

Finalists gather in the race for graphite production

The “Big Beasts” of the Canadian mining scene are neither as evident nor as prominent as they used to be. Some have reconfigured their activities for the new reality of markets since 2011. One of the “Big Beasts” that temporarily disappeared from the scene and has now resurfaced is Sheldon Inwentash. He is famed for his management of Pinetree Capital which, at its peak, commanded a market cap of over \$1 billion and held a rather daunting 400 plus names in its portfolio.

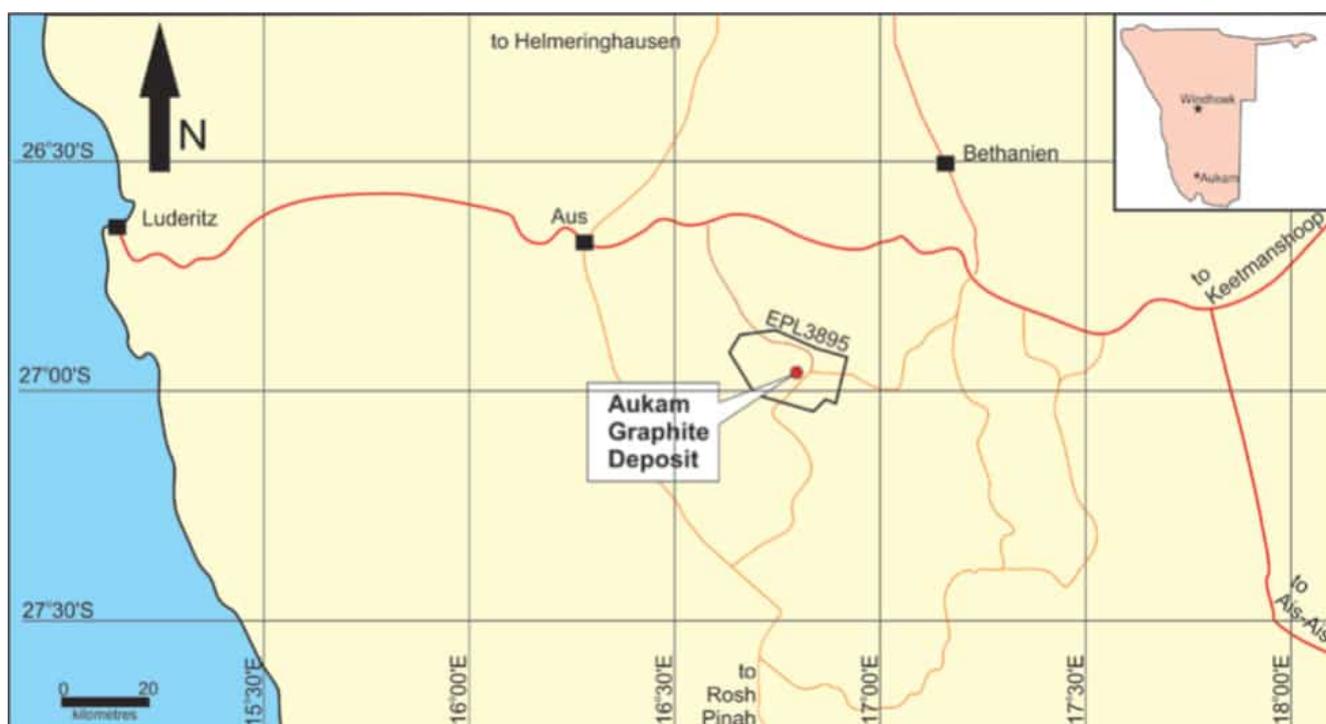
Pinetree Capital can be said to be the proto-mining hedge fund in the Canadian space and it revolutionized the resource investment model. Pinetree veterans are spread across Toronto, churning out deals, raising hundreds of millions of dollars, and managing funds and mining companies themselves. In its heyday Pinetree was famous for having seeded companies such as Queenston Mining (acquired by Osisko Mining Corp. for \$550mn), Aurelian Resources (acquired by Kinross for \$1.2bn), and Gold Eagle Mines (acquired by Goldcorp for \$1.5bn).

