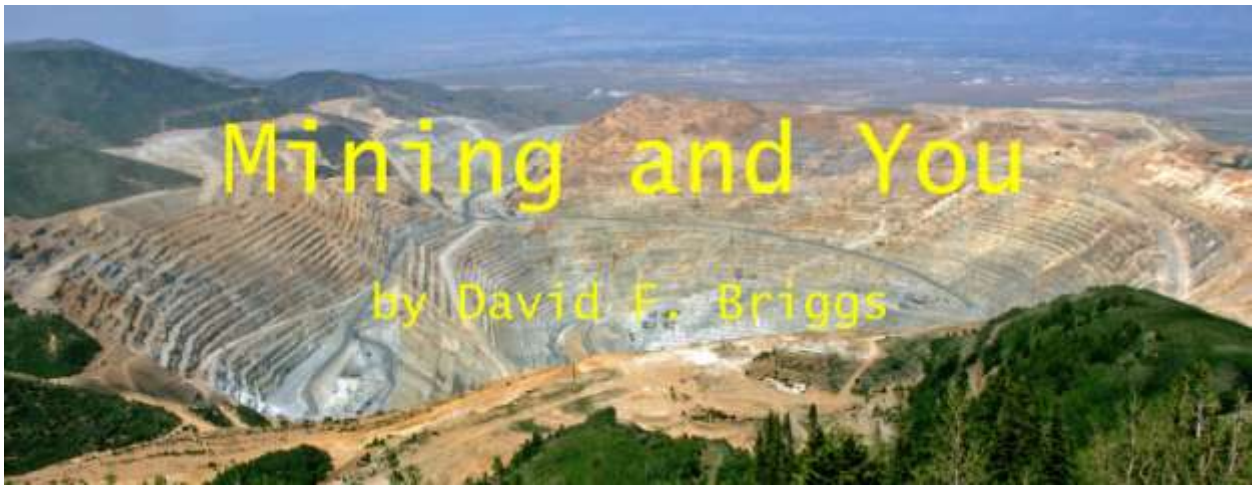

America's Mining Industry is Vital to Our Economic and National Security

by David F. Briggs

Resolution Copper's 6,943-foot No. 10 Shaft (left) is the Deepest Single Lift Shaft in the United States (Photo by David F. Briggs, August 2009)

In December 2014, Resolution Copper finally acquired the 2,400 acre parcel of federal land it needed to develop a large copper deposit near Superior, Arizona. This property was obtained through a land swap with the federal government, which was included within the 2015 National Defense Authorization Act; an omnibus bill that funds all aspects and operations of the U. S.

military establishment. Opponents of mining have claimed this land exchange should never have been included in this piece of legislation, because it has nothing to do with our national security. I strongly disagree.

Over the last several decades, globalization of the world's economies has resulted in lower costs, more efficient supply chains and access to more resources. However, these benefits have not come without a price. It has also created a dependency on foreign sources for minerals, materials and finished products. This dependency not only impacts America, but affects all nations as they compete for their share of the world market.

Despite America's rich abundance of minerals, our dependency on foreign sources for these commodities is increasing. According to the U. S. Geological Survey publication, Mineral Commodity Summaries 2015, the United States was at least 50% dependent on foreign sources for 25 minerals and materials in 1978. By 2014, this number had risen to 43, including 19 of which America is totally dependent on foreign sources. Many of these commodities are essential for the defense, technology and energy sectors of our economy (see accompanying table). Reducing our dependence on foreign sources for minerals will make America's national security less vulnerable to decisions made by foreign governments.

With domestic production only accounting for approximately 66% of the copper we consume annually, there is even a shortfall for the second most common mineral used by the Department of Defense. By-products of copper mining, such as molybdenum, rhenium, tellurium and platinum group elements, also have important defense applications.

