30 June 2022

American Rare Earths Ltd Teams Up for Defense R&D Rare Earths Processing

American Rare Earths Limited (ASX:ARR, OTCQB:ARRNF, FSE:1BHA) (the Company) is pleased to announce that its wholly owned US subsidiary, Western Rare Earths, is the sole industry member of a consortium led by Lawrence Livermore National Laboratory (LLNL) that has been awarded research funding to develop scalable, bio-based separation and purification of Rare Earths elements.

Highlights

- The team was awarded an initial $4M USD (A$5.576M) in Phase 1.
- Additional $9M USD (A$12.547M) may be added in follow-on phases, based on performance.
- Feedstocks from the La Paz and Halleck Creek Rare Earth Projects have been provided to researchers.

The funding provides research support for the Defense Advanced Research Projects Agency's (DARPA) Environmental Microbes as a BioEngineering Resource (EMBER) program. EMBER has charged LLNL to lead the consortium in developing a biotechnology-based separation and purification strategy for Rare Earth Elements (REEs) from under-utilized domestic sources. The program aims to deliver multiple capabilities such as the separation of REE mixtures into individual elements.

Chris Gibbs, MD/CEO of American Rare Earths Limited, said, "We are honoured to have our US technical and management team collaborate with the leading researchers on cutting-edge technologies. Rare Earths separation and purification would benefit from a new tech stack combined with traditional mineral processing approaches. A renewable, reusable, sustainable approach will meet fewer permitting hurdles."

Consortium of Game Changers

The consortium is advancing the bio-based process using the REE-selective LanModulin protein, discovered by Prof. Joseph Cotruvo of Penn State University. The sustainable, renewable, reusable capabilities of LanModulin along with its simplicity of making high purity concentrations, could facilitate scaling the technology.

Collaborating institutions include Penn State University, Columbia University, Tufts University, The University of Kentucky, and Purdue University. The consortium draws on a wealth of rare earths experience in processing, separation, purification, and economic analysis. The EMBER project has provided the funding to activate world-class talent and labs as they seek to scale game changing technology.

Onshoring a Cleaner Supply Chain for National Security

DARPA outlined the EMBER program metrics to "enable new biomining methods for separation, purification, and conversion of REEs into manufacturing-ready forms. Microbes (and/or biomolecules) can be biologically engineered or adapted to bind, assimilate, and manipulate individual REEs." "Resultant bioengineering approaches will be coupled to process engineering workflows to extract and purify REEs from domestic source materials. Demonstration of viable schemes will be supported by compelling techno-economic analyses and culminate in an aggressive, proof-of concept pilot-scale REE biomining operation." [1]

"REEs, which include the 15-element lanthanide group plus yttrium and scandium, are critical ingredients in many DoD systems: e.g., in permanent magnets for electric motors, high temperature ceramics, and lasers." "Biomining is an alternative approach that utilizes microbes to recover metals (e.g., copper, gold) from source materials, often using redox processes to liberate the target metal from a mineral source." [1]

Unique Rare Earths Feedstocks

The Company's projects are host to unique REE bearing mineral deposits that are exceptionally large, accessible at the surface, simple in mineralization, with high value magnet REEs (Nd, Pr, Dy, Tb) exceeding 24% of total REE content, and all 14 of the naturally occurring lanthanides present.

American Rare Earths Limited (**ASX: ARR, OTCQB: ARRNF, FSE: 1BHA**) is an ASX listed Australian company with assets in the growing rare earth metals sector of the United States of America, emerging as an alternative international supply chain to China's market dominance of a global rare earth market expected to expand to US$20 billion by the mid-2020s. The Company's mission is to supply Critical Materials for Renewable Energy, Green Tech, Electric Vehicles, National Security, and a Carbon-Reduced Future. Western Rare Earths (WRE) is the wholly owned US subsidiary of the Company.

1. Defense Advanced Research Projects Agency, Broad Agency Announcement: HR001121S0035 July 13, 2021

The events detailed in this document do not imply endorsement of the Company by any organization mentioned herein.

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This market announcement has been authorised for release to the market by the Board of American Rare Earths Limited.

