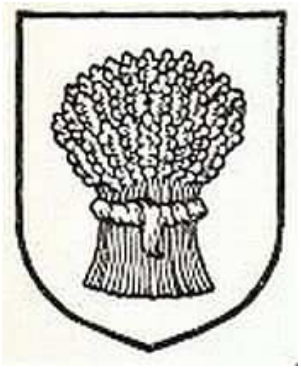
Monday, November 2, 2020



HALLGARTEN & COMPANY

Corporate Actions

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Fortress VAC/MP Materials

(NYSE:FVAC to be MP)

Strategy: NEUTRAL

Price (USD)	$12.000
12-Month Target Price (USD)	$12.50
Upside to Target	4%
High-low (12 mth)	$9.91 - $17.40
Market Cap (USD mn)	1,768.0
Shares O/S (millions)	**147.3**
Fully Diluted (millions)	**147.3**

	FY19	**FY20e**	**FY21e**	**FY22e**
Consensus EPS		n/a	n/a	n/a
Hallgarten EPS (USD)		($0.33)	$0.16	$0.61
Actual EPS (USD) pro-forma	-0.04			
P/E	n/a	n/a	75.9	19.7

Fortress/MP Materials

Déjà vu all over again?

- + The (re)listing of the Mountain Pass property via a SPAC potentially provides the Rare Earth space with a large-cap player as a champion
- + The US government has shown a commitment towards reviving a Rare Earths supply chain independent of China
- + Mountain Pass is going to morph from being a mere quarry supplying ore to China, instead (attempting to) produce value-added Rare Earth products
- + Profits likely to rise on improved volumes and a move to the sale of separated Rare Earth Oxides rather than just concentrate
- + A distancing from Shenghe will "liberate" MP from China-dependency
- + Rare Earths prices and sentiments look likelier to move higher rather than lower at this stage
- + Enormous cash-on-hand of over $500mn gives the company a good cushion and makes it immune from the vagaries of rare Earth financing markets
- ✘ Likely demise of the Trump Administration risks steering US back onto a course of China-dependency/sycophancy
- ✘ Those with long memories in the Rare Earth will remember the fate of Molycorp at the start of the decade which came a cropper due to various limitations
- ✘ Rare Earth prices are still far from ebullient and are a mere fraction of what they were at the start of the decade
- ✘ Shenghe is the (almost) sole offtaker of MP's current sales of REE ore
- ✘ Shifting to a model of upgrading ore and then selling to US (or non-Chinese) buyers involves a total replacement of the company's current customer base

This Time It'll Be Different….

We must confess we were surprised when Mountain Pass emerged mid-decade from the smoking and still-hot wreckage of the benighted Molycorp. A confluence of US politics and Chinese machinations have led to a situation where the corpse of the old mine was reanimated (the Chinese influence) and is now being brought to market as a shiny sparkly new object of desire for those US investors interested in "critical metals" (this being driven by the US politics aspect). Perversely the latter will drive out the former (while making a bundle of money for the Chinese as they exit Stage Left). Then verily as all this is bedded down and trumpets sound and a Brave New Dawn spreads light across the US, the Trump Administration looks like it's on its last legs and a potentially Sinophile Democrat-led regime stumbles into the White House with a foreign policy objective of rendering *proskynesis* (look that up) to Beijing and cooing "We were wrong, we really do want to be your eternally grateful servants".

So investors face the prospect of the rewarmed Mountain Pass losing its *raison d'etre* PDQ if the political

wind changes direction. In this review we shall trawl back through the past history, as we recall it, and look at what tidbits of information the Red Herring has served up for the market's delectation.

The Deal

Or should we say the latest deal? In this instance we mean the SPAC and how it evolves into the listing of Mountain Pass. The previous transmogrifications we shall deal with along the way.

In the beginning there was the SPAC called FVAC which, on the 4th May 2020, completed its initial public offering, generating gross proceeds of $345mn. Then in mid-July it was announced that the SPAC would subsume the business that had been carried by MPMO, which owns and operates the Mountain Pass facility. MPMO acquired the Mountain Pass mine and processing facilities out of bankruptcy in July 2017. Interestingly, the prospectus confesses that FVAC's board of directors did not obtain a third-party valuation or fairness opinion in connection with their determination to approve the business combination.

