

March 10, 2023

Dr. David Applegate  
Director, U.S. Geological Survey  
Department of the Interior  
12201 Sunrise Valley Drive  
Reston, VA 20192

Submitted electronically via [www.regulations.gov](http://www.regulations.gov)

**Re: Request for Comments on Helium Supply Risk [Docket Number DOI-2022-0012]**

Dear Director Applegate:

Premier Inc. appreciates the opportunity to submit comments to the U.S. Geological Survey (USGS), Department of the Interior's *Request for Comments on Helium Supply Risk [Docket Number DOI-2022-0012]*. The notice solicits input on the potential risk of supply disruptions for helium and the downstream impact to the defense, healthcare, aerospace, consumer electronics and other industries.

Premier's comments focus on the critical role that helium plays in healthcare and the detrimental impact a helium supply disruption would have on patient care.

**I. BACKGROUND ON PREMIER INC.**

Premier Inc. is a leading healthcare improvement company and national supply chain leader uniting an alliance of 4,400 hospitals and approximately 250,000 continuum of care providers to transform healthcare. With integrated data and analytics, collaboratives, supply chain solutions, consulting and other services, Premier enables better care and outcomes at a lower cost. Premier's sophisticated technology systems contain robust standardized data gleaned from nearly half of U.S. hospital discharges, 812 million hospital outpatient and clinic encounters and 131 million physician office visits. Premier is a data-driven organization with a 360-degree view of the supply chain, working with more than 1,460 manufacturers to source the highest quality and most cost-effective products and services. Premier's work is closely aligned with healthcare providers, who drive the product and service contracting decisions using a data driven approach to remove biases in product sourcing and contracting and assure access to the highest quality products.

A Malcolm Baldrige National Quality Award recipient, Premier plays a critical role in the rapidly evolving healthcare industry, collaborating with healthcare providers, manufacturers, distributors, government and other entities to co-develop long-term innovations that reinvent and improve the way care is delivered to patients nationwide. Headquartered in Charlotte, North Carolina, Premier is passionate about transforming American healthcare.

**II. HELIUM'S CRITICAL ROLE IN HEALTHCARE**

In healthcare, helium is an essential natural gas with indispensable characteristics used primarily in three ways to support patient care.

First, helium powers magnetic resonance imaging (MRI) machines that require approximately 2,000 liters of ultra-cold liquid helium to cool the magnets necessary to operate the machinery. MRIs provide a noninvasive means of producing high-resolution images of organs, tissues and skeletal systems to help diagnose several disease states. Alternatives to helium as a cooling mechanism for MRIs, such as use of high-temperature superconducting wire, continue to be studied for efficacy but would increase the cost of MRI machines by an estimated 500 times.

Alternatives to MRI machines, such as computed tomography (CT) scans, are not effective in detecting certain disease states such as prostate cancer, uterine cancer, certain liver cancers, and metastases to the bone and brain. Therefore, helium plays an integral role in ensuring patient access to affordable and efficacious diagnostic imaging.

Second, helium is leveraged in the manufacturing process for the semiconductor industry due to its high thermal conductivity. Helium is utilized to perform the minuscule etchings on semiconductor chips and to cool superconducting magnets to mechanically stabilize the hot boules of semiconductor materials. Approximately 50 percent of all medical devices have a semiconductor, ranging from blood pressure cuffs to MRI machines, and that percentage is expected to grow as the use of technology in healthcare continues to grow over time. Therefore, helium plays an integral role in ensuring patient access to semiconductors for medical devices.

Third, helium is utilized in direct patient care. Heliox, a mixture of helium and oxygen, is used for treatment of intrinsic and extrinsic upper airway obstructions, croup and post-extubation stridor. Heliox has been associated with a faster improvement of respiratory rate, acidosis, hypercapnia and encephalopathy. Heliox has also shown a shorter duration of mechanical ventilation and ICU stay.<sup>1</sup>

While essential to healthcare operations, there are significant challenges to the global helium supply chain driven by geopolitical tensions, a lack of investment in new helium production and the pending sale of the Federal Helium System which would eliminate a domestic source of the product. These challenges could lead to disruptive shortages and price volatility for helium globally.