Inwentash “retired” from Pinetree in 2015 after 23 years at the helm, but began incubating another company almost immediately after, waiting for the markets to stabilize and emerge from the bear market. One of the targets for his interest has been CKR Carbon Corporation (TSXV: CKR), with its focus on graphite in Namibia. Thus far in the process of broadening the supply of graphite (and reducing China dependency) Africa has been seen as a major new frontier with Madagascar (NextSource and some historical small producers), Guinea (with SRG, the former Sama Graphite), Mozambique (with Syrah and Triton, some other ASX players in the now blighted Tanzanian sphere and CKR Carbon with its past producer in Namibia).

As is well known to InvestorIntel followers we are big fans of reopening old mines and in this case we have one of the few mine reopenings in the graphite space. CKR is not alone in following this strategy but not many others have been able to identify mines worth reviving. In this case CKR have discovered what seems to be a highly prospective target for reanimation. In this piece I shall discuss their main target and how things are progressing.

The Deal

The Aukam property is comprised of Exclusive Prospecting License (EPL) 3895 in respect of base and rare metals, industrial minerals and precious metals. The license covers an area of 34,075 hectares on the farms Aukam104 and Harichab121 located in the district of Bethanie, Karas region of southern Namibia.



Back in September 2016, CKR Carbon signed a Farm Out agreement to earn up to a 63% interest in the Aukam Graphite project from Next Graphite Inc. and Gazania 242 Pty Ltd via a commitment to invest up to US\$1.1mn in the project, or constructing a processing plant with necessary infrastructure,

and making payments to Next of US\$180,000. CKR can also, subject to agreement by Next, earn an additional 10% interest by paying Next US\$180,000. CKR had invested more than US\$400,000 in the project at the time of signing the Farm Out agreement and had already earned a 23% interest in the project.

The Back Story

Since its discovery in 1928 the Aukam graphite deposit has been worked intermittently including two periods of mining between 1940 and 1974 that produced a total of 22,602 tons of graphite from three adits and an open cut. Minimal further exploration was undertaken in the area prior to Next's acquisition of the property in November 2013. Following the acquisition, Next carried out work programs predominantly aimed at characterizing the graphite remaining in dumps from the historical mining.

Geology

The Aukam Graphite deposit lies at an elevation between 1150m and 1300m above sea level. The surrounding area is up until 1450m above sea level at the highest point. The area is rugged with steep sided valleys and abrupt changes in local relief caused by differential erosion.

The Aukam graphite deposit daylights in an erosional window incised through the hard layers of sedimentary rocks that mantle southern Namibia. This suite of rocks indicates that the entire complex was once deeply buried. Steep dipping shear zones are common and some are dated around 1200 million years ago.

A prominent flat-lying and resistant sediment layer overlies the erosional unconformity at the top of the Namaqualand Complex. Hydrothermal alteration is common to some rocks in the window as is pegmatite veining. Both are evidence of hot water flowing through the rock. The graphite occurs at one

such site where over-pressured hot waters evidently carried carbon dioxide and maybe methane mineralized carbon into a zone of broken rock. This hosting "shear zone" is exposed for 350 m. The zone comprises three parallel lodes. Veins, lenses and pockets of ore, several centimeters wide, dip 70 to 90 degrees to the south.

Graphite mineralization at Aukam is of the vein or lump type and occurs as massive lenses and veins and more rarely as minor disseminated patches hosted by variably altered granite of the Namaqualand Metamorphic Complex. Kaolinite is the most widespread alteration mineral, while strong epidotization occurs in the immediate vicinity of the graphite veins and lenses. Iron oxides in the form of hematite and limonite are commonly associated with the graphite mineralization. An east-west trending shear zone cuts through the property and is traceable on surface for about 400 metres before disappearing under cover, but which an historical report indicates may extend for four kilometres.

Recent Exploration

The work carried out by Next and CKR has focused on characterizing the graphite mineralization in the adits, and open cut and especially in the dumps remaining from the historical mining. During 2014, Next conducted bulk testing of the Aukam dumps and screened 500 tonnes of graphitic material. Results of 84 composite samples from the screened material averaged 41.58% Cg (Carbon as graphite). An unscreened representative sample from a 350 tonne stockpile graded 35% Cg. Next also sampled exposed graphite veins, presumably from the open cut, and assays of the samples range from 41.45 to 68.85 % Cg.

