

Subcommittee on Energy and Mineral Resources

Paul Gosar, Chairman

Hearing Memo

June 19, 2017

To: All Natural Resource Committee Members

From: Subcommittee on Energy and Minerals Staff (x5-9297)

Hearing: **Legislative hearing on the Discussion Draft of H.R. _____**, To amend the Mineral Leasing Act to provide that extraction of helium from gas produced under a Federal mineral lease shall maintain the lease as if the helium were oil and gas.
June 21, 2017 at 10:00 AM; 1324 Longworth HOB

Discussion Draft of H.R. _____, *“Helium Extraction Act of 2017”*

Summary of the Bill

The bill amends the Mineral Leasing Act to allow helium extraction from gas on federal lands under the same lease terms as oil and gas.

Policy Overview

- Helium is an essential element used in MRIs, air-to-air missile guidance systems, semiconductors, and as a tracer for leaks. As such, a steady helium supply is critical for American medical, defense, and energy industries.¹
- The Helium Stewardship Act of 2013, (P.L. 113-42), passed with overwhelming bipartisan support, was aimed at preventing the closure of the Federal Helium Reserve near Amarillo, Texas, by way of a gradual privatization process. This process must be completed by September 30, 2021, at which time, all remaining helium in the Reserve must be sold and the facility closed.
- The United States is currently the world’s largest supplier of helium, with the Federal Helium Reserve accounting for roughly one-third of global supply. The next largest producer is Qatar, followed by Algeria and Russia.²
- The uncertainty caused by Qatar’s recent political crisis, combined with the approaching closure of the Federal Helium Reserve, could put global helium supply under intense strain.

¹ Bureau of Land Management, About Helium, <https://www.blm.gov/node/5522> (accessed June 19, 2017).

² John E. Hamak, *Mineral Commodity Summaries 2017, Helium*, U.S. Geological Survey (Jan. 2017).
<https://minerals.usgs.gov/minerals/pubs/commodity/helium/mcs-2017-heliu.pdf>

- The “Helium Extraction Act of 2017” works to alleviate some of these supply concerns by facilitating the production of helium on federal lands, while simultaneously providing a fair return to the taxpayer.

Invited Witnesses (in alphabetical order):

Dr. Stuart Brown

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University of California, Los Angeles
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Mr. Jason Demers

President and CEO
Tacitus Ventures Corporation
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Mr. Walter L. Nelson

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Acting Assistant Director
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Background

Refined helium continues to serve as an essential component of America’s economy, particularly in the fields of medicine, science, and defense. Liquefying at the ultra-low temperature of 4.2 °K (-452 °F), helium’s unique properties as a coolant and nonreactive, nonflammable gas make it irreplaceable in these and other industries.³

Historically, much of the American demand for helium has been satisfied by the Federal Helium Reserve (“Federal Reserve” or “Reserve”). According to the Bureau of Land Management (BLM), the Reserve provides “enough helium to meet more than 40 percent of

³ American Physical Society, Materials Research Society, and American Chemical Society, *Responding To The U.S. Research Community’s Liquid Helium Crisis* (Oct. 2016).

domestic demand for the gas.”⁴ First developed in 1926 to keep up with global advancements in military technologies, the Federal Reserve is maintained by a reservoir and pipeline system spanning Oklahoma, Kansas, and the panhandle of Texas.

In 2013, Congress passed the Helium Stewardship Act (“HSA”) with broad bipartisan support, thus avoiding a closure of the Reserve and the immense market shortages that would have followed. The HSA presented a competitive, free market approach to sell off the remaining helium in the Federal Reserve, such that by fiscal year 2021, all helium would be auctioned by the BLM to interested buyers.

Acknowledging the vital role of helium in our space, defense, and medical research and development endeavors, one of the principal aims of the HSA was to ensure continued access to federal helium users at a fair price, including federal grant recipients. The House Natural Resources Committee bill report on the HSA articulated this intention, directing a portion of helium be preserved for federal use “when the remaining Reserve volume equals 3 billion cubic feet,” and continuing “until the recoverable helium in the reserve is expended.”⁵

Unfortunately, major concerns remain regarding the future of our domestic helium supply. The BLM has interpreted the language in the HSA to mean that they should sell off the Federal Helium Reserve in its entirety, including the 3 billion cubic feet designated for federal users. The helium supply for researchers is already in a state of “crisis,” with end-user prices for helium increasing by as much as 250 percent in the last six years.⁶ And as the single largest producer of helium in the world, uncertainty in the American market could have far-reaching impacts on global supply as well.

