ASX Announcement 26 October 2018

# 30 SEPTEMBER 2018 QUARTERLY REPORT

## HIGHLIGHTS

- Successful advancement of Honeymoon Re-Start Strategy
- Honeymoon infill drilling program successfully completed ahead of schedule and within budget
- Exceptional infill drill intercepts of uranium $pU_3O_8$ include:
    - BIF0044 from 105.25m GT 62,144 (6.25m @ 9,943ppm $pU_3O_8$)
    - BIF0069 from 102.75m GT 11,016 (4.25m @ 2,592 ppm $pU_3O_8$)
    - BIF0048 from 106.25m GT 9,096 (3.00m @ 3,032ppm $pU_3O_8$)
    - BIF0040 from 107.00m GT 7,560 (2.25m @ 3,360ppm $pU_3O_8$)
    - BIF0047 from 113.00m GT 7,090 (2.50m @ 2,836ppm $pU_3O_8$)
- Uranium mineralisation remains open at the East Kalkaroo Deposit
- Divestment of Burkina Faso Gold assets to JV partner Teranga for A$10 million cash banked 3 October 2018

**Boss Resources Limited (ASX: BOE)** ("**Boss**" or the "**Company**") is pleased to provide shareholders with the quarterly activities report for the three-month period ending 30 September 2018.

## Honeymoon Uranium Project

### Infill Drilling Program

Throughout the quarter, Boss completed its infill drilling campaign at the Honeymoon Uranium Project. The infill program formed Part A, Phase 1 of the Company's Honeymoon Re-Start Strategy, as announced to the ASX on 2 July 2018 (see below for further information).

Impressive results were received from the infill drilling program which was carried out in three tranches and covered the Honeymoon, Brooks Dam and East Kalkaroo Deposits (situated approximately 1 kilometre west and 3 kilometres east, respectively, from the existing Honeymoon Uranium Mine and processing plant infrastructure).

The significant intercepts returned from each deposit

a. validated historic drill results which had indicated "pods" of high-grade uranium accumulation within the deposits,

b. confirmed the continuity of mineralisation along strike of the east-west orientated palaeovalley,

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c. highlighted that mineralisation remains open in all directions, increasing the prospectivity of exploration in areas adjacent to the main Honeymoon Resource.

The morphology of the system hosting Honeymoon currently suggests a palaeovalley of approximately 2 kilometres in width however, within this palaeovalley, there is also the potential for narrower, meandering channel systems that may be mineralised but have not yet been defined or constrained. The results of the recent infill drill campaign suggest that the majority of the mineralisation appears to be situated in the basal channel facies, while some of the high-grade zones appear to coincide with the shallow embankments of the channels. Fluid flow rates in these shallow areas would be relatively slower than the faster-moving waters in the deeper parts of the channels, allowing more time for the formation of redox boundaries (through oxygen removal, accumulations of sulphidic and organic material) and subsequent precipitation of the uranium.

The main objectives of the infill drilling were to update the existing Honeymoon Mineral Resource Estimate by:

- Converting the Inferred Resources to Indicated category;
- Upgrading a portion of the Indicated Resources to Measured category, with the ultimate purpose of converting Indicated and Measured Resources to Ore Reserves.

