources and Water Committee – has introduced Senate Bill 918. If enacted, it would improve the availability of safe recycled drinking water by requiring the Department of Public Health (DPH) to develop and adopt uniform water recycling criteria for indirect potable reuse (IPR), and investigate the feasibility

of developing uniform water recycling criteria for direct potable reuse (DPR).

By adopting uniform health criteria for using recycled water to augment drinking water supplies, the DPH can provide engineers with the guidance needed to cost-effectively design new recycling facilities that protect public health.

## CONSISTENTLY INCONSISTENT

*For new readers and those regular readers who are mystified with WDR's use of various units of measure and currencies in our stories, we occasionally include the following story:*

Nothing illustrates the local complexion of the global desal market more than the units of measure used to measure a facility's production capacity or the currency used to report its cost. The primary units and currencies used in *WDR* articles are those either used by the facility itself or commonly used in the region in which a facility is located.

The most frequently used and universally understood unit used to measure water volume is the *cubic meter* (m<sup>3</sup>), while many Australasian countries use the *megaliter* (ML), which equals one million liters, or one thousand cubic meters. Americans measure water volume using the US *gallon*, and plant capacities are described in terms of *million gallons per day* (MGD), although many Western US states rely on the *acre-foot* (ac-ft, or AF), a unit used in agriculture to describe the volume of water that would cover a one-acre area to a depth of one foot. Some Middle Eastern Gulf States and much of the Caribbean quantify desalination plant output in *million Imperial gallons per day* (MIGD), with one Imperial gallon being 20 percent greater than a US gallon.

The use of these units can be further complicated when they are expressed on a *per year* rather than *per day* basis, as in *million cubic meters per year* (MCM/yr), *acre-feet/year* (AFY) or *gigaliters/year* (GY).

In most articles, a secondary unit is included parenthetically as a reference for those readers who may be unfamiliar with the primary unit, and when water prices are reported, they are almost always reported as both \$/m<sup>3</sup> and \$/kgal.

Some frequently used units and their conversions are:

- 1 cubic meter = 264.2 US gallons
- 1 US gallon = 3.785 liters
- 1 Imperial gallon = 1.2 US gallons, or 4.546 liters
- 1 acre-foot = 325,900 US gallons
- 1 megaliter = 1,000 cubic meters
- 100 million m<sup>3</sup>/year = 60.3 MIGD, or 72.4 MGD
- 1 million gallons/day = 1,120 AFY (acre-feet/year)
- 1 gigaliter = 1,000,000 cubic meters

## IN BRIEF

Researchers from Korea's **Gwangju Institute of Science & Technology's** (GIST) Department of Environmental Science & Engineering have sent several 13 L/min (3.4 GPM) nanofiltration water treatment systems to Haiti. The units are well suited for disaster locations because they do not require electricity; instead, they operate using pumping pressure generated either by pedaling the device like a bicycle or using a manual hand pump. The NF membranes were donated by Woongjin Chemical.

**Surfrider Foundation** will host a premier of its new online video *The Cycle of Insanity: The Real Story of Water* at The Loft on the University of California-San Diego campus in La Jolla, California on 22 March. A trailer for the video is available at [www.vimeo.com/9760124](http://www.vimeo.com/9760124) and more information is available at [www.surfridersd.org/water.php](http://www.surfridersd.org/water.php).

It's official: Tampa Bay Water (TBW) and Acciona Agua announced on Thursday that the **Tampa Bay Desalination Plant** has passed the last two performance milestones, and TBW will receive the final \$31.25 million payment from its partner, Southwest Florida Water Management District.

The Southern California Regional **Brine-Concentrate Management Study**, a collaborative effort between the Bureau of Reclamation and 14 agencies, has examined the different challenges that affect brine-concentrate management, resulting in six reports and an Executive Summary. The Phase 1 reports are available for download at [www.usbr.gov/lc/socal/planning.html](http://www.usbr.gov/lc/socal/planning.html).

**Hyflux** subsidiary Hydrochem has been awarded a S\$35.8 million (\$25.5) contract to design and build Singapore PUB's 68,000 m<sup>3</sup>/d (18 MGD) Jurong MBR water reclamation plant. The treated water will be used for industrial facilities located on Jurong Island, and is scheduled for completion in August 2012. Hyflux also announced last week that its 2009 earnings were up 27 percent despite a five percent drop in revenue to S\$24.8 million (\$373.2 million). The 2009 order book was reported at S\$1.8 billion (\$1.28 billion).

**Kuwait Ministry of Electricity and Water** has prequalified five contractors for the 463,692 m<sup>3</sup>/d (122 MGD) MSF desalination plant at Az-Zour North. They are: Doosan Heavy Industries, Fisia Italimpianti, Hitachi Zosen, Hyundai Heavy Industries and Mitsubishi Heavy Industries. An EPC tender is expected to be issued momentarily.

ITT's Texas-based **C'Treat Offshore** has appointed Viet-Tech JSC to represent its desalination products and services in the Vietnamese market. C'treat manufactures and services

the SWRO watermaker and packaged water system market in the offshore energy industry.

## PEOPLE

**Lisa Sorgini**, formerly director of strategic marketing at Siemens Water, has announced that she has joined Oasys Water Technologies as vice president of strategy and marketing. She is based in Massachusetts and can be contacted at [LSorgini@oasyswater.com](mailto:LSorgini@oasyswater.com).

GE Water has appointed **Bob Gorgol** as business leader of outsourcing water systems with responsibilities that include managing Caribbean BOO contracts. He was formerly with Basin Water and Veolia Water. He will be based in Houston, Texas and can be contacted at [robert.gorgol@ge.com](mailto:robert.gorgol@ge.com).

Beginning with this issue, **Freddy Hunter** has taken over the management of *WDR's* sales and marketing from **Marta Hudcová**. Marta (who would receive a very high C<sub>DR</sub> if it applied to *WDR* staffers) will spend a few months with her family in the Czech Republic before returning to Oxford to pursue a master's degree in environmental studies. Freddy is an Oxford native who received a chemistry degree from the University of Birmingham. Many *WDR* readers will recognize Freddy from his previous position as sales champion for *GWT's* DesalData. If you have any questions about subscriptions or jobs ads, or would like to discuss *WDR's* participation at an upcoming conference, contact Freddy at [fh@globalwaterintel.com](mailto:fh@globalwaterintel.com).

## JOBS

**Seven Seas Water**, a dynamic growth company based in Tampa that supplies complete water solutions in the Greater Caribbean and the Americas, is seeking a vice president of business development. Candidates must be fluent in English, familiar with the region and have a minimum of ten (10) years direct industry sales experience. Fluency in Spanish is a plus. Please direct ONLY qualified inquiries to [bd\\_jobs@7seaswater.com](mailto:bd_jobs@7seaswater.com).

**Woongjin Chemical America** is seeking (1) Florida-based Sales Representative for the Southeast US to develop customer relationships, identify opportunities, review specifications, and write proposals. (2) Southern California-based Technical Support Engineer to provide technical support and training. Applicants should be proficient with MS Office and membrane design simulation software. An engineering or science degree is preferred, and up to 50% travel is required. Email resume to [kenyoon@wjcs.com](mailto:kenyoon@wjcs.com).