This month's feature takes a look at a groundwater report released by coal seam gas (CSG) explorers and Osmoflo's desalination contract for the Ichthys LNG project. Also covered is the Queensland government's new plan for CSG, Australia's training deal with Indonesia and new software from Intergraph.

Compiled by Conrad Bem.

Groundwater report released by explorers

In the Galilee Basin, in Queensland's central west, an emerging coal seam gas industry has combined forces to develop an integrated assessment of known geology and hydrogeology across the basin – the first time such an assessment has been completed across the basin.

As the management of groundwater is a major issue surrounding the coal seam gas industry the Galilee Basin Operators' Forum (GBOF), a voluntary body established in 2010 by a group of coal seam gas (CSG) explorers, commissioned environmental consultancy RPS to undertake a desktop hydrogeological investigation aiming to build a conceptual understanding of different groundwater systems in the region and identify trends that might be apparent.

The GBOF consists of AGL Energy, Australia Pacific LNG (a partnership of Origin Energy, ConocoPhillips and Sinopec), Blue Energy, Comet Ridge, Exoma Energy, Galilee Energy, Origin Energy, Pangaea Galilee, Queensland Energy Resources, Resolve Geo and WestSide Corporation. The group was established to develop a more comprehensive database of regional information than would have been possible on an individual company basis.

At the launch of the Galilee Basin report on hydrogeological investigations, Tor McCaul from Comet Ridge and John Ross from AGL noted that CSG activity in the area was still in the early exploration stage, so current activities were not impacting the identified groundwater resources. But the report has compiled data sets which will assist the future baseline assessments and monitoring programs for the gas industry moving forward.

RPS took almost two years to complete the report, which establishes a basin-wide and consistent description of groundwater systems, and identifies known and possible aquifers from all current, accessible information.

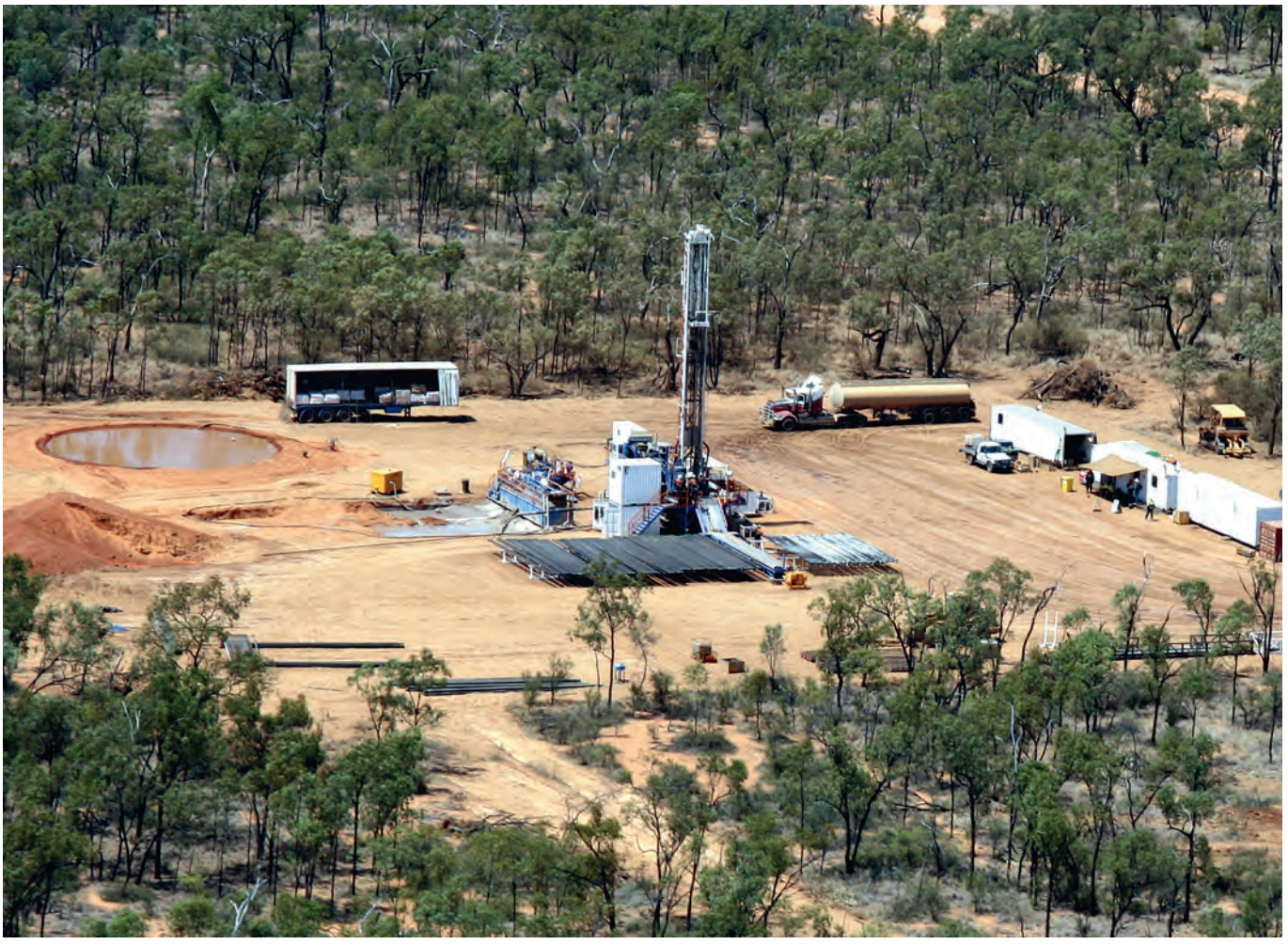
Data held by the state Department of Environment and Heritage Protection on some 10,400 registered water bores was collected and assessed to provide a series of hydrogeological maps within the report. The data includes water bore locations and summary statistics, such as groundwater levels and water quality. Additionally, the report used geological and hydrogeological information gained by GBOF companies during their exploration of the basin.