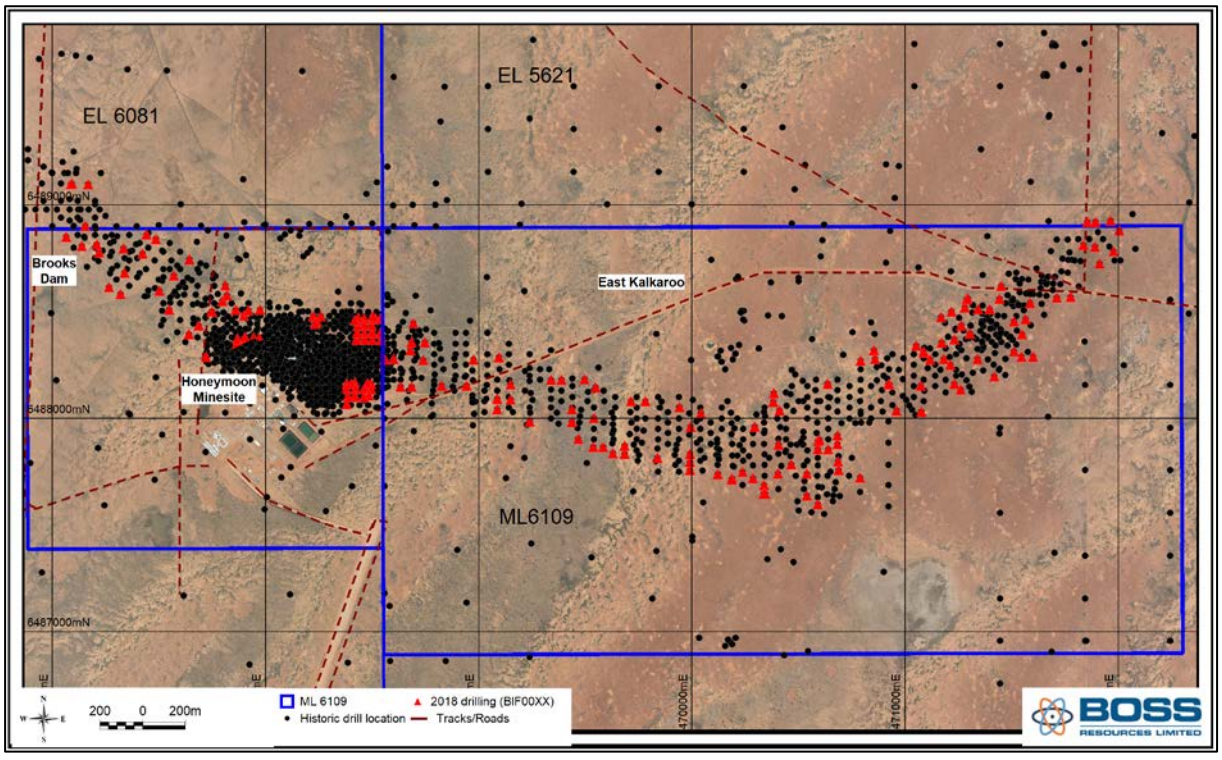


**Figure 1: Map showing location of the 2018 DFS infill drilling**

Results from the first and second tranches of drilling were announced on 2 August and 27 August 2018, respectively.

Results returned from the last tranche of the program (ASX Announcement 4 October 2018) suggest that mineralisation at East Kalkaroo remains open to the east and northeast of the Mining Lease, increasing the potential for future growth of the Company's existing Mineral Resource.

The initial infill program was designed to comprise 200 holes, however given the results obtained it was deemed unnecessary to drill 11 planned holes, which further resulted in cost savings for the Company.

Each drillhole was logged with a suite of downhole geophysical tools consisting of gamma, prompt fission neutron (**PFN**), nuclear magnetic resonance (**NMR**), resistivity/induction, self-potential conductivity, caliper and magnetic deviation. Drill chip samples collected and logged for geological information were analysed with a handheld XRF (x-ray fluorescence) spectrometer for qualitative measurements of sulphide and iron content. The objective of this exercise was to better understand the distribution of sulphides in the system that may impact on the final design of the wellfield. The various datasets compiled from the different suites has created the most advanced modelling set to date for mineral delineation at Honeymoon and will prove invaluable in optimising the engineering component of the next stage of the Definitive Feasibility Studies (**DFS**).

The next stage of work will involve updating the existing Mineral Resource Estimate with leading independent mining experts AMC Consultants, based in West Perth. The updated resource estimate will subsequently be used in the engineering studies for the final wellfield design, the results of which will determine the optimal size and shape of a practical mineable resource for the Honeymoon Uranium Mine. The data collected will also be used in a deposit-wide update of the lithostratigraphic model and the development of a systems-style exploration model that can then be applied more regionally to identify further prospective areas and potentially extend the Honeymoon Mineral Resource.

**Table 1** of **Appendix 1** provides the full list of significant intersections returned from the infill drill campaign. **Figures 2** and **4** provide the grade-thickness (grade multiplied by thickness) distribution maps from the Honeymoon and East Kalkaroo Deposits, respectively. Historic drilling has also been plotted in black to provide reference for areas of infill from the 2018 drill campaign. Additional reference features are shown as black lines to represent the cross-sectional views in **Figures 3** and **5**. The grade thickness distribution maps illustrate the interpreted "pod-like" accumulations of high-grade mineralisation whereas the cross-sections show the continuity and consistency of mineralisation along the strike of the deposits. The red lenses represent the interpreted uranium mineralisation from all available drilling data, while the red dashed lines at the end of the sections indicate that mineralisation is still open in these areas.

