



HALLGARTEN & COMPANY

Coverage Update

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Ceylon Graphite (TSX-V:CYL) Strategy: LONG

Key Metrics

Price (CAD)	\$0.09
12-Month Target Price (CAD)	\$0.20
Upside to Target	122%
12mth hi-low	\$0.06-\$0.18
Market Cap (CAD mn)	\$4.93
Shares Outstanding (millions)	54.78
Shaes (Fully Diluted)	61.68

Ceylon Graphite

Silent Achiever in the Graphite Space

- + First production has occurred at the company's K1 mine in Sri Lanka
- + Environmental approval and mining licences for K1 project were gained in 2H19
- + The price of most categories of graphite have picked up since 2017 but with some slight easing in 2019
- + Ceylon Graphite has accumulated a large land package with significant evidence of past production from the glory days of Sri Lanka as the world's prime producer of graphite
- + The travails of Syrah (necessitating its production cuts) are curiously positive for the rest of graphite developers
- + Trump Administration has recently declared Graphite to be a metal critical to US interests
- + China has now switched over to being a graphite importer
- ✘ Graphite price movements and stockpiled quantities remain essentially at the discretion of the Chinese
- ✘ The financing scene remains tough for graphite developers
- ✘ Syrah Resources has put a chill on other graphite projects until its future becomes clear

A Hare Amongst the Tortoises

The company is engaged in the development of graphite mines in Sri Lanka. It has received environmental approvals for its K1 mine and has recently gained an industrial mining licence with first production likely in early 2020. The mining licence is a notable triumph as it is only the fourth one issued since the country's independence in the 1960s.

The company holds exploration rights over a land package of around 121km². These rights cover areas of historic graphite production from the early twentieth century and represent a majority of the known graphite occurrences in Sri Lanka. The company's K1 mine is now on the fast track and then M1 should be following on with production rising incrementally in a non-market-disruptive manner.

Battery metals have gone off the boil since 2017's frenzy but graphite has held up exceptionally well, largely because it is not (yet) dominated by the potential for electric vehicle (EV) usage. With a plethora of other usages in a wide range of industries, its dynamic is not driven solely by EV sentiments but rather by supply considerations.

Chinese cutbacks in production (for environmental reasons) and limitations on needle-coke supply (for artificial graphite) have underpinned prices when otherwise they might have trended lower with Lithium and Cobalt.

However, all has not been rosy on the supply front with the over-dimensioned Balama mine of Syrah looming over the marketplace and suppressing prices.

Despite all this, the EV revolution rolls on in the background and graphite is the key component in the lithium-ion battery configuration that had been pushed to the side during the hype over other battery minerals.

Ceylon Graphite aims to be the "silent achiever" in the graphite space. In this review we look at the K1 mine and its recent commencement of production.

The Waiting Game

Most of the graphite space is playing a waiting game. Developers are in a holding pattern and exploration has gone on hold (though the discovery of new resources is not necessary). The problem for the space is the oversupply created by Syrah having built its mine at a size that far exceeds current market needs. This has not only put a lid on prices it has also imposed a dampener.

Curiously, a few small players have been able to keep moving despite this stasis amongst the mid- and large-size players because they have projects that can move through the specialised niches in the space and have capital expenditures that are not dependent upon massive funding.

In the current market for all mining projects, nothing succeeds like production (except if you are Syrah) and so small graphite players perversely have more chance of navigating the tough markets with their shallow funding pools than those trying to tap more significant funds.

As we noted in our original launch of coverage earlier this year, Ceylon Graphite is one of those still with forward momentum. Indeed, since that time it has secured mining licences for its K1 project and is well advanced with shaft construction; all of this has been achieved on a very tight budget.

In this update, we shall look at the progress made and how things might pan out into 2020 for the company and its projects.

Production Hits the Spot

Somewhat ahead of projections for first production in 1Q20 the company has announced in mid-December that the K1 mine is finally in commercial production mode and look forward to selling our first container of Sri Lankan vein graphite. In recent days the team has brought two tons of graphite ore to the surface.



