

# **THE TASMAN METALS STORY**

## **Bringing Rare Earth Elements to Europe and The World**

by Wayne A. Melvin MA

A Capital Street Group Publication



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## Where the Story Begins

Mark Saxon, a transplanted Australian, stands on the rim of a small abandoned quarry in Sweden. While the snow swirls around him and the early twilight of a Nordic winter descends, he surveys this seemingly unremarkable site almost as a place of pilgrimage. For the handful of scientists and geologists who know the history of Ytterby, however this grotto truly is a place of worldwide significance. From a mysterious black rock found here more than two centuries ago comes strategic metals that could help solve many of the world's most vexing environmental and technological problems.

Saxon scrapes the ice from a brass plate that helps tell the story. It was here, in 1787, that Lieutenant Carl Axel Arrhenius, a chemist with an interest in mineralogy and an officer in a Swedish artillery regiment, went exploring the local feldspar quarry. The old mine was known for its many unusual rock specimens and Arrhenius found a mysterious black boulder



*The Famous Feldspar Quarry at Ytterby, Sweden*

there that fascinated him. He sent a sample for analysis to Johan Gadolin, a Finnish scientist at the University of Åbo. Gadolin extracted a previously unknown oxide (earth) from it that he called ytteria, after the nearby village where it was found. He had successfully isolated the first rare earth element. The world now knows this substance as yttrium, a valuable material used in lasers and high temperature superconductors.

The material discovered by Arrhenius and Gadolin is one of the family of 16 rare earth elements (“REE”) that are being used to produce energy efficient vehicles and are a key component of wind turbines and other “green technologies”. Their unique chemical and physical properties make them irreplaceable in computer hard drives and catalytic converters, mobile phones, medical devices, lasers, high-powered magnets and numerous other technologies. New uses for these elements are being found all the time and global demand is rapidly expanding—at the same time as supplies are being squeezed.



*Historical Plaque at the entrance of Ytterby mine.*

*Placed by ASM International, the professional engineering and scientific society.*

Saxon went on to co-found Tasman Metals, with a vision to help supply Europe and the rest of the world with these valuable metals. (Tasman Metals Ltd (TSX.V : TSM; Frankfurt : T61; Pink Sheets : TASXF) He serves as President of this Canadian mineral exploration and development company which remains focused on strategic metals in the European region, particularly Sweden and Finland. Saxon

says that “due to our first-mover advantage in the region, Tasman’s exploration portfolio is uniquely placed, with the capacity to deliver “high-tech” metals from politically stable, mining friendly jurisdictions with developed infrastructure.”

## History of Tasman Metals

Saxon and his long-time friends and associates—and fellow Australians—Michael Hudson, President of Mawson Resources and David Henstridge, President of Tumi Resources, were early to recognize the many opportunities that presented themselves in Sweden and Finland. Over the past decade they have worked together to launch numerous exciting projects throughout the Baltic Shield. Tasman was born out of the collaboration of this Australian management team, along with their close European and Canadian colleagues.



Saxon and Hudson were travelling around Europe looking for promising projects for a new public float. They set up discussions with the Swedish Geological Survey (SGU) hoping to gain their assistance in identifying properties in that country. REEs had been making the news and they wanted to specifically ask about those. The geologists recognized the growing urgency in Europe for secure supplies of REEs to feed the rapidly expanding high-tech sector. The world started to panic as China, which already had a near monopoly on REEs,

was moving aggressively to further lock down supply. Other countries and companies now had to scramble to find alternate supplies. A classic supply and demand squeeze!

From their extensive work in the Baltic region, the Aussies knew there were promising REE opportunities there waiting to be tapped. After all, it was Swedish and Finnish scientists who had first identified these elements from sources in this region. The SGU officials did not disappoint. At their morning meeting Saxon asked if they knew of any promising REE targets, and was immediately handed a list of properties that had just been compiled the day before. They rushed through coffee and by that evening the properties had all been staked. Tasman was quickly created to hold these claims and the company was listed in 2009. The need for a secure REE supply for Europe made for a compelling story and a fantastic business opportunity.

## Acquisition of the Norra Kärr REE Project

One of the most exciting properties identified by Tasman was the Norra Kärr site. This project had lain unclaimed on open ground for eight years, but boxes of dusty rocks and documents hinted at a something extremely valuable hidden within—REEs. Norra Kärr had been known previously as an unusual zirconium-bearing intrusion, but Saxon and Hudson had been looking at REE projects elsewhere, and knew that zirconium is often associated with REEs—in particular the higher value heavy REEs.

With such promise, there was initial shock to learn that authorities had placed a “reservation” on the property. Saxon assumed this likely meant a reserve for an ecologically sensitive region, perhaps placing Norra Kärr off limits. Not trusting his own proficiency with translating Swedish into English, Saxon arranged for a proper translation of the key document. As it turns out the reservation was placed on Norra Kärr because it had been identified as a mineral

property of strategic national importance. That is the kind of reservation you want to have. The normally reserved Saxon was more than relieved; he was ecstatic.