Key intercepts received from each of the three deposits include:

- Honeymoon Deposit:
  - BIF0044 from 105.25m GT 62,144 (6.25m @ 9,943ppm $pU_3O_8$)
  - BIF0048 from 106.25m GT 9,096 (3.00m @ 3,032ppm $pU_3O_8$)
  - BIF0040 from 107.00m GT 7,560 (2.25m @ 3,360ppm $pU_3O_8$)

- BIF0047 from 113.00m GT 7,090 (2.50m @ 2,836ppm $pU_3O_8$)
- BIF0019 from 104.50m GT 4,276 (2.00m @ 2,138ppm $pU_3O_8$)
- BIF0020 from 103.00m GT 6,360 (3.00m @ 2,120ppm $pU_3O_8$)
- BIF0013 from 111.50m GT 4,177 (2.75m @ 1,519ppm $pU_3O_8$)
- BIF0015 from 115.50m GT 3,735 (2.50m @ 1,494ppm $pU_3O_8$)
- BIF0016 from 114.00m GT 4,470 (3.00m @ 1,490ppm $pU_3O_8$)
- BIF0010 from 92.00m GT 2,260 (2.00m @ 1,130ppm $pU_3O_8$)
- BIF0017 from 88.75m GT 2,120 (2.00m @ 1,060ppm $pU_3O_8$)
- BIF0026 from 87.50m GT 3,510 (3.25m @ 1,080ppm $pU_3O_8$)

- Brooks Dam Deposit:
  - BIF0026 from 87.50m GT 3,510 (3.25m @ 1,080ppm $pU_3O_8$)
  - BIF0038r from 88.25m GT 2,805 (3.75m @ 748ppm $pU_3O_8$)
  - BIF0036 from 100.75m GT 6,539 (2.25m @ 2,906ppm $pU_3O_8$)
  - BIF0031 from 87.50m GT 2,430 (2.25m @ 1,080ppm $pU_3O_8$)

