ASX ANNOUNCEMENT
21 December 2021

WATER WELL DRILLING IDENTIFIES SIGNIFICANT GAS COLUMNS AT VOYAGER AND ENTERPRISE

Highlights

- Wireline logs run in redrilled BBB#1 well confirm a gas column of 134 ft in the Lyons formation at Blue Star's Voyager prospect – **4 times greater** than original BBB#1 hole (see BNL ASX release dated 17 November 2021).
- Analysis of gas obtained during drilling of original BBB#1 well determined a calculated **air-free gas composition of 8.8% helium** in the Lyons formation.
- This represents a similar gas composition to the historic Model Dome analogue production and **one of the highest in-situ helium concentrations both in the U.S. and globally**.
- With the benefit of new logs at BBB#1, results from the Hill#2 water well (Enterprise prospect) have also been reinterpreted, resulting in the identification of a 29 ft gas column.
- Hill#2 is interpreted to be downdip from the maiden Enterprise 16#1 well location, which is interpreted to be targeting a considerably thicker gas column.
- In discussions with other ranchers with permits already in place regarding funding of further low-cost water wells given strong initial outcomes of data collected to date and positive influence on exploration strategy and development planning across the play.

Blue Star Helium Limited (ASX:BNL) (**Blue Star** or the **Company**) is pleased to provide an update on new exploration data acquired in Las Animas County, Colorado.

The BBB#1 water well, located within Blue Star's Voyager prospect (see Figure 1), has been redrilled (offset 40 ft to the south) and geologic and wireline logging has been completed. Wireline logs from the original hole showed that it was still in the gas column at its total depth (**TD**) of 922 ft (see BNL ASX release dated 17 November 2021). The redrilled well has penetrated a further approximate 100 ft of gas column to the free water level, yielding a total identified gas column of 134 ft in the Lyons formation – which is approximately 4 times greater than the original BBB#1 hole.

Analysis of the log data in the redrilled BBB#1 has confirmed intersection of the top of the Lyons formation at 889 ft depth, with wireline logs confirming a gas column in high quality reservoir from the top of the Lyons formation to a depth of 1'023 ft (134 ft gas column). The well TD'ed at 1,054 ft in the lower Lyons formation.

Gas analysis of samples obtained in the original BBB#1 hole resulted in a calculated air-free gas composition from the Lyons formation of 8.8% helium (He), 78.7% nitrogen (N) and 12.5% carbon dioxide (CO_2) (see BNL ASX release dated 17 November 2021). This composition is very similar to the average historic Model Dome analogue production. It also represents one of the highest in-situ helium concentrations found both in the United States and globally.

Blue Star Managing Director and CEO, Trent Spry, commented:

"This is a great result for Blue Star, confirming a 134 ft gas column with high helium concentration in the Voyager prospect. We are very pleased to deliver this exploration success and validation of our prospect mapping.

"The average gas column height for wells in the historic Model Dome field is approximately 50 ft, making the column height at Voyager of 134 ft very significant in terms of supporting structural definition and seal capacity.

"We are looking forward to acquiring similar data over our other key prospects Argo, Galactica and Pegasus, where we have also interpreted gas from historic well data and where the Gov. Cynthia True well located on the same greater structure tested 8.8% helium.

"The modern data acquired from recent water well drilling at the Enterprise and Voyager locations is adding significant value to our understanding of the play. In particular, by applying the data from BBB#1 at Voyager to our interpretation of logs from the prior Hill#2 well associated with Enterprise, we have been able to identify a 29 ft gas column. Hill#2 is in a location interpreted to be downdip from our maiden Enterprise 16#1 well location and is targeting what is expected to be a considerably thicker gas column."

Voyager prospect – BBB#1 water well

No prospective resources associated with the Voyager prospect have been reported by Blue Star. Any prospective resources at Voyager would be in addition to the Company's stated prospective helium resources of 13.4 BCF associated with the Enterprise, Galileo, Argo, Galactica and Pegasus prospects.

The significant column height seen at Voyager in the redrilled BBB#1, as well as the top depth for the Lyons formation, will be integrated into the current mapping.

Given the positive results of the acquired data, selection of offset well locations for appraisal and development drilling is underway.

BBB#1 well details (see BNL ASX release dated 17 November 2021)

The BBB#1 water well is located in Township 28 Range 60 Section 33 (see Figure 1). The minerals are the subject of two mineral leases entered into between Las Animas Leasing Inc (**LAL**) and private mineral owners. The first lease has an effective date of 14 June 2021, the total area of the lease is 2,644 gross acres, the term is 5 years from the effective date, the rental was paid in advance, the royalty is 15% and LAL's working interest in the lease is 100%. The second lease has an effective date of 2 July 2021, the total area of the lease is 1,552 gross acres, the term is 5 years from the effective date, the rental was paid in advance, the royalty is 12.5% and LAL's working interest in the lease is 100%.

