Samples show that US Rare Earths has potential for high-value Europium rich critical rare earths

The term “Europe” has its roots in ancient Greece and it referred to the land west of Athens or the ‘West’. It is ironic that these days, Greece is once again considering dropping the ‘Euro’ currency. As it happens, that very same Greek word has lent its name to europium (Eu), one of the most reactive among the rare earth elements. It oxidizes rapidly when exposed to ‘air and reacts in a manner similar to calcium in the presence of water. Like other rare earths (REE) it spontaneously explodes in air at temperatures between 150 and 180 degrees Celsius. It is rather soft and, like lead, quite ductile. But above all, has fluorescent characteristics that make it suitable, along with all its other properties, to have been used to make the very watermark of Euro banknotes – and speaking of banknotes, europium prices have been less volatile than those of other, even critical rare earths. Of course, europium has other sophisticated industrial applications: it is used to enhance glassy materials for the manufacturing of lasers by which it is added to a semiconductor in order to modify the electronic properties of the material and increase the capacity of electric conductivity.The US and the European Union have classified Eu as a critical material and there is great concern for potential shortages because of its widespread, and growing, use by the lighting and display systems side of the electronics industry.

U.S. Rare Earths, Inc. (‘USRE’, OTCBB: UREED), a US based rare earths exploration company, will focus its efforts on developing a europium-rich rare earth deposit based on ‘dark monazite’. Europium represents a major aspect of USRE’s

value. Europium is used in the phosphors (light emitting materials that gives color TV its red hue; they are also used in fluorescent bulbs, lamps, TV and computer monitors and has also been used to mark the 'trim' of Euro denominated bills in Europe. One of the growth areas will be in commercial lighting applications from developing countries and, in fact, the price of europium is high compared to other REE. USRE has already received permit to start mining and producing rare earths at its 'Last Chance' Project in the Lemhi Pass region of Idaho and Montana. USRE announced that it has received approval to re-open historic adits (tunnels extending underground more than 400 meters, which present proven mineralized veins of critical rare earths), allowing the Company to move almost directly into the processing phase and speed up the production process. The horizontal adits, tunnels, lead underground and giving access to subsurface mineral deposits, intersecting the Last Chance Vein.

The historical record shows that these have known and high rare earth mineralization occurrences. USRE should be able to start production by late 2017 and thanks to its ability to 'skip' the mining phase, it will save some USD$ 6 million in CAPEX. Therefore, USRE has the potential to be the first company to proceed with rare earth underground exploration and sampling in the continental United States and at a much lower cost than expected. USRE has already sampled two short tons of material from the stockpile at the Last Chance Mine project, sampling it for advancing metallurgical test work as conducted by Hazen Research. The findings suggest that the main high-value rare earth minerals are dark-monazite and xenotime, enriched in Europium while also featuring aluminum, iron, titanium, calcium and magnesium. One of the unique feature of the samples is that assays have shown a remarkable europium content (5.25% of total rare earths). Moreover, early liberation and magnetic separation tests indicate that the cost of grinding (comminution) the mineral will be lower than expected because less than 0.1% of total rare earths plus

Yttrium feature fractions larger than +14 mesh, altogether allowing for the possibility of skipping the grinding to fractions less than 14 mesh for beneficiation. This will enable further production cost cuts.

USRE's stockpile was first extracted by Idaho Energy and Resources Co. (IERCO) as part of rare earths exploration and its published data suggests that the stockpile presents a high percentage of heavy and critical rare earth elements. Rare earths and other minerals are essential to the American defense industry and their supply, most of which comes from China, is wrought with uncertainties die to opaque political regulations and an ongoing reform of the mining industry system. The Armed Services Committee of the House of Representatives has warned of the risks of rare earth shortages and how China has the power to place an embargo on exports of key rare earth elements, causing a paralysis for the military industrial sector. Possible sources include India and Australia; however, it can now consider the United States as well, given USRE's accelerated development.

Wind turbines, electric vehicles or lasers are unthinkable without these high-tech materials but europium has become even more important for the defense sector, given its use in lasers. The US Navy's new laser cannon (known as Laser Weapon System or LaWS) might sound like something out of a 'Star Wars' movie but it was actually tested, by humans, last December in the waters of the Persian Gulf aboard the USS Ponce. The results were so encouraging that the commander is now authorized to use it, should his ship face a possible threat. Laser weapons are powerful, economical and will have a vital role in the future of naval combat operations; they also need europium. The US Navy hopes to deploy a number of different types of LaWS on its fleet by 2020. A reliable europium supply is necessary given that LaWS could lead a whole revolution on how the armed forces will operate. Japan, fearing economic and defense supply problems, has already

decided to secure a minimum of 60% of its rare earths supply from countries other than China within the next four years.