Not providing land leases for federal helium production would deprive the United States a supply of this precious, natural commodity and a significant revenue source for taxpayers. The “Helium Extraction Act” would help secure our domestic helium supply for years into the future.

Prices and Uses over Time

Although helium is one of the most abundant elements in the universe, it is rare on earth, formed in the earth’s crust by the decay of radioactive elements. Helium is typically a byproduct of the natural gas extraction process. To be viewed as economically viable for extraction, helium must have a concentration of more than 0.3 percent or higher in natural gas, and some helium-rich natural gas reserves can contain up to 8 percent helium.⁷ When it is not considered

⁴ News Release, Bureau of Land Management, BLM Announces a Proposed Plan and Schedule for FY 2016 Sale and Auction of Federally Owned Helium (June 15, 2015),

http://www.blm.gov/nm/st/en/info/news_releases/0/2015/june/blm_announces_a_proposed.html.

⁵ H. COMM. ON NATURAL RESOURCES, RESPONSIBLE HELIUM ADMINISTRATION AND STEWARDSHIP ACT, 113th Cong. (2013) (H. Rept. 113-42).

⁶ American Physical Society, Materials Research Society, and American Chemical Society, *supra* at iv.

⁷ National Research Council, *The Impact of Selling the Federal Helium Reserve*, NATIONAL ACADEMIES PRESS, <https://www.nap.edu/read/9860/chapter/7> (2000).

economically or logistically feasible to extract and store crude helium for later purification, it may simply be vented into the atmosphere.⁸

The value of helium has changed over time, and varies significantly depending on whether it is supplied by the government or by private industry. In the private sector, Grade-A helium (99.997% purity or better) extracted in 2016 was estimated at a value of \$650 million.⁹ Approximate domestic consumption of Grade-A helium in 2016 was 1.7 billion cubic feet and its primary uses can be broken down as follows: 30% for magnetic resonance imaging (MRIs), 17% as a lifting gas, 14% for analytical and laboratory applications, 9% for welding, 6% for engineering and scientific applications, 5% toward both leak detection and semiconductor manufacturing, and 14% for other applications.¹⁰

The privatization process outlined in the HSA continued in 2016, with the BLM conducting its third helium auction. This yielded an average price to private users of \$104 per thousand cubic feet.¹¹ Total sales generated almost \$43 million in revenue.¹²

The United States Geological Survey (USGS) estimates that international helium extraction plants will become the main source for global helium buyers by the end of the decade, with seven international facilities currently in operation and others planned over the next 3 to 5 years.¹³ The recent political and diplomatic turmoil involving Qatar, however, may cast into question the ability of the world's second-largest producer to provide a stable supply of helium to the market.

Foreign Suppliers and Complications

Today, the United States leads the world in helium supply, with the most recent USGS data estimating total resources and reserves to be 744 billion cubic feet.¹⁴ The volume of helium in the rest of the world, excluding the U.S., is approximated at 1.13 trillion cubic feet; the largest three suppliers after the United States are Qatar (357 billion cubic feet), Algeria (290 billion cubic feet), and Russia (240 billion cubic feet).¹⁵

An increased reliance on foreign nations for helium could be of particular concern, considering the national security challenges that exist between the United States and the three largest foreign suppliers.

⁸ *Id.*

⁹ Hamak, *supra*.

¹⁰ *Id.*

¹¹ *Id.*

¹² Bureau of Land Management, 3rd Annual BLM Crude Helium Auction (July 20, 2016), <https://www.blm.gov/sites/blm.gov/files/2016%20Auction%20Tally.pdf>

¹³ Hamak, *supra*.

