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## Gold price: Worries about Chinese, Indian physical demand

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At the end of this year 2015, many worries appear about the gold price, particularly in China and in India. Indeed, the price has decreased below \$1,050 in December 2015, the lowest level since October 2009. The woes concern the physical demand in gold in particular for the two largest markets for gold mentioned earlier. For example, the Indian demand for gold for the December 2015 quarter could fall to 150 tons. That is extremely low compare to a 5 year average for the quarter of 231 tons (according to the World Gold Council).

This lack of demand can be explained by the second year of a severe drought that hurt more than 50 million small scale farmers which completely depressed the business of gold in Indian rural areas.

In China, the reasons are different. Indeed, in 2013, China was the world's largest gold consumer with more than 1,000 tons of purchases. However, with the metal price continuing to decrease, women known for seeking out bargains (Dama) have slowed down their purchases. The second reason is linked to financial and political changes like the crash in on the Shangai and Shenzen stock markets and an anti-corruption guideline drive by President Xi Jinping tht hurt the Chinese practices. Finally, the weakening of the jewellery market in China have participated to the downturn of gold purchases.

LE LAIT Gaëtan

Reference: Frik Els, December 23, 2015. Available on : <http://www.mining.com/gold-price-worries-about-chinese-indian-physical-demand/>

## End of an Era in U.K. Coal Mining

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The last deep-pit coal mine in U.K plan to close. With this closing is the end of a century of the British Empire in the industrial revolution. This closing is due to the objective of reducing your carbon footprint. In 1954 the production of coal in U.K was about 217 million tons. On 2014 it was about 3.7 million tons. The Kellongley mine produces 8,000 tons of coal a day and employs 451 people, down from more than 2,000 in the 1970s. An estimated 30 million tons of coal will remain stranded in the ground. About 1,330 deep-pit mines accounted for 95%% of the U.K.'s coal production. That number will hit zero with this month's closing of U.K. Coal's Kellingley Colliery. A small number of open-cast surface mines in the U.K. will continue to produce. It costs about \$65 to produce a ton of coal, compared with \$45 a ton for imported coal. The government refused to provide financial support to coal.

LEFEBVRE Victoria

Reference: Scott PATTERSON, 14<sup>th</sup> December, 2015. End of an Era in U.K. Coal Mining. The Wall Street Journal, n°222. P.19-21.

## Shift in Global Tantalum Mine Production, 2000–2014

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Tantalum is a unique metal that is used for its material properties mainly in the electronic industry but also in the chemical processing industry. Its ability to store and release electrical energy makes it convenient for its use in capacitors that are needed in sophisticated electronic circuits for domestic and economic national security matters.

Tantalum mining has undergone a major geographical shift between 2000 and 2014. The production market was dominated by Australia and Brazil between 2000 and 2006 whereas African countries (such as the Democratic Republic of Congo or Rwanda) dominate the worldwide tantalum supply nowadays. This change shows a transition between countries with low governance risks, good industrial practice and supply chain transparency to countries with high governance risk, artisanal mining methods, and lack of supply chain transparency. Consequently, tantalum is considered as a “Conflict mineral” under the 2010 Dodd-Frank Act because the market is suspected to have helped finance rebel groups during armed conflicts as those in the Democratic Republic of Congo for instance.

As tantalum is a critical mineral, any supply disrupt could have a major impact in countries that are totally dependent on its importation (eg: United States of America). The U.S. Defense Logistics Agency must therefore track this mineral commodity as part of its mission to maintain the National Defense Stockpile.

GALTIER Alyssa

Available on: <https://pubs.er.usgs.gov/publication/fs20153079>

## Mauritanie: le géant minier Kinross dans le viseur des autorités américaines

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En Mauritanie le géant minier canadien Kinross Gold Corporation exploite depuis 2010 la mine de Tasiast. Racheté au groupe canadien Red Black Mining un peu plus de 7 milliards de dollars l’exploitation de la mine tourne aujourd’hui au cauchemar.

En effet avec le cours de l’or qui s’est effondré (perdant 42% de sa valeur depuis septembre 2011) le site tourne au ralenti (En 2010, la production de la mine s’élevait à 57 000 onces d’or (1,7 tonne) et la société Kinross se retrouve dans le viseur de la SEC (Securities and Exchange Commission).