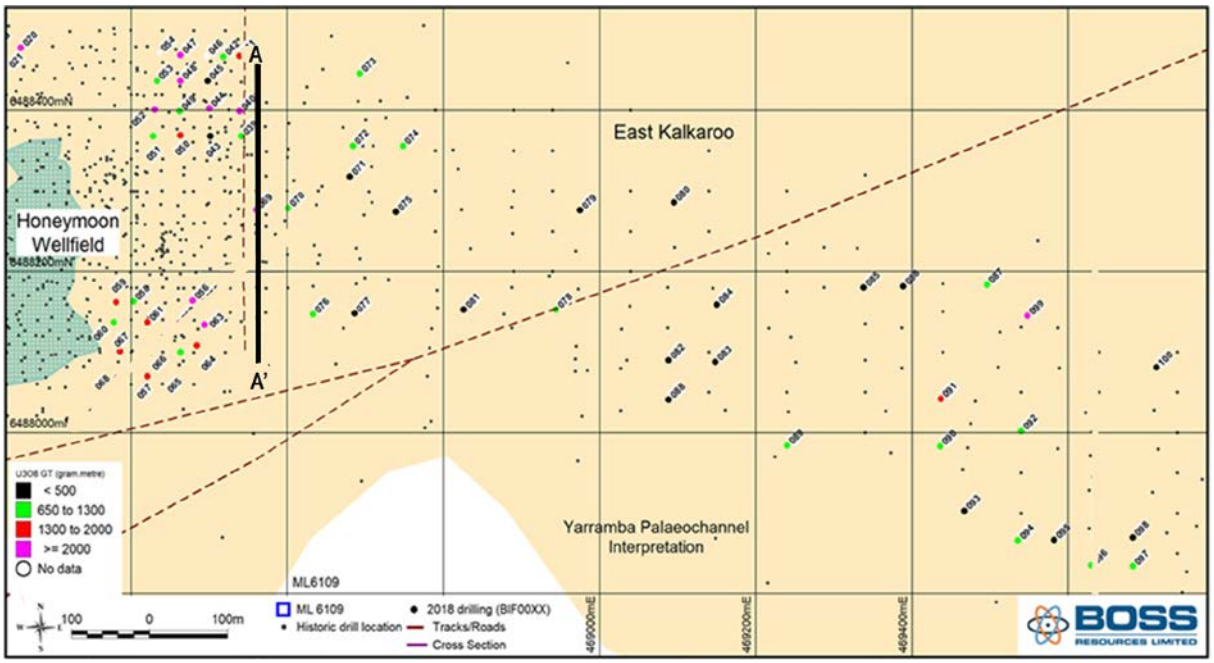


**Figure 2: Grade-thickness distribution map for the Honeymoon/East Kalkaroo Deposits**

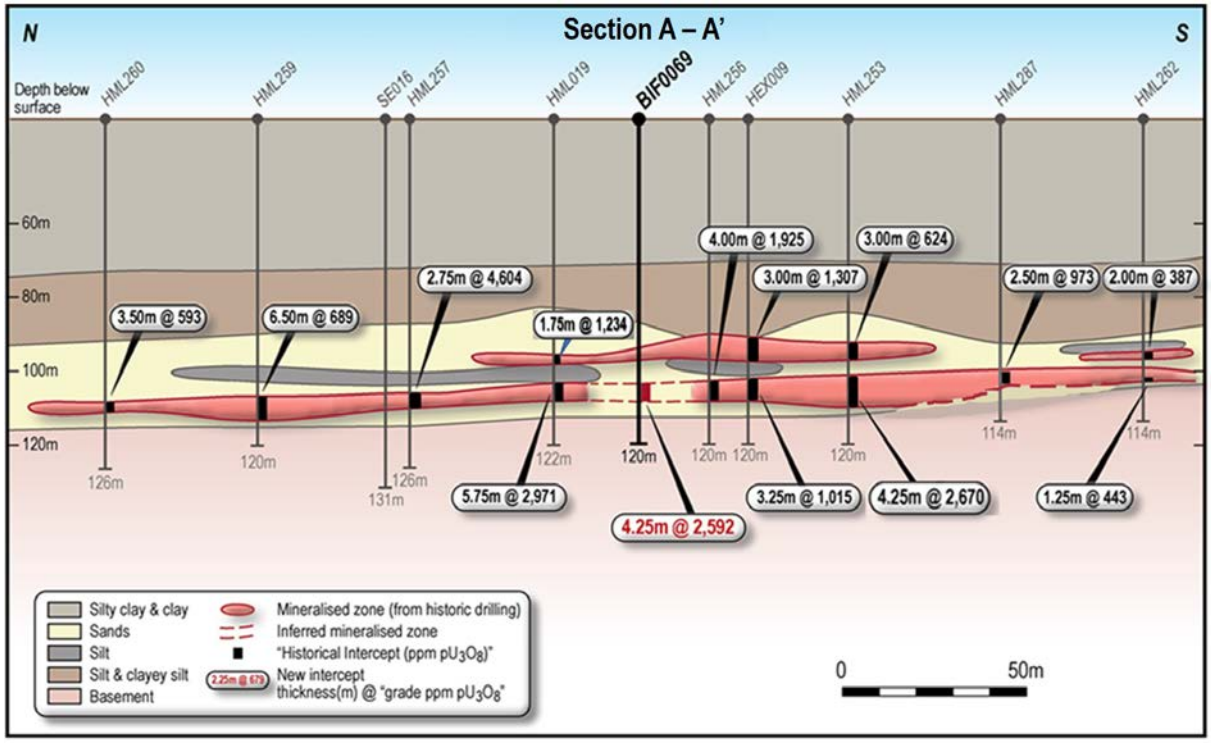


**Figure 3: Cross-sectional view from the Honeymoon Deposit, showing selected mineralised intercepts.**

- East Kalkaroo Deposit:
  - BIF0052 from 97.00m GT 2,236 (2.75m @ 813 ppm $pU_3O_8$)
  - BIF0055 from 99.75m GT 1,875 (3.25m @ 577 ppm $pU_3O_8$)
  - BIF0056 from 115.50m GT 1,950 (3.25m @ 600 ppm $pU_3O_8$)
  - BIF0057 from 94.00m GT 1,706 (3.25m @ 525 ppm $pU_3O_8$)
  - BIF0059 from 118.25m GT 1,474 (2.75m @ 536 ppm $pU_3O_8$)
  - BIF0061 from 114.75m GT 1,391 (2.25m @ 618 ppm $pU_3O_8$)
  - BIF0062 from 117.00m GT 1,590 (2.75m @ 578 ppm $pU_3O_8$)
  - BIF0063 from 93.75m GT 3,140 (3.25m @ 996 ppm $pU_3O_8$)
  - BIF0064 from 93.50m GT 1,397 (2.75m @ 508 ppm $pU_3O_8$)
  - BIF0066 from 110.25m GT 1,950 (3.75m @ 520 ppm $pU_3O_8$)
  - BIF0067 from 115.25m GT 1,680 (3.25m @ 517 ppm $pU_3O_8$)
  - BIF0068 from 108.25m GT 2,282 (3.50m @ 652 ppm $pU_3O_8$)
  - BIF0069 from 102.75m GT 11,016 (4.25m @ 2,592 ppm $pU_3O_8$)
  - BIF0090 from 95.25m GT 1,016 (2.00m @ 508 ppm $pU_3O_8$)
  - BIF0099 from 110.00m GT 2,135 (2.50m @ 854 ppm $pU_3O_8$)

