



University of Adelaide

ARC Linkage Project in Plant-Soil-Water Relations

Iluka Resources has a strong history of supporting ecological research at the Jacinth-Ambrosia mine site, South Australia, through its partnership with The University of Adelaide. Several research projects have been undertaken at the site, dating back prior to the mine's construction in 2007.

These research programs and partnerships complement the onsite rehabilitation activities and seek to achieve not only compliance with licence conditions but identify industry best practice and contribute to the broader understanding of revegetation in saline and arid environments.

The partnership with the University of Adelaide was strengthened in 2012 through the successful application for an Australian Research Council Linkage Project (ARCLP) grant.

The main purpose of the research is to provide knowledge to assist rehabilitation managers return ecosystem and landscape function to mine affected areas that is both resilient and sustainable, in an efficient and effective way.

Key Research Areas
• Exploring root distributions and rooting depths for key plant species
• Characterising soil properties in pre- and post-mine soils
• Examining drought resistance strategies used by Western myall trees
• Investigating water sources used by key tree species
• Assessing effects of rehabilitated soils and tailings on tree growth and health

A major component of the project is a large-scale field trial established in 2013, which examines the performance of key tree species in reconstructed soils and tailings. The trial is designed as a long-term study with plant structural, morphological and physiological measurements collected each season to assess establishment, growth and long-term survival effects. Soil chemistry and water dynamics are also being measured and analysed. After initial watering and establishment, the trees continue to grow without assistance. Some treatment effects are already being observed and are likely to intensify in the absence of additional watering.

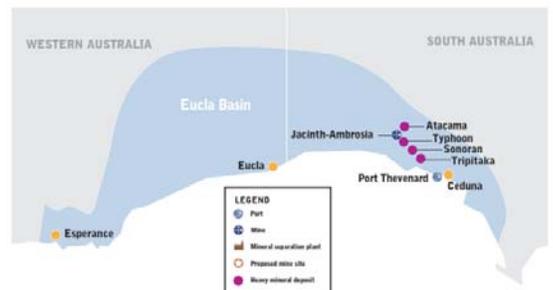
About Jacinth-Ambrosia

The Jacinth-Ambrosia operation is located in Yellabinna Regional Reserve, 800km from Adelaide in South Australia and 270km north-west of Ceduna.

It consists of two contiguous mineral deposits, Jacinth and Ambrosia, and is the largest zircon development globally for several decades.

Mining at Jacinth commenced with pre-stripping vegetation, topsoil and overburden in September 2009, with processing of ore commencing in November 2009. Based on current planning, mining is expected to continue till 2027.

As at December 2015, over 900 hectares had been disturbed. Rehabilitation of mined areas commenced in 2013 and will progress for the life of the mine, with major infrastructure areas rehabilitated at mine closure. A total of 25 hectares had been rehabilitated by December 2015.





Western Myall Open Woodlands

The woodlands occur along a 200-250 mm rainfall belt from northwest of Port Augusta and Whyalla in South Australia, extending into Western Australia as a narrow band fringing the Nullarbor Plain.

Western myall (*Acacia papyrocarpa*) is a long-lived tree that grows to 10 metres high. Their lifespan exceeds 250 years and they are considered a keystone species across the region due to their ability to modify establishment conditions that influence plant communities beneath their canopies.

Other tree species occurring in these woodlands include Red mallee (*Eucalyptus oleosa*), Bullock bush (*Alectryon oleifolius*), Quandong (*Santalum acuminatum*) and Sandalwood (*S. spicatum*).

The understorey plant community is dominated by perennial chenopod shrubs and a suite of annual forbs and grasses that emerge from the soil seed bank following suitable rainfall.

The linkage project brings together experts across several disciplines.

Assoc. Professor José M. Facelli

Extensive experience in the ecology of Western Myall open woodlands.

Professor Jennifer Watling

Expertise in plant ecophysiology, in particular plant responses to environmental stress.

Professor David Chittleborough

30 years research experience in paedology, land evaluation and water quality research.

Dr Emma Steggles

Knowledge of species and ecosystem processes through doctoral research at Jacinth.

Professor Alan Cooper

International leader in molecular analyses of ancient DNA and other materials.

Dr Kate Holland (CSIRO)

15 years of research experience in ecohydrology and ecophysiology of native forests in water-limited environments.

Samantha Doudle (previously Iluka Resources)

Expertise in research relating to mine rehabilitation, particularly soils and biological soil crust.



Senna cardiosperma ssp. *gawlerensis* (Gawler Ranges Senna)