Amorcée en septembre 2010, la chute du cours de l’or se poursuit, l’action Kinross s’enlise. Deux recours sont déposés en 2012 l’un aux Etats-Unis l’autre au Canada. Kinross est accusé d’avoir fourni de fausses accusations pour motiver le rachat de cette mine auprès des actionnaires.

L’enquête amène la SEC à mettre au jour un large réseau de corruption incluant de nombreuses personnes du gouvernement mauritanien dont l’actuel chef d’état Mohamed Ould Abdel Aziz. Kinross collabore depuis 2013 avec la SEC et prend l’affaire très au sérieux. L’exploitation de la mine continuera cependant de tourner au ralenti tant que le cours de l’or ne remontera pas.

MADON Baptiste

Référence: [http://www.lemonde.fr/afrique/article/2015/10/04/mauritanie-le-geant-minier-kinross-dans-le-viseur-des-autorites-americaines\\_4782189\\_3212.html](http://www.lemonde.fr/afrique/article/2015/10/04/mauritanie-le-geant-minier-kinross-dans-le-viseur-des-autorites-americaines_4782189_3212.html)

## Worldwide hunt for missing carbon minerals begins

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The Deep Carbon Observatory (DCO) scientists launched a citizen science project called “Carbon Mineral Challenge” on the 17th December 2015. Its aim is to mobilize academic mineralogists and also amateur collectors and mineralogists in order to find new carbon minerals over a four-year period. Scientists have shown that 406 minerals species out of 5,027 contain carbon, and the new predictive model states that about 145 carbon mineral species are yet to be found. These missing carbon minerals must be in small quantities and reside in remote places to have remained hidden for so long. They are also likely to be ephemeral and colorless, easily dissolved in water and poorly crystallized, says Robert Hazen (Senior Staff Scientist at the Carnegie Institution of Washington and Executive Director of the DCO). The predictive model combines the spatial distribution and the location of the known carbon-containing minerals with statistical methods used in biology and lexicography. But new carbon minerals can also be found in already existing collections, waiting to be discovered by chemical analysis.

The hunt for carbon minerals is motivated by the DCO’s particular interest in carbon: its main goal is to identify the forms of carbon in Earth. As the carbon element plays a great role in Earth’s biology and a number of fundamental processes, the discovery of news carbon mineral species would be of help to research on materials, energy and climate. It could also be of use to identify particular carbon footprint yet unknown on other life-supporting planetary bodies if it exists. Indeed, carbon (and carbon minerals) only exists on Earth because of the interaction of life with rocks.

KIEFFER Marie

Reference: WILSON E.K., 2015. Chemical & Engineering News, Geology. Available on:  
<http://cen.acs.org/articles/93/web/2015/12/Worldwide-Hunt-Missing-Carbon-Minerals.html>

More information about the Carbon Mineral Challenge on the DCO website:  
<https://deepcarbon.net/feature/announcing-carbon-mineral-challenge-worldwide-hunt-new-carbon-minerals#.VoJp6PnhCM9>

## Ultramafic to mafic magmas in the Norwegian Arcti: geochemical evidence for the multiplicity of mantle sources.

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This article is studying the Archean craton in the Finmark province in Norway and shows the link between these craton and economic diamond formation. This paper is first presenting the rocks of the area (especially ultramafic-mafic formation: komatiites, shoshonitic lamprophyres, picobasalts and basalts) and their new geochemical data. Using these data it is then discussing the possible origin of those rocks. Some might be coming from a fractional crystallization process and others seems to be produced by partial melting. This involve multiple possible lithospheric sources of the ultramafic-mafic formation. This article is finally evaluating general potential of this craton to carry an economic diamond mineralization in some kimberlite or lamproite. Kimberlite indicator minerals found in the area and comparison of this craton’s crustal structure and rock associations with others diamond bearing known cratons shows a high perspectivity in hosting commercial diamond deposits.