Besides the two merging parties there is another name to conjure with which is Secure Natural Resources LLC (SNR), a Delaware limited liability company, that holds mineral rights to the Mountain Pass mine and surrounding areas as well as intellectual property rights related to the processing and development of Rare Earth minerals. SNR is/was controlled by JHL Capital Group, QVT and some minority holders.

Over and above the mergers mentioned above, FVAC entered into subscription agreements with what it calls the PIPE Investors, including the sponsor, pursuant to which the PIPE Investors committed to provide equity financing to FVAC in an aggregate amount of $200mn, involving the issuance of 20,000,000 shares of FVAC Class A common stock, par value $0.0001 per share at a purchase price of $10.00 per share.

The terms of the merger and the end-product of the transaction will be dealt with closer to the end of this note after we have opined on the business, history and outlook for the business.

Mountain Pass – Background

The Mountain Pass facility is located approximately 60 miles southwest of Las Vegas, Nevada near Mountain Pass, San Bernardino County, California (as shown on the map on the following page). The Mountain Pass facility straddles Interstate 15 and is accessed by

existing surfaced roads.

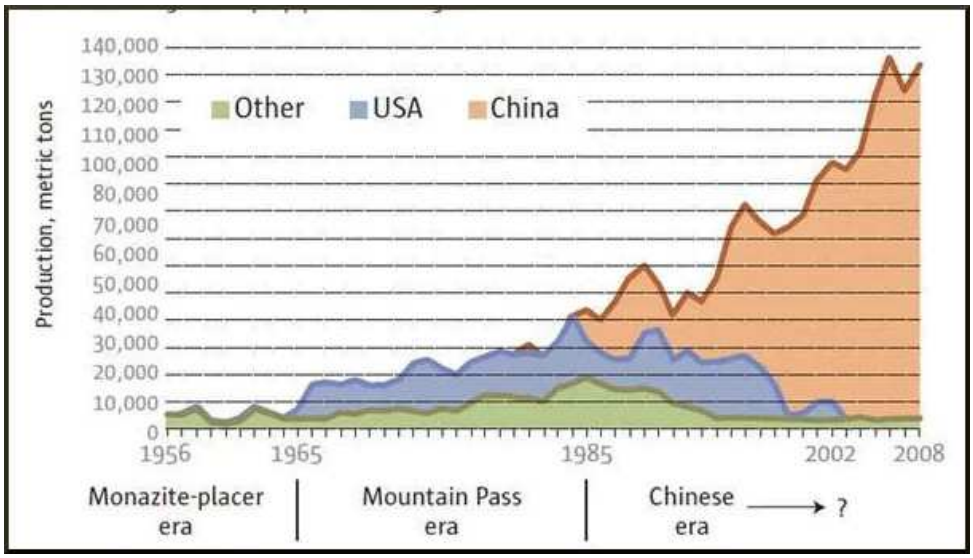
The Mountain Pass facility is located on 2,222 acres of owned property, while the company owns mining and mill site claims over a further 15,000 acres of adjacent land. Approximately 938 acres of the 2,222 fee simple acres are currently in use (e.g., existing buildings, infrastructure or active disturbance). The lands surrounding the Mountain Pass facility are mostly public lands managed by the Bureau of Land Management and the National Park Service. In addition the company will also hold 525 unpatented lode and mineral mining claims and mill sites under the provisions of The Mining Law of 1872.

The Wayback History

The carbonatite complex at Mountain Pass was discovered in the early 1950s. This occurred almost by accident during the time when uranium prospecting was a major activity for geologists in the South-west. Two prospectors using a borrowed a Geiger counter staked a series of claims on a radioactive outcrop they thought might have some potential as a uranium resource. Samples were sent to the U.S. Geological Survey for analysis.

The "ore" was identified as the rare earth fluorocarbonate bastnäsite. The discovery, however, piqued the attention of the U.S.G.S. They undertook a detailed field survey of the immediate area in 1954 and discovered a much larger, non-radioactive deposit of bastnäsite on adjoining land. One of the two original prospectors, a metallurgist for Molybdenum Corporation of America, urged the company to claim the land and this was duly done. The mining operation was initially developed by Molybdenum Corporation of America, and this continued until 1998, under Unocal Corporation (which had purchased Molybdenum Corporation of America in 1977).

