

WATER DESALINATION REPORT

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California

POSEIDON TWO FOR TWO LAST WEEK

San Diego's Regional Water Quality Control Board (WQCB) unanimously approved Poseidon's revised NPDES permit and *Flow, Entrainment and Impingement Minimization Plan* last week. The approval was granted one day after the San Diego Superior Court rejected one of three lawsuits filed by The Surfrider Foundation and the Planning and Conservation League arguing that the Coastal Commission's prior approval of the project violated state water code.

The only regulatory hurdle standing in the way of issuing the coastal development permit and starting construction of the 50 MGD (189,250 m³/d) SWRO plant now appears to be the Coastal Commission's approval of several "prior to issuance" and "prior to construction" conditions to the November 2007 approval. Most of the conditions are largely housekeeping matters — submitting copies of the site lease, WQCB permit, etc. However, a new issue has the potential to delay the project a bit more.

Coastal Commission desalination staff expert Tom Luster told *WDR* that a permit change is required to correct an inaccuracy in Poseidon's original submittals, noting, "The change is necessary because new information from Poseidon shows that the intake velocity at the bar racks is 50 to over 250 percent higher than the 0.5 fps [0.15m/s] velocity stated in the original project description."

The matter was not a subject considered in last week's WQCB hearing because that hearing only addressed operation of the desal plant in conjunction with the Encina Power Plant. A WQCB staffer previously told *WDR* that the matter would have to be reviewed when, and if, the desalination plant operates as a standalone facility as expected when the power plant is decommissioned.

Luster estimated that under a best-case scenario, the Commission's approval of the amendment will be a two-month process after it receives Poseidon's submittal.

"If the velocity is higher than that stated in the original project, it will be necessary for us to calculate its impact and find an acceptable means of mitigation," he said.

Meanwhile, the City of Carlsbad's Scott Donnell said that the planning department is continuing to work with

Poseidon on a CEQA review of a site reconfiguration of the desal plant and pipeline. The changes have been proposed in hopes of being able to avoid having to do a new environmental impact assessment (EIA), which could further delay the project. A decision regarding the reopening of the EIA could be made sometime this summer.

Marco Gonzalez, a lawyer for the Surfrider Foundation and the Planning and Conservation League, has been reported to say that he would appeal the regional board's decision to the state board. There are also two remaining lawsuits filed by Surfrider that must be resolved, both of which are set for trial next month.

Poseidon's Scott Maloni told *WDR* that they expect to finalize a contract with an EPC provider later this summer, and anticipate starting construction before the year's end.

California

SoCAL SWRO STUDY PRESENTED

A draft feasibility study for a new, seawater desalination plant was presented to San Diego County Water Authority's (SDCWA) board last week. The study was done by RBF Consulting, and is a follow-up to a 2005 pre-feasibility analysis that considered several sites including the San Onofre Nuclear Generating Station (SONGS).

The new study considered a SWRO project that could initially produce between 50 and 100 MGD (189,250 and 378,500 m³/d) and would ultimately be expanded to 150 MGD (567,750 m³/d). The new study focused on eight sites in the southwest region of Camp Pendleton and identified two viable 26 to 30 acre (10.5 to 12 ha) sites that could accommodate the plant near the mouth of the Santa Margarita River.

Product water from the plant would be conveyed to aqueduct facilities near the SDCWA's Twin Oaks Water Plant, via a 72-inch (1.8m) diameter pipeline approximately 19 miles (30.5km) long, at an elevation more than 1,000 feet (300m) higher than the plant.