MASSON Karl

Reference: ERIKSEN Glenn, KEPEZHINSKAS Pavel and KEPEZHINSKAS Nikita

## **La fluorine, une substance à criticité élevée pour l'Union Européenne**

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La fluorine est la forme minérale du fluorure de calcium, très utilisé dans l'industrie dans la fluorochimie, la métallurgie et l'industrie des verres et céramique. Au niveau mondial, les réserves connues en fluorine équivalent à un peu moins de 35 ans au rythme de consommation actuel. En Europe, cette substance est considérée comme matières premières stratégiques : la quantité produite est très largement en dessous des besoins des pays européens. La Chine, le premier producteur mondial, devrait dans les années à venir, diminuer ses exportations pour satisfaire une demande interne grandissante. Le Mexique, 2<sup>ème</sup> producteur mondial, a lancé, en plus des 6 mines déjà en activités, 3 autres projets miniers concernant la fluorine. La Mongolie, 3<sup>ème</sup> producteur mondial, exporte principalement pour les marchés russe et chinois, car la demande interne est très faible. En ce qui concerne l'Afrique du Sud, qui possède les plus grandes réserves mondiales, les mines de fluorine connaissent depuis 2012 de grosses difficultés économiques (coûts de productions élevés, restrictions réglementaires et concurrence chinoise). A l'avenir, pour réduire leur dépendance aux pays producteurs, les grands consommateurs (Amérique du Nord, Europe et Asie du Sud-Est) devront produire eux-mêmes la ressource afin d'assurer un approvisionnement constant.

VIEY-CHEVALIER Alyzée

Référence : LEFEBVRE G., MARTEAU P. 2015. La fluorine, une substance à criticité élevée pour l'Union Européenne. Bulletin Ecomine. Disponible sur: <http://www.mineralinfo.fr/ecomine/fluorine-substance-criticite-elevee-lunion-europeenne>

## **L'Union Européenne compte encadrer le commerce des minerais de conflits**

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Dans le cadre de la réglementation des minerais dits « de conflits », l'Union européenne prévoit un projet de lois en continuité de la directive prise par les Etats Unis en 2010.

Les minerais « de conflits », dit aussi « de sang », concerne l'étain le tungstène, le tantale ainsi que l'or. Cette dénomination vient du fait que ces éléments sont extraits majoritairement depuis les années 90 en Afrique, dans la région des Grands Lacs, qui est une zone de conflits. Ceux-ci sont ainsi financés par ces extractions.

Cette situation fait suite de la guerre du Congo, liée à la présence de ces minerais, mais aussi au développement de l'industrie électronique qui nécessite un besoin important de ces minerais. A la suite du constat de ce processus, de nombreuses demandes de transparence ont été émises pour les groupes exploitants ces minerais, d'où la création de la loi américaine « Dodd Franck ». Celle qui prévoit d'être adoptée au sein de l'Union Européenne va concerner l'ensemble de la chaîne de valeurs, ce qui rassemble les importateurs de minerais ainsi que les industries en aval. Ce système serait mis en place pour avoir une traçabilité du minerai.

THOLLON Maude

Référence: Gaëtan LEFEBVRE, BRGM.

Article disponible sur: <http://www.mineralinfo.fr/ecomine/lunion-europeenne-compte-encadrer-commerce-minerais-conflits>

## **Impact of phosphate mining and separation of mined materials on the hydrology and water environment of the Huangbai River basin, China**

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Phosphorus (P) is an essential nutrient to plant production. Phosphate mining (PM) activities have been strongly motivated by the increased marketing of fertilizer produced by PM. The PM activities (i.e., processes of exploitation, exploration, and beneficiation) can dramatically change the existing geology, topography, vegetation cover, and chemical equilibrium of the mine site (Ralston et al., 1980; Manner et al., 1984; Lewelling and Wylie, 2003).

In this study, the influence of large-scale phosphate mining (PM) on hydrology and water quality in the Huangbai River basin, China was investigated. Rainfall and runoff data were used to analyze hydrological changes of the basin before (from 1978 to 2002) and during (from 2003 to 2014) the PM period. From 2009 to 2014, flow rate and concentrations of ammonia nitrogen (NH<sub>4</sub><sup>+</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), fluoride (F<sup>-</sup>), suspended solids (SS), total nitrogen (TN), soluble phosphorus (SP), and total phosphorus (TP) were measured at the outfalls of PM as well as at outlets of sub-basins with and without PM practice.

Results showed that the PM activities generally reduced runoff coefficient and runoff peak. Total nitrogen (TN), soluble phosphorus (SP), and total phosphorus increased with the mining scale. Ammonia nitrogen (NH<sub>4</sub><sup>+</sup>) and TN loads were significantly higher in the sub-basins with PM than without PM.

The yearly mean TN concentrations in the reservoirs increased with the PM scales. The SP concentrations in the reservoirs greatly increased during the later stage of PM, mainly attributable to the dissolution of apatite in the sediment.

