

Samphire Uranium Project - In Situ Recovery (ISR)



WHO IS ALLIGATOR ENERGY?

Alligator Energy Ltd (ASX:AGE) is an Australian exploration company focused on uranium and energy related minerals. The Alligator Energy leadership team has significant uranium experience and the Company's projects include two uranium projects in South Australia (the Samphire Project near Whyalla, and Big Lake in northern SA), the Alligator Rivers uranium project (Northern Territory) and a cobalt-nickel focused project in Piedmont, Italy.



SAMPHIRE PROJECT OVERVIEW

The Samphire Uranium Project is located approximately 20km south of Whyalla (Mullaquana Road area) in regional South Australia and comprises two historical uranium areas –the Blackbush deposit and the Plumbush prospect.

Alligator Energy acquired the Samphire Project in 2020 and is proposing to undertake a short-term (approximately 3 months) small-scale Field Recovery Trial (FRT) at the Blackbush deposit in 2024. The purpose of the trial is to test the application of the In-Situ Recovery (ISR) mining method on the Blackbush uranium deposit. ISR is a mining method used in approximately 60% of the world's uranium production and has been used safely and successfully at other uranium mines in northeastern South Australia since 1998.



WHAT IS IN SITU RECOVERY (ISR)?

Alligator Energy acknowledges and respects that the topic of uranium is a concerning one for some people. Equally, Alligator Energy respects the importance that local communities place on groundwater, aquifers, and any natural or man-made water sources, and acknowledges the concerns stakeholders may have regarding mining activity taking place near these sites.

We will always work to better understand any concerns people have and provide information about the project and the environmental protections that must be followed as transparently and openly as possible.

The ISR method involves reversing the natural process that deposited the uranium in the first place.

ISR is also known as 'invisible' mining due to its extremely low visual impact – there is no digging or moving tons of overburden material (i.e. rock or dirt) in the same way that you would see in open cut or underground mining.

At the Samphire Project, the uranium occurs within compacted sand beds 60m to 80m below the surface deposited in the tertiary period 5.3 - 23 million years ago. The uranium occurs around and in between the sand grains which also houses hypersaline groundwater. This is called the Tertiary Aquifer and is where ISR is proposed to be undertaken to extract the uranium.

The Tertiary aquifer is capped both above and below by impermeable layers of clay (confining layers) meaning the groundwater can only move laterally but not up or down. The upper confining layer is 40-50m thick making it much deeper than and separated from the Spenser Gulf ~ 3.6km away. Independent external modelling confirms there is no interaction between the contained aquifer (sand beds) containing the uranium and the waters in the gulf.

The natural chemical process that deposited the uranium millions of years ago is called reduction. The extraction of uranium is achieved by reversing this chemical process (i.e. oxidation). This is done by circulating the native groundwater within the orebody through an injection and recovery well network. The network is dosed with oxidant reagents (4L of oxidant to 10,000L groundwater) to enhance uranium extraction.

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Energy's projects, you can reach us at:



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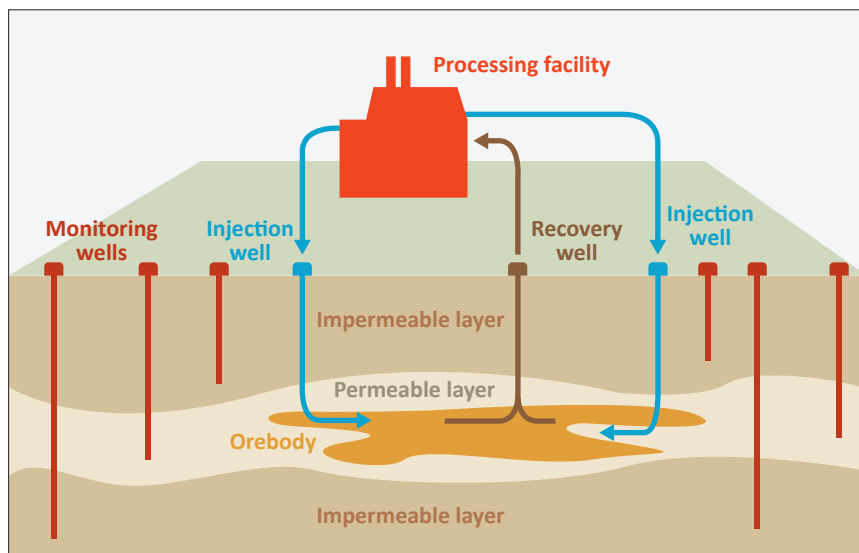
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feedback@alligatorenergy.com.au



