

Accelerating Development of Australia’s Rare Earth Resources (ADARER)

The ADARER project is a collaboration between ANSTO, Geoscience Australia and CSIRO, with ANSTO as the lead partner. The project is funded by the Australian Critical Minerals Research and Development Hub, which brings together expertise from Australia’s leading science agencies to address technical challenges that support the Australian Government’s Critical Minerals Strategy.

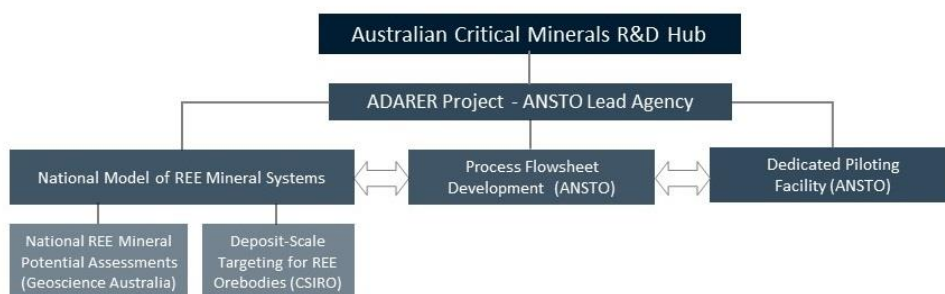
Objective

The project objective is to accelerate the discovery, extraction and processing of Rare Earth Elements (REE) from Australian lower grade deposits, particularly clay-hosted Rare Earth Deposits (CHRED) and Ionic Adsorption Deposits (IAD). These deposits are typically enriched in the high-value rare earth elements that are an essential part of the transition away from fossil fuels.

One of the challenges for these types of projects is that there may not be conventional processes that can be readily deployed.

This project has a number of components targeting mineral systems and deposit characterisation, metallurgical process development and establishing a dedicated testing facility for Australian projects.

ADARER Project Structure



National Scale Model of REE Mineral Systems (Geoscience Australia)

Geoscience Australia will contribute new knowledge on Australia's REE mineral potential. Geoscience Australia will investigate REE mineral deposits found in Australia, with a focus on clay-hosted REE deposits.

The project will develop comprehensive mineral system models associated with the selected REE deposits. These models will provide insights into the geological processes and conditions that govern REE formation. Geoscience Australia will use those models to create the first-ever national-scale mineral potential map for clay-hosted REE deposits. This map will highlight areas across Australia with significant clay-hosted REE exploration potential.

An Explorer's toolbox will help exploration companies by providing guidance on suitable areas for clay-hosted REE exploration and recommending appropriate analytical techniques. Geoscience Australia will deliver a series of industry workshops to disseminate the knowledge and data acquired during the project.

Deposit-Scale Targeting for REE Orebodies (CSIRO)

CSIRO is completing camp-scale studies of clay-hosted REE deposits to examine commonalities and differences in REE accumulations across Australia. CSIRO will leverage its expertise in regolith geoscience, geophysics and detailed mineralogical and geochemical characterisation to produce

case studies documenting controls on quality and grade of mineralisation.

Detailed field and laboratory analysis using a range of new and existing techniques will link the national-scale mapping being completed by Geoscience Australia and metallurgical studies completed by ANSTO.

The work will produce deposit models and workflows for sampling and analysing clay-hosted REEs to determine suitability for leaching, ideally using rapid, in-field techniques.

Process Development for the Australian Context (ANSTO)

Ionic adsorption deposits have been mined commercially overseas for many years. These types of resources, while lower grade, can be processed using less chemically aggressive conditions when compared with higher grade, hard rock deposits such as those containing monazite. However, the processing of IADs has historically been associated with poor environmental outcomes. In addition, there are indications that the processing of some Australian clay-hosted rare earth deposits results in greater impurity dissolution compared to what has historically been associated with IADs. ANSTO aims to develop process improvements to address these technical challenges, with a focus on operating costs and environmental outcomes.

Another area of investigation for ANSTO is to explore the process interface between the hydrometallurgical process and the rare earth separation refinery, which produces individual high purity products, to determine if novel approaches lead to improved process economics.

Pilot Plant Testing Facilities for Australian Projects (ANSTO)

A purpose-built pilot plant for clay processing will be designed, installed and commissioned at ANSTO's Lucas Heights campus in Sydney and will be ready in the first quarter of 2026. The facilities will enable Australian companies to demonstrate all aspects of clay processing from desorption through to impurity removal and further rare earth processing and will complement ANSTO's existing rare earth separation facility.

For further information contact:

- ANSTO: Karin Soldenhoff
khs@ansto.gov.au
- Geoscience Australia: Jessica Walsh
jessica.walsh@ga.gov.au
- CSIRO: Mark Pearce
mark.pearce@csiro.au



The Australian Critical Minerals Research and Development Hub brings together expertise from Australia's leading science agencies – the Australian Nuclear Science and Technology Organisation (ANSTO), Geoscience Australia and CSIRO – to support the scale up and commercialisation of Australia's critical minerals potential by aligning R&D to priority technical challenges and Australia's strategic priorities.

For further information on the Australian Critical Minerals Research and Development Hub:

www.criticalmineralshub.au
criticalmineralshub@csiro.au