Our nation's mines are not just holes in the ground. In addition to supplying the minerals we consume, they are also laboratories where highly trained professionals develop the new technologies and innovative mining practices required to responsibly meet our future needs. Without the development of new mines to replace current domestic producers as their reserves are depleted, there will be fewer opportunities for the next generation of Americans to practice and hone the skills required to meet the challenges of the 21st century. Development of new technologies and skill sets are essential for remaining competitive in global marketplace and a strong national security.

I support the responsible development of new mining projects in Arizona because it helps reduce America's dependence on foreign sources for minerals, materials and finished products. America's national security depends on our ability to remain competitive within the global marketplace. New technologies and mining practices being developed at Resolution Copper and other sites around Arizona will benefit Americans for many years to come. Products produced by Arizona's mining industry help reduce our nation’s trade deficits, allowing us to retain more of our wealth, which can be invested in our nation’s economic future. Mining is one of the industries that has played an important role in our state's history and will continue to play a

vital role in Arizona's future.

David F. Briggs is a resident of Pima County and a geologist, who has worked in the mining industry for more than 35 years.

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List of Some of the Commodities Essential for Defense, Technology and Energy Sectors of the United States' Economy

Mineral	Net Import Reliance %	Applications/Uses	Import Sources
Bismuth	94	Thermoelectric devices and metal alloys	China (59%) Belgium (34%)
Chromium	72	Turbine engines for jet aircraft, tanks and marine applications	South Africa (38%) Kazakhstan (16%) Russia (9%)
Cobalt	76	Jet engines, nickel-metal hydride and lithium-ion batteries, samarium-cobalt magnets and Alnico magnets	China (21%) Norway (11%) Russia (10%) Finland (9%)
Gallium	99	Electronic, radar missile defense, satellite communications, microwave power transistors, integrated circuits, optoelectronic devices, laser diodes, solar cells. radar missile defense and infrared imaging	Germany (36%) United Kingdom (24%) China (23%)
Germanium	95	Missile guidance, solar cells for satellites, infrared lenses, thermal imaging systems and telecommunications	China (65%) Belgium (15%) Russia (11%)
Graphite	100	Batteries, lubricants, body armor, engine turbine components and coatings for aircraft manufacture and missile parts	China (45%) Mexico (26%) Canada (17%)
Indium	100	LCD displays, LED light bulbs, fiber optics, solder and alloys, solar cells, nuclear control rods, alkaline batteries, IR imaging and communications systems	China (21%) Canada (21%) Belgium (14%) Japan (11%)
Manganese	100	Steel, primary aluminum production, non-rechargeable batteries and additive to unleaded gasoline	South Africa (32%) Gabon (22%) Australia (12%)
Niobium	100	Steel, stainless steel, air transport, gas turbines, heat-resistant combustion equipment, tool bits, cutting tools, nuclear industries and superconducting magnets	Brazil (84%) Canada (11%)
Rare Earths	59	Computer hard drives and monitors, avionics displays, radar, wind turbines, hybrid and electric vehicles, electronics, lasers, heat-resistant super alloys, aircraft engines, magnets, night-vision goggles, electric motors, optical glass, high temperature fuel cells and satellite-based infrared sensors	China (75%) France (6%) Japan (6%)
Rhenium	83	High temperature alloys, including super alloys used in air transport and land power generation turbine engines; and catalysts in petroleum refineries	Chile (88%) Poland (7%)
Tantalum	100	Jet engines, capacitors , missile systems, ignition systems, night vision goggles and global positioning systems	China (21%) Germany (12%) Kazakhstan (10%) Russia (7%)
Tellurium	>80%	Solar cells, thermoelectric devices, semiconductors, thermal imaging devices, integrated circuits, laser diodes and navigation systems	Canada (46%) China (17%) Philippines (13%) Belgium (10%)
Titanium	91	Aerospace applications, armor, chemical processing, marine hardware and power generation	South Africa (40%) Australia (21%) Canada (18%)

Source: Mineral Commodity Summaries 2015 published by the U. S. Geological Survey and Strategic and Critical Materials 2015 Report on Stockpile Requirements published by the Department of Defense.