MATHEY Camie

Reference: **KANG W., ZHONGBING L., RENDUO Z.** Impact of phosphate mining and separation of mined materials on the hydrology and water environment of the Huangbai River basin, China. *Science of the Total Environment* 543 (2016) 347–356.

## Warm weather threatens vital ice road for Canada's remote diamond mines

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Each winter, the highways of ice built atop frozen lakes and tundra of Canada's north are used by traffic to reach remote diamond mines. But this year, the warm weather delays the ice formation on the Tibbitt to Contwoyto Winter Road. This road, used since 1982, is vital to cross the tough terrain (water and spongy tundra) which is otherwise only reachable by air. It is long over 400 km and it links three diamond mines. The road is still expected to open in late January but if the season is shorter it could limit the period of operation and increase costs and work for crews building the ice. The warmer temperatures this year could be due to the El Nino phenomenon which is a periodic warming of Pacific Ocean waters. According to Environment Canada, the temperatures for this December, - 15 C°, are above the mean of around - 22 C°. Ice roads in Canada are 5,400 km long and are critical to unlocking mineral wealth from remote regions. Moreover, the warming temperature creates others risks to mining companies in the North provinces of Canada where a lot of mines are hold on because of the low prices of gold, rare earths and other metals.

BOUAROUK Emma

Reference: Susan Taylor, 2015. Warm weather threatens vital ice road for Canada's remote diamond mines. In: The Globe And Mail. Date de consultation : 2/01/2016. Disponible sur : <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/warm-weather-threatens-vital-ice-road-for-canadas-remote-diamond-mines/article27937755/?cmpid=rss1>

## Metallogeny of the syenite-related Dongping gold deposit in the northern part of the North China Craton: A review and synthesis

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The Dongping gold deposit is located at the northern margin of the North China Craton in Hebei Province and it is the largest alkaline pluton-related Au deposit in China. The deposit is hosted in the Shuiquangou syenite intrusion which cuts Archean-ages metamorphic rocks. The ore bodies consist of a set of *en echelon* lenses and veins controlled by shear zones. Two stages of gold mineralization exists, the first one consists of high grade (>10 g/t) quartz veins, the second stage consists of low grade mineralization (<10g/t) which matches with white quartz veins.

The studies of fluid inclusions in quartz indicate that the fluids have been formed in the mantle. Isotope analysis showed that a genetic link exists between the gold mineralization and the syenite. The first mineralization stage has been dated at 389 +/- 1 to 385 +/- 5,7 Ma, the second stage has been dated around 140 Ma. They propose a model for the formation of the deposit involving a late-magmatic hydrothermal process related to a Devonian mantle sourced syenites with a Late Jurassic-Early Cretaceous hydrothermal overprint.

HUGUET Julien

Reference: ZHIWEI B., CHUANGJIU L., ZHENHUA Z., 2015. Metallogeny of the syenite-related Dongping gold deposit in the northern part of the North China Craton: A review and synthesis. ORE GEOLOGY REVIEW. 13 p.

## **La chute du prix du minerai de fer: surproduction et affaiblissement de la demande chinoise en acier**

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Au contraire de la plupart des minerais, le minerai de fer connaît une baisse de son prix en 2015. Cette baisse peut être expliquée par deux facteurs : tout d'abord par une stabilisation de la croissance économique chinoise et en particulier son marché immobilier, mais aussi, par une surproduction du minerai de fer par les premiers producteurs mondiaux.

Les importations de minerai de fer chinoises sont stables par rapport à l'année 2014 et la production chinoise d'acier connaît une baisse de près de 2% sur cette même période. Grâce à la baisse des prix, la Chine importe près de 80% du minerai de fer qu'elle consomme. Cependant, la consommation est en baisse car la demande du secteur du bâtiment est plus faible. Cette réduction de la consommation entraîne une augmentation des exportations chinoises d'acier qui revendent leurs excédents estimés entre 300 et 400 Mt.

L'offre en minerai de fer continue cependant à augmenter. Les quatre premiers producteurs mondiaux, Vale, Rio Tinto, BHP et Fortescue, misent sur une baisse de leurs coûts de production pour maintenir leur rentabilité et s'accaparer un part plus importante du marché du minerai de fer. En effet, la baisse des prix a forcé de nombreux producteurs à arrêter leur production et les quatre acteurs majeurs représentent désormais près de 70% du marché.

