

RareX's Cummins Range is shaping up to be a very large rare earth and phosphate project

Cummins Range Potential Getting Bigger

Last week, when looking at the Swedish REO discovery of LKAB, we referenced RareX's (REE) Cummins Range rare earths project in the Kimberly region of WA. That project took a significant step forward last week with the announcement of an intercept of 513m at 0.5% TREO and 5% P₂O₅. It is clearly emerging as a very large, bulk tonnage REE-phosphate project.

Some early history

When RareX first came to the market with the Cummins Range project in 2020, I must admit that I was less than enamoured with it owing to our experience at Canaccord in circa 10 years prior with Kimberley Rare Earths (KRE), an IPO spun out from Navigator Resources. Timing wasn't good as the stock market cycle in rare earths was peaking at the time. KRE walked from Cummins Range after spending less than \$1m on the project. We were all licking our wounds at the disappointing outcome.

The recent perspective on geology

The recent news flow from RareX is causing us, and the Company, to see Cummins Range as an entirely different beast. It is not a small high grade rare earths project. It is something much more substantial in size, and offers indications of commerciality with rare earths and phosphate products contributing approximately 50:50 of potential revenue, depending on commodity prices of the day.

Cummins comprises two separate carbonate dykes 200m apart. The Rare Dyke is stronger in the rare earths elements while the Phos Dyke is stronger in phosphates, though each dyke has similar chemistry that has mineralised the surrounding mafic rocks. The Rare Dyke, where the majority of the exploration has been undertaken, is a > 400m wide mineralised system and grades 4% P₂O₅ and 0.4% TREO. The Phos Dyke is dominated by an apatite phosphorite and is a higher phosphate grade at 10-12% P₂O₅ and 0.3% TREO. On top of the Rare Dyke in the upper 80m are several million tonnes of 2% TREO and 12% P₂O₅.

The rare earths are associated with monazite and bastnaesite (70% and 30%) respectively, with each mineral type requiring a different separation method. Monazite is a paramagnetic material that may be separated by high intensive magnetic separation, while bastnaesite is a fluorocarbonate that requires separation by flotation.

A useful feature is the low levels of radiation with uranium thorium levels a low 10-20 ppm. Phosphate deposits always carry uranium, typically in the range of 50-150 ppm, as seen in the sedimentary deposits in Florida, USA. Cummins Range is an igneous phosphate deposit that stands in contrast. As such it should have cleaner

metallurgy. Concentrate grades can be higher and it won't have the unwanted residual heavy metals that are typical of sedimentary deposits; all useful features.

How big is Cummins Range?

We are still in the early stages of exploration, but there is every indication that RareX will be looking at a mineable resource in the order of 200 Mt. The ultimate potential could be a multiple of this figure. Thus it is looking at a long life project.

Saleable products - mixed or specific?

At this point RareX has done enough work in the primary to show it can produce a 39% mixed concentrate, which is higher than the common 35% grade, but it will improve the revenue line if it can separate this into rare earth and phosphate concentrates using the magnetic separation and flotation methods referred to above.

Other interests

In addition to Cummins Range, REE has a 35% free carried interest in the Trundle exploration project in the Lachlan Fold Belt, currently being drilled by Kincora. It also owns 28% of Cosmos Exploration (C1X), worth \$3.5m.

The Bottom Line

At the recent share price of 7.3¢ (+40% on the recent announcement) the market capitalisation is only \$42m. That suggests there is no premium in the share price at these levels. It doesn't seem to have attracted the froth that we see in other rare earth stocks.

There has been plenty of enthusiasm for rare earth stocks over recent months, particular when a company dangles the ionic tag in front of punters. The likelihood of these becoming producers is remote. Cummins Range's status as one of the two recognised carbonate pipe rare earth deposits in Australia, along with Mt Weld, makes it somewhat more significant. There has been a lot of talk about WA1's carbonatite discovery, but so far this look to be more about niobium than rare earths. Still, it is early days here.