During late 2015, CKR completed a 25 tonne bulk sampling program of graphite from the lower adit. Representative samples totalling 1,000 kilograms were sent for assay, particle size analysis and flotation testing. Results of

assays of 84 sub-samples showed a range of 11.39% Cg to 72.14% Cg with an average of 27.66% Cg. During April 2016, CKR sent a 1.6 tonne bulk sample of screened graphitic material to an operating mill and graphite plant. Seven composite samples ranging in weight from 20 kg to 30kg were taken from the bulk sample and assayed for their carbon content. The results of the assays show a range of 55.64% Cg to 63.87% Cg with an average of 59.40% Cg.

Flake size distribution tests have been carried out that show a distribution showing primarily medium to large flake (35% to 38.4%) and fine flake (39.7% to 42%) sizes.

Conclusion

It's interesting that as the fervour for graphite which peaked in 2013 started to retreat then Sheldon Inwentash started to move into the space. During the "downtime" of the last four years, the universe of graphite wannabes has seen some companies move towards production, some abandon the space (or fizzle out from lack of funds) or continue working waiting for the Brave New World of EV's where graphite would earn its due as a key component in Lithium-Ion batteries.

It will be interesting to step what next steps are taken here. Frankly a mine reboot might be possible if the funding can be found with a by-pass being driven around the consultants and other leeches determined to gain a pound of flesh for their dubious PFS and BFS offerings. With the magic words being Production, Production, Production and CKR having a past-producer in its hands the potential is there to fast-track this operation to remain in contention as the finalists gather for the Graphite Stakes.

Niger – Africa's Rising Uranium Hotspot

No one much in the West paid much attention to Niger's mining activities before 2003 and hardly anyone knew that Niger was an important uranium producer. All that changed in the run-up to the Iraq War where the "smoking gun" for the invasion of Iraq was the supposed attempts by Saddam Hussein of Iraq to obtain yellowcake from Niger to feed some sort of nuclear program. Subsequently the whole affair proved to be a bogus false-flag operation and the matter degenerated into a morass of lawsuits known as the Plame Affair. It turned out that a former US ambassador had been sent to Niger to investigate the matter but his finding, that it was highly unlikely that Niger had exported any uranium to rogue states, was suppressed. This was too late though for Iraq as the allegations were used as the trigger for the invasion. The Coalition of the Willing turned out to be the Coalition of the Misinformed.

Leading (Sometimes) the Pack

The one thing that was true was that Niger was one of Africa's leading uranium producers, swapping first place over time with Namibia depending on which country was ahead on sales at any time. In 2011, the country ranked fourth (globally) in terms of uranium production by volume, accounting for about 8% of world production.

Niger has been mining uranium since 1971. It is currently the world's fifth largest uranium producer, producing approximately eight million pounds of uranium per year, and its global market share has fluctuated between 5-9% over the last decade. It has accounted for as much as 72% of the country's export revenues. Foreign direct investment in the sector from 2008 to 2012 (the most active period) was estimated to have been US\$1.4 billion.

The Geology

All uranium production in the country comes from sandstone-hosted deposits within sediments of the Tim Mersoï Basin, which are adjacent to and overlie rocks of the Air Massif. At least 13 individual uranium deposits are known in the area. The Tim Mersoï deposits have attractive uranium grades, typically of 0.3% to 0.6%. The abundance of uranium in the district, the attractive grades, and the relative lack of exploration clearly make this area an attractive exploration target.



The uranium deposits in the country are the orange circles in the mid-north of the country.

The rocks hosting the uranium mineralization are commonly arenites of the Carboniferous Guezouman and Tarat Formations. Some beds within the Tchirozerine Formation of Jurassic age and the Irhazer Formation of Cretaceous age also contain uranium. The depositional environment of these formations was fluvial to deltaic, and apparently the uranium was leached from the basement units. Tectonic, lithological and geochemical features are important in trapping the mineralization, which is often of roll-front type, either reduced consisting of pitchblende and coffinite (Akouta, Arlit, Afasto, Madaouela) or oxidized minerals (Imouraren).

