

# Critical minerals in Alberta

## What are critical minerals?

Canada, the United States, the European Union and Japan have identified more than 30 minerals that are classified as critical for infrastructure, electronics, national security interests and in the transition to a low carbon economy. Alberta has potential for many of those critical minerals, and the province is well-positioned to become a preferred supplier of raw materials and products.

The following table lists minerals that have potential to be produced in Alberta. The check mark indicates which of these minerals are also listed as critical minerals by other selected nations.

## Table legend



### Occurring in rocks and sediments

Mining methods include surface and underground mining to extract ore. For underground mining, a horizontal or vertical tunnel is driven and the minerals are gradually cut away.



### Occurs in deep wells including oil and gas





















Minerals, such as magnesium or lithium could be extracted from groundwater (brine) during oil and gas production.















### Concentrated in industrial waste

Titanium and other minerals can be extracted from the waste products of industrial activities.

## IDENTIFIED CRITICAL MINERALS WITH OPPORTUNITIES IN ALBERTA

Critical element or mineral	Industries	Canada	US	EU	Japan	Common sources of mineral
Aluminium (Al)	Almost all industries including car manufacturing and food processing	✓	✓			
Arsenic (As)	Pesticides, lumber preservatives and semiconductors and, gold mining		✓			 
Barite (BaSO <sub>4</sub> )	Cement and petroleum			✓		
Bismuth (Bi)	Medical and pigments	✓	✓	✓		
Chromium (Cr)	Production of stainless steel	✓	✓			
Cobalt (Co)	Rechargeable batteries	✓	✓	✓	✓	
Gallium (Ga)	LEDs and integrated circuits	✓	✓	✓	✓	
Germanium (Ge)	Fiber optics and night vision	✓	✓	✓	✓	 
Graphite	Lubricants, batteries and fuel cells	✓	✓	✓	✓	
Hafnium (Hf)	Nuclear control rods and high temperature ceramics		✓	✓		 
Indium (In)	LCD screens	✓	✓	✓	✓	
Lithium (Li)	Primarily batteries	✓	✓		✓	  
Magnesium (Mg)	Steel, ceramics and furnace linings	✓	✓	✓	✓	 
Manganese (Mn)	Steel	✓	✓		✓	

Critical element or mineral	Industries	Canada	US	EU	Japan	Common sources of mineral
Nickel (Ni)	Stainless steel, batteries and coins	✓				
Niobium (Nb)	Stainless steel alloys		✓	✓	✓	
Platinum group metals (PGMs)	Catalyst agents	✓	✓	✓	✓	
Potash (K minerals)	Fertilizer	✓	✓		✓	
Rare earth elements (REE)	Batteries and electronics	✓	✓	✓	✓	
Scandium (Sc)	Fuel cells	✓	✓	✓		
Tantalum (Ta)	Electronics	✓	✓	✓	✓	
Tin (Sn)	Steel alloys and coatings	✓	✓		✓	
Titanium (Ti)	White pigments and metal alloys	✓	✓		✓	
Uranium (U)	Nuclear fuel	✓	✓			
Vanadium (V)	Alloys, grid batteries	✓	✓	✓	✓	
Zinc (Zn)	Galvanized steel, castings and manufacturing	✓			✓	
Zirconium (Zr)	High temperature ceramics		✓		✓	