

# Total Inferred Resource Value of Gallium

---



**U.S. CRITICAL MATERIALS**

Security of Supply



US CRITICAL MATERIALS CORP | 4190 S HIGHLAND DR. STE 230 SLC, UT 84124 | 801-322-3401  
[WWW.USCRITICALMATERIALS.COM](http://WWW.USCRITICALMATERIALS.COM)

# Total Inferred Resource Value of Gallium at US Critical Materials Sheep Creek Property

Gallium = \$909.30 kg on September 6, 2024

150 ppm x \$909.30 kg = \$136.395 per kg (low estimate of gallium in rock)

\$136.395 per kg x 1000 kg per metric tons = \$136,395 per metric ton

Total of 40 claims x 20 acres = 800 acres

1 acre = 43,560 square feet

Original 800 acres = 34,848,000 square feet

34,840,000 sq feet x 1 foot deep = 34,840,000 cubic feet (low estimate)

34,840,000 cubic feet / 27 cubic yard = 1,290,370.37 cubic yards

1,290,370 cubic yards x 0.765 metric tons per cubic yard = 987,133 metric tons

987,133 cubic yards x 5.9 g/cm<sup>3</sup> (gallium) = mt 5,824,084

Volume x Density = Mass (Vp=m)

## **Total Inferred Resource Value**

**\$136,395 per mt x 5,824,084 mt = \$794,375,937,180**

**Mass X Inferred Value per metric ton = Total Inferred Value**

# Rare Earth Calculations from Samples Taken From the US Critical Materials' Sheep Creek Property and Analyzed at Idaho National Laboratory



**134,515 ppm (parts per million) of TREE - 13.4% Total Rare Earths**

**187,480 ppm (parts per million) of TREE - 18.7% Total Rare Earths**

**138,199 ppm (parts per million) of TREE) - 13.8 % Total Rare Earths**

**177,849 ppm (parts per million) of TREE - 17.7 % Total Rare Earths**

**GALLIUM AS HIGH AS 350 PPM. CURRENTLY PROFITABLE**

**@ 50 PARTS PER MILLION**

**These Gallium and rare earth numbers are higher than any that we are aware of in the United States. Idaho National Labs is confident that they can separate and process our gallium.**

**US Critical Materials is currently working with Idaho National Laboratory on an environmentally responsible separation and processing system.**



# Gallium

## Highest Supply Chain Risk of Any Element

By James B. Hedrick

U.S. Critical Materials

July 2023

### Gallium at Sheep Creek, Ravalli County, Montana

- Based on the gallium content in the original samples of Ancylyte-(Ce), it averages 692 ppm.
- Sheep Creek is one of the richest gallium deposits in the United States The highest-grade gallium sample for Sheep Creek is 1,370 ppm
- US Critical Materials is researching an environmentally-sound process to recover rare earths, strontium, and gallium.
- This averages nearly 14 times the 50 ppm currently recovered for a profit as a byproduct of bauxite or zinc processing
- US Critical Materials is currently exploring Sheep Creek, Montana, over a 10 square mile area

# US Critical Materials identifies outstanding Gallium Grades with the High-Grade Rare Earths at its Sheep Creek Project.

*Metal Tech News – March 25, 2024*

[Shane Lasley](#), [Metal Tech News](#)



Sampling of carbonatite rocks at Sheep Creek returned high-grade gallium, rare earths, and other critical minerals.

In addition to showing promise as a high-grade domestic source of rare earths, US Critical Materials Corp.'s Sheep Creek project in Montana shows the potential to be an equally high-grade alternative to China for the gallium used in a wide array of high-tech, green energy, and military applications.

“US Critical Materials looks forward to being the primary gallium producer in the United States,” said US Critical Materials President Jim Hedrick, who worked for 29 years as a rare earth commodity specialist at the U.S. Geological Survey and former Bureau of Mines.

In his current role, Hedrick is focused on Sheep Creek, a promising source of at least 13 minerals critical to the United States.

While gallium, rare earths, scandium, and yttrium were first discovered at Sheep Creek when the project was being explored for niobium in the 1960s, there were very few uses for these obscure elements at the time. Six decades later, however, this group of tech metals has been elevated onto the U.S. critical minerals list due to their uses in electric vehicles, computer chips, high-strength alloys, and a plethora of other high-tech and consumer devices.

Gallium, which has long been overshadowed by the group of 15 technology elements known as rare earths, has recently garnered the spotlight due to its importance in chipmaking, coupled with America's heavy reliance on China for this critical metal.

According to the most recent data from the USGS, China produces more than 98% of the world's supply of gallium.

“With this monopoly power comes tremendous ability to target adversaries and to use this economic position to shape the behavior of other governments,” Tim Moughon, director of field intelligence at the U.S. Department of Homeland Security, said during

a December presentation in Nevada on the national security implications of minerals critical to the U.S.

In mid-2023, China emplaced state-controlled restrictions on the exports of gallium needed for semiconductors, 5G technology, smartphones, satellite systems, solar energy, and next-generation defense systems.

Market and geopolitical analysts believe that China's restriction on exports of gallium, along with germanium and graphite, is likely a retaliatory strike in a technology trade war with the U.S. and other Western nations.