The mine's main motor was the production of Europium, the rise of which paralleled the evolution of the colour television industry due to its use as a red phosphor in screens. Indeed, so iconic was the Mountain Pass mine that this oft-employed graphic refers to its period of dominance as the "Mountain Pass era".



In 1998, the pipeline that carried waste water to evaporation ponds, at some distance from the mine,

suffered a series of wastewater leaks with a substantial amount of water carrying radioactive waste spilled into and around Ivanpah Dry Lake. The company paid more than $1.4 million in fines and settlements. After preparing a cleanup plan and completing an extensive environmental study, Unocal (the then owner of the operation) obtained a county permit in 2004 that allowed the mine to operate for another 30 years. The mine also passed a key county inspection in 2007. However in the meantime the eclipse of the US television production industry (in fact across most of the Western world) coincided with predatory pricing by the Chinese REE producers and mining at Mountain Pass ceased in 2002, with only sales from stockpiles taking place after that time.

After the mothballing of the mine, Unocal Corporation sold or otherwise disposed of substantially all of the mining equipment at the Mountain Pass facility (earthmoving equipment, haul trucks etc) prior to being acquired by Chevron in 2005. Operations at the Mountain Pass facility remained suspended until September 2007 when Chevron Mining Inc., a wholly-owned subsidiary of Chevron Corporation, commenced a NFL pilot processing campaign. Under the NFL campaign, Lanthanum, which was produced prior to suspending activities in 1998 and held in Lanthanum pond stockpiles at the Mountain Pass facility, was processed in order to recover the related Neodymium and Praseodymium. The NFL campaign did not constitute the restart of fully integrated operations at the Mountain Pass facility and was used as an opportunity to improve processing technologies and generate very modest revenue.

It should be kept in mind that the original reason for the Mountain Pass SX plant was to recover Eu. There were no commercial uses at that time for most Rare Earths, other than pyrophoric ammunition and electroluminescent phosphors. The latter is the reason that STER (later Rhodia STER, now Solvay) built the plant at La Rochelle in France to separate "all" of the Rare Earths.

The Troubles

As previously mentioned the deposit, mine and associated assets were acquired from Chevron Mining Inc. in September 2008 by Rare Earth Acquisitions LLC (which was later renamed Molycorp Minerals, LLC). The shareholders in the new vehicle included Resource Capital (an Australian asset manager), Traxys (a leading trading house in the metals space), Pegasus (another asset manager) and an arm of Goldman Sachs.

The assets that came along with the Mountain Pass purchase included an open-pit mine, overburden stockpiles, a crusher and mill/flotation plant, a separation plant, a mineral recovery plant tailings storage areas and on-site evaporation ponds, as well as laboratory facilities to support research and development activities, offices, warehouses and support buildings. The majority of the physical plant and equipment at the Mountain Pass facility was over 20 years old. The acquisition excluded certain assets and liabilities, including certain liabilities related to environmental and employment matters, that were retained by Chevron Corporation.

The move looked rather prescient at the time as Rare Earths were far from being the words on everyone’s lips (rather more like the words on nobody’s lips).

Who even remembers that Molycorp was on the verge of merging with Great Western (the TSX-listed REE player that owned Less Common Metals and later the Steenkampskraal project in South Africa)? However that deal came to grief in June of 2009.

On July 29, 2010, Molycorp, Inc., a newly established parent company of Molycorp Minerals LLC, made its (later to be controversial) debut on the New York Stock Exchange. The company sold 28,125,000 shares at $14 in its IPO. This was a sell-out opportunity for several of the original venture capital investors.

In April 2011, Molycorp bought 90% stake in the rare metals processing company Silmet in Estonia for US$89mn. Silmet, which owned a Soviet-era plant, was renamed Molycorp Silmet, and remaining 10% was acquired by Molycorp in October 2011. For more on this transaction see our research note of July 2011.

Molycorp bought Santoku America for US$17.5mn, also in April 2011, and the bankruptcy trustee sold it for $1.5mn in 2017. Santoku produced Neodymium-Iron-Boron magnets, as well as for Samarium-Cobalt magnets. This allowed Molycorp to enunciate a strategy that it called “mines-to-magnets”. That was a much used mantra of those times.