To add to the excitement of this new venture was a “treasure chest”, in reality several dusty and crumpled cardboard boxes. But to those who were anxiously ripping into them they were the equivalent of a pirate’s locker or a barrel of jewels from Ali Baba’s cave. The storage boxes held mineral samples from Norra Kärr. Saxon and Hudson marvelled at the strange pinky green rocks they held in their hands. They shared this moment of discovery with the spirit of Arrhenius and Gadolin. Amazing specimens. Beautiful rocks. But what did they really have? It was time to consult an expert on REEs.

### John Kaiser: A “Behind the Scenes” Look at the Acquisition of Norra Kärr

In June of 2009 a meeting was arranged by Nick Nicolaas of Mining Interactive, the firm that provides investor relations for Tasman. Knowing they all had an interest in REEs, Nicolaas brought Saxon and Hudson together with the mining analyst John Kaiser. Here in Kaiser’s words are what happened next:



*John Kaiser, Mining Analyst*

*“During June 2009, after we filmed the MIU (Mining Interactive University) Lecture: “How to value Pre-Production Resource Investment”, Nick and I joined Michael Hudson and Mark Saxon for lunch at the La Soleil Restaurant. They were principals of a company which I had adopted as a bottom-fish buy for 2009 Bottom-Fish Edition. I had started to write more intensively about the rare earth sector and knew that geological provinces which host uranium deposits often have associated rare earth mineralization. I suggested that they use their Scandinavian knowledge base to assess the region’s potential for known rare earth systems and their availability. They did in fact come up with a number of prospects, one of them Norra Kärr for which they had partial sample values. I plotted up the distribution and recognized that Norra Kärr had a good distribution of heavy rare earths. Based on the tonnage footprint and the presence of heavy rare earths I suggested that Norra Kärr could become a solution to Europe’s rare earth security of supply problem. And so it came that the rare earth portfolio they had assembled during the summer of 2009 ended up as Tasman.”*

*—John Kaiser, January 19, 2011*

(John Kaiser is a mining analyst with over 25 years experience and publisher of Kaiser Bottom-Fishing Report. Kaiser Research Online is his newsletter and online information portal: <http://www.kaiserbottomfish.com> )

### Tasman Metals is Listed on the TSX.V—And the Drills Start Turning

Acting on Kaiser’s expertise and timely advice, Tasman was quickly created to hold the Swedish REE claims. Saxon was named as President and Hudson and Henstridge placed on the Board. To round out the business side of the new company, two other directors were included, Nick DeMare, a long-time friend and financial expert, and Robert Atkinson, “one of Canada’s most respected Investment dealers”. The team did not waste much time getting into

action. The Phase One drilling program began in early December 2009—only 1 month after Tasman Metals Ltd was listed on the TSX.V—and was completed early February 2010.

## A Short History of REEs: The Swedish & Finnish Connections

Science now recognizes 16 rare earth elements, or lanthanides: elements with atomic number 39 (yttrium), and 57 (lanthanum) to 71 (lutetium). As new REE elements were isolated and added to the list many of them were given Swedish and Finnish names. “The region is rightly regarded as the “home of REE” as many REE’s were first discovered in Sweden, including cerium, erbium, holmium, lanthanum, scandium, terbium, thulium, ytterbium and yttrium.”

Swedish and Finnish scientists greatly contributed to this exciting new branch of chemistry. According to many fellow scientists, “Their accomplishments rank amongst the top science and technological accomplishments of the 19th and 20th centuries.” From Sweden there came Baron Jons Jakob (cerium), Carl Gustav Mosander (lanthanum, erbium, terbium), Paul E. Lecoq de Boisbaudran (samarium), Lars Fredrik Nilson (scandium) and Per Teodor Cleve (holmium), and from Finland there was Johan Gadolin (yttrium).

**Rare Earth Elements**

La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
57	58	59	60	61	62	63	64	65	66	67	68	69	70	71

**Lanthanides**

*Chemical periodic table delineating the 16 rare earth elements (REE): the lanthanides, La through Lu, plus Y, whose geochemical behaviour is virtually identical to that of the heavier lanthanides. Promethium has no long-lived isotopes and occurs naturally on Earth only in vanishingly small quantities. An represents the first 14 actinide elements; Lr is the last actinide.*

— From U.S. Geological Survey, Fact Sheet 087-02



Carl Gustaf Mosander



Per Teodor Cleve



Johan Gadolin

The search for and identification of the REEs “is probably the most confusing and complex of any of the elements.” There were many false claims of new discoveries and continuous struggles with placing them in the periodic table. Several factors made their identification difficult. For one, the chemical and physical properties of the different elements are quite similar. This meant that laborious separation and purification techniques were required to isolate

them from the “earths” or oxides of the elements. The last—and very elusive—REE to be discovered was the unstable element 61. It was only found in 1947, with the advent of the nuclear age, and appropriately named promethium after the Titan who stole fire from the gods.

Although rare earth elements are not always that “rare”, in terms of their abundance on earth, their complex chemistry makes for ongoing challenges for scientists working with them. It also means that solving metallurgical challenges is paramount to economically mine and extract these elements.