The report presented findings on groundwater presence, hydrogeological mapping, groundwater quality and areas for monitoring. It has been prepared as a "first step" towards understanding how CSG will impact on the basin, but the report makes no predictions about the impact.

Looking at current water bore extraction, groundwater in the basin was found to be "most frequently taken from the shallow unconfined aquifers in the very young Quaternary alluvium and Tertiary sediments that sit above the [basin]". There were approximately 6760 bores "with known aquifer targets", of which 1400 were attributed to the Quaternary alluvium and 200 were attributed to Tertiary sedimentary aquifers or basalts.

In the Eromanga Basin (within the Galilee Basin), three main aquifers were identified as being the most significant sources of groundwater: Hutton Sandstone, Hooray Sandstone and Cadna-owie Formation. The "relatively shallow" Rolling Downs Group was also identified as a water resource.

Aquitards, which according to the Bureau of Meteorology is a geological formation that can only transmit limited amounts of groundwater, were found to produce locally significant amounts of water in the basin. These included water drawn from the Westbourne, Moolayember and Rewan formations. Some aquitards



Comet Ridge's Skiff 1 Well in the Galilee Basin, Queensland. It is a coal seam gas exploration well.

"The report has been prepared as a first step towards understanding the impact of CSG on the Galilee Basin.

produced sufficient groundwater to be classified as aquifers.

At the launch of the report, McCaul and Ross noted peak measured flow per bore declined non-linearly to about 40L/s per bore around 1975. Groundwater flow from around 2000 has continued a slow decline to about 30L/s.

Of note to the coal seam gas industry, should gas extraction commence in the region, two areas were found to need close monitoring. The eastern margin of the Galilee Basin was identified because it has deeper geographic features coming to the surface and because it is more frequently tapped for water. The Maneroo Platform area was selected because the Hutton Sandstone aquifer was either in contact with or otherwise close to a Permian coal measure. It was noted that within the basin these coal measures are otherwise normally very distinct from aquifers and aquitards.

RMS noted that hydrogeological mapping was hampered by limited data. Piezometric (equal well elevation) surface contours could only be drawn for the Rolling Downs Group, Cadna-owie Formation/Hooray Sandstone and Hutton Sandstone.

The full report is available from www.rlms.com.au/galilee26.asp. ■