Lucapa reports strong 2022 performance

Lucapa (LOM) released its December quarterly last week, the fourth quarter in its calendar reporting timetable. All the Lulo operational parameters were strongly higher for Q4 and the full year, over the 2021 figures. Looking at the December quarter, volume treated was up 48%, carats recovered were up 137% and the recovered grade was up 64%. Rough diamond revenue was up 51%.

Unfortunately the Mothae mine in Lesotho had a minus sign in front of the operational parameters, though the revenue and the diamond prices received were strongly

higher for the quarter, but down slightly on the annual comparison. Management has identified solutions to improve Mothae's operational performance, but it doesn't want to spend much money until such time as the VAT amendment bill is repealed

Clarification of the debt position, which is minimal

Frequent questions from FEC clients concerning the level of interest bearing debt owed by Lucapa and repatriations of returns from SML in Angola. On this front in 2022, Lucapa materially reduced the interest bearing debt by A\$17.9m, from A\$27.3m to A\$9.4m. It was able to do this because \$23m was repatriated from Lulo in Angola, in 2022. In the early days some investors were sceptical about the ability for LOM to repatriate funds from Angola, but this is clearly not an obstacle.

An important asset which is likely overlooked, is that Lucapa is owed A\$90m in loan assets for funding the exploration and mining at both its mines over the years; A\$18.6m is due to LOM from SML in Angola and \$71.7m is due to LOM from Mothae in Lesotho. These will be paid to LOM over time from cash flows from operations

When you add all this up, the interest bearing debt owed by Lucapa of \$9.4m is less than the A\$10m current cash balance in the kitty at present. A further A\$8.2m has been approved for payment to Lucapa early in 2023 (\$5.9m loan repayment and \$2.3m in dividends). More money (A\$90m) will flow back to Lucapa from the operating mines when cash flow permits, over a number of years. Thus the Company is in a very strong financial position. It is a strongly profitable diamond producer with significant blue sky potential owing to the discovery of the diamond source pipes. The stronger share price last week suggests that the market is finally starting to understand (I hope).

Disclosure: Interests associated with the author own shares in Lucapa. Capital raising fees have been received.

Nagambie discovers a second high grade vein system

Nagambie Resources announced the discovery of a second high-grade gold/antimony vein system last week, about 200m from the first, C1 vein system. The discovery hole, NAD012, returned 1.7m at 10.4 gpt and 1.3m at 7.1 gpt AuEq. While these are good grades, they should not be assessed on grade alone, in isolation. The entire population of drill results need to be included when trying to get an idea of what a mining operation could achieve. So far the 10 high grade veins intercepts reported have an average grade of 16.3 gpt AuEq with an average stoping width of 1.8m. That looks impressive.

Perhaps the most important observation of the discovery of a second vein system is the confirmation of the validity of the revised geological model. It took a few lesser holes (NAD004 to NAD006) to fine tune this model, but now that has been done the Company is getting much better success rates in the drilling. It expects to continue to identify additional vein systems with further drilling.

A few shareholders commented that they were disappointed with the share price movements upon the release of the news on Monday. The shares initially jumped

about 20% but unfortunately there was a large seller who decided to use this as a liquidity event to reduce his holding. That is just the way the market works. Shareholders should not be despondent, or look for any other reason for the lacklustre performance on the day.

Disclosure: Interests associated with the author own shares in Nagambie. Capital raising fees have been received. The author is a non-executive director.

Krakatoa reports good initial TRE met results

Having a rare earth deposit is a useful first step, but what is more critical is having favourable metallurgy. The process of testing and then designing a recovery process does not happen quickly as there are many variables. The optimisation process involves a number of tradeoffs along the way.