Le prix de la tonne de minerai de fer est ainsi passé sous la barre des 40\$/t en décembre 2015, soit une baisse de 45% par rapport à l'année 2014 déjà en recul de 47% par rapport à l'année 2013.

Mots-clés: Minerai de fer, baisse des prix, croissance économique chinoise, production en augmentation

GUERIN Benjamin

Référence : Maité Le Gleuher, BGM. Disponible sur: <http://www.mineralinfo.fr/ecomine/chute-prix-minerai-fer-surproduction-affaiblissement-demande-chinoise-en-acier>



## Oxygen isotopic composition as an indicator of ruby and sapphire origin: A review of Russian occurrences

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This article is a review of the composition of corundum along the Russian regions. There are about 80 corundum occurrences in Russia, but most of them are poorly studied geochemically. The deposits spotted are in Karelia, Ural, Baikal and in the far East regions. Commonly, geochemistry helps the distinction between the magmatic and the metamorphic gem corundum. The  $^{18}\text{O}/^{16}\text{O}$  ration between stable isotopes of oxygen ( $\delta^{18}\text{O}$ ) is often used in order to determine the geological origin of colored corundum (which is ruby and sapphire varieties). In this study, four groups according to geological settings : first sapphire from basaltic sourced placers, then sapphire and ruby from syenitic pegmatite and mica- and plagioclase-dominated metasomatic rocks, then ruby and sapphire from marble and finally ruby and pink sapphire from high- and medium grade. The oxygen isotopic composition of colored corundum is controlled by the host rocks. In most case, in corundum of mantle-magmatic origin, for example from ultramafic rocks, syenite and alkaline basalts,  $\delta^{18}\text{O}$  varies between + 2‰ <  $\delta^{18}\text{O}$  < + 7.5‰. In a metamorphic context, when corundum is formed during metamorphism of carbonate sedimentary rocks has the highest rate, ranging from + 19‰ <  $\delta^{18}\text{O}$  < + 24‰. In the other corundum deposits, hosted by pegmatite, skarn, mica- and plagioclase-dominated rocks, result from result from metamorphic–metasomatic processes that mix oxygen of crustal and mantle origin. This oxygen has  $\delta^{18}\text{O}$  ranging from + 7.5‰ to + 19‰. Finally, the isotopic characteristic  $\delta^{18}\text{O}$  is said to be a way to accurately identify the source for the gemstones.

Keywords: Russia, Oxygen isotopes, Ruby, Sapphire, Geological origin

DE MERCEY Valentine

Reference: **S.V. Vysotskiy, V.P. Nechaev, A. Yu. Kissin, V.V. Yakovenko, A.V. Ignat'ev, F.L. Sutherland, A.I. Agoshkov, T.A. Velivetskaya**, 2015. Oxygen isotopic composition as an indicator of ruby and sapphire origin: A review of Russian occurrences. *Ore Geology Reviews*. Disponible sur: <http://www.sciencedirect.com/science/article/pii/S0169136815000311>

## Madagascar: Sapphire Valley

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Ilakaka is a city in southern Madagascar, which is a major sapphire production area as the Madagascans extract from these open pits about 40% of the sapphires found on the planet. Sapphire or corundum is the second hardest mineral and most valuable in the world. Its price is set according to its carat weight but also according to the color intensity of the stone; however, their value is difficult to estimate since these gemstones are not quoted on the stock exchange in contrast to gold for example. The natural origin sapphire may also be subjected to various treatments such as heating, irradiation or diffusion staining which aims to improve the color intensity of the gemstone.

Sapphires from Madagascar are well known for their excellent quality and are analogous with those of Sri Lanka because of a similar geological structure of both islands. Sapphires are found in layers of ancient river alluvium at a depth of twenty to twenty-five meters. They are handmade extracted by two methods: the vovo, they are narrow shafts and low ceiling where men descended by a winch manufactured by large branches, rope and bucket. The other method, stripping, is a human chain of ten to a hundred men digging pits forty meters deep. These operation processes are highly dangerous and fatal accidents are numerous in these makeshift operations.