### Overview of Tasman’s Norra Kärr Project

At first glance there is nothing particularly remarkable about the Norra Kärr site on arrival. It is located in the township of Gränna, an area of mixed farming and poplar and spruce forests typical of southern Sweden. (300km SW of the capital Stockholm). It’s under the thin covering of earth that things become more interesting—at least for geologists in the know. The unusual intrusive rocks were first described in 1906 by the Swedish government geologist, Alfred Törnebohm, who named the site after the local farm. It is now known that the rocks he examined are uncommon on a global scale, but show geological similarity to REE/Zirconium/Niobium mines in Russia, and other advanced REE projects in Ontario, Quebec and Australia. More importantly, they are closely associated with several REE’s including zirconium, niobium, yttrium and hafnium, some of the “heavy”—and higher value—rare earth elements.



*Tasman Crew Setting Up Drill Rig at Norra Kärr  
(Drilling commenced one month after company went public)*

Historic exploration at Norra Kärr area was conducted by Swedish mining company Boliden AB during and after the WWII. This was at a time when Sweden sought self sufficiency for strategic minerals and energy—a continuing concern in highly industrialized Europe and in an increasingly competitive global marketplace. Work continued in 1948 and 1949, but Boliden determined that the limited separation technology of the day and competing sources of ore in Brazil made the project uneconomic. In 1974, they re-started exploration. This time they were looking for nepheline, zirconium and hafnium and they confirmed the presence of yttrium oxide and zirconium oxide.

As Saxon emphasizes, Boliden did not assay for 6 of the 9 higher value, heavy rare earth elements (HREE’s) as there were of limited use at the time but are attracting so much attention today. Tasman’s work however, has confirmed the presence of HREE’s and shown Norra Kärr to be elevated in the higher value HREE’s relative to light rare earth elements (“LREE”). Unusually low uranium and thorium content has also been confirmed.

Finding a truly promising project is the stuff of dreams for mining explorers. But even when the rocks prove of value, the project itself might not be economic. Along with complex geological issues there are other important geographical, climatic, environmental and infrastructure issues. Talk to any miner who works in remote regions of Canada’s Arctic or the jungles of South America about the problems of working in extreme climates and remote

regions. They all have their horror stories. The high cost of helicopters, road building and setting up camps kills many projects before they ever come close to production. When exiting the vehicle at Norra Kärr—while sipping a still hot cappuccino and talking on your cell phone—it is impossible not to contrast those scenarios with the drilling operation going on here.

By any standard the local infrastructure and amenities are second to none. Not only is the climate temperate and the geography “friendly”, but the property itself is well serviced by power, roads and water on site allowing all year round access. Saxon also points to rail and port facilities that are in close proximity, and also mentions the large mines that operate within 90km of Norra Kärr, providing a pool of skilled local workers and mining related contractors. He is confident that—in due course—these many positive factors combined will permit rapid and cost effective exploration and development of the project. All good news for Swedish and other European industries clamouring for near-term production of REEs to meet their increasingly urgent demands.

## The Geologist’s Perspective

*“I am excited to be working on this project at Norra Kärr. We are thrilled at how much progress we have been able to make in only 12 months.... It is great to be at the ground floor of a sector of the exploration and mining industry that is just taking off. We are focused on minerals and metals that weren’t even being assayed for only 3 years ago.”*

—Magnus Leijd, Tasman’s Principal Geologist

### Norra Kärr: Geological Highlights

- Independent NI43-101 report conducted by Mr. Geoff Reed of Pincock Allen & Holt;
- Norra Kärr contains a large inferred REE Mineral Resource of 60.5 Million Tonnes averaging 0.54% TREO with 53% HREO;
- Numerous intersections of mineralization at Norra Kärr are greater than 100m true thickness, which begin at surface and remain open at depth. The inferred Mineral Resource comprises a large mineralized volume amenable to shallow open pit mining;
- An unusually high proportion of high value heavy rare earth oxides (HREO). This Mineral Resource estimate shows HREO/TREO consistently exceeds 50%;
- An unusually high proportion of yttrium and dysprosium, two rare earth elements in scarce supply and strong projected demand. The base case Mineral Resource estimate shows Dy<sub>2</sub>O<sub>3</sub>/TREO averages 4.8% and Y<sub>2</sub>O<sub>3</sub>/TREO averages 35.1%;
- Initial work by Dr. Tony Mariano suggests REE’s are concentrated in one mineral only (eudialyte), allowing focused metallurgical research and potentially simplified processing;
- Norra Kärr is unusually low in uranium and thorium relative to peer company projects. The mine site will not require any special permitting or monitoring for radioactivity, and transport of concentrates will not require radioactive permitting.

## Tasman's Korsnäs REE Project

The historic Korsnäs REE and lead mine is located in central western Finland, 350 km north of Helsinki and only 25 km southwest of the Baltic Sea port town of Vaasa. It is now 100%-owned by Tasman and is considered by the company to be a “high merit advanced property”.

Between 1959 and 1972, the Finnish company, Outokumpu Oy reportedly produced a total of 0.87 million tonnes of ore at Korsnäs—at a grade of 3.6% Pb and 0.83% REE's, but stopped operations due to falling lead prices. A REE concentrate was previously produced on site providing encouragement for Tasman's future metallurgical research plans. Due to its mining history, the site itself is well serviced by power, roads and water allowing all year round access, plus the benefit of a skilled and well equipped community. Saxon is confident that these features “will permit rapid and cost effective exploration and development.”