Rare earths recycling has been proposed as an alternative to Chinese dependence and new REE mining, regaining the coveted metals from scrap. However, this is not practicable as there are still many obstacles to overcome in order to address growing world demand. For countries such as Europe and the US, this could be a huge advantage, but despite all the research done to date, less than one percent of all rare earths come from recycling. The recycling of rare earths is in its infancy and the technological challenge it faces is even greater than that encountered to extract and process rare metals. In order to re-absorb highly engineered products such as mobile phones require much work and additional chemical steps to be able to isolate the rare earths, obviously with increased costs. In addition, almost every rare-earth element needs a different recycling technology; separating terbium from a light bulb is not the same thing as recovering neodymium from a hard drive and europium cannot yet be recycled.

U.S. Rare Earths approved to start rare earths production immediately!

As of today, U.S. Rare Earths, Inc. (‘USRE’, OTCBB: UREE) can start mining and producing rare earths at its Last Chance Project in the Lemhi Pass region of Idaho and Montana. USRE announced that it has received approval to re-open its historic tunnel work, speeding up the production process by at least three years, which is literally at least two years ahead

of the closest competitor. USRE had expected to start processing by 2017 but thanks to the permission to revisit the existing adits (extending underground more than 400 meters, which have already proven to contain mineralized veins of critical rare earths), it can proceed much earlier; it can proceed now!

USRE said this accelerated development will enable it to save some USD$ 6 million in CAPEX while having being approved to handle 2,500 tons of metallurgical sampling starting now; it also has the rights to apply for the removal of an additional 7,500 tons of material for metallurgical sampling under Montana state exploration guidelines. The horizontal adits, tunnels, lead underground and giving access to subsurface mineral deposits, intersecting the Last Chance Vein. The historical record shows that these have known and high rare earth mineralization occurrences. Moreover, as a result of USRE having been approved by the U.S. Forest Service to access an REE stockpile located on its Last Chance prospect last August, the Company can get a head start on processing with zero CAPEX and OPEX costs.

The stockpile lends itself to prompt metallurgical sampling and USRE suggests the “stockpile contains at least 10 to 12 tons of highly concentrated rare earths enriched material”. This would make USRE “the first company to proceed with rare earth underground exploration and sampling in the continental United States” at far lower cost than anyone could have envisaged. “U.S. Rare Earths is very excited with the achievement of this milestone with the prospect of being the first underground mine since the 1960’s in the US to remove rare earth material,” said Kevin Cassidy, CEO of U.S. Rare Earths.

USRE has the luxury of being able to concentrate on the processing and metallurgy, rather than the exploration thanks to its readily available stockpile. Idaho Energy and Resources Co. extracted the material as part of rare earths exploration

and its published data suggests that the stockpile presents a high percentage of heavy and critical rare earth elements. The rare-earth deposits were first explored by the U.S. Geological Survey as well as the Idaho Bureau of Mines and Geology and IERCO among others. USRE can rely on a very experienced management and exploration team with many and successful years of experience in the sector and their determination to create an wholly American complete supply-chain solution, which will include a separation mill for the critical and heavy rare earth elements in the continental United States.

Rare earths and other minerals are essential to the American defense industry and their supply, most of which comes from China, is wrought with uncertainties die to opaque political regulations and an ongoing reform of the mining industry system. Japan, for example, was deprived of rare earth elements in its maritime dispute with China in 2010, and has since feared further disruptions, leading to plans to source these important minerals elsewhere. The United States wish to prevent this risk, given the dire consequences that could result from the sudden imposition of crackdown The Armed Services Committee of the House representatives has issued various reports since last year, presenting the risks of rare earth shortages in severe terms and scenarios. One of these is a Chinese embargo on exports of key rare earth elements and notes that in the current situation the United States would be paralyzed. The current and deepening dispute between NATO and Russia, evoking the gloomy relations of the Cold War, has added more tension to relations between NATO and China. Advocates of increased American self-reliance in the supply of critical materials suggest that it is not always safe to rely on our neighbors for the supply. Currently, the world rare earths market has become extremely asymmetric because China provides more than 90% of these minerals. Japan has already decided to secure a minimum of 60% of its rare earths supply from countries other than China within the next four years. Possible sources include India and Australia; however, it can

now consider the United States as well, given USRE's accelerated development.