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The uranium, which is attached to the sand particles then dissolves into the groundwater and is pumped to the surface where the uranium is removed from the groundwater in the processing plant. The barren groundwater is then re-dosed with oxidant and recycled through the process until most of the uranium is recovered from the orebody. No water is permanently added or removed, nor is any sand brought to the surface during the ISR process.

Under strict State and Federal regulatory requirements, any ISR operation in Australia must demonstrate the groundwater used in the ISR process will neutralize within pre-determined and approved (by regulators) distance from the injection/recovery wells. This process is called Natural Attenuation and occurs via groundwater continuing to interact with the minerals in the host formation via sorption, chemical/biological stabilization processes in addition to groundwater dispersion & dilution. Natural Attenuation is the approved method of groundwater remediation at other ISR operations in South Australia.



The trial is proposed to be conducted on 2 hectares of land (which includes a containerised pilot plant area), which is a small area within the overall Retention Lease area of 250 hectares. The footprint of the trial consists of 3 individual rings of wells each comprising 1 recovery and 4 injection wells spaced 10m apart. The wells are connected to a containerised pilot plant via small 6cm diameter pipes. After trial is completed, the area will be rehabilitated to its original state or better.

A ring of monitoring wells around the injection/recovery wells are used to demonstrate there is no migration of ISR fluids beyond the monitoring wells during and after the trial is complete. Neutralisation of the groundwater used in the FRT must also occur within the confines of the monitor well network and is monitored for several years afterwards to demonstrate this.

The trial will not produce any uranium oxide final product (also known as yellowcake), but instead the extracted uranium solution will be retained in liquid form and securely stored on site. If Alligator Energy does not proceed beyond the trial period, the mined material will be relocated to another existing ISR mine in South Australia.

The results of the trial will be used to assess whether a potential full-scale mining operation could be achieved. If successful, Alligator Energy will likely undertake a Feasibility Study in 2024, which if progressed beyond that would require further State and Federal Government approvals to secure a mining lease and project financing amongst other key matters, before a full-mine could be developed.



WHAT APPROVALS ARE REQUIRED?

Prior to the proposed Field Recovery Trial (FRT), Alligator Energy is required to secure a Retention Lease (RL) from the Department of Energy and Mining, who will regulate the FRT in conjunction with the Environment Protection Agency (EPA), Department for Environment and Water, and SafeWork SA.

Should the RL application be approved, a Program for Environmental Protection and Rehabilitation (PEPR), is required to be approved by the State Government before the trial can proceed. The PEPR outlines the key Environmental Outcomes to be achieved during and post the trial including the details of operational management.

The purpose of the proposed FRT is to demonstrate the application of the ISR method on the Blackbush deposit. Findings of scientific testing undertaken at the Australian Nuclear Science and Technology Organisation (ANSTO) and Alligator Energy, support the use of ISR on the deposit, however in-field trial work is required to further support this.



COMMUNITY ENGAGEMENT

Alligator Energy strives to build collaborative relationships with all stakeholders who may be impacted by or have an interest in the Company's activities. Environmentally, our ethos is to work closely with stakeholders and to ensure land we work on is returned to a better state than we began with. We maintain a relentless and innovative focus on managing the environment in which we work, along with the health and safety of our employees, contractors and nearby communities.

To find out more about Alligator Energy's projects, you can reach us at:



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