

## **Royal Helium Announces Large Helium Discovery at Climax-2 and 3 and to Begin Production Planning for Climax-1**

SASKATOON, SASKATCHEWAN – (May 12, 2021) Royal Helium Ltd. (“Royal” or the “Company”) (TSXV: RHC) is pleased to announce a significant helium discovery at the Climax helium project, located in SW Saskatchewan, Canada. Royal has discovered a 39 meter contiguous helium bearing zone at Climax-3 in the basal Deadwood Regolith (“Regolith”) which was a previously unknown helium bearing sequence. The same Regolith zone was also intersected at Climax-2 and Royal has seismically mapped the Regolith over a total area of 32 square kilometers (12.3 mi<sup>2</sup>) (“**Prospective Area**”). Based on internal estimates, Royal estimates total helium in-place within the Regolith zone across the Prospective Area to be between approximately 2.5 billion cubic feet (“Bcf”) (low-case) and 6.0 Bcf (high case). In addition, Royal will commence production planning shortly on Climax-1, with the intent of producing and monetizing each of the helium, CO<sub>2</sub>, and nitrogen gas streams discovered within the Souris River and Wymark zones.

### **Climax -3 Discovery and Helium-in-Place**

At the Climax-3 well, Royal has discovered economic grades of helium over a contiguous 39 metre zone in the basal Deadwood Regolith zone.

The internal estimates of helium resource-in-place are:

- High: 6 Bcf of helium for the Prospective Area, comprised of 0.5 Bcf of helium per square mile
- Low: 2.5 Bcf of helium for the Prospective Area, comprised of 0.2 Bcf of helium per square mile

Completed and production tested in sequence, the zone returned gas analyses including the following:

- Helium: 0.55 – 0.65%
- Nitrogen: 71.97 – 95.95%
- Hydrogen: 0.02 – 14.97%
- Methane: 0.02 – 40.00%

Following the discovery of the Regolith zone at Climax-3, Royal reinterpreted its existing 2D seismic and has mapped the areal extent, thickness, and rock mass volume of the Regolith Sequence. Royal has utilized this mapping, along with helium concentrations identified within Climax-3 to estimate a total “helium-in-place”. The Prospective Area of the Regolith is interpreted extend across 32 km<sup>2</sup> (12.3 mi<sup>2</sup>), flanking both the local uplifted cratonic block penetrated by Climax-1 and the regional massif.

The high estimate of 6.0 Bcf of helium-in-place assumes a 0.65% helium gas concentration, net porosity of 8%, and an average thickness of 39m (as discovered at Climax-3) across the entirety of the Prospective Area. The low estimate of 2.5 Bcf of helium-in-place assumes 0.55% helium gas concentration, net porosity of 5%, and an average reservoir thickness of 20m across the entirety of the Prospective Area. These estimates assume a 25% water saturation but do not include any adjustment

for recovery factor, deduction for unidentified reservoir-level anomalies, or deduction for plant and process losses. The estimate is also presented in the form of helium gas-in-place per section ( $\text{mi}^2$ ), and helium gas-in-place for the Prospective Area. The Regolith initially appears to be a low permeability zone and the Company will be working on completion and stimulation methodologies to initiate long-termed sustained flow rates.

The reader is cautioned that while this statement of helium-in-place volume is based upon current data and uses a calculation method published by the Government of Saskatchewan, helium is not included in either the NI 43-101 or the NI 51-101 guidelines. Additional data, including production testing and recovery factor, is required for the deposit contained within the Prospective Area to justify its classification as a resource.

Andrew Davidson, President and CEO of Royal states, “we are exceptionally pleased with this discovery at Climax. The Regolith appears to be helium charged over a significant interval and, once the production methodology is determined, it has the potential to be one of the largest helium discoveries in Saskatchewan history. Entering this drill program, we were targeting conventional helium production, which we have found in Climax-1, Climax-2 and potentially Climax-3. We are now evaluating the completion methodology of the Regolith which may include horizontal drilling and/or fracture stimulation in order to maximize the productive capacity of this zone.”