Premier recognizes that a reliable, sustainable helium supply chain is essential to the continuity of operations in healthcare. Our comments below align with the specific questions identified in the request for comments.

### **III. PREMIER RESPONSES TO USGS QUESTIONS ON HELIUM SUPPLY RISK**

#### ***Is there an increased risk of helium supply chain disruption?***

Yes, there is an increased risk of helium supply chain disruption, especially given that helium is a finite resource with no reasonable alternatives.

Supply chain concerns with helium have existed for almost 15 years with several instances of helium suppliers citing force majeure and placing product on allocation. In one recent example from 2022, the six-month outage of U.S. Bureau of Land Management's purifier, commonly referred to as the Crude Helium Enrichment Unit (CHEU), removed more than 10 percent of global capacity from the market resulting in shortages and price increases for available product.

Given the instability of the helium supply chain for almost two decades, it is unlikely that the volatility will be fixed on its own, especially if the U.S. proceeds with sale of the Federal Helium System which would further exacerbate shortages and tighten available supply globally.

#### ***Does that risk stem from suppliers outside of the US?***

While the CHEU outage example highlights the risk of disruption in domestic helium supply, the risk is exacerbated by recent geopolitical unrest and sanctions on imports from Russia. As recently as early 2022, a large facility in Russia was expected to bolster the production of essential helium supplies and supply upwards of 30 percent of global helium moving forward. However, the impact of the conflict in Ukraine, sanctions and overall uncertainty in the region make the promise of increased Russian production highly uncertain. At a minimum, supply from the region is likely to be volatile, if not unreliable.

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<sup>1</sup> Kleiman, A. M., & Huffmyer, J. L. (2018). Helium: Is the Sky the Limit? *Respiratory Care*, 63(4), 488–490.

Other global production of helium is concentrated in Algeria and Qatar, and it is unclear if either nation can increase production to offset the supply of helium from Russia.

Given the global concentration of helium supply, potentially losing a domestic source of a critical natural gas could be detrimental and leave the U.S. in a situation where we are dependent on others.

***Would a supply disruption jeopardize use of products vital to healthcare?***

A supply disruption of helium will jeopardize products vital to healthcare and negatively impact patient care. While MRI manufacturers are re-engineering MRI machines to use less helium or leverage alternative cooling technology, it is cost-prohibitive for many hospitals to support the required investment in new MRI machines, especially considering the financial distress that U.S. hospitals are currently facing. This includes community healthcare providers such as rural and safety net hospitals that do not have the financial capacity to take on new capital expenses and will likely question the need for large capital investment when the current machines are serviceable. A lack of MRI machines would result in patient harm due to the inability to accurately diagnosis several diseases states in a noninvasive manner.

In addition, a supply disruption of helium would negatively impact the availability of semiconductors resulting in downstream shortages of several medical devices used in routine patient care. Given the ongoing shortages of semiconductors over the past several years, any further disruptions in this space could have dramatic impacts on the availability of critical medical devices, including the manufacturing equipment necessary to manufacture other medical supplies and pharmaceuticals.

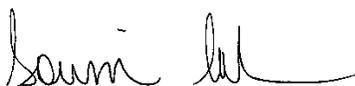
Finally, a supply disruption of helium would impact the treatment of patients with respiratory conditions. Given the prevalence of respiratory illness with the tripledemic of COVID-19, influenza and respiratory syncytial virus (RSV), a shortage of heliox would impact the ability to care for patients with airway obstruction in a minimally invasive manner.

**IV. CONCLUSION**

In conclusion, Premier recommends that the federal government take decisive action to mitigate the risks associated with the helium supply chain, including reassessing if sale of the Federal Helium System can be delayed given ongoing geopolitical issues. In addition, increasing investment in research and development of a comprehensive national helium strategy are critical steps to ensure a reliable and sustainable helium supply chain. Failure to address this issue could have dire consequences for industries reliant on helium, including healthcare.

Premier stands ready to work with the USGS to aid in any future data collection and/or analysis that might support strategies to positively affect the supply of helium. If you have any questions regarding our comments or need more information, please feel free to contact me at [soumi\\_saha@premierinc.com](mailto:soumi_saha@premierinc.com) or 732-266-5472.

Sincerely,



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