The Players

The 800-lb gorilla in the Niger uranium picture is Areva (formerly known as COGEMA). Its properties are:

Compagnie Minière d'Akouta (COMINAK), owned by Areva Group (34%), the Government of Niger (31%), Overseas Uranium Resources Development Co. of Japan (25%), and ENUSA Industrias Avanzadas, S.A. of Spain (10%). This mine produces around 2,000 tonnes of U₃O₈ per annum.

Societe des Mines et de l'Air (SOMAIR) owns the Arlit open-pit mine which is operated by Areva. It mines approximately 1,000 t U308 per annum. SOMAIR was owned by Areva Group (63.4%) and the Government of Niger (36.6%).

Areva also has four uranium projects (Imouraren, Afasto W, Techili and Abkorum), which are in the same area as the two operating mines, are in an advanced stage of evaluation.

Areva's open pit SOMAIR mine, together with its COMINAK underground mine, have produced approximately 240 million pounds of uranium oxide (U308) since 1971 and are the highest grade uranium mines in Africa.

Work began back in 2010 on the Imouraren deposit. The IMOURAREN Inc. exploitation company was established, held 66.65% by a JV of Areva and Korean groups (Areva 86.5% & KEPCO/KHNP -13.5%) and 33.35% by the State of Niger. This project has stalled in the wake of Fukushima but is envisaged as a 36 year mine life with production of 5,000 tpa of U308.



SinoU – a Chinese SOE

In a July 2006 joint-venture, the Nigerien government granted SinoU (China National Nuclear) the rights to develop a uranium mine complex in Azelik in the Agadez region of Niger. The joint-venture, known as Niger Azelik Mining Industry, is co-owned by SinoU (37.2%), the Nigerien Government (33%), ZXJOY Invest (24.8%), Korea Resources – Kores (4%), and Trendfield Energy & Resources (1%). In addition to the uranium mine, the complex will include two coal-fired power plants and a hydrometallurgy plant. On April 24, 2009, the Nigerien government announced that the Exim Bank of China had granted them a preferential loan of Yuan 650 million for the development of the mine. The loan is repayable in 15 years with a 5 year grace period and an interest rate of 2%. The first drum of yellowcake uranium rolled off the production

line in late 2010. Under the original plan the mine was expected to produce 700 tpa of uranium and to increase production to 2,500 tpa by 2015.

Pan African Uranium

Originally the bunch of assets held by this company was ensconced in Homeland Energy Corporation through its subsidiary, Uranium International. When Homeland was backdoored into Western Uranium the African assets were announced to be a spinco in late 2014. However, the website for Pan-African shows it as still unlisted. Originally Homeland's subsidiary had acquired a 100% interest in two exploration licenses in the Republic of Niger. The Agelal license is adjacent to that which hosts the Arlit and Akouta deposits, and represents an area formerly held by Cogema (nw AREVA). Over 36 holes were drilled by Cogema within the boundaries of the current Agelal license, several of which intersected uranium mineralization at depths of between 600-1,000 metres below surface. The Aserka license is located to the immediate southwest, somewhat deeper in the basin, due north of the Teguida uranium deposit and roughly 35 km west of the Imouraren deposit. Niger has also granted eight uranium prospecting concessions to Uranium International Ltd in the northeastern area around Agadez.

Pan African seems to be in somewhat of a listing limbo currently, but when finally set free should be an interesting pure play in uranium in Niger.

Aura Energy (ASX: AEE)

Aura's wholly owned Tim Mersoi Basin applications are located in Northwest Niger and cover 1,500 square kilometres.

The Aura application areas (known as Ebadargene 1, 2 and 3) lie close to and south of the Air Massif and contain a swarm of east-northeast fault structures that, further to the west, contain uranium and associated copper. In the company's view

the application areas appear to contain extensions to known mineralised structures. Fault structures, particularly east-northeast and north-south trending faults, have been influential in transmitting the mineralising ground waters within the Tim Mersoï Basin. An airborne radiometric and magnetic survey has been flown over the Air Massif under European Aid funding and covers much of Aura's northern application area. Seems like not much is happening here for the moment.

