supervising scientist report 203

eriss research summary 2010–2011

Editors DR Jones & A Webb

Australian Government
Department of Sustainability, Environment, Water, Population and Communities
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It is Supervising Scientist Division policy for reports in the SSR series to be reviewed as part of the publications process.

This Supervising Scientist Report is a summary of the 2010–2011 research program of the Environmental Research Institute of the Supervising Scientist and has been reviewed internally by senior staff and the editors of this volume.

Editors

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Preface

The Environmental Research Institute of the Supervising Scientist (***eriss***) is part of the Supervising Scientist Division (SSD) of the Australian Government's Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). ***eriss*** provides specialist technical advice to the Supervising Scientist on the protection of the environment and people of the Alligator Rivers Region (ARR) from the impact of uranium mining. Its major function is to conduct research into developing leading practice methodologies for monitoring and assessing the impact of uranium mining on water and air (transport pathways) and soil, and on the bushfoods that are consumed by the local indigenous people. This research spans the operational, decommissioning, and post rehabilitation phases of mining.

eriss also applies its expertise to conducting research into the sustainable use and environmental protection of tropical rivers and their associated wetlands, and to undertaking a limited program of contract research on the impacts of mining elsewhere in the north Australian tropics.

The balance and strategic prioritisation of work within the uranium component of ***eriss***'s project portfolio are defined by Key Knowledge Needs (KKNs) developed by consultation between the Alligator Rivers Region Technical Committee (see ARRTC membership and function in Appendix 2), the Supervising Scientist, Energy Resources of Australia Ltd (ERA) and other stakeholders. The KKNs are subject to ongoing review by ARRTC to ensure their currency in the context of any significant changes that may have occurred in U-mining related activities and issues in the ARR.

Not all of the KKN research areas (Appendix 3) are able to be covered by ***eriss***, since not all of the required disciplines are available within the Institute. To address these particular gaps, collaborative projects are conducted between ***eriss*** and researchers from other organisations, and consultants are commissioned by ***eriss*** and others to undertake specific pieces of work. For example, KKN projects related to detailed hydrogeology or tailings management on the Ranger lease are conducted and reported separately by consultants engaged by ERA. A more complete picture of the scope of research work that is conducted by all parties can be obtained by referring to the minutes that are produced for the meetings of ARRTC: www.environment.gov.au/ssd/communication/committees/arrtc/meeting.html.

This report documents the monitoring, research and consulting projects undertaken by ***eriss*** over the 2010–11 financial year (1.7.10 to 30.6.11). The uranium mining section of the research summary is structured according to the five major topic areas in the KKN framework, noting that this year there are no papers for Nabarlek.

1 Ranger – current operations

2 Ranger – rehabilitation

3 Jabiluka

4 Nabarlek

5 General Alligators Rivers Region

Of especial note for the Ranger Operations KKN is that continuous monitoring, with event-triggered automatic water sampling, was successfully implemented as SSD's primary water quality monitoring tool in Magela and Gulungul Creeks during the 2010–11 wet season. This represented the culmination of five years of research and development work, the successive

stages of which have been reported in previous annual research summaries. Also of note was the completion of the majority of testwork needed to develop a pulse exposure toxicity assessment framework for magnesium in Magela Creek. This framework will enable the results being obtained from the continuous monitoring of electrical conductivity to be put into an appropriate risk context. The wet season deployment of in situ biological monitoring in Gulungul Creek has now been undertaken for a second year and a substantive data set is now starting to be obtained for this waterway.

The acquisition of data from erosion plots constructed on the Ranger Trial Landform, and analysis of that data, continue to be major activities that will provide substantial inputs into the rehabilitation planning process for the Ranger mine site. The majority of research needed to derive a pre-mining radiological baseline for the Ranger Project Area has now been completed and the outcomes are reported here. The findings will inform the radiological component of closure planning for the site. ***eriss*** has been measuring the activity concentrations of radionuclides in bushfoods and associated environmental media from the ARR over the past 30 years. This extensive data set has now been compiled into a quality assured database that will enable the estimation of radiological ingestion doses from bushfoods for those circumstances where only the radionuclide concentrations present in soil or water are known.