GUILLEVIC Floriane

Available on: <http://madagascar-info.arte.tv/4/fr/>

## Mine de Yanacocha

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La mine de Yanacocha est située dans la province de Cajamarca à 600 km au nord de Lima au Pérou. Ce site aurifère est exploité par Newmont Mining via sa filiale péruvienne Buenaventura. Découvert en 1981 par le BRGM puis exploité par Newmont à partir de 1994, cette mine possède plusieurs projets d'extension. Ces extensions sont sujettes de tensions auprès de la population locale. Le premier projet d'extension a été refusé suite aux mobilisations des populations en 2006. La seconde devrait commencer son exploitation d'ici 2015. La compagnie est accusée de polluer les ressources en eau de la région et le doute est porté sur la conformité de l'étude d'impact environnemental validé par le gouvernement péruvien.

Pour pallier aux nombreuses critiques la Newmont s'est impliquée dans les activités locales en transformant l'ancienne mine à ciel ouvert de San Jose en réservoir d'eau pour alimenter les canaux d'irrigation utilisés par les agriculteurs locaux. Cette action permet à la compagnie de prendre à contre-pied l'argumentation des opposants à la mine qui l'accusent de polluer les ressources locales en eau.

Actuellement le projet d'extraction aurifère et cuprifère Conga subit des revendications d'opposition constantes. Le gouvernement régional de Cajamarca a manifesté publiquement le 9 novembre 2011 son opposition au projet Conga, craignant un impact écologique néfaste sur les réserves en eau et sur l'environnement en général. La compagnie est engagée à long terme et doit en conséquence développer une stratégie de relation qui lui assure la paix avec les communautés locales et entreprendre de nouvelles actions concrètes pour assurer la sécurité environnementale régionale.

BEQUET Frédéric

Reference: **LEVACHER Claire**, 2011. PEROU Mine de Yanacocha [en ligne]. GITPA, Novembre 2011, 3 p. Consulté le 03/01/2016. Disponible sur:

<http://gitpa.org/web/PEROU%20Mine%20de%20Yanacocha.pdf>

## Anomalously high arsenic concentration in a West Antarctic ice core and its relationship to copper mining in Chile

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The study of Antarctica ice cores permit to know the chemical elements present in the past atmosphere by analyzing air bubbles contained in the ice. This paper cores are interested in the austral summer 2008/2009 on the West Antarctic ice cap (Mount Johns). The carrot measuring 91.2 meters but this paper is interested only the last 45 m corresponding to the period 1883-2008. Arsenic is an element released into the atmosphere by anthropogenic sources in the mines of copper. This study allows us to see the impact of new environmental standards for the arsenic rate released into the atmosphere particularly in Chile (the world's largest producer of copper). It is shown that from 1999 to 1950 Arsenic rate increases sharply (by a factor of 7). After this year, the environmental standards are established in Chile. They are applied from 1993. Since 2000 copper production has doubled, yet the rate of Arsenic identified in cores is significantly reduced and follows a depression curve since 1993. Since 1999 the rate of Arsenic is comparable to the one observed in 1900 ( $1.92 \text{ pg g}^{-1}$ ).

BOUCHAYER Coline

Reference: **Franciele Schwancka, Jefferson C. Simões, Michael Handley, Paul A. Mayewski, Ronaldo T. Bernardoa, Francisco E. Aquinoa**, 2015. Anomalously high arsenic concentration in a West Antarctic ice core and its relationship to copper mining in China. *Atmosphere nvironnement* (2015). Available on: <http://www.sciencedirect.com/science/article/pii/S1352231015305343>

## The Chinese scramble to mine Africa

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China is the main mining nation in the world and is intensely growing to keep the first place and keep going with its development strategy. In less than 10 years (2006-2015), China gets more than 120 mining assets in Africa. There are also exploration sites and Greenfields projects which are not counted in this. Moreover, the number of countries where China is implanted increased from 3 in 2006 to 20 in 2015, especially in South Africa. Two big projects are mentioned as example for the “vast scope of China’s involvement in Africa ‘resources and mining industry’”. These two projects are China General Nuclear Power Corporation in Namibia and Kamao copper deposit in Democratic Republic of Congo. The first is related to the biggest uranium deposit known and the third largest uranium mine. The second project is also the world biggest copper deposit and Zijin Mining group will commission a mine there. Africa is the main target for China thanks to its numerous resources as world class deposits and also potential resources (Greenfield). Thanks to its political, china can develop long term strategy in the mining sector especially in Africa where the mineral commodities seems to be enduring.

