ASX Announcement
ASX: BOE

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Uranium Re-start Assessment Complete

HIGHLIGHTS

- Re-start Assessment for the existing Solvent Extraction plant completed
- Envisaged costs and schedule to recommence production remain valid as detailed in Pre-feasibility Study
- Endorsement of existing Drying Circuit can be modified to ensure production of 2Mlb U_3O_8 per annum production rate for Honeymoon development (Stages 1 & 2)
- CAPEX & OPEX emanating from the Re-start Assessment and modifications to the Drying Circuit will reflect in the DFS
- Results of Phase 1 trade-off studies to be reported end March 2019

Boss Resources Limited (ASX: BOE) is pleased to announce it has completed the Phase 1 Re-Start Assessment at its 100%-owned Honeymoon Uranium Project in South Australia which included a detailed review of the existing Drying and Packing facility. The Re-Start Assessment confirmed assumptions, including envisaged costs and schedule to restart production, made in the 2017 Pre-feasibility Study remain valid.

Focusing on the Solvent Extraction (SX) facility, precipitation circuits and reviewing the capacity and capabilities of the existing Drying and Packing (D&P) circuit, a team of Australian engineers and specialists completed the re-start assessment. In addition, the program looked at how the new proposed leach chemistry (i.e. lower pH and higher iron tenors) would impact on the downstream process and how this may impact the operating strategy and equipment selection.

Boss Resources Managing Director Duncan Craib said, *"We're really pleased with progress and results at Honeymoon through Phase 1 of the Re-Start Strategy. Today's announcement further validates the comprehensive PFS as reported in May 2017.*

"The solvent extraction and precipitation assessment identified modifications to improve the circuit as well as changes that may increase the efficiency of the whole process.

"The D&P work also looked at modifications required to the existing yellow cake drying and packing facility to improve the operability of the plant, and upgrades to support the ramp up of plant capacity of 2Mlbs per annum U_3O_8 equivalent. The further future expanded production rate of 3.2Mlb/annum U_3O_8 equivalent was also considered."

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HONEYMOON RE-START STRATEGY

As previously announced[1] the Re-Start Strategy is categorised into the below three key phases.

The reporting of Phase 1 is expected this quarter, Phase 2 has commenced and expected to be released in Q3 2019 with Phase 3 following later in the year.

Phase 1: The generation of the final input data required for the Definitive Feasibility Study (DFS) including the drilling program to deliver the measured and indicated resource, an optimisation program to deliver further cost savings and/or process improvements and a preliminary execution plan, updated cost estimate and schedule for the re-start of the existing solvent extraction (SX) plant.

Phase 2: The second phase comprises the DFS and permitting updates. The DFS engineering works; process, engineering design and cost estimation, will use the results from the Phase 1 studies along with the outputs of the wellfield design, derived from the updated mineral resource, to deliver an independent feasibility study report.

Phase 3: The third phase covers the detailed execution planning, operational readiness inclusive of the SX plant recommissioning plan, in conjunction with the ion exchange plant detailed design.

On completion of the three-phase strategy, Boss will be in a position to make a decision to mine, assuming a specified global uranium price has been achieved to satisfy the targeted IRR and NPV return to shareholders. Being an ISR mine in combination with IX production, the Honeymoon Uranium Project will operate in the lowest cost quartile of world-wide producers. In order to deliver the targeted 3.2Mlbs / annum U_3O_8 equivalent production plan, the following three stages have been defined:

Stage 1: Restart of the existing operation; which will involve the use of existing wellfields, and restarting the existing SX plant with minor modifications to rectify identified operational issues. Construction of the ion exchange (IX) plant will commence;

Stage 2: Ramp up of plant capacity to 2Mlb/annum U_3O_8 equivalent using the combined SX / IX system;

Stage 3: Ramp up of plant capacity from 2Mlb/annum to ~3.2Mlb/annum U_3O_8 equivalent (after validating the IX technology) through the addition of further IX columns.