Key Progress on Licences

In late August the company announced that its wholly-owned subsidiary Sarcon Development (Pvt) Ltd had been granted an industrial mining licence category A for its K1 project at Karasnagala from the Geological Survey and Mines Bureau (GSMB). The GSMB is the mining regulator in Sri Lanka. An industrial mining licence category A (IMLA) is the highest category licence in Sri Lanka and grants exclusive rights to mine, process and trade in graphite mined within the area specified in the licence. It also allows for underground multi-borehole blasting, commercial production, use of all mining machinery and equipment and the export of graphite.

This was an important step. Historically the GSMB has granted just four IMLA licences for graphite mining in Sri Lanka including the Sarcon/Ceylon Graphite licence. Ceylon Graphite managed to achieve this licence in a relatively short time.

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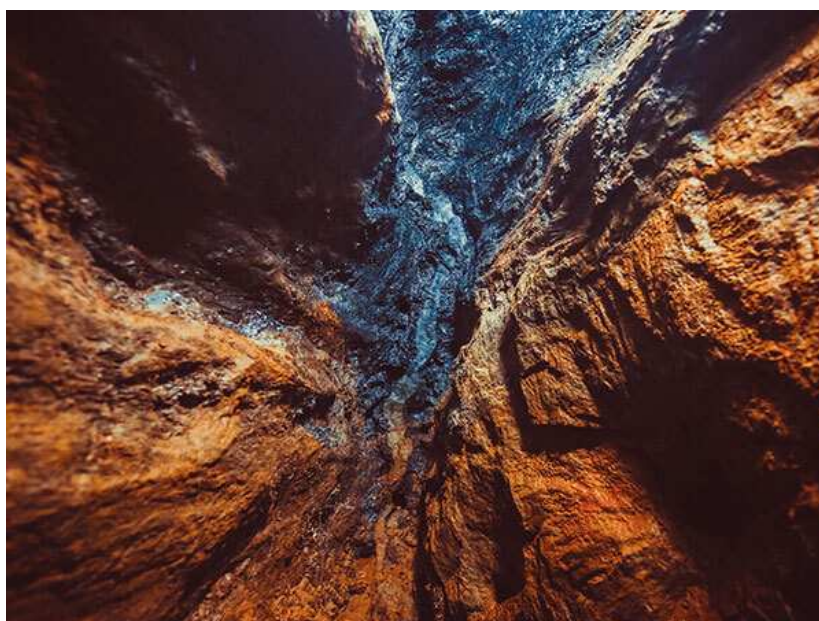
Background to the K1 project

The K1 project is Ceylon Graphite's prime development focus. The K1 site was selected for its historic crystalline graphite production as it contains several abandoned mine shafts and adits and has ample dump material.

In May of 2017, the company announced assays conducted on a “pre-drilling” grab sample of historic dump material (graphite and quartzite) including substantial rock fragments of graphite from the K1 site. Samples of dump site material from history production yielded 86.63% carbon, and samples were subject to weather and oxidation from more than 50 years.

K1 also has a drill rig on the property and shaft & adit refurbishment is currently underway. There is no NI 43-101 compliant resource currently on this asset.

In April of 2018, the company announced the discovery of two new large graphite veins at a depth of more than 200 ft at the K1 site. Each vein is