In February of 2012, a Chilean company, Molibdenos y Metales S.A. (Molymet), the world’s largest processor of the strategic metals Molybdenum and Rhenium, agreed to invest approximately US$390mn in Molycorp in exchange for 12.5 million shares of Molycorp common stock. The price of the Molycorp shares issued was based upon the 20-day VWAP plus a 10% premium. This was a transaction that Molymet came to bitterly regret.

In early March 2012, when the Rare Earth boom was already in its dotage, Molycorp announced a takeover of Neo Material Technologies (then NEM.TO) in a CAD$1.3 billion (US$1.31 billion) cash and share deal. Neo owned facilities in China, Thailand, Germany and North America, producing Rare Earth oxides, alloys and magnetic powders. The company also processed various minor metals like Gallium, Rhenium and Indium.

Neo also brought along Magnequench (in bonded Neodymium-Iron-Boron magnets). This was an entity that it had merged with in 2006, but this had actually been founded in 1986 by General Motors.

The agreed deal involved Molycorp paying CAD$8.05 in cash, plus 0.122 of a share for each share of Neo Material, amounting to a total consideration of CAD$11.30 per share (based on Molycorp’s 20-day average). Molycorp’s offer was 42% higher than Neo’s closing price of CAD$7.97 on the Toronto Stock Exchange. The offer was above Neo’s peak of CAD$10.67 in April of 2011 when the Rare Earth mania still had legs. In retrospect, the management of Neo chose a good moment to exit.

However, Molycorp was heading towards twin icebergs (one of its own making). One was the Chinese decision to sabotage the surge of REE wannabes by plunging the price of the whole suite of REEs and the other was the disastrous management of the Project Phoenix at Mountain Pass.

In December 2012, the mastermind of the Molycorp strategy parted ways with the company and, ironically, the respected former head of Neo Materials, Constantine Karayannopoulos, accepted the poisoned cup of leading the already stricken Molycorp. Like the Titanic, Molycorp was slow in sinking but the sinking had already taken on a quality of inevitability.

In November 2012, the company announced that it was being investigated by the U.S. Securities and Exchange Commission in connection with the accuracy of the company's public disclosures.

In June 2013, Molycorp Inc. said the SEC has completed the investigation and has not recommended any enforcement action.

In 2014, with the company facing heavy capital needs and lower prices in the China-dominated market, Oaktree Capital Group had won the bidding to provide up to $400 million of senior restructuring finance.

Eventually, Molycorp filed for bankruptcy protection in late June 2015. At the same time it announced an agreement with major creditors to restructure its $1.7bn debt load.

In the final twist, the core group of assets acquired with the Neo deal (including Magnequench and Silmet) were rescued from the smouldering wreckage by Karayan and Molycorp's largest creditor Oaktree Capital Management and was reorganized as Neo Performance Materials.

Poignantly the new entity was launched back onto the TSX. It has done reasonably well in its reincarnation, despite on-going flaccid pricing in the REE space. Our most recent coverage of the company from July 2019 can be accessed at our website.

The More Recent History

A consortium led by the Chicago based investment firm JHL Capital acquired the Mountain Pass mine and the rare earth processing and separation facilities located at the mine out of bankruptcy in July 2017. The prospectus claims that in the five years prior to JHL's acquisition, Molycorp had invested over $1.7bn in the Mountain Pass mine, primarily in constructing Rare Earth processing and separation facilities on the Mountain Pass mine site. It is not clear though how much more was spent in the several years before 2012.