- BIF0066r from 110.50m GT 6,240 (5.00m @ 1,284 ppm $pU_3O_8$)
- BIF0155 from 109.00m GT 5,139 (3.00m @ 1,713 ppm $pU_3O_8$)
- BIF0142r from 78.00m GT 4,459 (7.00m @ 637 ppm $pU_3O_8$)
- BIF0145 from 77.75m GT 4,094 (5.75m @ 712 ppm $pU_3O_8$)
- BIF0153 from 79.25m GT 4,055 (4.25m @ 954 ppm $pU_3O_8$)
- BIF0152 from 99.75m GT 3,300 (3.00m @ 1,100 ppm $pU_3O_8$)
- BIF0157r from 108.25m GT 3,014 (3.50m @ 861 ppm $pU_3O_8$)

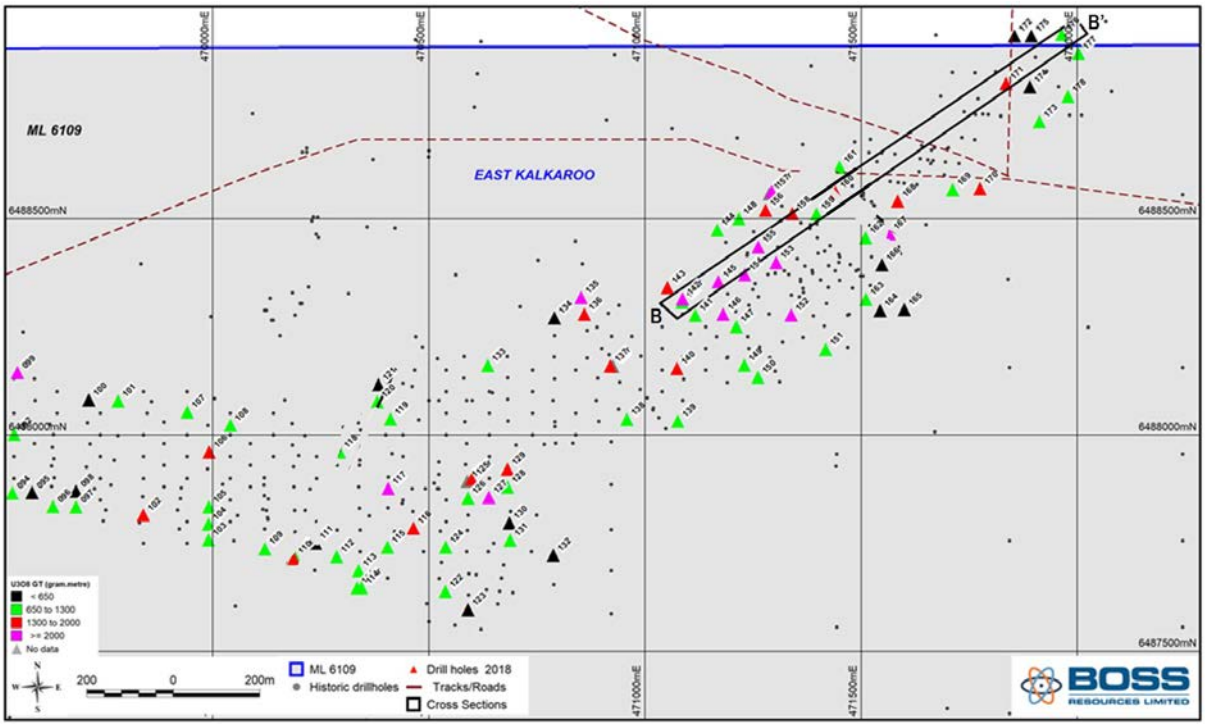


**Figure 4: Grade-thickness distribution map for the East Kalkaroo Deposit**

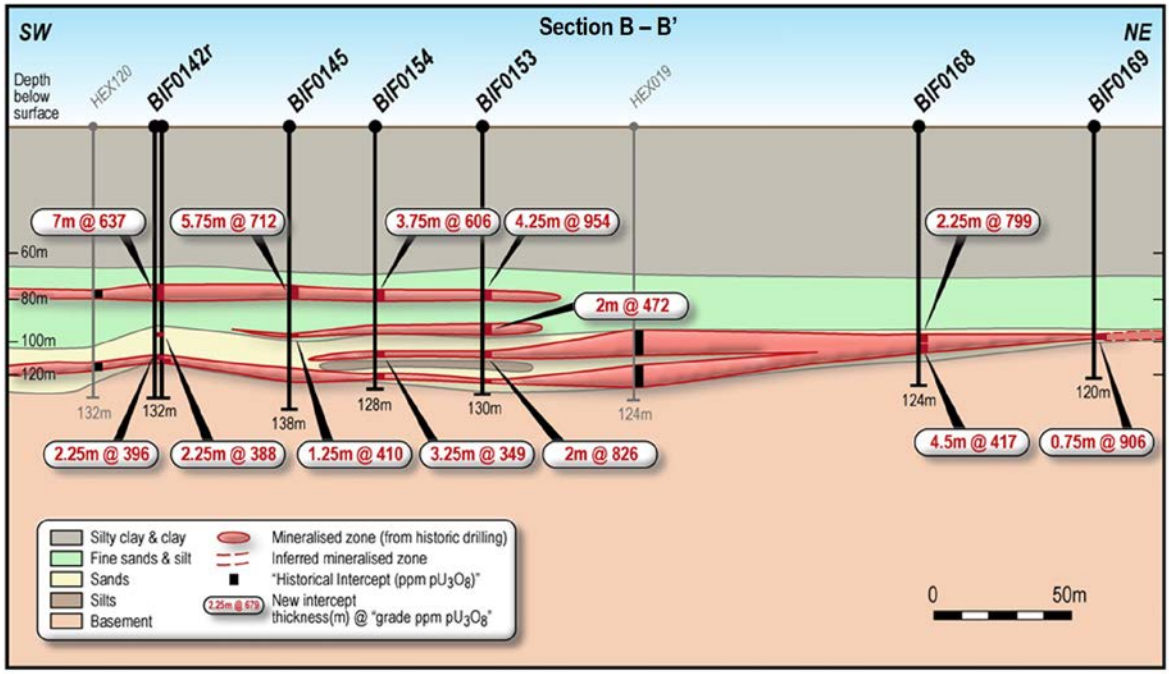


**Figure 5: Cross-sectional view from the East Kalkaroo Deposit, showing selected mineralised intercepts.**

The cut-off parameter selected for Mineral Resource Estimation is a nominal grade of 250ppm $pU_3O_8$, with a minimum interval thickness of 0.5 metres and a maximum internal dilution of 1 metre. Grades are reported in parts per million (**ppm**) $pU_3O_8$ (results from the downhole PFN logging) and $eU_3O_8$ (results from the downhole gamma logging). Reporting of results is also shown in units of grade x thickness (**GT**) in order to be consistent with common practice in uranium deposits of this type.

## Advancement of Re-Start Strategy

Boss recently announced an update on the advancement of the Honeymoon Re-Start Strategy (see ASX Announcement 2 July 2018), which comprises three key phases. The first phase is focused around the recently completed infill drilling program, from which the final data will be used to deliver the measured and indicated resource required for the completion of the DFS.

Phase 1 also includes the optimisation program and trade-off studies which are being carried out to identify potential cost savings and/or process improvements, in addition to a preliminary execution plan, updated cost estimate and schedule for the restart of the existing solvent extraction (**SX**) plant.