## Otanmäki REE—Niobium Project

Tasman's 100% owned Otanmäki project is located in an historic mining district in central Finland, 450 km north of the capital Helsinki. It covers a 10,954 hectares site with railway access within 2 km of the claim boundary.

Previous sampling from the project shows high grades of REE's, niobium (Nb) and tantalum (Ta) associated with extensive mineralized boulder trains. In September 2010, Tasman reported 44 boulder samples returning an average of 0.91% Nb<sub>2</sub>O<sub>5</sub>, 0.33% Y<sub>2</sub>O<sub>3</sub> and, 421 ppm Ta<sub>2</sub>O<sub>5</sub>. The REEs are conveniently located next to a former vanadium mine and the local community is both mining aware and highly supportive of the Tasman initiative in their area.

## Finland: Land of Opportunity for REES

The Finnish people are a generally robust and hearty people. In driving along the nation's highways in the middle of a typical Finland winter, for example, you can't help but notice that many have another broad road running parallel to the highway. Instead of being filled with cars, these tracks are packed with skiers commuting to work and school—along with hundreds of bicycle riders equipped with studded tires for biking on snow and ice. Old and young alike obviously take their outdoor exercise seriously. No “snow days” here.

Saxon emphasizes that Tasman is more than just Sweden and that the Company is also enthusiastic about its Finland properties. According to him, this diverse collection of properties, “reinforce Tasman's position as a leader in the REE field in Europe”. Finland and Norway certainly share many of the same geological features of the Baltic Shield that makes Sweden so attractive to explorers. Not only is there great geological potential, but there is also excellent infrastructure, progressive mining legislation, invaluable geological databases, exploration support services, and a highly qualified labour force.

Finland has a long history of mining in the mineral rich Baltic Shield. Mining, quarrying and metal manufacturing, continue to play a major role in the economy. This long tradition of mining allows for “mining-aware” local communities where diligence is expected from the industry, but where jobs and the other economic benefits of mining are also appreciated.

*“Interest on the part of municipal authorities and local residents is high, and public-opinion surveys indicate that an absolute majority of residents are favourably disposed towards mining. The Finnish government, regional, and local authorities are highly committed to developing the mining industry. While legislation regarding mining is stringent, Finland’s mineral-resources policy is well defined...”*

—*Invest in Finland* <http://www.infomine.com/publications/docs/Finland2004.pdf>

The Finns are equally proud of their work ethic and their quality of life. The country has a population of only 5.4 million people making it the least densely populated of any country in the EU. Finland was a relative latecomer to industrialization, remaining a largely agrarian country until the 1950s, but economic development came rapidly after that. They now rank as one of the most well educated, competitive, prosperous and stable countries not only in Europe but around the world. The country is also an important player in pulp & paper, food, chemical, machinery, industrial instruments and electrical products—particularly cell phones and other hand-held devices that are all big users of REEs.

### **The James Dines Perspective: His Commentary on REEs and Tasman**

Since their initial discovery in 1787, REE’s have occupied an obscure part of the periodic table of elements. They had limited industrial uses until efficient separation techniques were developed during the late 1950s and early 1960s. The explosive growth of the computer and high-tech industries changed all that as more and more uses were found for these exotic materials with their unique properties. Even after their usage became more common, however the enormous potential of REEs went largely unrecognized by the mining industry and the investing public. That is until a massive supply/demand imbalance was identified by industry commentators as China aggressively cornered much of the world’s supplies.

One of the first to recognize that something extraordinary was happening with REEs was the writer, James Dines, publisher of the influential Dines Letter. Over the years he has proved uncannily prescient about mining trends that others have not recognized. In earlier editions of his newsletter, for example, he had accurately predicted a forthcoming renaissance in uranium, a prediction that many scoffed at—until the uranium boom hit and prices soared to historic levels.

In May of 2009, after several years of carefully observing industry trends in the computer, automobile and so-called “green technology” sectors, he declared himself “The Original Rare Earth Bug.” Even mining experts were taken aback when he wrote about “The Coming Rare Earth Buying Panic”, but he was again proven right and his subscribers reaped the rewards of one of “the greatest bull markets in this newsletter’s history.” Dines sees important applications for REES in various high-tech, military and medical applications including specialized in various nano-technologies, magnetic refrigeration systems and filters for water purification systems. He also sees countries like China, Japan and the USA stockpiling REEs and buying up companies in order to control strategic supplies.

One of the REE companies that Dines is closely following is Tasman. As he writes in his January 10, 2011 newsletter: “Europe’s automotive, wind turbine and solar panel operations will be in deepening trouble due to Rare Earth unavailability. As we wander through the future, figuring how the Mass Psychology might evolve, we expect Europeans at last to notice Tasman... in Scandinavia, the only near term producer in contiguous Europe, and throw unlimited quantities of money at it to get it producing sooner!... Tasman’s Norra Kärr mine is blessed with an unusually

low uranium and thorium content that would facilitate early and safe production. Only a general bear market could stop what we expect to be stonking rises in Rare Earth stocks.”