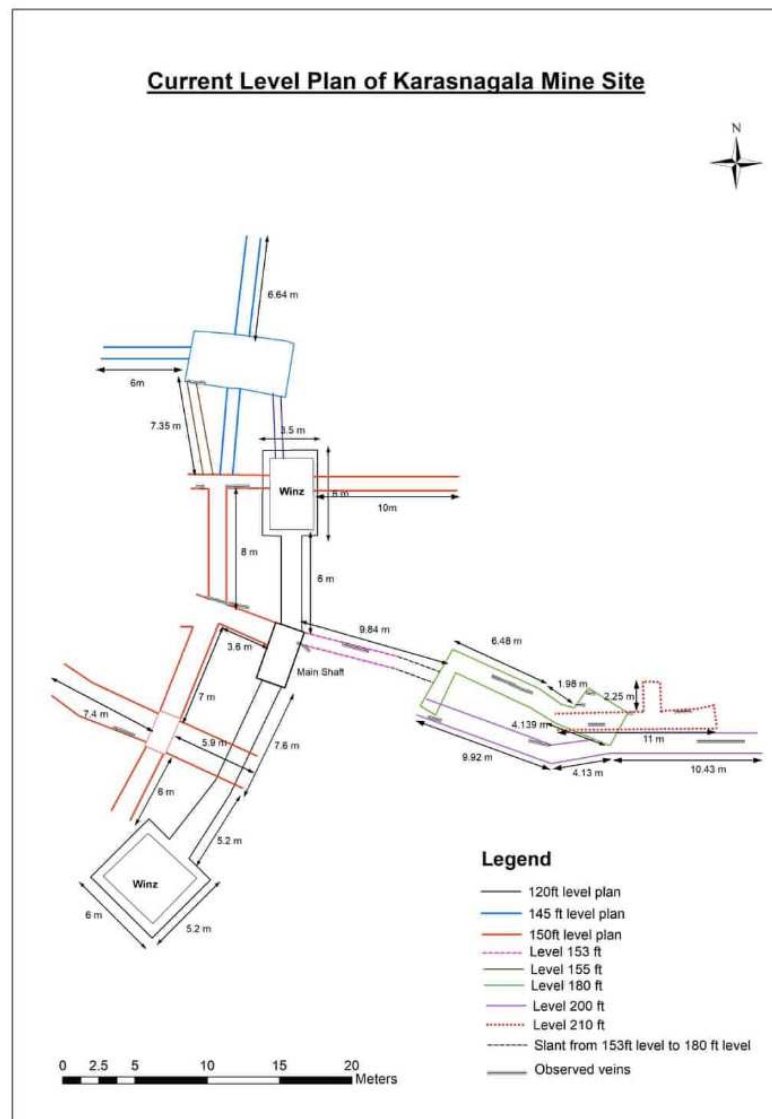
around 18 inches (46 cm) across and is situated in the ceiling of a drive on the north side of the tunnel (shown in the picture below). Samples were taken from the veins and sent to the country's Geological Survey and Mining Bureau for carbon testing. Laboratory tests indicated a Cg level of 89.2%. These samples were sent to laboratories for micronisation to 20 microns and then spheronisation tests.

Graphite Vein at K1

Further work resulted in an announcement in September 2018 that assay test results of samples from the large, untapped natural graphite vein discovered in late August 2018 at its K1 site came in at 97.61%. K1 has now yielded six sizeable veins over a relatively short period of work.

The company's geologists expect there to be additional similar sized or larger veins at lower depths and the company continues to actively pursue its aggressive exploration plan at its K1 site while rehabilitating the main shaft.

Samples were also sent to the leading graphite testing laboratory, Dorfner Anzaplan, in Germany; Dorfner Anzaplan certified that graphite from the K1 meets the specifications of marketable battery-grade graphite. They also confirmed that the graphite obtained from the K1 project is upgradable and has a carbon content of about 99.96%. The test results show that K1 can supply high-quality graphite that lithium-ion battery manufacturers can use in their products.



The Mine Build at K1

Cheap, cheap cheap is the mantra at Ceylon Graphite. At the K1 mine, the company has already refurbished the shaft down to 150 feet from where it can access other parts of the old mine. Below is a plan of the mine.

Reactivation of the mine is an exceedingly low capital expenditure (capex) operation in Sri Lanka. Every 100 feet of shaft refurbishment only costs around US\$40,000. Below can be seen the entrance to the rehabilitated shaft.



Once the facility is ready for production the further processing of the high-grade material will be undertaken by one or various sources inside or outside Sri Lanka. To this end, the company is engaged in talks with several groups at this time, including the potential for a joint venture (JV) with a local processor.