US Rare Earths secures 'fast track' to processing rare earth minerals

US Rare Earths ('USRE', OTCBB: UREE) has one of the best chances of developing a successful rare earths mining and processing facility in the United States thanks to its rare earths property at Lemhi Pass (western Montana and eastern Idaho), for which it has already completed a NI- 43-101 compliant preliminary exploration and assessment showing high concentrations of critical rare earths.

USRE expects to begin processing by 2017 in the United States. The exploration record at Lemhi Pass suggests that it may hold the highest concentrations of rare earths elements in the U.S. USRE intends to revisit existing horizontal mines extending underground more than 400 meters, which have already proven to contain mineralized veins of critical rare earths. At the moment there is virtually no place where the critical and heavy rare earths are being processed into something useful except for China. Molycorp and Lynas Corp are processing outside of China (California and Malaysia respectively) but, so far, this activity has been limited to light rare earths (LREE). USRE has already reported very aggressive drilling results thanks to the strategic use of historical data and the application of new technology.

Very favorable exploration results led the company to expand its land claims to around 25,000 acres in several states

including two Central Park-sized properties in accordance to data indicating the presence of very high percentages of critical rare earths. Moreover, USRE has the opportunity to divert much of its attention to processing because it has access to a sizeable stockpile of extracted rare earths ore on site and ready for processing. On August 11, USRE announced having gotten U.S. Forest Service approval to access an REE stockpile located on its Last Chance prospect claims in the Lemhi Pass region of Idaho and Montana. The stockpile lends itself to prompt metallurgical sampling and USRE suggests the "stockpile contains at least 10 to 12 tons of highly concentrated rare earths enriched material". This would make USRE "the first company to proceed with rare earth underground exploration and sampling in the continental United States" at far lower cost than anyone could have envisaged.

USRE has the luxury of being able to concentrate on the processing and metallurgy, rather than the exploration thanks to its readily available stockpile. Idaho Energy and Resources Co. extracted the material as part of rare earths exploration and its published data suggests that the stockpile presents a high percentage of heavy and critical rare earth elements. The rare-earth deposits were first explored by the U.S. Geological Survey as well as the Idaho Bureau of Mines and Geology and IERCO among others. USRE can rely on a very experienced management and exploration team with many and successful years of experience in the sector and their determination to create an wholly American complete supply-chain solution, which will include a separation mill for the critical and heavy rare earth elements in the continental United States.

Mining companies in the 'West' have been looking for ways to compete with China's rare earths industry. But actual success remains elusive, at least until the next few years when some miners in Australia, Canada and the United States are expected to come on line. Nevertheless, it is not sufficient in itself

to discover a valuable resource, rich in heavy rare earths (HREE) at high grades; it is perhaps more important to develop the right processing or metallurgical technology in order to extract the desired metals in a cost effective and environmentally safe manner. At the moment there is virtually no place in the world where the ore can be further processed into useful rare earths except for China. Yes, Lynas Corp and Molycorp have built processing facilities, which are now operational, but they are not producing the kinds of products that are most in demand now. Metallurgy and rare earths processing has often proven to be complex and polluting, which has left China as the dominant force in the industry for the kind of magnets that are needed to make components used in anything from solar panels and wind turbines to laser guided missiles.

China's rare earths export policy remains contentious even if the World Trade Organization has deemed it illegal for China to restrict exports of these ever more important materials. China has already adopted countermeasures; however, by doing so, it has threatened the national security of the United States and its allies. So much of modern weapon systems (not to mention cell phones or computers) require the kind of sophisticated electronics, nanotechnology and optics that are only possible through the use of rare earths and related critical metals. Chinese restrictions risk being tighter in periods of confrontation such as the one the world is experiencing now with a virtual resumption of Cold War attitudes between the West, Russia and China. Even if the geopolitics improves, China has adopted its own internal mining restrictions in order to control pollution, which has become a crucial political issue.

The demand for political freedom in China might be trumped by the demand for clean air as a trigger for widespread social revolt. After the ore has been extracted from the ground, unnecessary components are removed and a concentrate is

treated with acid and chemicals to achieve separation of the individual metals. Many of the 17 rare earths are so similar that the separation of individual elements is extremely difficult in their physical structure. It can take several months and require more than 1,000 chemical treatments. This is costly and polluting; it is also the most important step that a rare earths company must consider in order to have a shot at commercial success. Therefore, the Chinese Government has very valid reasons to reduce and rationalize rare earth production beyond issues of nationalism and 'realpolitik'. There is no doubt that the West must act quickly to address the potential rare earth supply chain threat posed by China's concerns. China itself would appreciate the emergence of other heavy rare earth mining and, especially, processing resources. China's share of global production will certainly fall in the next few years even as it shall continue to dominate the industry, especially the processing of the raw mineral into commercially ready products.