

Race to find North American sources

North American Helium leads the way with new helium sources in the US and Canada

By Nick Parkinson

The global helium landscape is changing, but some companies are working to ensure helium supply stays close to home in North America.

Uncertainties around the reliability of overseas helium sources might not be a huge concern today, but there is worry that they could be in the future if North America becomes heavily dependent on importing helium from Russia and Qatar. With the winding down of the US Bureau of Land Management (BLM) helium system in the US, two of the world's largest helium sources are set to be in Qatar and Russia. But geopolitical risks associated with those two locations are helping to generate investment and activity in securing more North American helium sources.

Exploration companies are stepping up efforts to increase the portfolio of smaller helium sources located in North America. Among the busiest is North American Helium Inc. (NAH), which earlier this year started up its \$32-million Battle Creek helium plant near Consul, Saskatchewan, the largest helium purification facility in Canada, three months ahead of schedule and under budget. It is NAH's second helium facility and, combined, the two



© North American Helium | Battle Creek under construction earlier this year

plants have total helium productive capacity of approximately 60 million cubic feet per year (MMcf/y).

As with NAH's first plant at Cypress, the offtake from the Battle Creek facility has been pre-sold on long-term contracts, 'with a major global industrial gas company as the anchor customer'.

Nick Snyder, Chairman and CEO of NAH, says it is vital to develop new sustainable sources of helium supply in the US and Canada, like Battle Creek, that are capable of reliable long-term production.

"We receive a lot of interest because of the 'green' aspect of our low-emissions production from nitrogen fields, but it's the geopolitical and logistical issues that are most important to our industry partners," Snyder told *gasworld*.

"No one knows how much

production we will ultimately see from these overseas sources or when it will arrive, but what everyone can agree on is that production in North America from the legacy oil and gas sources of helium and sales from the federal helium stockpile are in a state of irreversible decline and depletion. In our experience, geopolitical risk really outweighs all other factors, but that might not be the right label, because the real risks to overseas production have been more technical and logistical over the last decade. Because all of the major overseas projects are the byproduct of technically challenging and often high-cost oil and gas projects in remote areas, most of the delays and outages have been more related to problems with these oil and gas projects rather than political risks. Certainly this could change as Russia becomes a larger producer and the blockade that temporarily halted the Qatari supply was a political action, but it might be more accurate to say 'logistical uncertainty and complexity'."

Big overseas players

Whatever the production amount from new, major overseas helium sources, the helium landscape is changing.



© North American Helium | Battle Creek completed

Gazprom's Amur Gas Processing Plant (GPP), in the far southeast of Russia, entered operation in June. The first and second production trains of the Amur GPP were underway in June and in 2025 the GPP is expected to reach its full design capacity. About 35,000 construction workers are currently at the Amur GPP to ensure it is completed on time, according to Gazprom. As of June, Gazprom said it was threequarters complete.

Helium is one of the main products at GPP and 'with an annual output of 60 million cubic meters (when it reaches full capacity), the GPP is poised to become the global leader in helium production,' according to Gazprom. The key link in the logistics chain of helium supplies to the international market will be the helium hub near Vladivostok, which is going to be put in operation soon, according to the Russian major. Infrastructure is important to the Amur project, due to its isolated location.

Qatar is the other overseas project set to increase production. Qatargas, the operator of Qatar's helium production in Ras Laffan, claims that when the Helium-3 plant reaches full

capacity, Qatargas will account for approximately 35% of world helium production with an overall production capacity of 2.6 bscf per year.

But Snyder believes that with successful exploration work, North American-based helium sources can continue to play a leading role in supply in the US and Canada for the rapidly growing space exploration and semiconductor manufacturing industries.

"Customers want to know that their helium source has adequate reserves, reliable operations, and a simple and safe logistics and transportation, which really adds up to reliability," Snyder said. "North America is the only place that can provide that type of reliability into the future, and having low-emissions helium production from sources that aren't producing hydrocarbons only adds to that long-term reliability."

NAH has drilled 30 exploration and development wells for non-hydrocarbon helium targets. NAH says it has recently made a new helium discovery in the Cypress West area of Saskatchewan and is moving towards building a third helium production

facility. Engineering and design for the next plant at Cypress West is well under way and they expect production from this discovery to come online in 2022.

"We have an active drilling program in both Saskatchewan and Utah, with about half of this drilling directed towards proving up additional reserves in fields where we already have a successful discovery well," Snyder said.