Mr Chris Gibbs
CEO & Managing Director

About American Rare Earths:

American Rare Earths Limited (**ASX: ARR, OTCQB: ARRNF, FSE: 1BHA**) is an Australian company listed on the ASX with assets in the growing rare earth metals sector of the United States of America, emerging as an alternative international supply chain to China's market dominance of a global rare earth market expected to expand to US$20 billion by the mid-2020s. The Company's mission is to supply Critical Materials for Renewable Energy, Green Tech, Electric Vehicles, National Security, and a Carbon-Reduced Future.

Western Rare Earths (WRE) is the wholly owned US subsidiary of the Company. ARR owns 100% of the world-class La Paz Rare Earth Project, located 170km northwest of Phoenix, Arizona. As a large tonnage, bulk deposit, La Paz is potentially the largest, rare-earth deposit in the USA and benefits from containing exceptionally low penalty elements such as radioactive thorium and uranium. Approximately 742 - 928 million tonnes of Rare Earths mineralised rocks are identified as an exploration target in the La Paz Rare Earths project's Southwest area with an average TREO Grade of 350 - 400ppm and Scandium Oxide grade of 20 - 24.5ppm. The new exploration Target is additive to the La Paz Rare Earth project recently upgraded 170MT Resource. (ASX Announcement, 29 September 2021). During the period from February to April 2022 the Company drilled nine holes for 821 metres and collected 677 samples in the La Paz southwest area. The assay results from the first 332 samples demonstrate rock type associated with higher rare earth grades. The enhanced grades and thickness of the mineralised zone have accelerated exploration planning. The Company is working on establishing a JORC resource for the southwest area (ASX Announcement, 14 June, 2022). Preliminary metallurgical test work demonstrates that La Paz ore can be effectively concentrated using conventional magnetic separation, selective grinding and direct flotation. Under the guidance of Wood Australia, advanced metallurgy and mineral processing test work is near completion with Nagrom Laboratories in Perth Western Australia (ASX Announcement, 7 April 2022).

In the first half of 2021, ARR acquired the USA REE asset, the Halleck Creek Project in Wyoming. Since acquiring the asset the company has increased the land holding to over 6,000+ acres. Approximately 308 to 385 million tonnes of rare earths mineralised rocks were identified as an exploration target for the Halleck Creek project area with an average Total Rare Earth Oxide (TREO) grade of 2,330 - 2,912 ppm. Initial surface sampling of the Overton Mountain area conducted in 2018 revealed average TREO values of 3,297 ppm, average Heavy Rare Earth Oxide (HREO) values of 244 ppm, and average Magnetic Rare Earth Oxide (MREO) values of 816 ppm. (ASX Announcement,26 April 2022). The maiden exploration drilling program was completed in April 2022. The Company is updating the existing exploration target and developing a more comprehensive drilling program with the objective of defining a high tonnage maiden JORC resource.

La Paz and Halleck Creek's mineral profiles are incorporated into emerging US advanced rare earth processing technologies in collaboration with US national laboratories, major universities and the US DOE innovation hub, the Critical Materials Institute.

Forward-Looking Statements

This press release contains certain statements that are not historical facts and are forward-looking statements for purposes of the safe harbor provisions under the United States Private Securities Litigation Reform Act of 1995. Forward-looking statements may be identified by the use of the words such as "estimate," "plan," "project," "forecast," "intend," "expect," "anticipate," "believe,"

"seek," "will," "target," or similar expressions that predict or indicate future events or trends or that are not statements of historical matters. These forward-looking statements include, but are not limited to, statements regarding the Company's plans for exploration, development, production and/or processing of materials, including the timing and associated costs and expenses. Such statements are all subject to risks, uncertainties and changes in circumstances that could significantly affect the Company's future financial results and business.

Accordingly, the Company cautions that the forward-looking statements contained herein are qualified by important factors that could cause actual results to differ materially from those reflected by such statements. These forward-looking statements are subject to a number of risks and uncertainties, including the ability of the Company to successfully permit, plan, develop and/or construct a facility to mine, process and/or refine critical minerals, which may be delayed, and related costs and expenses, which may be increased beyond our current estimates; changes in domestic and foreign business, market, financial, political and legal conditions, which may or may not occur; the impact of the global COVID-19 pandemic, on any of the foregoing risks; and those factors discussed in the Company's JORC 2012 compliant technical reports as submitted to the Australian Securities Exchange (ASX). The Company does not intend to update publicly any forward-looking statements except as required by law. In light of these risks, uncertainties, and assumptions, the forward-looking events discussed in this press release may not occur.