We would emphasise that the company is not looking to get into the business of spheronisation in the short-term.

Management estimates the operating expenditure (opex) to be slightly less than US\$200 per tonne of

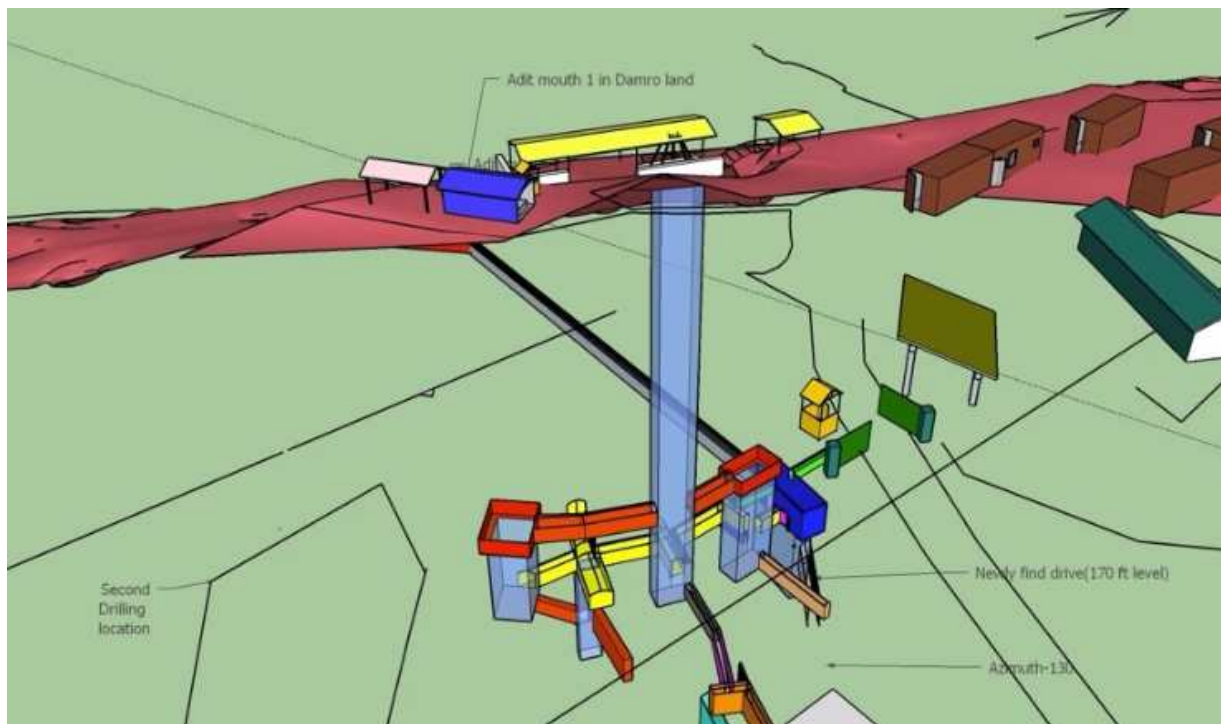
graphite. As noted, Sri Lankan vein graphite sells at around USD\$2,300 per tonne in its raw form. Even if the upgrading to battery-grade graphite costs US\$100 per tonne (and that is a far cry from reality), with the selling price of the upgraded material in the US\$5,000 per tonne range the economics are very favourable for Ceylon Graphite.

K1 Progress Thus Far

The K1 main shaft is currently down to a depth of 155 feet and with winzes and other adits reaches down to 240 feet. The plan in the short term is to add another 40 feet to the main shaft.

Other planned constructions are a powder magazine, collaring of the shaft and a horizontal adit into the hillside to meet the shaft for egress of ore.

The costs of these site enhancements, additional shaft depth and work on M1 between now and the end of the first quarter of 2020 (Q1-20) are between US\$500,000-\$700,000.



Production outlook

Initial production might be expected in mid-Q1 of 2020. This is expected to be 20 tonnes per month (tpm) at a grade of 95% Cg. The exceptional grade is because of the highly focused nature of graphite vein mining.