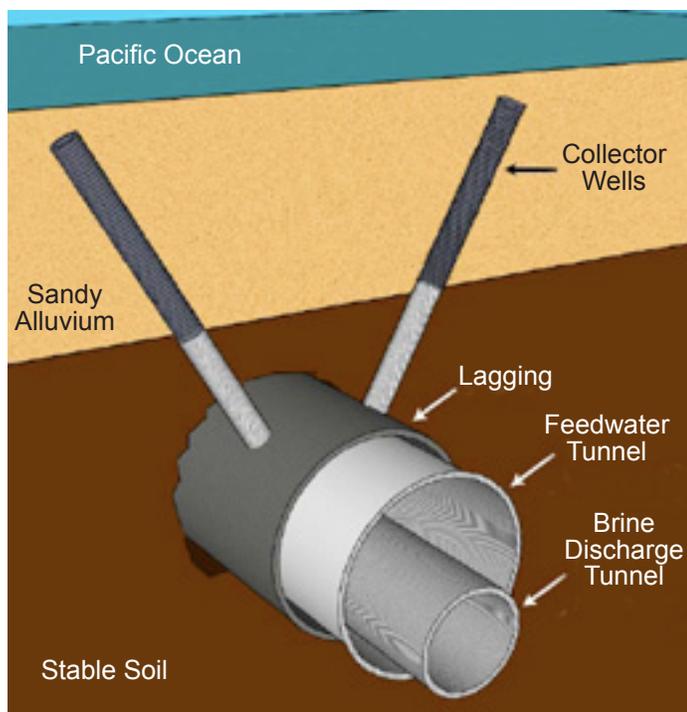
Like most new, large-scale desal facilities, the seawater intake and outfall represent one of the project's biggest variables. According to RBF project engineer Mak Shatila, four intake alternatives were considered and two options were submitted for consideration.

“We considered an offshore open-ocean intake, a seabed infiltration gallery, a deep infiltration gallery and subsurface slant wells. Although slant wells were evaluated, they were eliminated from further consideration due to the number of wells required and because they would have limited the plant size. This decision could still change as a result of offshore hydrogeological investigations in future stages of the project,” he told *WDR*.

Descriptions of the intake/discharge options are as follows:

- *Open ocean intake* — A 16-foot (5m) diameter subsurface tunnel extending 2,000 feet (610m) offshore, followed by an 8,000-foot (2,440m) pipeline on the seabed equipped with eight, 6-foot (1.8m) diameter wedgewire screens. The subsurface tunnel would also accommodate a brine discharge pipeline that ultimately discharges through a multi-port diffuser system. This option is estimated at approximately \$250 million, which includes the concentrate discharge system.
- *Deep infiltration gallery (DIG)* — A 16-foot (5m) diameter subsurface tunnel extending 4,000 feet (1,220m) offshore, equipped with up to 90 gravity collector wells, is estimated at approximately \$260 million, including the concentrate discharge system.

Both intake options are designed for the ultimate 150 MGD capacity, and will be followed by drum screens and DAF pretreatment, while the open-ocean intake would require a UF membrane filtration system as additional pretreatment.



Deep Infiltration Gallery (DIG) Intake and Outfall Arrangement

Planning level capital costs for the project range from \$1.3 billion for an initial 50 MGD facility to \$1.9 billion for a 100 MGD facility. A breakdown of the capital cost showed the intake/outfall facilities at 15 percent of the total cost, the treatment facilities at 57 percent and the conveyance facilities at 28 percent.

These estimates include a 25 percent implementation cost for engineering, permitting and administration. The onshore portion of the project includes a 30 percent contingency allowance, while the marine works portion carries a 40 percent contingency.

Next month, the SDCWA staff will provide the Board with a new capital improvement program (CIP) project budget request to continue funding technical and planning studies, including the completion of a study to consider a vessel-based desalination alternative. It is expected that staff would initiate preparation of an EIR/EIS around mid-2010, which could take two years to complete.

The project has a target online date of 2018.

Australia SWRO PLANT CAPACITY TO DOUBLE

South Australia’s state government announced last week that it would double the size of the Adelaide Desalination Plant from 137 ML/d (36 MGD) to 274 ML/d (72 MGD). The expanded plant will have a total cost of A\$1.8 billion (\$1.4 billion), reflecting an increase of A\$450 million (\$340 million) over the smaller plant.

The state government will fund one half of the expansion cost, and the federal government will furnish a matching amount. The intake, outfall and potable water conveyance system were already being constructed for a plant with a 274 ML/d production capacity.