Jabiluka is in long-term care and maintenance and the current work of the Supervising Scientist is focused on maintaining a routine continuous monitoring program for flow and electrical conductivity downstream of the formerly disturbed area. The Nabarlek lease was taken over by Uranium Equities Ltd to pursue exploration activities. Environmental monitoring and assessment for this site is being conducted via Mining Management Plans submitted by the company to the Northern Territory Government.

Three maps (following this Preface) provide the regional context for the locations that are referenced in the research papers. Map 1 shows Kakadu National Park and the locations of the Ranger mine, Jabiluka project area, the decommissioned Nabarlek mine, and the South Alligator River valley. A schematic of the Ranger minesite is provided for reference in Map 2. Map 3 shows the locations of billabongs and other waterbodies used for the aquatic ecosystem monitoring and atmospheric and research programs for assessing impacts from Ranger mine.

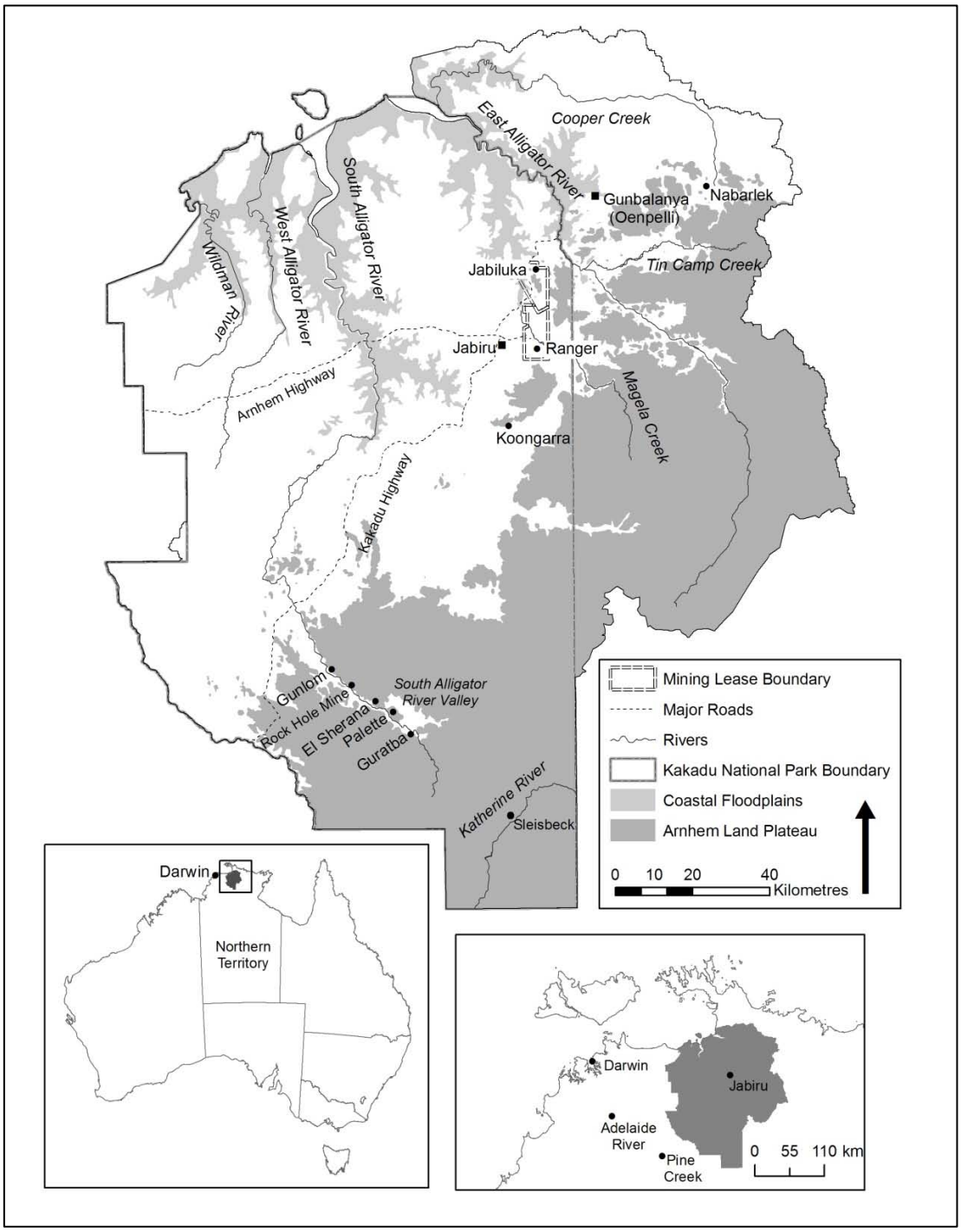
The final section of this report contains summaries of the non-uranium mining related external projects. Commercial-in-confidence projects have been excluded from this compilation.