Following on from the maiden Mineral Resource estimate of 101 Mt at 840 ppm TREO at its Tower Project in WA, Krakatoa (KTA) has reported its first set of met tests. Recoveries of 64% Nd and 61% Pr were achieved using simple extraction techniques - Importantly, the results came from the credible ANSTO organisation that has some of the best technical personnel on its staff. So, it is a good start.

The Tower Project was initially promoted as being ionic, but the reality is that there is some ionic element but also acid soluble and refractory types within the mix. That will mean the Company needs a versatile process route to handle all three types of mineralisation, or it may chose to focus on the dominant style, but we don't yet know what that is.

Krakatoa correctly states that this is the initial round of tests and there is a lot of optimisation work required. Achieving maximum percentage recovery in the first phase is not necessarily the best way to go even though a high figure may look impressive. The elements in solution will need further separation and the more you have in solution, the more difficult that process can be. Every prospective rare earths producer needs to go through this exercise, and achieve acceptable results, before it can honestly declare it has a potentially commercial deposit.

The ASX release of 23/1/23 is worth reading if you want a more detailed explanation of what is involved.

Disclosure: Interests associated with the author own shares in Krakatoa .

Analyst's Notes - Pure Gold Mining Inc.

During the week a paper appeared in my inbox that I thought would be worthwhile sharing with those readers who are still working their way up the knowledge curve with respect to economic gold mining. Pure Gold experienced a raft of problems when it commissioned its gold mine. While gold mining should be a well-understood business, it is amazing how frequently start up companies get it wrong. Click the link below for the commentary.

https://www.cruxinvestor.com/articles/analysts-notes-week-21?_kx=H Z H R F W a Z i n O 3 W 1 q P j 0 6 D h 6 x _ - 1 8 - l w F y b h y g w U D d M M v Z E H P 4 C L 1 r q q e r x u r 7 _ C c . Y m d 8 S Y

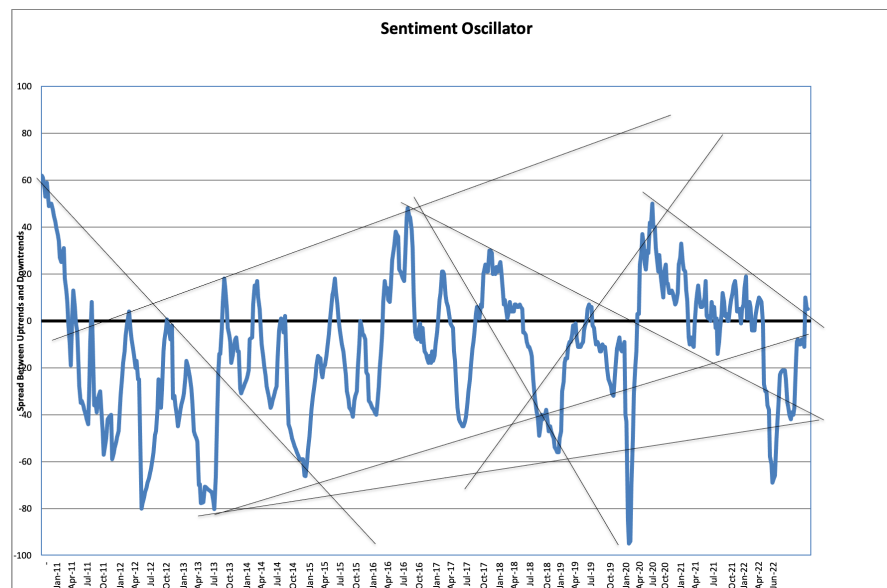
We have added two rare earth/phosphate stocks to the chart coverage. **Parabellum Resources** (PBL) has the right to buy 80% of the Khotgor Project in Mongolia for US\$15m where the previous explorers calculated a resource of 350 Mt at 0.96% TREO. A high grade starter pit for the first five years could enable a better grade at 2%. This is beyond grass roots exploration with various studies having been completed in the past. Up to date information will be available with the release of a Scoping Study in a few months. That is expected to justify the raising of the US\$15m needed to complete to acquisition of the 80% equity in the project.