¹⁴ *Id.*

¹⁵ *Id.*

The complexity of the issue has become even clearer in recent weeks. Beginning in early June, Saudi Arabia and its regional allies broke off economic and diplomatic relations with Qatar, accusing Qatar of sponsoring terrorism and enabling Islamist movements such as the Muslim Brotherhood.¹⁶ The nation was systematically isolated by its neighbors, with air, land, and sea routes cut off and sanctions levied by multiple countries including Egypt, the United Arab Emirates, and Bahrain.¹⁷ A regional crisis on multiple fronts, this geopolitical struggle may have major implications on American foreign policy in the Middle East, as American allies in the fight against ISIS have landed on opposing sides of the conflict.¹⁸

The ultimate effects of Qatar's diplomatic crisis and its impact on America's relationship with its allies may not be apparent for some time. Suffice it to say, the regional turmoil and the functional isolation of the world's second largest helium producer is one concern among a plethora of complications. Qatar supplied 95 percent of U.S. helium imports over the 2012-2015 period.¹⁹ Also troubling is as of June 13, 2017, Qatar had already closed two of its helium plants due to the rift with its neighboring states.²⁰

Another foreign source of helium is Algeria, currently the world's third largest producer. The United States is a major trading partner of Algeria, despite the U.S. State Department's acknowledgment of the "necessary changes" Algeria must make to achieve economic diversity and transparency.²¹ Our active trading operations notwithstanding, the 290 billion cubic feet of Algerian helium reserves would not be nearly sufficient to satisfy American users' demand for the element.

Russia also possesses a substantial helium supply. Similar to Algeria, however, Russia's helium resources would not be able to sustain American domestic demand, let alone global demand.

Given the vast political, economic, and diplomatic uncertainty surrounding many of the largest foreign suppliers of helium, it would be imprudent to rely on these nations to fully satisfy global demand. Past supply shortages have had drastically negative effects on the price of the product, and introducing more unpredictability into the future of helium supply has the potential to destabilize the market.²²

With the impending closure of the Federal Helium Reserve in 2021, and without other means for the United States government to produce its own helium, the future of the domestic and global helium markets will face ever increasing uncertainty.

¹⁶ Asa Fitch, Nicolas Parasie, and Margherita Stancati, *Saudi Arabia, U.A.E., Bahrain and Egypt Cut Diplomatic Ties With Qatar*, The Wall Street Journal, June 5, 2017. Web. Accessed June 15, 2017.

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ Hamak, *supra*.

²⁰ Stephen Kalin and Tom Finn, *Qatar Closes Helium Plants amid Rift with Arab Powers*, Reuters, June 13, 2017. Web. Accessed June 16, 2017.

²¹ Bureau of Near Eastern Affairs, *U.S. Relations with Algeria*, U.S. Department of State (Feb. 2, 2017).

²² Ira Flatow, *Global Helium Shortage Causes Prices to Rise*, NPR, Oct. 12, 2007. Web. Accessed June 16, 2017.

Conclusion

Venting off helium, or otherwise not facilitating its extraction from natural gas reserves on federal lands, would be a neglectful waste of a valuable and finite natural resource. With the complete sell-off of the Federal Helium Reserve fast approaching, alternative routes to helium acquisition for future use, particularly for federal users, remains largely unclear.

Easing America's ability to actively extract helium on federal lands under the Helium Extraction Act would not only help secure the future of the American helium supply, but also has the potential to be a substantial revenue source, through both land lease royalties and foreign exports to support international demand.

Major Provisions of the Bill

Section 2:

- Amends the Mineral Leasing Act to authorize the BLM to lease land for helium production in areas where natural gas production is not financially viable.