AdelaideAqua, a consortium of Acciona Agua, United Utilities, McConnell Dowell and Abigroup, is constructing the plant. First water is still planned for December 2010, and the full production will be available in late 2012.

Australia \$25 MILLION FOR DESAL R&D CENTER

Murdoch University has been selected to host Australia’s new National Centre of Excellence in Desalination. A Federal Government grant of A\$20 million (\$15.1 million) will fund the Center over the next five years, with an additional A\$5 million (\$3.8 million) from the Western Australia state government.

The Center is expected to be running later this year and will be located at Murdoch's Rockingham campus, 40km south of Perth, near the Perth Seawater Desalination Plant at Kwinana.

Murdoch has more than 17,000 students and a staff of 1,400.

Company News

SWRO GROUP RE-LAUNCHED WITH NEW FOCUS

A private equity group with resort development experience has provided the capital for Global H2O Investments, a San Diego-based company focusing on seawater desalination projects. The company will focus on build-own-operate (BOO) projects with production capacities ranging from 0.1 to 5 MGD (375 to 18,925 m³/d).

Although it is a 'new' company, Global H2O founder Kevin Bauer, told *WDR* that its management team has a lot of desal experience. "Our core team, including myself, previously worked for East West Utilities. This is the same team that built the most recognized desal brand in Baja Sur, Mexico over the past two and a half years. We were selected for eight SWRO projects, including five plants that will be commissioned by mid-2009."

Bauer said Houston-based Senterra Corporation, the new company's parent, will help to provide a better insight into the resort development community and an entrée into Global H2O's target market. "We will concentrate on Mexico, Latin America and the Caribbean, and will likely be expanding into the US over the next 12 months. And, we are not only interested in new installations; we are also looking to acquire existing water and wastewater assets."

As it undertakes its first new BOO project — a 2 MGD (7,570 m³/d) SWRO for Senterra's Villas del Mar community in Cabo San Lucas — Global H2O is actively recruiting new engineers, business development and O&M staff in San Diego and Mexico.

Company News

DESALTER HANGS A SHINGLE

After having departed Poseidon Resources as its chief technology officer in April, Nikolay Voutchkov has established a company offering independent technical advisory services. The firm — Water Globe Consulting — will be based in Stamford, Connecticut.

Voutchkov has 25 years of experience in planning, permitting and implementing large-scale water projects, and, while at

Poseidon, he oversaw seven turnkey water projects valued at over \$340 million. He told *WDR* that his new company will support the development and implementation activities associated with desalination projects and technologies in the US and abroad.

He can be contacted at nvoutchkov@water-g.com.

Book Review

WATER WOES – THE REAL AND SURREAL

Unquenchable: America's Water Crisis and What To Do About It by Robert Glennon. Island Press; 432 pages; \$27.95.

This entertaining, easy-to-read book contains a collection of stories describing the extravagances and waste that are sucking the nation dry. Glennon — the Morris Udall Professor of Law and Public Policy at the University of Arizona — explores the circumstances and bad habits that led to the current water shortages and offers a blueprint for reform "before the crisis turns into a catastrophe."

He proposes market-based solutions that value water as both a commodity and a fundamental human right, noting that our water use poignantly reflects our cultures and values and that only when we recognize water's worth will we begin to conserve it.

Book Review

IS HARD WATER HEALTHY?

Calcium and Magnesium in Drinking Water: Public Health Significance edited by J. Cotruvo and J. Bartram, WHO publications; 170 pages; No charge.

The nutritional necessity of sufficient dietary intakes of calcium and magnesium is well established but quantitatively imprecise. Many studies have reported an inverse relationship between consumption of hard water and cardiovascular mortality. However, there is no evidence of an association between water hardness or calcium and acute myocardial infarction or deaths from cardiovascular disease, stroke and hypertension, or between drinking water consumption of magnesium and acute myocardial infarction.