[1] Refer ASX announcements 2 July 2018, 9 October 2018, 28 February 2019

RE-START ASSESSMENT HIGHLIGHTS

The Re-Start Assessment was undertaken to define the work program, provide a cost estimate and look at the timing required for the restart of the existing Honeymoon plant (880,000 lbs / annum U_3O_8 equivalent). The study focused on:

- Reviewing existing wellfields infrastructure and modifications
- Assessing the SX, precipitation circuits and their associated ancillary equipment
- Defining scopes for structural integrity testing
- Returning the existing systems (i.e. control & maintenance systems) back to full functionality
- Re-establish onsite laboratory
- Reagent and consumables first fills
- Wellfield recommissioning activities
- Infrastructure upgrades (access roads, airstrip, ponds etc)

Proposed capital works from the study include:

- Fire water and raw water tanks relocation
- Carbon columns and Jameson cell installation (for organic removal)
- Minor modifications to the SX circuit
- Water treatment and disposal upgrades

The CAPEX and OPEX cost requirements compare favourably with estimations used in the PFS as reported in May 2017.

As part of the assessment, a number of potential opportunities were identified that could possibly reduce costs. These include:

- Utilising only one of the SX pulse columns at start-up and bring the second unit on line only later in the schedule when the production profile requires it (reduced capex)
- The new leach chemistry may eliminate the need for a bleed stream to manage gypsum (reduced capex and opex)
- Potential to increase uranium loadings on the solvent leading to lower reagent consumptions (reduced opex)
- Simplified organic removal from SX raffinate streams

The results of this work will be reviewed more thoroughly as part of the DFS and the options selected that will achieve an acceptable risk profile will form the project.

YELLOW CAKE (DRYING AND PACKING) HIGHLIGHTS

The existing drying and packing plant at the Honeymoon site was designed to deliver a production rate of 0.88Mlbs per annum U_3O_8 equivalent yellow cake. The plant consists of two batch vacuum dryers that share a common hot oil and vacuum system and as such, they cannot operate independently. Issues related to operability of the process, which in turn extended the cycle time of each drying batch, as well as technical issues such as organic carry over affected the plant performance when previously operated.

The Pre-feasibility Study identified the opportunity to "separate" the two dryer units from each other by installing a new vacuum and hot oil system so the dryers can run independently. This concept was engineered and costed at a high level and shown to be theoretically feasible.

The focus of the D&P study program was more detailed and looked to address the operability of the existing system as well as supporting the ramp up of plant capacity to an initial rate of 2Mlbs per annum U_3O_8 equivalent. The future expanded production rate of 3.2Mlb/annum U_3O_8 equivalent was also considered as part of the review.

The study identified two options that could be implemented to address the existing issues and meet the new production rate. Both options modified the existing dryers so they could be run independently with one option focused on reducing the moisture content of the dryer feed by installing a centrifuge in series with the existing plate and frame filer. The second option focused on operating the dryers at a higher temperature (but still within the design envelop). This second option requires the replacement of the existing filter press with a larger unit so that the dryers can be loaded with one filter load instead of two, as in the current set up.

Costs for each of these are similar at ~$3M, but operating cost for the second may be higher due to the higher oil temperature. Each of these options will technically meet the required throughput, but all have different risk profiles. This cost is higher than the cost assumed in the PFS (~$1.2M) due in part to the expanded scope but also as a result of a more detailed review.

In order to complete the assessment, a third option has been included that considers replacing the vacuum dryers with a high temperature kiln that produces a calcined product, instead of uranyl peroxide as produced from the existing system. The study has shown this to be higher cost option (~$5M), but potentially carries lower risk with it and may be favourable from a marketing perspective. Also, the implementation of this technology could simplify the upstream process as organic removal and chloride removal steps are not required (removal is actually carried out in the kiln) which would have a cost benefit as these removal stages can be removed from the flowsheet. A full cost benefit analysis will be undertaken as part of the DFS work program.

FUTURE PROGRAMS

Testwork

In addition to the testwork that has been identified as part of the optimisation program, the following work is recommend based on the restart study:

- Model alternative calcium management strategies on bleed volumes
- Further SX testwork to define max loading configurations
- SX kinetic studies
- Simplification of the scrubbing process and chemistry

The results from the current work and testwork recommended above will support the trade-off studies which are currently in progress and together, these can then define the optimal flowsheet for the project.

Studies

The following further studies are also proposed:

- Review Jameson Cell location and barren liquor solution (BLS) settling pond modifications
- Yellow cake storage facilities (drums)

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