Closer to home, **RareX** (REE) has a similar rare earth/phosphate project. See coverage supra.

Please note that the Weekly will be somewhat truncated in February owing to my absence overseas in remote locations.

"Knowing the truth, seeing the truth and telling the truth, are all different experiences."

McConaughy, M. "Greenlights", 2020. Headline Publishing



Sentiment Oscillator: Sentiment moderated over the previous week. There were 36% (38%) of the charts in uptrend and 31% (33%) in downtrend on Friday's close.

Detailed Chart Comments

NB. Only the bold comments have been updated. Comments in grey type are from previous weeks and will be less relevant. Please note that this list is a cross section of the market. It IS NOT a list of recommendations.

Indices	Code	Trend Comment	
All Ordinaries	XAO	holding highs	
Metals and Mining	XMM	new high again	
Energy	XEJ	testing resistance line	
Information Technology	XIJ	testing uptrend	
Stocks	Code	Trend Comment (updated comments in bold)	Main Interest
92 Energy	92E	down	uranium
A-Cap Energy	ACB	testing downtrend	uranium
ADX Energy	ADX	sideways	oil and gas
Alpha HPA	A4N	off its highs	HPA

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Adriatic Resources	ADT		new high	zinc, polymetallic
Advance Metals (was Pacific American)	AVM		off its lows	coal, gold exploration
Alkane Resources	ALK		breached downtrend	gold
Alicanto Minerals	AQI		risen to resistance line	base metals, silver, gold
Altech Chemical	ATC		rising again	HPA, anodes
Anteotech	ADO		testing downtrend	silicon anodes, biotech
Alto Metals	AME		at resistance	gold exploration
American Rare Earths	ARR		sideways	rare earths
Antilles Gold	AAU		spiked higher	gold
Anax Metals	ANX		testing downtrend	copper
Arafura Resources	ARU		good bounce	rare earths
Ardea Resources	ARL		down	nickel
Aurelia Metals	AMI		new uptrend	gold + base metals
Australian Rare Earths	AR3		down	rare earths
Auteco Minerals	AUT		testing ST uptrend	gold exploration
Arizona Lithium	AZL		failed at resistance line	lithium
Azure Minerals	AZS		breached downtrend	nickel exploration
BHP	BHP		new high	diversified, iron ore
Barton Gold	BGD		new high	gold exploration
Beach Energy	BPT		uptrend breached	oil and gas
Bellevue Gold	BGL		new high	gold exploration
Benz Mining	BNZ		breaching downtrend	gold
Black Cat Syndicate	BC8		rising	gold
BMG Resources	BMG		down	gold exploration
Boab Metals	BML		breached downtrend, then pullback	silver/lead
Breaker Resources	BRB		stronger	gold exploration
Buru Energy	BRU		strong rally	oil
Calidus Resources	CAI		bounced from lows	gold
Capricorn Metals	CMM		new high	gold
Caravel Minerals	CVV		at resistance	copper
Castile Resources	CST		still in downtrend	gold/copper/cobalt
Celsius Resources	CLA		new uptrend	copper
Chesser Resources	CHZ		breaking downtrend	gold exploration
Cobalt Blue	COB		breaching downtrend	cobalt
Cyprium Metals	CYM		breached downtrend	copper
Dateline	DTR		at lows	rare earths
E2 Metals	E2M		breached new uptrend	gold exploration
Ecograf	EGR		new low	graphite
Element 25	E25		new uptrend commenced	manganese
Emerald Resources	EMR		rising, new high	gold
Empire Energy	EEG		testing steepest downtrend	gas
Euro Manganese	EMN		breached downtrend	manganese
Evolution Mining	EVN		strongly higher	gold
First Graphene	FGR		risen to final resistance line	graphene