DUVERNOIS Alban

Reference: BASOV Vladimir, 15<sup>th</sup> December 2015. Available on: <http://www.mining.com/feature-chinas-scramble-for-africa/>

## Australian uranium in demand as China goes full steam for nuclear

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Despite reactor closures in Europe and the US, uranium demand growth with Asia's nuclear energy industry. After a collapse in nuclear industry following the 2011 Fukushima disaster in Japan, nuclear power has been making a quiet comeback. China, India, Korea and Russia are the causes of growth in the industry and will represent 70% of new reactors by 2030. Furthermore, Japanese reactors were returning to the fleet, with 20 Japanese reactors back online by 2020. However, in Europe and America, the low price of gas and coal, the rise of politically-friendly renewable energy and the investments needed to extend the life of reactors are growing down uranium demand. But the nuclear power is still a growth industry. The cost of uranium was the highest in 2009 and despite, nuclear electricity was still cheaper than fossil fuel. The reducing of fossil industry due to global warming is also a cause of this growth. The augmentation of consumption is the main reason of that. For example, China has 26 nuclear reactors in operation, 25 under construction and a long term plan of 92 operating reactors in 2025. The price of uranium is actually of \$US 35.3. Despite the low actual price (over US\$100 before 2008), most of the mining projects are still viable. With increasing demand, the price of uranium will increase of between 15 and 22% by 2020 and between 37 and 58% by 2025.

Australia is the third producer in the world with 11% of the production. It has three operating mines: Ranger in the Northern Territory, Olympic Dam in South Australia and Four Mile in South Australia too. Australian miners and explorers include Energy Resources of Australia, BHP Billiton, Rio Tinto, Paladin Energy, and Mintails. There are numerous project proposals in Australia. The 4 most advanced are Lake Way, Yeelirrie, Kintyre and Mulga Rock. These projects are located in Western Australia. However, these projects have still not been approved and are dependent on the uranium price improving forecast. A last brake is environmental groups opposing to the projects.

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Reference: Stephen Cauchi, 15/31/2015. Australian uranium in demand as China goes full steam for nuclear [on line]. Available at: <http://www.smh.com.au/business/energy/australian-uranium-in-demand-as-china-goes-full-steam-for-nuclear-20151217-glqldr#ixzz3vogzSU1H>

## Mineral exploration in regolith-dominated terrains: Global considerations and challenges

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With an increasing demand from commodities and a growing population, the market supply in critical metals (Ni, Co, Au, PGE, ect) is one of the biggest challenge for the mining sector. Since few years, new technologies and methodologies are being developed. That revives the mining exploration in regions that were considered to be unfavourable for ore deposit exploration. Among these areas, there are regions of Regolith-Dominated Terrains (RTD) which correspond to basement rock suites buried under thick transported cover and/or deeply weathered profiles. Furthermore, the developments of new technologies and methodologies are making mineral exploration in RTD more economically feasible. Weathered mineralization leaves intense geochemical footprints. These footprints constitute geochemical markers that can be used to decode complex weathering processes by separating one weathering event from another and link them with the general landscape geochemistry. By studying these markers, it's possible to have a better understanding of weathering processes throughout time and enable to articulate more efficient exploration protocols to discover ore deposits under transported and in situ weathered cover. This article also presents several studies on exploration in RTDs in Brazil, China and Australia. The regolith-dominated terrains exploration is a strategic challenge for mineral exploration in the 21<sup>st</sup> Century. To accomplish significant advances, it's necessary to revise the traditional approaches on deep weathering in tropical and non tropical areas.

CLEMENT Gaëtan

**Reference:** GONZALES-ALVAREZ I., BONI M., ANAND R.R., 2016. Mineral exploration in regolith-dominated terrains: Global considerations and challenges. *Ore Geology Reviews*. volume n°73. pp.375-379.

Available on: <http://www.sciencedirect.com/science/article/pii/S0169136815002619#>

## Mining projects in Peru beginning 2016

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There is 47 ventures in the last stages of development in the country and environmental impact studies have been completed for 14 projects while three other projects are still in evolution phase. The mining projects, led mostly by Chinese, American and Canadian companies, worth more than \$56 billion and are expected to come on stream in Peru in 2016. The construction have been authorized for six projects by now: Las Bambas, Quellaveco, Conga, Crespo, Shauindo, Shouxin. Moreover, the largest project is the Las Bombas copper, zinc, silver and gold mine will begin production in the first quarter of 2016 and is run by a Chinese companies: MMG.

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Available on: <http://www.mining.com/mining-projects-worth-56-billion-to-come-on-stream-in-peru-beginning-2016/>