

26 February 2021

Companies Announcement Office
Via Electronic Lodgement

Low-pH Field Demonstration Update

Peninsula Energy Limited (“Peninsula” or “the Company”) (ASX:PEN, OTCQB:PENMF) provides the following update on the MU1A low-pH field demonstration, at the Company’s flagship, 100% owned Lance Project (“Lance”) located in Wyoming, USA.

The Company started operating the field demonstration in August 2020 following extensive laboratory testing of the low-pH In-Situ Recovery (“ISR”) chemistry on core samples obtained from the project site. In early 2019, a Field Leach Trial (“FLT”) conducted in an area previously mined using alkaline ISR techniques successfully demonstrated the ability to modify the system pH to 2.0 standard units (“S.U.”) and subsequently restore the pH to above 5.0 S.U. The primary objective of the present low-pH field demonstration is to operate in an unmined area of the orebody and thereby confirm the optimal operating conditions for Lance, as suggested from laboratory studies completed between 2017 and 2020. Laboratory testing is beneficial to determine ore amenability to a process and provides a fair approximation of the process parameters, but not all ISR variables can be properly simulated in a laboratory. Further, the scope of the 2019 FLT did not include a full assessment of uranium recovery. Therefore, additional field scale evaluation was planned to provide more complete and definitive data for forecasting, modelling and an eventual return to production.

MU1A FIELD PATTERNS

Three new full-scale ISR patterns are operating within a previously unmined area of Mine Unit 1 (collectively “MU1A”), as represented in **Figure 1** below. A typical ISR pattern consists of several injection wells (blue triangles) and one production well (red squares).

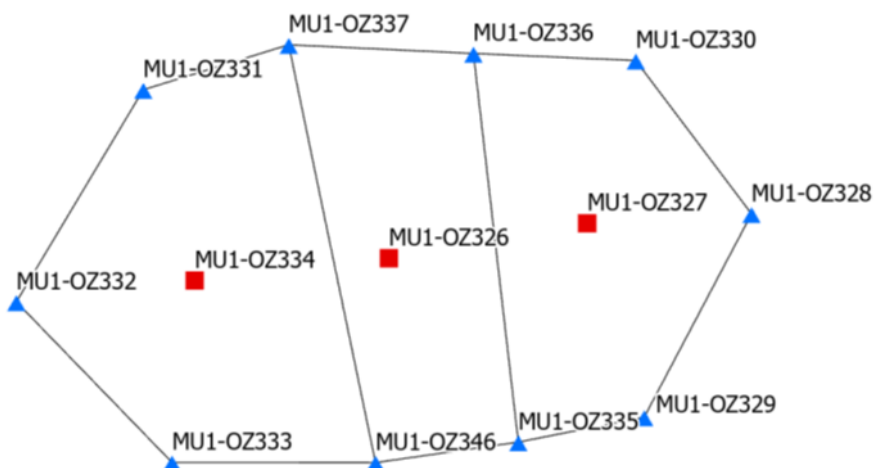


Figure 1: MU1A low pH field demonstration ISR patterns

The well spacing for the field demonstration patterns was selected to match the 2018 Feasibility Study assumption (approximately 125 feet) which is 67% larger than the well spacing of the historical alkaline ISR patterns at Lance (including the 2019 FLT patterns). Larger patterns yield lower overall wellfield development costs but can impact the effectiveness of the operations in ways that cannot be simulated in the laboratory. Larger pattern sizes also lead to generally longer response times and operating lives

For personal use only

for each pattern as a larger quantity of mineral and a larger volume of solution are contained in each pattern. The overall impact of the selected pattern design will be evaluated throughout the operating life of the field demonstration. Once completed, the field demonstration will provide valuable data on the influence of this design criteria, which will in turn inform the design of the optimal commercial scale production ISR pattern.

Each pattern was designed for a flow rate of 25 gallons per minute (“GPM”), or 75 GPM in total for the demonstration operations. The field demonstration flow rates have been safely and successfully maintained at approximately 75 GPM since commencement of operations in August, despite the ongoing external challenges of COVID-19 and the normal cold winter weather conditions at the site location.

CHEMICAL PARAMETERS

While there are many technical aspects to successful uranium in-situ recovery operations, achieving and maintaining the correct pH and oxidation-reduction potential (“ORP”) of the process solutions is paramount. The Company has been tracking the progression of the injection and recovery stream chemical parameters in detail from the commencement of the field demonstration operations.