Paladin Energy (ASX: PDN, TSX: PDN)

With its main focus on Namibia, Niger clearly takes a back seat. This company's Niger interest is the Agadez project which is located 30km west and north-west of the township of Agadez. It includes three exploration concessions: Tagait 4 (TAG4); Toulouk 1 (TOU1); Terzemazour 1 (TER1); and, one application Ekazan 1 (EKA1), covering in total an area of 990km². The concessions cover sandstone type uranium mineralisation in the Tim Mersoï Basin. At this stage Paladin has suspended all field activities in the Arlit and Agadez areas and a *force majeure* has been requested from the government authorities for indefinite suspension of expenditure requirements.

GoviEx Uranium (CSE: GVX) – Friedland Junior (literally)

It was a meeting with this company a couple of weeks back that perked up our interest in Niger and its potential on the uranium front. Its existing role in the industry was known to me but the extent to which juniors were playing here was not.

It was particularly intriguing that GoviEx was the vehicle of Govind Friedland, the son of Robert Freidland. Much to our surprise the strange name of the company is merely a coincidence. The company is a relatively recent listing dating only from June 2014. Interestingly it chose the CSE over the TSX-V. This is no small project with over \$100mn having been

spent on it so far between \$30mn in acquisition costs and \$70mn in exploration work. Neither is the project fledgling as GoviEx in its private manifestation has been working on the project since 2007. The company has undertaken a rather stunning 581,000 metres of drilling so far, so like every Friedland family project, nothing is being skimped.

The main prospect is Madaouela, which is in the main prospectivity zone for uranium in Niger and in close proximity to the aforementioned Arlit mine of Areva. The Probable Mineral Reserve is 54.88mn lbs at 0.098% U3O8.

The proposed base case envisions an average 2.53mn lb per year U3O8 yellowcake production rate over an eighteen year mine life, with an 83% ultimate recovery of uranium. The base case project economics for this project at a long-term uranium price of USD 70 /lb U3O8 are positive, and indicate an after-tax NPV of US\$251mn (at an 8% discount rate) with an IRR of 21.9%. Initial capital costs are estimated at US\$339mn, total life of mine capital costs at US\$646mn, and cash operating costs of US\$33.10 per lb U3O8 including royalties.

The shareholder list is A-grade with Govind Freidland holding 21.36%, Toshiba with 19.42% and Cameco with 8.55% (even Semafo is in the mix with 6.7%).

So capex here is chunky and opex is flirting with the levels at which uranium is currently trading in the spot markets. This implies that nothing much is likely to happen in the short term as far as production decision is concerned. The company is not fazed though as it has a tie-up with Toshiba and is clearly focusing on proving up the deposit and plans for its development and "awaiting the turn" in the uranium price like so many others. As "failure" is not in the Friedland family phrase book and "too big" is not employed either, GoviEx remains something to watch for eventually becoming a reality.

Orezone (TSX: OZN) – Bulking Up

Orezone Resources owes its position in uranium in Niger to a merger of its uranium interests in Niger with those of North Atlantic Resources Ltd (TSX: NAC). In late 2009 the two groups signed a definitive agreement whereby Orezone acquired three uranium exploration licenses in the Republic of Niger, West Africa, from North Atlantic to create Brighton Energy Ltd. Prior to this Orezone's wholly-owned subsidiary, Niger Resources, had been granted two uranium exploration permits in Niger. The two permits totaling 980km² were located adjacent to Areva's exploration permits and within 40km of Areva's SOMAÏR and COMINAK uranium. The permits, named ZELINE 1 and ZELINE 4 are within the Tim Mersoï sedimentary basin. In late 2010 and early 2011 drilling (twelve holes in 2011) intercepted uranium mineralization above a lower cut-off 100ppm of U308, with eight of the holes intersecting more than 200 ppm of U308. Drilling (in 2010) of the Guezouman-Talak Formation, which is the host rock of the neighboring Cominak mine and Madaouela deposits, was consistently mineralized within a 6 km² zone at depths from 112 to 182 m.