The testwork programs are all well advanced with improvements being demonstrated over the original base case process defined in the Pre-feasibility Study. Results to date confirm that Boss is well on track to successfully return the Honeymoon Uranium Project to production.

## Optimisation Program

### Ion Exchange

The ANSTO testwork program is focused on investigating options for improving the elution process for the selected resin. The ion exchange ("IX") piloting undertaken as part of the Field Leach Trial ("FLT") program indicated lower than predicted eluate tenors, which would result in higher eluate flowrates (for the same production) and therefore marginally larger downstream equipment. The testwork results have shown these eluate grades can be improved by physical changes e.g. increased elution temperature and lower elution flowrates as well as by modifying the eluant liquors with increased acid content. One area of specific interest relates to modifying the loaded resin prior to stripping. This option has shown significant increase in eluate tenors and is currently an ongoing focus for the program.

### Nano-filtration

Nano-filtration will be used on the IX eluate stream to recover the IX eluant reagent (sodium chloride), while at the same time increasing the uranium tenor in the feed liquor to precipitation circuit. The first stage of the program has been completed, with a number of membranes tested to determine the preferred membrane type and associated operating conditions. A small pilot rig is now being set-up to run a continuous system to generate more representative data that can be used for the design of the system. The results of this work will be provided to the engineering consultants so they can size and cost the nano-filtration equipment required for commercial operation.