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Fortescue Metals	FMG		new high	iron ore
FYI Resources	FYI		sideways through downtrend	HPA
Galena Mining	G1A		breaching final resistance	lead
Genesis Minerals	GMD		rising	gold
Genmin	GEN		breached uptrend	iron ore
Gold Road	GOR		strongly higher	gold
Great Boulder Resources	GBR		softer	gold exploration
Hastings Technology Metals	HAS		improving	rare earths
Hazer Group	HZR		testing downtrend	hydrogen
Heavy Minerals	HVY		back in downtrend	garnet
Highfield Resources	HFR		testing LT uptrend	potash
Hillgrove Resources	HGO		strongly higher	copper
Iluka Resources	ILU		testing downtrend	mineral sands
Image Resources	IMA		still down	mineral sands
ioneer (was Global Geoscience)	INR		down	lithium
Ionic Rare Earths	IXR		testing downtrend	rare earths
Jervois Mining	JVR		new low	nickel/cobalt
Kaiser Reef	KAU		sideways through downtrend	gold
Kalina Power	KPO		at lows	power station additive
Kingston Resources	KSN		breached secondary downtrend	gold
Krakatoa Resources	KTA		down	rare earths
Kingfisher Mining	KFM		back to highs	rare earths
Lepidico	LPD		testing downtrend	lithium
Lindian Resources	LIN		correcting after rise	bauxite
Lion One Metals	LLO		rising	gold
Los Cerros	LCL		breached downtrend	gold exploration
Lotus Resources	LOT		sideways through downtrend	uranium
Lucapa Diamond	LOM		down again	diamonds
Lunnon Metals	LM8		resumed uptrend	nickel
Lynas Corp.	LYC		turned down at resistance line	rare earths
Magnetic Resources	MAU		surge on REO news, then retracement	gold exploration
Mako Gold	MKG		down	gold exploration
Marmota	MEU		drifting lower	gold exploration
Matador Mining	MZZ		down	gold exploration
Mayur Resources	MRL		recovering	renewables, cement
Meeka Gold	MEK		pullback	gold
Megado Gold	MEG		new low	rare earths, gold exploration
MetalsX	MLX		spiked higher	tin, nickel
Meteoric Resources	MEI		spiked higher	rare earths
Metro Mining	MMI		testing downtrend	bauxite
Mincor Resources	MCR		testing downtrend	gold/nickel
Mithril Resources	MTH		sideways	gold/silver
Musgrave Minerals	MGV		still falling, gently	gold exploration
Nagambie Resources	NAG		back to lows	gold, antimony

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Neometals	NMT		falling	lithium
Northern Star Res.	NST		new high	gold
Nova Minerals	NVA		holding longer term uptrend	gold exploration
Orecorp	ORR		surge higher	gold development
Oz Minerals	OZL		new high on takeover bid	copper
Pacific Gold	PGO		bounced to meet resistance line	gold exploration
Pantoro	PNR		new low	gold
Panoramic Res	PAN		testing downtrend	nickel
Parabellum Resources	PBL		Breaching downtrend	rare earths
Peak Resources	PEK		rising	rare earths
Peninsula Energy	PEN		risen to resistance line	uranium
Poseidon Nickel	POS		improving	nickel
Perseus Mining	PRU		new high	gold
Provaris Energy	PV1		testing downtrend	hydrogen
PVW Resources	PVW		testing downtrend	rare earths
QMiners	QML		breached downtrend, then correction lower	copper
Queensland Pacific Metals	QPM		slump. still in downtrend	nickel/cobalt/HPA
RareX	REE		firmer	rare earths, phosphate
Regis Resources	RRL		higher	gold
Reenergy	RLT		down	gas, helium
Resource Mining Corp.	RMI		gently down	nickel exploration
Richmond Vanadium	RVT		down after IPO	vanadium
RIO	RIO		new high again	diversified, iron ore
Rumble Resources	RTR		secondary downtrend	gold exploration
S2 Resources	S2R		sideways	gold exploration
Sandfire Resources	SFR		strongly higher	copper
Santos	STO		breached trend line support	oil/gas
Sarama Resources	SRR		sideways through downtrend line	gold exploration
Sarytogan Graphite	SGA		uptrend	graphite
Silex Systems	SLX		strongly higher	uranium enrichment technology
South Harz Potash	SHP		new low	potash
Southern Cross Gold	SXG		testing uptrend	gold exploration
Stanmore Coal	SMR		surge higher	coal
Strandline Resources	STA		down	mineral sands
Sunstone Metals	STM		new uptrend forming	exploration
Suvo Strategic Minerals	SUV		breached downtrend	kaolin
Talga Resources	TLG		rising again	graphite
Tamboran Resources	TBN		breached downtrend	gas
Technology Metals	TMT		down	vanadium
Theta Gold Mines	TGM		testing resistance line	gold
Thor Mining	THR		down	gold exploration
Tietto Minerals	TIE		new high	gold
Vanadium Resources	VR8		new low	vanadium
Venture Minerals	VMS		improving	tin, tungsten