“So, these aren't hypotheticals,” said Moughon. “We see adversaries use monopolistic power very intentionally to advance their own national interests.”

## **High-grade gallium at Sheep Creek**

US Critical Materials believes its Sheep Creek project in southwestern Montana – along with a critical minerals separation technology it is developing in partnership with Idaho National Laboratories – could help break America's heavy dependence on China and others for gallium, rare earths, and other critical minerals. Last year, the company reported that 52 surface samples collected at Sheep Creek returned an average grade of 9% total rare earth oxides, with individual samples containing as much as 21.7% TREO.

“We have confirmed that Sheep Creek is the highest-grade rare-earth deposit in the United States, with a multibillion-dollar resource value,” Hedrick said at the time.

New sampling has demonstrated that this Montana property also hosts gallium grades on par with the Apex Mine in Utah, which was the first mine in the world to produce gallium and germanium as primary metals instead of byproducts.

“US Critical Materials prime gallium claims average over 300 ppm (parts per million) and go as high as 1,370 PPM,” Hedrick said.

According to USGS reports, the ore mined at Apex averaged 332 ppm gallium.

“Not only is our gallium high grade, but we are also confident that we will be able to create a separation process that will be environmentally respectful,” the US Critical Materials president added.

## **Separation tech is key**

The processing and separation of critical minerals like gallium and rare earths is a key link in establishing domestic supply chains in the U.S.

China’s global monopoly on the production of gallium, rare earths, and other critical minerals is largely due to its low-cost processing of these materials.

While lower labor costs and much less stringent environmental laws give China a competitive advantage, the U.S. has the ability to leverage innovation to push down the costs and elevate the sustainability of processing critical minerals.

“By advancing technology, the US can develop new products and materials that allow for the US to manufacture something for one-tenth to one-hundredth the cost of doing so in China,” said Robert Fox, a senior chemical research scientist at Idaho National Lab. “So, whereas it takes China a billion dollars and much environmental pollution to do something, we can develop technology that allows us to do the same thing for \$100 million and little to zero pollution.”

“Advancing technology and R&D is our ticket to making China obsolete,” he added.

When it comes to achieving this goal when it comes to gallium, rare earths, and other critical minerals, US Critical Materials and Idaho National Lab are collaborating on developing a low-cost and environmentally sound critical minerals processing technology.

Idaho National Lab, whose involvement with rare earth separation goes back to the dawn of the nuclear age in the 1950s, has decades of expertise to bring to the table.

“Our CRADA (cooperative research and development agreement) with US Critical Materials allows us to continue to develop our prowess and to expand our technological solutions to solve rare earth element (REE) challenges,” Fox told Metal Tech News in December.

That same technology is expected to also be used to separate gallium from concentrates produced at a future Sheep Creek mine – providing the U.S. with a reliable and sustainable alternative to China for this increasingly important tech metal.





## **US Critical Materials discovers exceptional gallium grades among the high-grade rare earths at its Sheep Creek project**

April 26, 2024, [Maurizio Di Paolo Emilio](#)

*US Critical Materials' Sheep Creek project has the potential to be an equally high-grade alternative to China for the gallium used in a wide range of applications.*

[US Critical Materials](#) has verified the presence of a strategically important deposit of high-quality gallium on its 6,700-acre claims in Sheep Creek, Montana. This mineral is routinely identified as the top supply risk concerning National Security, given that the United States relies entirely on imported gallium, predominantly sourced from China.

The Chinese government has lately imposed an export ban on gallium, a crucial resource for national defense and various other essential uses. Gallium is utilized in the production of [semiconductors](#), 5G technology, cellphones, satellite systems, crucial photonics technologies, and particularly in current and future defense systems.

Gallium has been identified as having the highest supply risk in the United States according to the 2022 list of important minerals. This risk has materialized due to the recent export limits implemented by the People's Republic of China on gallium and other critical and rare earth minerals.

In December 2023, US Critical Materials and Idaho National Laboratories (INL) entered into an agreement to collaborate on the development of novel techniques for processing rare earth elements, with a specific focus on gallium separation. The cutting-edge technologies created through this Cooperative Research and Development Agreement (CRADA) are expected to have the ability to offer environmentally appropriate mining and processing methods to address environmental problems.

According to US Critical Materials, the gallium that has been found is of superior quality. Furthermore, they express assurance in their ability to develop a separation method that will prioritize environmental sustainability. The average concentration of gallium in US Critical Materials is around 300 parts per million (PPM), with some samples reaching as high as 1,370 PPM. The mineral may be economically extracted at a concentration of 50 parts per million (PPM). US Critical Materials aims to become the leading producer of gallium in the United States.

US Critical Materials is a privately-owned corporation that focuses on exploring, developing, and utilizing rare earths. The company is headquartered in Salt Lake City, Utah and has assets in Montana and Idaho.



**U.S. CRITICAL MATERIALS**

Security of Supply

Visit us on our website

[WWW.USCRITICALMATERIALS.COM](http://WWW.USCRITICALMATERIALS.COM)

For more information, please contact Rachel Winn

[rachelwinn@uscriticalmaterials.com](mailto:rachelwinn@uscriticalmaterials.com)

801-322-3401