Figures: Domestic Production and Use Trends²³

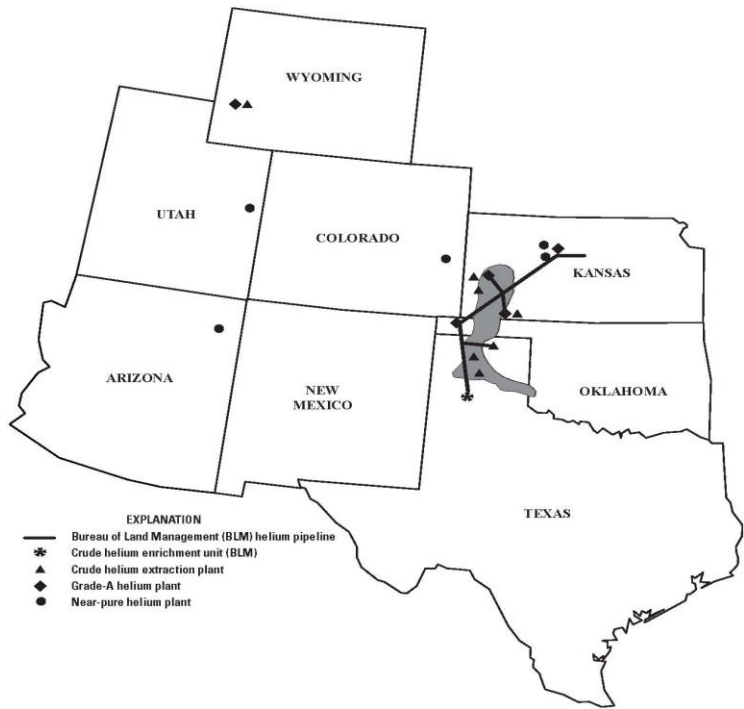


Figure 1. Major helium-bearing natural gas fields in the United States.

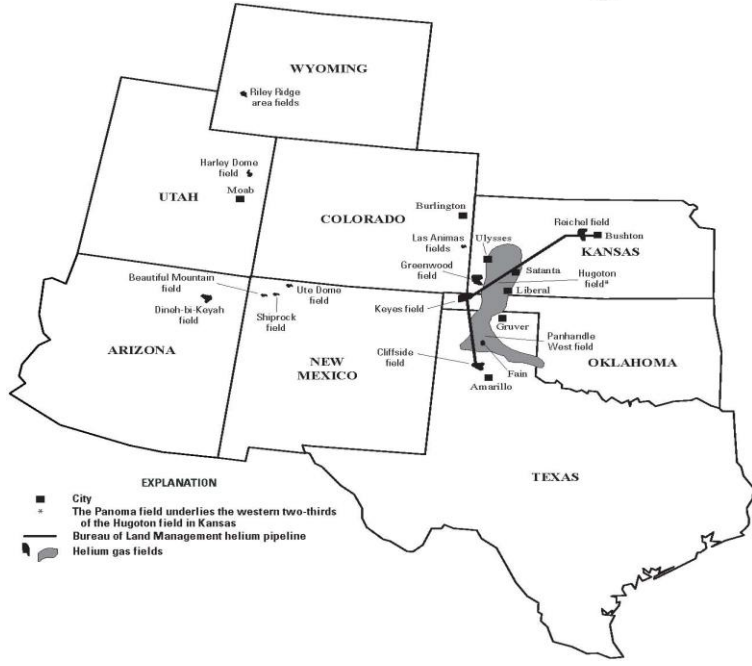


Figure 2. Active helium extraction and refining plants in the United States.

²³ Figures 1-4 acquired from the United States Geological Survey Minerals Yearbook – 2014 (October 2016).

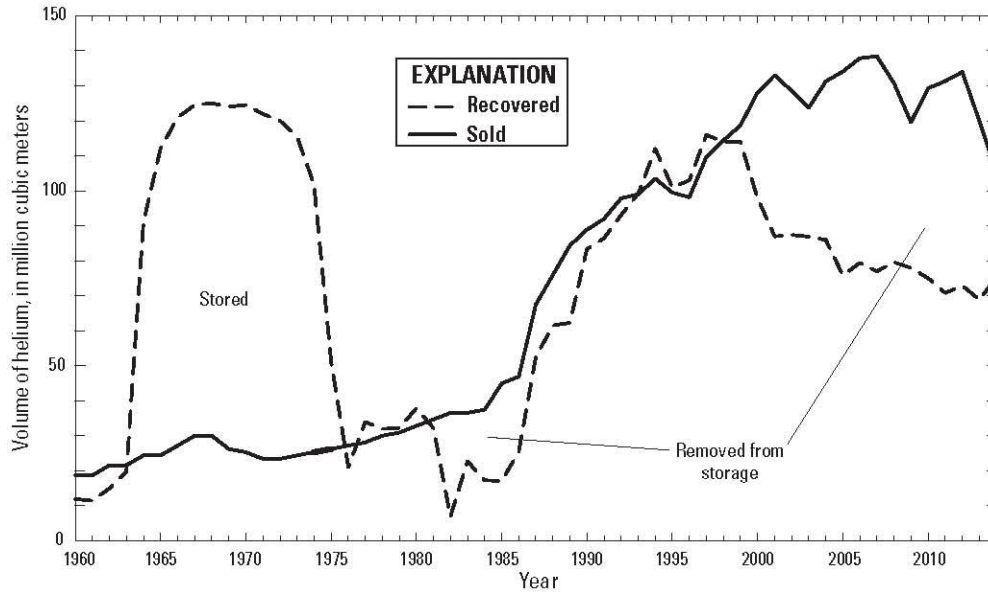


Figure 3. Helium recovery in the United States, 1960–2014.