The BBB#1 water well was not conventionally tested. The Company ran a suite of logs including gamma ray, resistivity (induction), density and neutron logs.

Gas analysis of samples obtained while drilling was performed using mass spectrometry. An estimated air-free gas composition from the Lyons formation in BBB#1 of 8.8% helium (He), 78.7% nitrogen (N) and 12.5% carbon dioxide (CO_2) has been calculated after backing out air.

The miniRuedi mass spectrometer was operated by Geochemical Insight. The instrument was calibrated with a certified air standard comprised of 0.000524% He, 0.934% Ar, 0.05% CH_4, 0.2%

CO_2, 20.95% O_2 in a nitrogen (77.87%) balance. The standard was prepared and certified by Global Calibration Gases, LLC out of Sarasota, Florida, USA.

The redrilled BBB#1 well was offset by 40ft to the south of the original hole and redrilled to retest the aquifer potential at the location. Geologic and wireline logging was conducted as described in this release.

BBB#1 will not be completed as a water well as it did not encounter material water to TD. However, the determination of a free water level in the Lyons formation will be used for locating any future water wells by the rancher, targeting the Lyons formation

Enterprise prospect – Hill#2 water well reinterpretation

The Hill#2 water well, which was associated with Blue Star's Enterprise prospect, was completed during October 2021. The company previously reported neutron and density wireline logs run in the well show approximately 26 feet of gas effect at the top of the high-quality Lyons formation, with a free water level interpreted in the well at the base of the gas effect. The resistivity logs across the gas effected part of the Lyons formation suggest a transition zone above the free water level. The composition of the free gas in the Lyons formation could not be determined because of the nature of the water well configuration (see BNL ASX release dated 20 October 2021). This drilling and sampling protocol was revised, and the new protocol used on BBB#1.

The Hill#2 water well was located approximately 1.5 miles to the north-east, and interpreted to be down dip from, Blue Star's planned Enterprise 16#1 helium exploration well (see Figure 1). Blue Star expects to receive the approved final permit to drill the Enterprise 16#1 well soon and to commence drilling the well promptly thereafter.

With the benefit of additional modern logs acquired at the BBB#1 location over time, which provided the company with valuable information about the invasion of fluids (from water in the well bore) into the Lyons reservoir while and subsequent to drilling, re-evaluation of the logs acquired in the Hill#2 well has resulted in the previous transition zone being reinterpreted by the Company's Petrophysicist as a gas column.

The Hill #2 well intersects the top of the Lyons formation at 809 feet depth, with wireline logs interpretation of a gas column in high quality reservoir from the top of the Lyons formation to a depth of 838 feet (29 ft gas column). This is in a location interpreted to be downdip from the Enterprise 16#1 well location, which if the current interpretation is validated should see a thicker gas column again.