(For more information on REEs and The Dines Letter: 1-800-84-LUCKY (1-800-845-8259); 1-707-576-3272; PO Box 22 • Belvedere, CA 94920; production@dinesletter.com )

## Tasman the Explorer: The Inspiration Behind the Tasman Metals Name (The Spirit of Exploration, Discovery and Development)

Tasman Metals was named in honour of Abel Tasman (1603 – 10 October 1659), heralded as the greatest of the Dutch explorers, navigators and merchants of the 17th century. Tasman, like many other European explorers of during the Age of Discovery, was on a search for the storied riches of the Far East, including precious silk and porcelains, valuable spices like pepper and cinnamon, and “islands of gold and silver”.

In the employ of the VOC (Vereenigde Oost-Indische Compagnie or United East India Company), Tasman “discovered” Tasmania, New Zealand, Tonga, and the Fiji Islands and explored the waters of the Indian Ocean, Australia, and the southern Pacific. (The VOC is considered to be the first multinational corporation in the world and the first company to issue stock. For more than two centuries it dominated trade in the Spice Islands and Far East.)

The Tasman name augers back to the Australian heritage of the management team of Tasman Metals. The name is shared with many geographical and geological features of the South Pacific region, including, of course, the islands of Tasmania that make up one of Australia’s six states. Unfortunately, as Saxon learned early on, the Nordic region does not quite share the same climate as Australia and the South Pacific. Nevertheless, Abel Tasman continues to inspire the Management of Tasman Metals who share his spirit of exploration and thrill of discovery—as well as his tenacity.



*Painting of Abel Tasman  
attributed to Jacob Gerritsz Cuyp, 1637*



## Mining in Sweden, Finland & Norway: A Vast Mining District Opens Up to the Modern World

The Baltic Shield, which covers large portions of Sweden, Finland, Norway and Russia, contains the oldest rocks of the European continent and boasts a centuries old tradition of mining. In Sweden, mining was concentrated in the Bergslagen region, north west of Stockholm, and in the Skellefte and Kiruna districts in northern Sweden. The country is particularly noted for its iron ore deposits as well as the famous copper mine at Falun and the legendary silver mine at Sala, with some of the richest silver grades on record. Modern exploration methods have led to new discover-



*Tasman REE & Iron Projects  
in the Baltic Shield Region*

ies and new mines throughout Sweden, including many around historic mining sites.

For much of Sweden's history there were severe restrictions on foreign participation in Sweden's mining industry. These laws were liberalized in 1991, following an application to join the European Union, and the country adopted new policies to encourage foreign investment. These revolutionary changes included: cuts in taxation rates; more supportive business conditions; lifting of foreign ownership restrictions; the privatization of state industrial interests; and, the halting of State participation in mining projects. These new policies and corresponding new mining laws breathed new life into the industry. Saxon and his partners, along with other Junior Canadian and Australian explorers, were amongst the first to move in to this vast new playground excited by with its promise of great untapped resources.

## Mining the SGU Archives: Miles of Core Boxes and Mountains of Paper

In the early 2000's, Mark Saxon and the other Aussies set up home and offices on quiet Granstigen Street in Malå, the small isolated town in northern Sweden that is justifiably proud of their exotic menus that feature reindeer pizzas, wild mushrooms and cloudberry preserves. The first sign that you are truly off the beaten track is checking into the local hotel after regular hours. You simply pick up your keys from an open box at the front door. One key lets you into the hotel the other into your room. You can help yourself to a midnight snack and beverage from the hotel restaurant and simply pay when the staff arrives in the morning. Pretty civilized place, after all.

Any explorer who wants to do business in the mining industry In Sweden must sooner or later make the trek to Malå. This is the location for The Mineral Resources Information Office (MINKO), a regional office for SGU, where the agency has their "core shacks", vast warehouses with endless corridors filled floor to ceiling with boxes of drill core. Nearby are equally massive archives of geological, geochemical and geophysical records all meticulously maintained with typical Swedish efficiency. The National Drill Core archive contains more than 4,000,000 metres of drill core representing around 17,000 diamond drill holes. Most of the core was drilled by the SGU during 100 years of exploration, with more being added all the time. Great place to start your exploration!

Saxon and his colleagues recognized straight away that these and other invaluable mining archives were key to success in Sweden. Instead of coming and going like other itinerant geologists they established a permanent base in the local community and started mining those treasure houses of SGU records... literally!

In addition to their ongoing research activities at Malå, Saxon and Hudson also travelled the country extensively looking at other metal



*The Mineral Resources Information Office (MINKO) is a regional office within the Geological Survey of Sweden that is located in Malå, northern Sweden. Its commission is to store and supply exploration-related information from Sweden.*

projects and staking those that showed the greatest promise. Their persistence and diligence paid off. Ultimately, so many promising projects were identified that four separate companies had to be established to properly handle them all. Each company was to have its own specialty –gold, uranium, silver then REEs, with Saxon taking leadership of that highly specialized mineral group.

### Advantages of Exploration & Mining in the Nordic Countries

For explorers who are often accustomed to remote locations, hostile climates and primitive living and working conditions, the Scandinavian region can see like a miner's dream come true. Many drill sites are readily accessible by car instead of by expensive helicopter rides and few areas are without excellent cell phone service. Instead of a wilderness camp accommodations can be usually obtained in a neighbouring town or village. You can also get a cappuccino at any service station and at the end of a hard day in the field the crew can usually go for hot pizza and a cool drink.

