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Australian Nuclear Science and Technology Organisation

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World-first software protects environment from industry

Unique new software (AQUARISK) designed to protect the environment when industry is at work, was launched today on Hearne Scientific Software's web site www.hearne.com.au/aquarisk.

Developed by ANSTO* and marketed by Hearne, this world-first Environmental Risk Assessment (ERA) tool is the result of years of research into the biological impact of acid rock drainage and release of metals into the environment resulting from industrial processes such as mining.

ANSTO environmental researcher and key player in the software's development, John Twining, said the product was developed from the need to estimate the ecological costs of economic and industrial development.

"Until now there hasn't been a straightforward way to adequately assess the long term ecosystem impact of environmental protection strategies industry puts into place, making this software the first of its kind," he said.

"AQUARISK is in line with Australian water quality guidelines and provides a pragmatic and convenient means to perform site-specific ecological risk assessments to measure industrial discharges into water in a methodical and structured way," said Twining. "The software directly links on-site environmental engineering options with off-site ecological goals."

Twining explained that examples of AQUARISK's predictions of ecological detriment are shown at sites affected by acid drainage in the Northern Territory and in South Australia.

"In both cases the software results closely aligned with, but slightly overestimated, the measured degree of ecological detriment," he said. "This proves AQUARISK was sufficiently accurate whilst also being precautionary as there were limitations in available data, which is important to ensure protection of biodiversity."

"In addition, AQUARISK was used in a cost-benefit analysis of various remedial water quality options for the abandoned Rum Jungle uranium/copper mine," explained Twining. "Here the cost of applying a range of water treatment options was compared against a scale reflecting the predicted degree of biodiversity improvement in the Finniss River. This gave stakeholders an easier task in deciding the level of treatment needed for the required degree of ecological recovery."

Twining said AQUARISK could also be used to save money.

“I used AQUARISK to compare a variety of environmental engineering options for water quality management before any expenditure was incurred.

“The results showed that whilst cheap options were individually unable to achieve the required goals, they could be sufficient if applied simultaneously,” he said. “Also, the less expensive of the more complex solutions was shown to be adequate for the site, saving costs going for the more expensive option.”

AQUARISK is not just focused on the Australian environment but has an international market reach. Potential users include regulators, mine managers, consultants, researchers, government and public sector advisers, environmental engineers, academics, students and downstream users, and the general public.

“Overall AQUARISK has a tiered assessment approach to predicting pollutant releases, linking environmental engineering with ecological goals,” said Twining. “This makes it an important tool for sustainable development within any industry that impacts on the environment.”

A trial example of the product can be downloaded from the Hearne web site.

**For more information and to arrange an interview please contact:
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*ANSTO is the Australian Nuclear Science and Technology Organisation, the country's national nuclear research and development organisation and the centre of Australian nuclear expertise – over 70 per cent of all radioisotopes used in Australian nuclear medicine are made in ANSTO's reactor