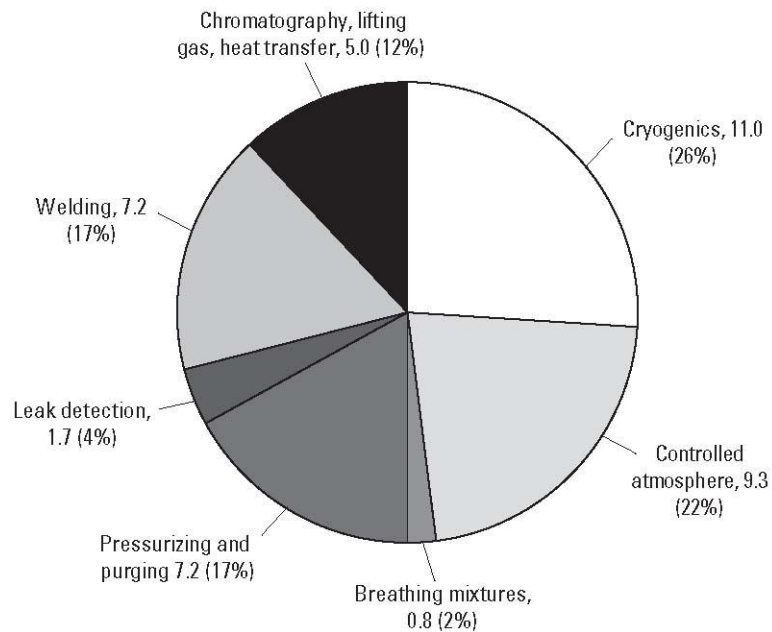


Figure 4. Estimated helium consumption in the United States in 2014, by end use, reported in million cubic meters. Total helium used in the United States in 2014 was estimated to be 42.2 million cubic meters.

Showing current law as amended by Helium Extraction Act of 2017
[Discussion Draft]

[new text is highlighted in yellow; text to be deleted is bracketed and highlighted in blue]

Mineral Leasing Act [30 U.S.C. 181]:

§181. Lands subject to disposition; persons entitled to benefits; reciprocal privileges; helium rights reserved

Deposits of coal, phosphate, sodium, potassium, oil, oil shale, gilsonite (including all vein-type solid hydrocarbons), or gas, and lands containing such deposits owned by the United States, including those in national forests, but excluding lands acquired under the Appalachian Forest Act, approved March 1, 1911 (36 Stat. 961), and those in incorporated cities, towns, and villages and in national parks and monuments, those acquired under other Acts subsequent to February 25, 1920, and lands within the naval petroleum and oil-shale reserves, except as hereinafter provided, shall be subject to disposition in the form and manner provided by this chapter to citizens of the United States, or to associations of such citizens, or to any corporation organized under the laws of the United States, or of any State or Territory thereof, or in the case of coal, oil, oil shale, or gas, to municipalities. Citizens of another country, the laws, customs, or regulations of which deny similar or like privileges to citizens or corporations of this country, shall not by stock ownership, stock holding, or stock control, own any interest in any lease acquired under the provisions of this chapter.

The term "oil" shall embrace all nongaseous hydrocarbon substances other than those substances leasable as coal, oil shale, or gilsonite (including all vein-type solid hydrocarbons).

The term "combined hydrocarbon lease" shall refer to a lease issued in a special tar sand area pursuant to [section 226 of this title](#) after November 16, 1981.

The term "special tar sand area" means (1) an area designated by the Secretary of the Interior's orders of November 20, 1980 (45 FR 76800–76801) and January 21, 1981 (46 FR 6077–6078) as containing substantial deposits of tar sand.

The United States reserves the ownership of and the right to extract helium from all gas produced from lands leased or otherwise granted under the provisions of this chapter, under such rules and regulations as shall be prescribed by the Secretary of the Interior: *Provided further*, That in the extraction of helium from gas produced from such lands it shall be so extracted as to cause no substantial delay in the delivery of gas produced from the well to the purchaser thereof, and that extraction of helium from gas produced from such lands shall maintain the lease as if the extracted helium were oil and gas.