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West African Resources	WAF		rising again	gold
Westgold Resources	WGX		stronger	gold
West Wits Mining	WWI		sideways, to higher	gold
Whitehaven Coal	WHC		down	coal
Zenith Minerals	ZNC		breached steepest downtrend	gold exploration
Totals	36%	51	Uptrend	
	31%	43	Downtrend	
		140	Total	

Guides to Chart Interpretations

- Charts usually go pass from one trend (up or down) into the other via a period of indecision and uncertainty during which the trend can either recover or change. This period is signified by the orange colour. The orange represent both the greatest risk and greatest reward possibilities.
- Once a chart is in confirmed up or downtrends it is not uncommon for 10-20% of that trend to have already transpired.
- There are trends within trends. The focus of this chart review is the immediate trend that affects the sentiment i.e. it can be a downtrend within a long-term uptrend.
- Not every chart warrants a new comment every week. The new comments are in bold type. Grey type comments may be dated.
- Individual charts provide a single view. It is valuable to look at charts of other companies in similar commodities, and the overall sentiment is also very valuable. Not many stocks can swim against the tide.
- We periodically add or delete charts, some times for obscure reasons. If a chart consistent gives poor signals or is very erratic, we may delete it. Sometimes we add a chart because we want to see what all the fuss is about. We do have a preference for charting stocks that we cover in our research as well.
- Errors and omissions may occur from time to time, especially in fast moving markets.

Amber Lights in Tables: Just a reminder if when the amber light is used in the table – it is when the charts are ambiguous or when there is a change of trend taking place. If a chart is breaching a downtrend it can either be a positive sign or a trap. Only once it has done more work can it be confirmed as a new uptrend. Maybe it is a new uptrend (or conversely a new downtrend); the risk takers can decide to jump on board early (or sell). They will maximise their profits (or minimise their losses if indeed it is the start of the new uptrend (downtrend)). More risk-averse investors should wait a little longer, being prepared to give up some of the gains in return for greater certainty.

Weightings of Sectors Represented in the Company Charts			
Sector	No. of Companies	Weighting	
Gold	29	20.7%	
Gold Exploration	22	15.7%	
Rare Earths	15	10.7%	
Oil/Gas	10	7.1%	
Nickel	8	5.7%	
Copper	9	6.4%	
Iron Ore/Manganese	6	4.3%	
Uranium	5	3.6%	
Zinc/Lead	3	2.1%	
Lithium	4	2.9%	
Graphite/graphene	4	2.9%	
Coal	3	2.1%	
Mineral Sands	3	2.1%	
Potash/Phosphate	2	1.4%	
Silver	2	1.4%	
Bauxite	2	1.4%	
Vanadium	3	2.1%	
Cobalt	1	0.7%	
Tin	2	1.4%	
Diamonds	1	0.7%	
Other	6		
Total	140		

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