The monograph contains 11 papers and the committee consensus report from a 2006 conference held in Baltimore to examine the benefits of calcium and magnesium consumption from drinking water. Among its recommendations, the committee said that stabilization

practices should ensure that the overall process does not reduce total intake nutrients such as calcium, magnesium and fluoride.

It was produced as part of the effort to develop the *Desalination for Safe Water Supply* guidance document that has not yet been published, but is available on the World Health Organization (WHO) website. The projects were organized and managed for WHO by Dr Joe Cotruvo, and can be downloaded at http://whqlibdoc.who.int/publications/2009/9789241563550_eng.pdf.

IN BRIEF

Koch Membrane Systems (KMS) is understood to have strategically eliminated some positions in its Wilmington, Massachusetts and San Diego, California facilities. A company representative told *WDR*, “Transitions are challenging and decisions like this are difficult, but this reduction in force is necessary in light of present economic realities. We appreciate all the hard work of our employees and are working together at KMS to build a platform for continued success.”

WDR has learned that **Flowserve** acquired **Calder AG** for up to \$45 million. Seventy percent of the amount was paid in cash at closing, and the balance will be paid in cash when Calder meets certain defined performance levels after closing. The Dallas-based pump company announced the acquisition of the energy recovery company on 21 April.

An official ceremony to lay the first stone for Kahramaa’s **Ras Laffan C IWPP** was held in Qatar. The plant will produce 2,730 MW of power and desalinate 286,400 m³/d (76.7 MGD) of seawater using Sidem MEDs. The \$3.8 billion, 25-year BOOT project was developed by a consortium including GDF Suez, Mitsui, Chubu Electric and Shikoku Electric.

American Membrane Technology Association (AMTA) members are reminded that online voting at the dedicated election website ends on 31 May. If you have any questions about voting, contact the AMTA office at +1-772-463-0820.

Energy Recovery Inc (ERI) has been selected by AdelaideAqua — a consortium that includes Acciona, United Utilities, Abigroup and McConnell Dowell — to supply its PX energy recovery technology for the SWRO plant being constructed at Port Stanvac near Adelaide, Australia. The South Australian Government has just announced that the capacity of the 140,000 m³/d (37 MGD) plant will be doubled.

Dow Water & Process Solutions has released version 7.0 of its Reverse Osmosis System Analysis (ROSA) software. The version’s new features include the ability to model partial two-pass systems, internally-staged membrane configurations, advanced temperature ranges and a user-defined, pre-stage pressure drop. For more information, visit www.dow.com/liquidseps/design/rosa.htm.

The **California Dept of Water Resources** has published a 9-page pamphlet entitled *Logistics for Deploying Mobile Water Desalination Units* by Fethi BenJemaa. The document can be downloaded at www.owue.water.ca.gov/recycle/docs/Mobile_Desalination.pdf.

Rolled Alloys has completed its acquisition of Weir Materials and the company is now known as **RA Materials**. The company remains based at the Park Works site in Newton Heath, Manchester, UK, where it will stock its ZERON 100 super-duplex stainless steel products. The company’s website has changed to www.ramaterials.co.uk and managing director Glenn Byrne’s e-mail address is now gbyrne@ramaterials.co.uk.

REMINDERS

7–11 June: Prague, Czech Republic will host PERMEA 2009, the Membrane Science and Technology Conference of Visegrad Countries. Visit www.imc.cas.cz/sympo/permea09/ for information.

20–24 June: The North American Membrane Society (NAMS) will hold its annual meeting in Charleston, South Carolina. Visit www.icom2008.org/nams2009/.

PEOPLE

Vari-RO announces the appointment of **Brian Hays** as CEO. He is the former CEO of SiteScope and senior vice president of Science Applications International. He can be contacted at bhays@vari-ro.com.

Dick Smith, the founder and editor of *WDR* from 1965 to July 2005 is recovering from surgery. If you would like to send him your best wishes, his postal address is:

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NO WDR NEXT WEEK

WDR will take the US Memorial Day holiday off and return on 1 June.