Swedish people live up to their legendary reputation for efficiency and both machines and people can be relied upon. Finnish, Swedish and Norwegian people are all noted for being scrupulously honest and the countries routinely score the highest marks in the world for being corruption free. In addition to its long and prosperous mining history, the region has the potential to be a long term supplier of strategic metals, including rare earth elements, to the European high technology, automotive, aerospace and medical industries.

### World Demand Outstrips Supply for REEs

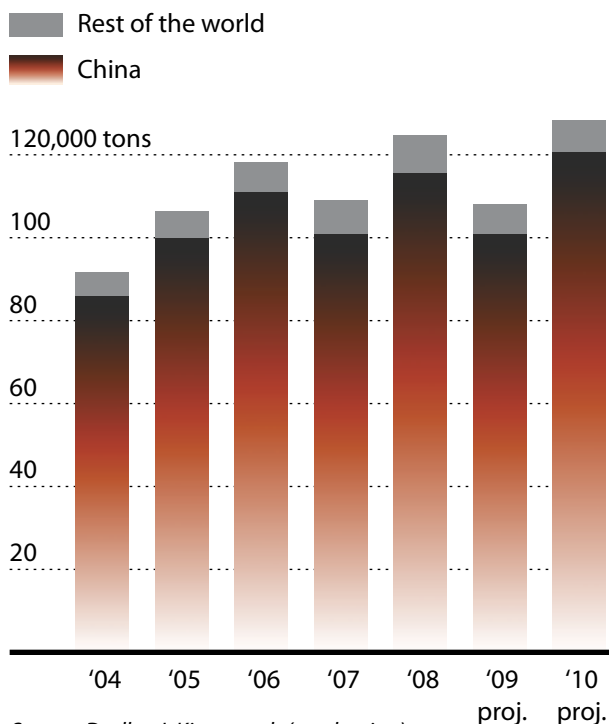
Over the past decade the demand for REEs has jumped from 40,000 to 120,000 tons. At the same time current sources are becoming increasingly restricted by China, by far the world's biggest supplier. More than 95% of REE supply

is currently sourced from mines in China, but they are increasingly reserving them for their own industries. China now exports only about 30,000 tons a year. This is only one-fourth of the world current needs and a fraction of the estimated 200,000 tons needed by 2014. Worse, they are threatening to completely stop the export of REEs to the rest of the world as early as 2012.

It is feared that if this happens prices of REEs will skyrocket. Many dependant industries could be forced to drastically slow production or close their doors until new mines can be rushed into production. Companies—and countries like Japan—are reportedly stockpiling supplies and aggressively seeking new sources.

Jack Lifton, an REE expert, was quoted in the British newspaper *The Independent* as saying, "A real crunch is coming. In America, Britain and elsewhere we have not yet woken up to the fact that there is an urgent need to secure the supply of rare earths from sources outside China."

#### Rare Earth Mineral Production



## Supply and Demand: The European Perspective

Europeans are also slowly awakening to the fact that a REE crisis is looming and that decisive action is needed to secure supplies. The EU comprises 26 member countries with applications pending from several others. Most of these nations are highly industrialized and enjoy an enviable standard of living. Those that are less developed are striving to match the industrial success of their more prosperous neighbours. They are all heavily dependent on the imports of metallic minerals needed to maintain or increase their industrial growth. (Domestic supplies currently represent about 3% of global production.)

The EU itself now acknowledges that secure sources of REEs and other strategic minerals must be found or they will not remain competitive in the global marketplace. Trade, economic growth, social stability and jobs all depend on reliable supplies of raw materials. This is particularly true as countries—like China and Japan—move to protect their national interests by restricting exports, stockpiling key resources, or locking up supplies by buying existing mines and mining companies.

Another major factor for Europeans is that both manufacturers and consumers are increasingly concerned about global warming and other environmental issues. They have placed a lot of trust in technological solutions to these problems—such as wind turbines, more efficient vehicles and cleaner energy—precisely the sectors most dependent on REEs.

*“Access to and affordability of mineral raw materials are crucial for the sound functioning of the EU’s economy. Sectors such as construction, chemicals, automotive, aerospace, machinery and equipment sectors provide a total value added of € 1.324 billion, employment for some 30 million people all depending on access to raw materials.... In the case of high-tech metals, this dependence can even be considered critical in view of their economic value and high supply risks.”*

*—European Commission Enterprise and Industry Body, November 2008*

## Uses for REEs

The 16 rare earth elements, plus zirconium, yttrium and niobium, are highly sought after due to their unique chemical properties that make them essential in electronic, optical, magnetic and catalytic applications. They are used in computers, electronics, fibre optic cables, vital military applications and even humble farm machinery. Other applications include: catalytic converters, household appliances, industrial motors, MRI machines, cell phones



*Powders of six rare earth elements oxides. Clockwise from top center: praseodymium, cerium, lanthanum, neodymium, samarium, and gadolinium. Credit: U.S. Department of Agriculture / Peggy Greb.*

and iPods. They have already become an indispensable part of our everyday lives and new uses for these metals are continually being discovered.