"We plan to bring new plants onto production on both sides of the border in 2022, which could double our current levels of production. We've spent the last eight years defining helium-bearing structures in Saskatchewan and have built an unparalleled 5 million acre land position based off of the work of our geologists. We now have 20,000km of seismic data in-house covering our land position in Saskatchewan and we have an active program of both exploration drilling and development drilling underway. We have well over 100 prospect areas our geologists are working on and we will continue to bring plants online as we prove up reserves in successful fields."

Exploration

NAH calls its product 'green helium', as it estimates its helium production will result in ~99% less CO₂ equivalent emissions compared with the gas streams produced from current global sources of helium from hydrocarbon projects. Helium fields in Saskatchewan are found predominantly in nitrogen charged reservoirs. ▶



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© Gazprom | GPP, Russia



► “Saskatchewan is unique geologically because the helium deposits are deep and under high pressure – meaning lots of gas in place – but the bulk gas is almost entirely inert nitrogen,” Snyder said.

“There is an increasing focus within industry on new sources of helium that are both geopolitically safe and have a small environmental footprint with low emissions, so we really think this is going to be the growth area in North America and building a regional liquefier in the next few years is going to be key to that growth.”

Royal Helium Ltd. is also active in Saskatchewan and Climax-4 was expected to spud in mid-July. Royal is budgeting for seven new wells. For Climax-1, Climax-2 and Climax-3, initial production testing and facility design specifications will be completed (Climax-1 already underway) with a plan to have these first three wells operational within six months of testing completion, according to Royal.

Andrew Davidson, President and CEO said, “With the exceptional investor interest in the oversubscribed bought deal prospectus offering, Royal is in a position to execute on a large drilling and exploration program to expand on the success of its first three helium wells.”

Global Helium has 302,000 acres of holdings in southeast Saskatchewan and is aiming to move its “prospects to

the drill stage.”

But it’s not just Saskatchewan which is seeing increased helium exploration. Avanti Energy, a new player in the hunt for helium, has established roughly 75,000 acres of land holdings in Alberta and Montana. In June, Avanti announced it has entered into binding agreements on two additional properties totaling ~50,000 acres of land in Montana. In southern Alberta, Imperial Helium announced the spud of its initial helium well in July. In Arizona, an area which is seeing an expansion of semiconductor fabs, Desert Mountain Energy recently started operation on a fourth well in the Holbrook Basin area.

NAH is also exploring Utah, and expects to provide an update later this year. Marlon McDougall, NAH President and Chief Operating Officer, told the Utah Helium Symposium earlier this year, “As we look forward, it’s an exploration game. To go and find new sources requires a large capital program. We believe in Utah there’s a big opportunity for that. Exploration requires scale, and a certainty that you can lease land, shoot seismic, and drill wells. You typically have to spend a lot of that money upfront before you’re even sure you are going to find helium.”

Wesley Adams, Assistant Director Oil and Gas at the Utah School and Institutional Trust Lands Administration (SITLA), an agency

trying to promote helium exploration in Utah and which has 30,000 acres leased for helium and associated hydrocarbons, told the Utah Helium Symposium, “We are looking at other ways to incentivize helium exploration here in Utah and one of those way is the possibility of running a helium credit bill in 2022 to support exploration efforts which will give operators the opportunity to reduce some of that risk. A lot of the exploration in Utah is very remote, very hard to get to.”

Demand

Demand from high-tech industries, like semiconductor manufacturing as well as the burgeoning space industry, is driving the demand for helium. And that demand is creating concern that there is not enough domestic supply to avoid any potential problems with overseas sources.

“The one concern is that if we don’t have more helium investments here [North America] we may become a net importer,” Lita Shon-Roy, President/CEO at TECHCET, a San Diego-based advisory service firm focused on process materials supply-chains and electronic materials technology, told the Utah Helium Symposium earlier this year.

“As the US becomes more dependent on overseas sources these are things that have to be put on boats that have a 4-6 week turnaround which is prone to interruption due to geopolitical issues given that the sources are in the Middle East and Russia.”

Snyder added, “The industry needs to develop new sources of supply that are reliable and long-term in nature. End users care about price in the short term, but in the longer term for vital growth industries like semiconductor production and space exploration, the reliability and availability of helium over the next 5-10 years can start to look pretty scary because of a number of the factors we discussed [above].” 