The new discovery was considered to be shallow and amenable to open pit mining, and is also largely associated with reduced rocks that are typically amenable to standard extractive processes.

In 2012, Orezone consolidated all of Brighton Energy into its main structure by offering Orezone stock to the minority holders. As uranium was out of favour, one scarcely sees mention any more of the Niger properties in the Orezone promotional material.

Conclusion

To most distant watchers of Uranium, the name Namibia rings a bell but Niger scarcely raises an eyebrow. Besides its more controversial (and involuntary) bit-part role in one of the

most sleazy false flag operations ever, it frequently has out produced Namibia and may yet do so again in terms of uranium output. Thus far production has been centred on deposits owned by the French giant Areva and JVs with a heavy Chinese SOE component, however rising companies like GoviEx and temporarily sidetracked ones like Aura Energy and Homeland/Pan African give Niger the potential to return to number one ranking in Africa and a shot at being in the world's top five producers within the next ten years.

The existing production of Areva and China National Nuclear mines combined with Areva's and GoviEx's projects could boost uranium production capacity to over 10,000 tpa within five years from the present 4,500 tonnes. This would put Niger definitively ahead of Namibia in the African U308 stakes.

Now all we need is for uranium prices to come to the party.

Discovery Africa steps up graphite exploration in Tanzania, Uganda and Namibia

✘ Discovery Africa Ltd ('DAF', ASX: DAF) is actively expanding its graphite asset portfolio. Two weeks ago, DAF announced that it had signed a memorandum of understanding (MOU) to acquire an 80% stake in Hatua Resources ('Hatua'), which has a large graphite property in Tanzania. Hatua holds four promising exploration licenses for graphite, covering 416 square kilometers in an area featuring a graphitic outcrop schist formation measuring 800 m. X 150 m. Just days prior to the Hatua MOU, DAF announced that it had signed another memorandum of understanding to acquire all of Consolidated

African Resources (CARL) which owns an exploration license in the vicinity of Kitgum, in Uganda, said to conceal another very favorable graphite deposit. Indeed, on February 18, the company announced that it has discovered graphite at grades of up to 25.3% at the Kitgum project as part of its due diligence exploration. Nine out of 16 samples were found to have graphitic carbon levels of up to 10. DAF will continue the program and expects to complete geological reconnaissance before the end of March and the airborne geophysical program by June in order to start drilling in July. Should the program proceed on schedule, DAF will be able to announce its resource before the end of the year.

Discovery Africa had previously focused on coking coal; now, it has shifted more attention to developing the aforementioned Kitgum Project in Uganda, Area 51 Graphite Project in Namibia, the Tanzanian Graphite Project and the new Lithium Project in Namibia. DAF's interest in Hatua may well have been prompted by the latter's proximity to tenements struck by Syrah Resources (ASX: SYR) at the latter's Nachingwea Project, aiming to improve the mineralization potential already observed while adding new targets. Nachingwea covers an area of about 30 square kilometers and it is located some 325 kilometers north of Syrah's highly prospective Balama graphite-vanadium project in Mozambique.

The project is also well linked to roads and infrastructure, readily accessible from the coastal areas. In addition, by focusing on the new Tanzanian property, DAF is targeting a type of graphite that differs from Canadian and European varieties. Syrah's experience in Mozambique at Balama is indicative. The resource at Balama is rich in volume and it is of a consistently high grade, medium to coarse flake variety of graphite that should be readily upgraded to purity levels of 94%. The Balama graphite deposit offers an important geological advantage in that most of it rises above ground and can be seen. Syrah says that it has not had to drill a single

hole to determine that Balama is a very significant deposit, the variety of which can command high prices in world markets as it is suitable for use in the new Li-ion batteries that are expected to drive demand for electric transportation.

DAF is also developing a graphite project in Namibia at the Erongo graphite project. In 2013, DAF hired the mineral resource company, Minrom, to define the graphite distribution hosted in the Karabib Marble (Karibib is an area of Namibia home to the 'Karibib Marble and Granite Works', rich in some of the best marble deposits in Africa), Mimorm has already started work and is expected to deliver analytical results by the start of summer 2014.