### Uranium Precipitation

Uranium precipitation testwork assuming the existing circuit configuration onsite at Honeymoon has progressed well. The initial phase of testwork has focused on defining the optimal "recipe" for the precipitation process i.e. hydrogen peroxide addition rates, pH and residence times. The results have defined an operating window for the process that maximises precipitate particle size (which is important for downstream dewatering) and optimum reagent use. Improvements over the original production data have been witnessed, although this will need to be scaled up to determine the final benefits.

The program has focused on the conditions to be used when treating the solution produced from the SX circuit i.e. conditions for the first 18 months of the operation based on the current production schedule. The program will now move onto testing the conditions relevant to treating a combined IX and SX solution, which is relevant to the planned operation after the 18-month ramp-up. Confirmation of this will allow the DFS to move ahead with only a single uranium precipitation circuit, as opposed to the two-train system proposed in the PFS which treated IX and SX solutions separately. This will allow a reduction in upfront capital costs.

### Leaching

Leaching testwork carried out previously on core samples recovered from the sonic drilling program identified an issue with pre-oxidation of the material during sample transport and / or sample preparation prior to the leaching, that resulted in a portion of uranium being recovered during the initial re-pulping step. The causes of this issue have been investigated and through consultation with other operations, a revised handling procedure for the material prior to leaching has been developed. This new procedure is being tested on the existing Honeymoon core held at ANSTO and once verified, will be used for the new core to be delivered from the sonic drilling program scheduled for later this month as part of the resource drilling program.

The leaching program is set up to confirm the leachability of the core samples from Honeymoon and the entire proposed wellfield area i.e. Brooks Dam and East Kalkaroo.

In addition, the program will develop a simple leaching test that can be carried out onsite during the operating phase to assist in defining the operating conditions for each wellfield as it is brought online.

### Alternate Leach Oxidant

Inception Group has a patented process for in-situ oxidant generation which would be ideal for Honeymoon where higher levels of sulphide are seen. Inception has now initiated a small-scale laboratory testwork program to develop a "proof-of -concept" assessment that the technology could be applicable to the Honeymoon scenario. Boss will participate in developing this technology if the proof-of-concept proves successful. A joint program of work is planned to be undertaken to pursue this further.

## Trade-off Studies

### Ion Exchange Columns

The most significant capital cost items in the expanded plant proposed in the PFS are the Ion Exchange columns. NIMCIX columns were selected as the preferred equipment type due to their reduced resin inventory and higher eluate grades.

A study is currently being carried out with an engineering consultant and external process consultant to determine if alternate ion exchange columns used by other operators in the uranium mining industry (e.g. fixed bed or "U"-tube units) may provide some benefit to the project with regards to either reduced capital costs, reduced operating costs or improved operability. The results from the IX pilot plant will be used for this study as well as the results from the current IX elution testwork program.

The results from this study will define the preferred case for the DFS and provide further confidence in the selection process going forward.

### Yellow Cake Dryer Capacity

The planning stages for the drying capacity assessment at Honeymoon have been completed, with the team mobilising to site at the end of October to review the current condition of the two installed dryers. The team selected includes a number of persons involved with the plant when it was operating under the previous owner. Their input with regard to the critical issues that occurred during this period will be crucial to developing a robust process that will not constrain production. At the completion of the assessment, confirmation of the modifications and upgrades that are possible and whether these will allow the expanded production rate to be achieved will be determined. A cost estimate for the upgrade and a delivery schedule will also be devised.

### SX Re-Start Assessment

An important component for the Project is the re-start of the existing SX processing plant at Honeymoon. The SX plant will be started up during the construction of the new IX plant and for the first 18 months of operation, the majority of the production will be derived from this plant. These facilities have been on care and maintenance since the plant shutdown in 2015, with only critical maintenance activities undertaken.

Planning for the assessment of the current state of the plant is underway and a number of experts have been identified that will assist with this review. The scope of works and expected deliverables are currently being confirmed. A site visit to start the assessment is planned for mid-November and the team is preparing for this visit by reviewing the proposed upgrades identified in the PFS and collating historical operating data that will assist in the assessment.

The results of this work will be available in early January so that it can be incorporated into the DFS work program.

### Operational Readiness

Work will be done to develop the first pass of an operational readiness plan which will cover what the Company needs to do at both a corporate level and an operational level, to be ready to execute the Project and re-commence operations.

### Phase 1 Schedule

The estimated dates for the completion of the main deliverables for Phase 1 are as follows:

- Infill drilling program has already been completed
- Optimisation testwork (except leaching) programs to be completed by end November
- Trade-off Studies to be completed by mid-December
- Preliminary SX Re-Start Assessment delivered by early January
- Preliminary Operational Readiness plan delivered by end January

### Future Work Programs

On completion of the Phase 1 activities, Phase 2 of the Re-Start Strategy will commence. This will begin with the updated mineral resource estimate, followed by the wellfield design activities which will be based on the geological and resource models.