For additional information, readers are referred to the annual publications list (Appendix 1) that details all of the material published, and conference and workshop papers presented by ***eriss*** staff in 2010–11.

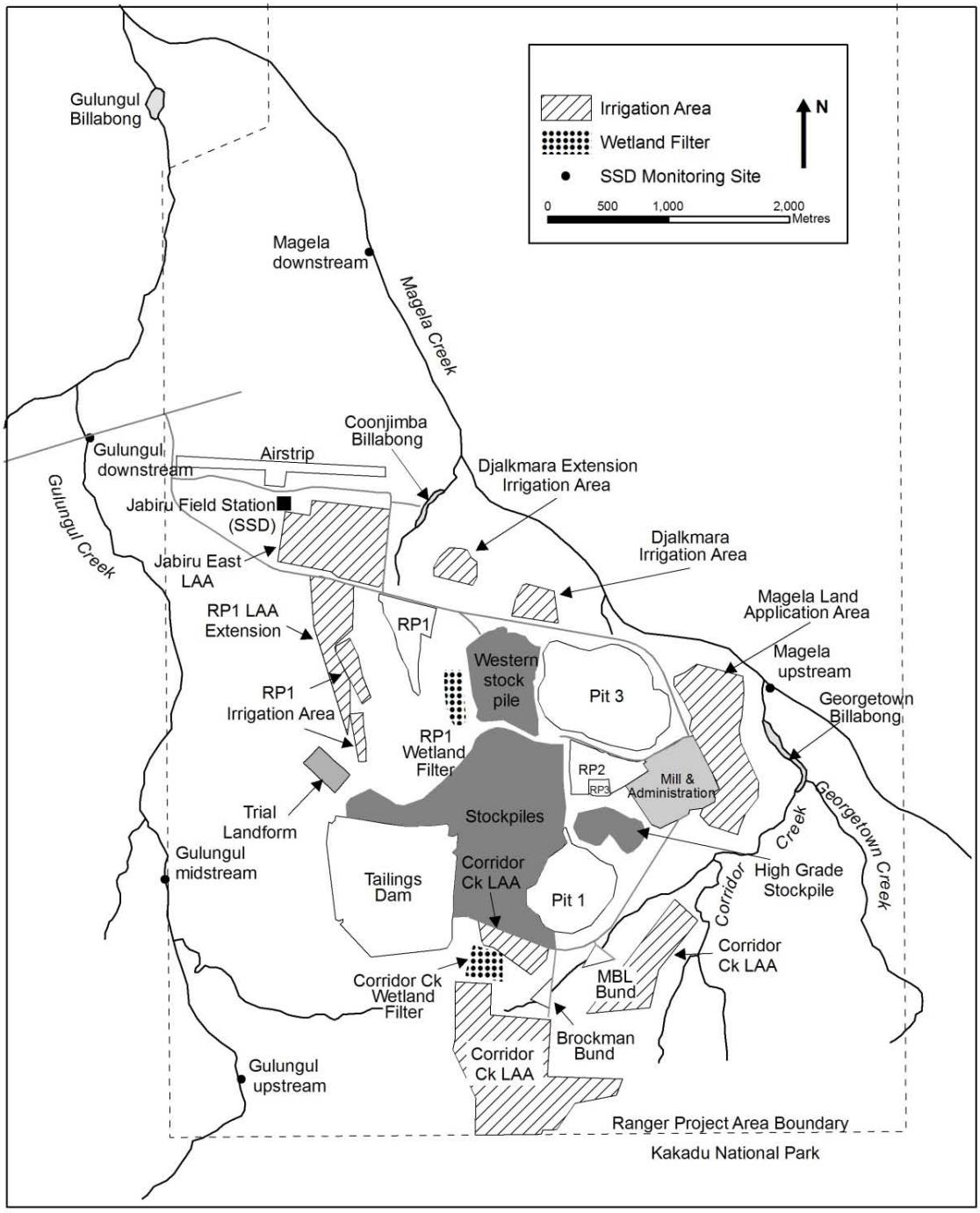
Dr DR Jones

Director, Environmental Research Institute of the Supervising Scientist