Data acquisition from water wells

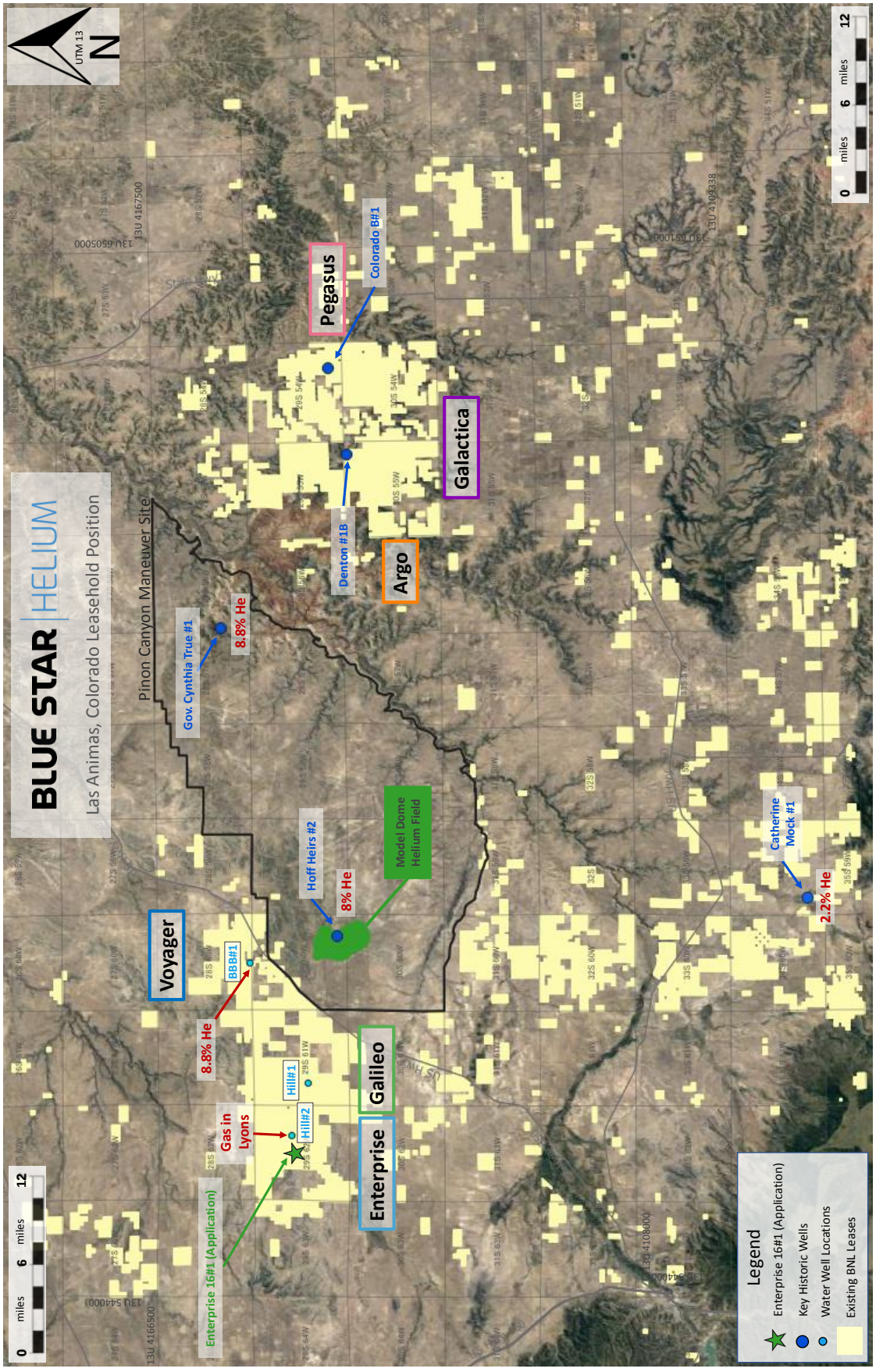
As previously advised, Blue Star agreed to fund the drilling of water wells by local ranch holders (see BNL ASX releases dated 29 July 2021, 10 September 2021, 30 September 2021, 20 October 2021 and 17 November 2021). In the process of drilling these wells, Blue Star is seeking to gather data from the wells that might aid in the further definition of its helium prospects. The wells are drilled and owned by the ranchers and Blue Star does not have any interest in them. However, the Company does own a mineral lease interest at each of the well locations.

Water wells are of significant interest to landowners and our data acquisition program helps fund water wells in the area. We are acquiring wireline log, geologic and geochemical data from selected wells (that landowners are having independently contract drilled) for the following purposes:

- Gaining data on freshwater aquifers, their depths, flow rates, and formations that have the potential to produce fresh water across the area.
- Protecting these aquifers as it relates to the drilling of shallow gas (helium wells) across the area.
- Determining correct location and thickness of these formations and allowing for broad scale mapping that aids in well drilling and appropriate surface casing depth determination.
- Gas logging to determine what gasses are present to help determine the best types of casing to use for surface casing to ensure the longevity of the casing in a down hole environment.
- Mudlogging, wellsite geology, continuous mass spectrometry gas and wireline logging are being evaluated prior to helium well operations.
- Data gathered during drilling may aid in the further definition of helium prospects minimising the number of exploration test wells required.

Water wells are drilled differently to the method the Company expects to use to drill dedicated helium gas wells. The water wells are air drilled with increasing pressure and if significant water is encountered are assisted, if required, by foam to lift the cuttings. The result is that formation gas can only be monitored while drilling and the return gas is highly diluted by air. Therefore, water wells are not planned to be conventionally tested. Other than that, the geologic logging and wireline logging being utilised are conventional techniques to the oil and gas industry.

Figure 1: Location of Hill#1, Hill#2 and BBB#1 water wells, the planned Enterprise 16#1 helium exploration well and the historic Model Dome field



This ASX Announcement has been authorised for release by the Board of Blue Star Helium Limited.

For further information, please contact:

Trent Spry
Managing Director & CEO
info@bluestarhelium.com
+61 8 9481 0389

About Blue Star Helium:

Blue Star Helium Ltd (ASX:BNL) is an independent helium exploration and production company, headquartered in Australia, with operations and exploration in North America. Blue Star's strategy is to find and develop new supplies of low cost, high grade helium in North America. For further information please visit the Company's website at www.bluestarhelium.com

About Helium:

Helium is a unique industrial gas that exhibits characteristics both of a bulk, commodity gas and of a high value specialty gas and is considered a "high tech" strategic element. Due to its unique chemical and physical qualities, helium is a vital element in the manufacture of MRIs and semiconductors and is critical for fibre optic cable manufacturing, hard disc manufacture and cooling, space exploration, rocketry, lifting and high-level science. There is no way of manufacturing helium artificially and most of the world's reserves have been derived as a by-product of the extraction of natural hydrocarbon gas.