The recent infill drill results, along with the historical drill results, will be used for the mineral resource update which is targeting a measured and indicated resource for the Honeymoon, East Kalkaroo and Brooks Dam deposits.

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 (wellfield solution tenors and flowrates) to deliver an independent feasibility study report. As part of this work program the solvent extraction re-start assessment and operational readiness programs will be updated to reflect any changes and a detailed execution plan developed. In addition, the necessary permitting updates and applications will be prepared so as to minimise any delays with progressing into the next phase.

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

## Burkina Faso Assets

Post period the Company announced it had signed a share sale and purchase agreement to sell its interest in the Golden Hill and Gourma Projects in Burkina Faso, West Africa, to its joint venture partner Teranga Gold (Australia) Pty Ltd (**Teranga**), a wholly owned subsidiary of Teranga Gold Corporation (TSX: TGZ), for consideration of A$10 million cash. The Company is pleased to note that the A$10 million was banked on 3 October, strengthening the Company's balance sheet and taking the Honeymoon Uranium Mine closer to being Australia's next uranium producer.

Under the terms of the agreement, Boss sold all of its shares held in Boss Minerals Pty Ltd and Askia Gold Pty Ltd, being the entities that held Boss' 49% interest in the Golden Hill and Gourma Projects, , to Teranga.

As announced on 5 February 2018, following approaches and renewed interest in the West African gold sector, Boss commenced assessing options to maximise value of its joint venture interest in Golden Hill and Gourma to realise value for shareholders and allow it to maintain focus on the Honeymoon Uranium Project.

Proceeds from the sale will be key to assisting Boss to ensure that the Honeymoon Uranium Project is production-ready once the uranium price hits the Company's target, taking Boss closer to becoming Australia's next uranium producer.

## Corporate

During the quarter the Company released from voluntary escrow 137M shares held by Mr Grant Davey (through his controlled entities) to facilitate additional support by existing Tier 1 institutional shareholders in the Company, however the escrow provisions remain in place in respect of the balance of the consideration shares held by Mr Davey.

On 19 March 2018, the Company had announced completion of the acquisition of the remaining 20% of the Honeymoon Uranium Project from Mr Grant Davey (through his controlled entities) in consideration for 300,000,000 new fully paid ordinary shares in the Company. The majority of these shares were subject to voluntary escrow for a period of 12 months.

**For further information, contact:**


| | | |
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**Competent Person's Statement**

The information in this report that relates to exploration results for the Honeymoon Project were initially reported to the ASX on 2 August, 27 August and 4 October 2018. The Company is not aware of any new information or data that materially affects the information included in the relevant announcements . The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

**APPENDIX 1**

The following information is provided pursuant to Listing Rule 5.3.3 for the quarter ended 30 September 2018.

## SCHEDULE OF MINING TENEMENTS

| Tenement Name | Location | Licence Number | Interest |
|---|---|---|---|
| Yarramba | South Australia | EL5621 | 100% |
| South Eagle | South Australia | EL6081 | 100% |
| Goulds Dam | South Australia | EL5623 | 100% |
| Katchiwilleroo | South Australia | EL5622 | 100% |
| Ethiudna | South Australia | EL6020 | 100% |
| Goulds Dam | South Australia | RL83-90 | 100% |
| Honeymoon Mine | South Australia | ML6109 | 100% |
| Boutouanou* | Burkina Faso | 2011/11/410 | 49% (TGZ farming in) |
| Diabatou* | Burkina Faso | 2011/11/409 | 49% (TGZ farming in) |
| Tyara* | Burkina Faso | 2011/11-159 | 49% (TGZ farming in) |
| Foutouri* | Burkina Faso | 2011/11-160 | 49% (TGZ farming in) |
| Baniri* | Burkina Faso | 2009/09-060 | 49% (TGZ farming in) |
| Intiedougou* | Burkina Faso | 2009/09-061 | 49% (TGZ farming in) |
| Mougue* | Burkina Faso | 2009/09-062 | 49% (TGZ farming in) |
| Kankandi* | Burkina Faso | 10/142/MCE | 49% (TGZ farming in) |
| Tyabo * | Burkina Faso | 10/144/MCE | 49% (TGZ farming in) |

There were no acquisitions or disposals during the quarter.

* Subsequent to the end of the quarter, these assets were divested via a share sale agreement with Teranga Gold (Australia) Pty Ltd.