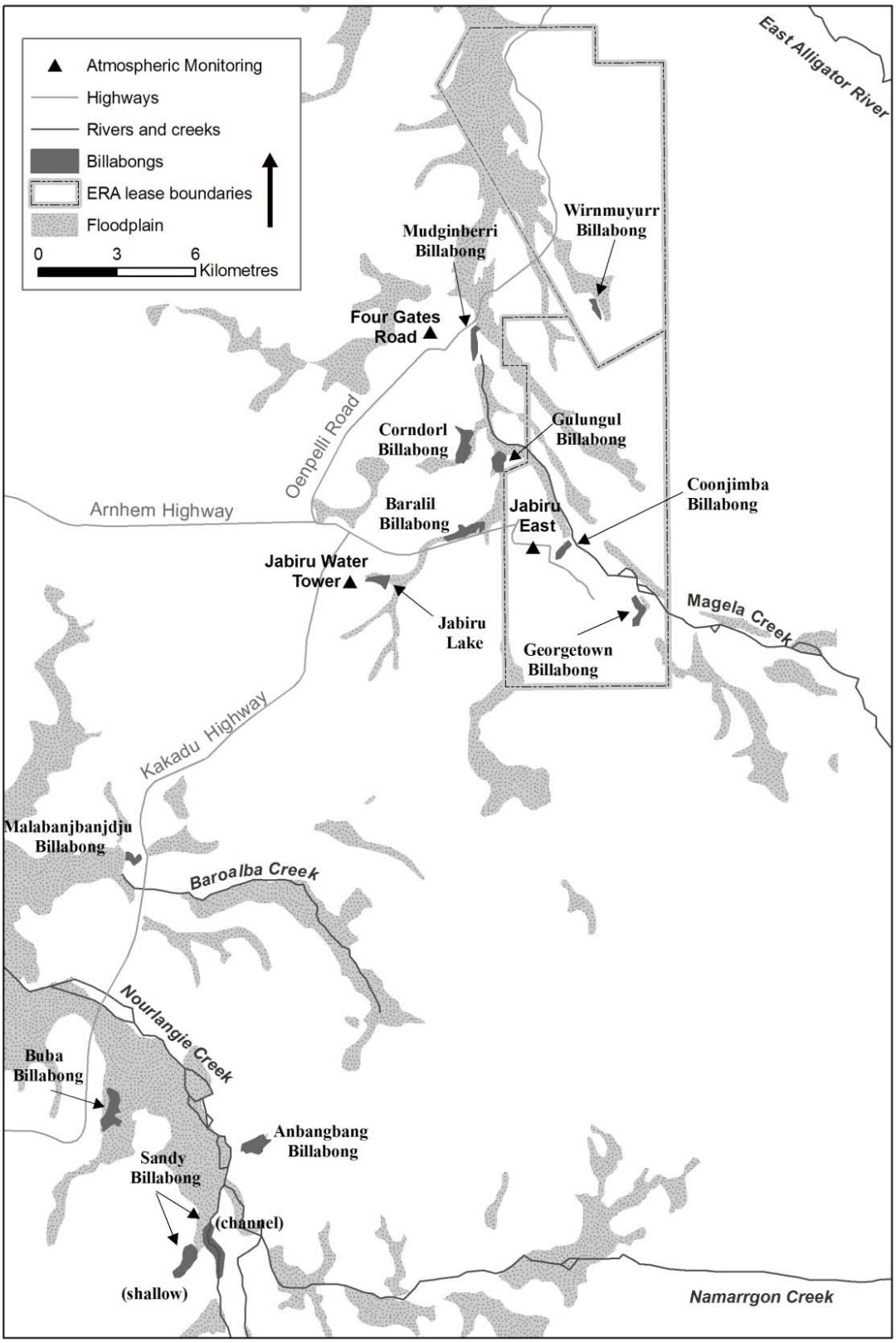
Note: Authors were Supervising Scientist staff at time of research and/or write-up unless otherwise stated.



Map 1 Alligator Rivers Region



Map 2 Ranger minesite



Map 3 Sampling locations used in SSD's research and monitoring programs