K1/M1	
Capex	US\$
Purchase Damro Land	70,000
Complete Shaft Concrete Work	25,000
Buildout Adit	30,000
Build Explosives Magazine	5,000
New Winch and head frame	52,500
Site Preparation/concreting Adit entrance	30,000
New Ventilation/Blower	3,000
Underground mining Equipment	75,000
K1 labor cost to company	60,000
K1 Working capital for operations	60,000
Back office expenses	48,000
M1 Labor cost to company	60,000
M1 Working Capital for Operations	60,000
M1 IMLA/IEE Expenses	15,000
IEE Sundry Expenses	10,000
GSA - Corporate	90,000
Travel	21,000
Contingencies	29,000
Total Expense	743,500

By the end of 2020, it would be expected that production would be running at around 200tpm and then up to 300-400tpm by the end of 2021.

The company has estimated an off-take price of US\$2,500 per tonne of raw Sri Lankan graphite and US\$4,500 - US\$5,000 for upgraded battery marketable graphite.

The product would be shipped to end-users or processors in container loads at a transport cost of around US\$1,200 per unit.

Other factors

There is a 6% royalty payable on industrial minerals not exported and 7% royalty payable on exported industrial minerals. These payments are not required until mining operations commence and are then payable from sales or determined market value of mine output.

Risks

It is important to highlight general and specific risks which, in the case of Ceylon Graphite, we perceive as being:

- ✘ Graphite price weakness
- ✘ Financing difficulties
- ✘ Country risk in Sri Lanka
- ✘ Excessive supply from too many projects coming online mid-term

Price weakness is less a case of potential demand faltering (which is highly unlikely) but rather of some sort of malevolent price-spoiling action emanating from China or the likes of a resurgent Syria. If it did it would be self-harming for either of them.

Financing is a perennial issue in mining markets but with a mine in Sri Lanka up and running (and on minimal capex) the company would be moving into that sweet spot where it does not need more money *per se* but has the luxury, as a producer, of being able to expand from cash flows or funding from off-takers that now realise that the company is "real".

Exotic locations like Sri Lanka come with their tribulations, but the civil war in the country is now retreating further into the past. Also left behind are the strange nationalist/socialist economic policies that ruled for decades after independence. The lessons have been learnt that these did not help the mining sector in particular.

As noted many of the remaining graphite projects won't be going anywhere due to excessive capex numbers attached to their aspirations. Syrah will most likely be the only "big" producer to come to market with the other likely entrants being non-disruptive smaller capex developers. Thus Ceylon Graphite is likely to be part of a small band of producers, rather than trampled in a rush of bigger players.

With K1 advancing towards production and M1 following in its wake, Ceylon Graphite would be achieving a first amongst listed entities in having not one but possibly two graphite mines producing by the end of 2020.

Conclusion

The mantra at Ceylon Graphite is production, production and production. Management is not interested in going through the motions of endless drilling and reporting to avoid the inevitable; they too want to get into production as soon as possible. It is only those in production, after all, that can benefit from price spikes or improved demand.

Graphite was not the first battery metal to have its "day in the sun"; lithium was a first-mover late last decade then fizzled. Graphite, however, had its boomlet in 2012-13 and then went back into quiescence; however, prices snapped out of their doldrums in 2017 and have remained at reasonable levels since.

Ceylon Graphite mercifully missed the first go-around in the market so was not scarred by that event. It arrived fresh and could learn from the mistakes of others.

While graphite shows little potential for the same type of price squeeze that has propelled other battery metals higher, there is a distinct feeling that major Western end-users want to see a non-Chinese graphite supply (and elaboration) industry evolve so they will not be vulnerable to Chinese policy gyrations or attempts at market manipulation.

With K1 advanced towards production and M1 following in its wake, Ceylon Graphite would be achieving a first amongst listed entities in having not one but possibly two graphite mines producing by the end of 2020.

We have a **LONG** rating on Ceylon Graphite with a twelve-month target price of 20 cents.



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