Dilute acid solutions are used to decompose naturally occurring carbonate minerals and the bicarbonate contained in the local groundwater system to achieve an operating pH of approximately 2.0 S.U. in the system, from a baseline pH of approximately 8.0 S.U. The volume of acid required is primarily a function of the ore body constituents and has been estimated in the 2018 Feasibility Study from the results of laboratory tests completed under ideal conditions. To date, the field demonstration has exhibited a trend toward consuming more acid than was modelled from the laboratory results and subsequently projected in the 2018 Feasibility Study. While one of the demonstration patterns has arrived at the target pH of 2.0 S.U., it is taking more time than expected for the other two patterns to reach the recovery pH target. At present the two lagging patterns are yielding a recovery pH of approximately 4.0 S.U. notwithstanding having sustained the objective flow rates and acid concentrations in the injection stream. The Company will continue to closely monitor the progression of the system pH and will assess opportunities to optimise the process design at the completion of the field demonstration.

A recent series of laboratory tests focused on the importance of achieving and maintaining an adequate ORP to maximise uranium solubility. Commercially available oxidants can be introduced to achieve ORP targets. The field demonstration has allowed the Company to evaluate the commercial potential of several oxidants. Gaseous oxygen was selected as the initial oxidant, as the addition system was already in place and available from alkaline ISR operations at Lance. Introduction of gaseous oxygen has not been completely successful in maintaining the target ORP in the injection stream. Consequently, an addition system for an alternative oxidant, hydrogen peroxide, as used in our laboratory studies, was developed and has recently been successfully commissioned. Importantly, hydrogen peroxide has already proven effective in achieving the target ORP in the field demonstration injection stream and the Company is confident that the required chemical conditions for uranium solubility can be established systemwide.

MANAGING SOLIDS

To date, there have been no significant issues with fine solids in the production stream. Use of a settlement pond as part of the solids management system is performing to expectations. Fine solids presented a significant challenge during the 2019 FLT. This system has the beneficial effect of minimising filtration costs, waste disposal costs and worker exposures.

ION EXCHANGE

Uranium solubility and production solution grades are expected to increase as the recovery stream approaches the target pH and oxidation levels. At that time, the ion exchange demonstration plant will be activated. The Company is also progressing technical evaluations related to the potential for application of membrane separation systems to enhance resin performance. Enhanced resin loading has the potential to significantly reduce downstream processing and operating costs. A laboratory scale test is planned to be performed on production solutions from the field demonstration. A pilot demonstration

For personal use only

based on the laboratory test results could be completed in conjunction with the continued operation of the field demonstration.

OUTLOOK

Peninsula will continue to run the field demonstration for the foreseeable future as it generates valuable data related to the specific performance of the low-pH process at Lance. It is expected that the field demonstration may now run for 18-24 months, an increase of around 6 months from the operating timeframe originally envisaged.

Commenting on the progress of the field demonstration, Peninsula Managing Director and Chief Executive Officer Wayne Heili said *"The decision to advance our capabilities and technical understanding of low-pH ISR through the operation of a well-designed field demonstration has been rewarded with the collection of a significant body of data. To date, the operations have helped inform us on areas for further focus including rates of pH adjustment, acid consumption and the need to utilize stronger oxidants. This information will be invaluable as the Company progresses the Lance Project toward a return to commercial production"*.

Peninsula will continue to provide progress updates on the MU1A low-pH field demonstration as additional meaningful results become available.

Sincerely Yours,



Wayne Heili
Managing Director / CEO

This release has been approved by the Board of Directors.

For further information, please contact

Peninsula Energy
+61 8 6263 4461

or

Citadel-MAGNUS
Michael Weir - +61 402 347 032
Cameron Gilenko - +61 466 984 953

ABOUT PENINSULA ENERGY LIMITED

Peninsula Energy Limited (PEN) is an ASX listed uranium mining company which commenced in-situ recovery operations in 2015 at its 100% owned Lance Projects in Wyoming, USA. Following a positive feasibility study, Peninsula is embarking on a project transformation initiative at the Lance Projects to change from an alkaline ISR operation to a low-pH ISR operation with the aim of aligning the operating performance and cost profile of the project with industry leading global uranium production projects.