Many environmentally-beneficial applications, the so-called “green” technologies, are particularly dependent on REEs, including wind turbines, low-energy light bulbs and hybrid car batteries. Hybrid vehicles like the Toyota Prius simply cannot be built without rare earth elements. Many technological initiatives to combat global warming and other pressing environmental issues are threatening to become derailed unless more stable sources can be brought into production.

The EU is actively trying to secure domestic supply of strategic metals for their burgeoning high-tech industries. Tasman with its Norra Kärr project and other promising properties is well placed to take advantage of the current and future demand for REEs in Europe. These projects have the capacity to deliver secure supply of these essential metals to near-by European consumers.

### Selected REE Products

**Catalysts:** Petroleum refining, Chemical processing, Catalytic converters, Diesel additives, Industrial pollution scrubbers

**Glass:** Polishing compounds, Optical glass, UV resistant glass, X-ray imaging, Thermal control mirrors, Colorizers/Decolorizers

**Metal Alloys:** Hydrogen storage (NiMH batteries, Fuel cells), Steel, Lighter flints, Aluminum/Magnesium, Cast iron, Superalloys

**Other:** Water treatment, Nuclear control rods, Pigments, Fertilizer, Medical tracers, Coatings

**Electronics:** Display phosphors (CRT, PDP, LCD), Medical imaging phosphors, Lasers, Fiber optics, Optical temperature sensors

**Ceramics:** Capacitors, Sensors, Colorants, Scintillators

**Magnets:** Motors, Disc drives & disk drive motors, Power generation, Actuators, Microphones & speakers, MRI, Anti-lock brake system, Automotive parts, Communication systems, Electric drive & propulsion, Frictionless bearings, Magnetic storage disk, Microwave power tubes, Magnetic refrigeration, Magnetostrictive alloys

### Names and Uses for Specific REEs

**Scandium:** Aerospace alloys, additive in mercury-vapour lamps

**Yttrium:** Infrared lasers, high-temperature superconductors, microwave filters,

**Lanthanum:** High refractive index glass, flint, hydrogen storage, battery-electrodes, camera lenses, cracking catalyst for oil refineries

**Cerium:** Chemical oxidizing agent, polishing powder, yellow colours in glass and ceramics, self-cleaning ovens, cracking catalyst for oil refineries

**Praseodymium:** Rare-earth magnets, lasers, ceramics, core material for carbon arc lighting, colorant in glasses and enamels, flint products

**Neodymium:** Rare-earth magnets, lasers, violet colours in glass & ceramics, ceramic capacitors

**Promethium:** Nuclear batteries

**Samarium:** Rare-earth magnets, lasers, neutron capture, masers

**Europium:** Red and blue phosphors, lasers, mercury-vapour lamps

**Gadolinium:** Rare-earth magnets, high refractive index glass, lasers, x-ray tubes, computer memories, neutron capture

**Terbium:** Green phosphors, lasers, fluorescent lamps, makes electric lights 80% more efficient

**Dysprosium:** Makes electric motor magnets 90% lighter, lasers

**Holmium:** Lasers

**Erbium:** Lasers, vanadium steel, vanadium steel

**Thulium:** Portable X-ray machines

**Ytterbium:** Infrared lasers, chemical reducing agent

**Lutetium:** PET Scan detectors, high refractive index glass

## Tasman's People

### Board of Directors and Advisory Board

Saxon has built a strong management team for Tasman with plenty of “grey hair” serving on both the Board of Directors and Advisory Board. Collectively, they have many years of experience in mining, finance and the successful operation of public companies. The Advisory Board is particularly strong in the area of REEs. In addition, the Company has been able to attract some of the best International geologists, mining specialists and administrators to assist with exploration and development work in the Nordic region.

## Board of Directors



### **Mark Saxon, President & CEO, Director**

The vast boreal forests, glacier-scarred rocks and snow-covered farmer's fields of Sweden and Finland seem a far cry from Mark Saxon's native Australia. Nevertheless, he has spent much of the past decade searching for uranium, gold, and REEs in the mineral rich Baltic Shield.

After graduating as a geologist from the University of Melbourne, in 1991 Saxon gained experience working for both major and junior mining companies in Australia, South America and Europe. His experience ranges from first pass project generation to resource definition. He is a founding Director of Mawson Resources Ltd (MAW:TSX) and he managed Mawson's uranium projects across Europe as Vice-President Exploration. Saxon also sits on the Advisory Board of Hansa Resources Ltd (TSXv:HRL). He is a member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists.

### **David Henstridge, Non Executive Chairman, Director**

Mr. Henstridge is a Professional Geologist with over 37 years of experience in mineral exploration. He is currently President, CEO, and a Director of Tumi Resources Limited, a Director of Tinka Resources Limited, and a Director of Mawson Resources Limited.

### **Michael Robert Hudson, Director**

Mr. Hudson is a founding Director of Tasman Metals Ltd with 19 years of experience in mineral exploration in Australia, Asia, South America and Europe. He has developed junior exploration companies over the past 9 years in the Canadian and Australian markets. For the past five years he has headed Mawson Resources Ltd as President & CEO. He also sits Advisory Boards for Salazar Resources Ltd (TSXv:SRL) and Hansa Resources Ltd (TSXv:HRL).