### **Climax-1**

At Climax-1, potential production zones consist of the Souris River and the Wymark Member of the Duperow Formations of the Upper to Middle Devonian era. Through the various gas tests performed, the following sample results were received:

- Helium: 0.33 – 0.39% (Souris River)
- Nitrogen: 86.6 – 95.6% (Souris River and Wymark)
- CO<sub>2</sub>: 89.8 – 94.7% (Wymark)

These zones showed shut-in pressures, measured at surface, of up to 3,726 kPa and the presence of a water drive typical of conventional helium developments, with both gas and water samples being further analyzed for helium and other gases. Flow rates at Climax-1 peaked at 1.15 MMcf/day. Actual production flow rates will be optimized in production planning.

Production planning will commence shortly on Climax-1, with the intent of producing and monetizing the helium, CO<sub>2</sub>, and nitrogen gas streams. Discussions with potential processing partners are underway and Royal will report once a gas processing agreement and off-take agreement(s) are in place.

### **Climax-2**

At Climax-2, completion operations were halted due to the onset of break-up. The Regolith sequence is present in Climax-2, and remains untested to date. Once the optimal completion and production methodology is determined for the Regolith in Climax-3, the same methodology will be applied at Climax-2. The Wymark zone in Climax-2 was perforated before moving off location, but an acid stimulation treatment has yet to be completed. This zone is prospective as a helium production zone and further completion testing will be conducted in due course.

## **Geological Summary**

The highest helium concentrations were measured within a sequence of rocks believed to be sedimentary in origin that underlie the Cambrian Deadwood Formation and overlie the Archean-age granitoid Wyoming Craton. This sequence, internally referred to as the Regolith, is some 100m thick in the Climax-3 well and consists of interbedded strata consisting of igneous (granitoid) minerals, quartz of sedimentary origin, weathered igneous minerals, clays, and possibly anhydrite and traces of tuffaceous material. This sequence has been anecdotally reported in other parts of southern Saskatchewan however its distribution and origin is poorly understood. The Regolith was penetrated by both the Climax-2 and Climax-3 wells, which flank an uplifted block of Wyoming Craton penetrated by the Climax-1 well.

All wells were drilled to total depth and cased to total depth (except the Climax-1 well in which casing could only be run to a depth of 2,394.55mKB due to hole instability). Evaluation of wellsite mud gas chromatograph and cuttings descriptions, borehole geophysical logs, and drill penetration rates identified 22 zones of interest worthwhile of further testing with eight zones selected for initial completions testing. Each of the eight zones were systematically tested to confirm the presence of economic grades of helium, and testing operations included perforating through casing, acidizing to enhance flow, swabbing, measuring tubing and casing pressures, and measuring static gradients where possible.

During the testing program 212 gas cylinder samples and 65 water samples were collected, including duplicate cylinders for each sample taken throughout the duration of the program. All original and duplicate samples were run by two independent third party analytical laboratories to ensure strict QA/QC guidelines were followed.

A re-interpretation of 2D seismic was undertaken after completing the drill program, and it suggests that the helium-bearing Regolith sediments are part of a pre-Deadwood basin that onlaps onto a regional cratonic massif that may underlie the regional Val Marie Uplift or Arch, which is the northern extension of the Bowdoin Dome of northeast Montana. Within the Project area, the Regolith onlaps a local uplifted block of granitoid craton that underlies the Royal Climax-1 well. The helium-bearing Regolith may be a separate reservoir compartment from the overlying Deadwood, since none of the tested zones are connected to the strong water flow identified in a test of the overlying Deadwood BAU sands in the Climax-2 well.

Steven Halabura, VP of Exploration for Royal states “the discovery of the Regolith is a major moment for Royal. The sheer scale of this formation and the fact it is consistently helium charged is a significant step in proving long-term and large-scale helium production in Saskatchewan. When combined with the conventional production planned at Climax, the further development of the Regolith has the ability to move Royal from a small explorer to a large producer in the relative near-term.”

### **About Royal Helium Ltd.**

Royal is focused on the exploration and development of primary helium production in southern Saskatchewan. With over 400,000 hectares of prospective helium lands held under permits, leases and applications, Royal is one of the largest helium leaseholders in North America. Located next to highways, roads, cities and importantly close to existing oil and gas infrastructure, Royal’s projects were methodically evaluated for helium potential for over two years, and have been vetted by helium experts, professional geologists and engineers.

For more information, please contact Andrew Davidson, the Chairman, President and CEO of the Company.

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