### **Nick DeMare, CA, Chief Financial Officer, Director**

Mr. DeMare is a chartered accountant who has served as a director and officer of many publicly listed companies in the resource sector since 1986 providing accounting, management, securities regulatory compliance and corporate secretarial services.

### **Robert G. Atkinson, Director**

Mr. Atkinson has been in the investment industry for over 30 years. He is former President and CEO of Loewen Ondaatje McCutcheon & Co Ltd., one of Canada's most respected investment dealers. He now serves as Director of Trimin Capital Inc., Quest Capital Corp. and a number of other public companies.

## Tasman's Advisory Board

### **Gil Leathley, Advisory Board**

Mr. Leathley brings over 50 years of senior experience encompassing all aspects of international mining operations. Between the periods of 1975 to 2000, Mr. Leathley was the driving force in overseeing the development of six major operating mines on behalf of Noranda Mining, Corona Resources and Homestake Mining. Strategic development included the Golden Giant, Jolu, Eskay Creek, Santa Fe, Ruby Hill and Nickel Plate mines. During his tenure, he held various senior management and operating positions, ranging from Mine Superintendent and General Manager to Senior Vice President, and Chief Operating Officer.

### **Folke Söderström, Managing Director, Tasmec AB (Tasman's 100% owned Swedish subsidiary)**

Mr. Söderström is an accountant by training and brings extensive managerial experience with various legal, accounting and mineral exploration firms throughout northern Sweden.

### **Dr. Anthony Mariano, Advisory Board**

Dr. Mariano is a PhD geologist who worked for a number of years for Kennecott Research. Upon leaving Kennecott, he became a consulting geologist, specializing in carbonatite-hosted rare-earth and niobium deposits. He has consulted for many of the companies having an interest in these commodities including Molycorp, Union Carbide, Anschutz Corp., CBMM (Brazil), and Hecla Mining Company. He has an extensive field and laboratory experience in exploration and economic geology, spanning forty-nine years and in forty-eight different countries, including the exploration for rare earths—yttrium and rare metals such as niobium and tantalum.

### **Les Heymann, Advisory Board**

Mr. Heymann is a chemical engineer that has a long experience as a professional manager in the introduction of innovations to increase mineral processing plant efficiency and recovery, especially for Rare Earths. Among others, he has particular engineering expertise in the areas of leaching, flotation, solvent extraction and ion exchange. He worked mainly in China between 1995 and 2001 for joint-venture partnerships on rare earth projects with AMR Technologies, Inter-Citic Mineral Technologies and two Chinese rare earths producing factories.

## Investor Relations Consultant

### **Nick Nicolaas, Mining Interactive Corp.—Investor Relations**

Mr. Nicolaas brings over 37 years of leadership, management, marketing and financing expertise. The forming and structuring of private and public companies including financial consulting services, corporate communications and investor relations to assist in the creation of strong after market support and subsequent shareholder value.

## The Tasman Metals Story: Year One—“A Year of Achievements”

Tasman’s first year was noteworthy attained a number of major achievements. This success comes in Sweden and Finland after many years of perseverance in the region for Saxon, Hudson and their colleagues. As explorers, they have made a major commitment to the Baltic Shield in recognition of the many mining opportunities that exist there. Saxon and his team have made themselves part of the local communities in both a professional and personal way.

Here are a few highlights from Year One:

- Tasman was established on October 22, 2009 (amalgamation of Ausex Capital Corp., Lumex Capital Corp and Tasman Metals Ltd.),
- Discovery of the Norra Kärr project in Sweden on open ground—dusting off of paperwork and rocks that hadn’t been opened since they had been left with the Swedish Geological Survey years before;
- Drilling within weeks of listing;
- Only 1 year from first drilling to resource calculation;
- Acquisition of a former producer at the Kornas mine in Finland;
- Added to the Bloomberg list of “advanced” projects and companies; <http://www.tech-metalsresearch.com/2011/01/the-bloomberg-rare-earth-mineral-resources-index>
- \$200M+ Market Cap

## The Tasman Metals Story—Year Two and Beyond

With a strong first year behind them and the Company in a healthy financial state, the Tasman team can now focus on their key goal of bringing REE security to the European region. Metallurgical research is now well underway at Norra Kärr, as is additional drilling that shall take the project to a higher level of resource confidence. Once these milestones are achieved, the next step will be to understand the cost and payback on a potential mine through a Scoping Study and Pre-Feasibility Study.

*“We are certainly pleased with the growth we have seen in both Tasman and the rare earth sector as a whole over the last 12 months. The industry has gone from an interesting yet small industry, to front page news, as the world comes to grips with the issue that a geo-political crunch is coming over the global allocation of resources. With our European sphere of operation, Tasman has some natural advantages giving us great potential to be an early producer of heavy rare earth elements. The large resource which exists at our Norra Kärr project, and its unusual enrichment in HREEs could alone supply Europe’s needs for many years to come. We see a strategic partnership with European consumers as a potential way forward to bring Norra Kärr on line sooner.”*

*—Mark Saxon, President of Tasman Metals*

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