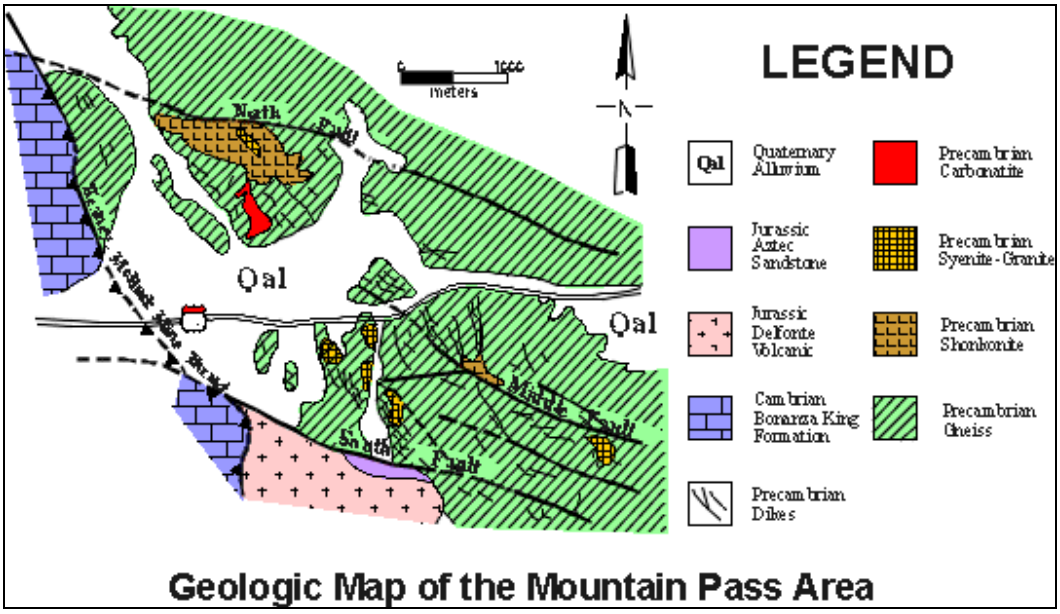
During its tenure, Molycorp encountered operating challenges, struggling to achieve stable production at their designed capacity due to execution issues in concentrate production and challenges in implementing a revised process flow, which MPNO (JHL's operator) believes "sacrificed the natural advantages of Mountain Pass bastnäsite ore and its inherent suitability to low-cost processing". In the refining process further downstream, Molycorp removed the critical oxidizing roasting circuit, which previously had been used at Mountain Pass since 1966. JHL claims that this was done to maximize the production of Cerium, one of the lower-value Rare Earth minerals in the Mountain Pass ore. Oh well, does this surprise us?

The current operators claim that Molycorp implemented a novel, complicated, reagent-intensive, and, ultimately, unreliable multi-stage leaching and cracking process, which resulted in low recovery of NdPr and high operating costs.

Since relaunching production at Mountain Pass in July 2017, the operators have increased the full-time employee base from eight contractors in 2017 to approximately 250 employees in 2020. They anticipate hiring approximately 200 additional full-time employees as part of the Stage II optimization plan.

The Geology

The Mountain Pass deposit is a carbonatite complex that lies within a northwest trending block of Precambrian basement bounded on three sides by faults and on the fourth by alluvium of the Ivanpah Valley.



Geologic Map of the Mountain Pass Area

The Precambrian host rock consists of a series of gneisses and schists, strongly foliated and sheared. The earliest phases, hornblende schist and biotite gneiss were subsequently intruded by granite gneiss. These rocks were in turn cut by pegmatitic dikes (gneissic pegmatite). The entire sequence was metamorphosed at some time prior to the intrusion of the carbonatite complex about 1.4 BP.

The carbonatite complex consists of a total of eight plugs of alkali igneous rocks ranging in composition from shonkinite to carbonatite. The plugs are all elongated in a northwest direction and dip about 50 to the southwest. They range from 100 to 2000 meters in length and appear to lie unevenly spaced along two nearly parallel northwest trending rows. Associated with the plugs are 200 dikes of carbonatite which also trend northwest.

Phanerozoic rocks to the west of Mountain Pass consist of a nearly complete sequence of marine sedimentary strata from Cambrian through Triassic. Southwest of the district TriassicJurassic sediments are intruded by Jurassic/Cretaceous quartz monzonite (Teutonia batholith) and locally overlain by Delfonte volcanics of uncertain age (possibly Jurassic).

Resource Estimates

The currently defined zone of REE mineralization exhibits a strike length of approximately 2,750 feet in a north-northwest direction and extends for approximately 1,500 feet down dip from surface. The true thickness of the greater than 3.0% REO zone ranges from 15 feet to 250 feet. The percentage of each Rare Earth material contained in the Mountain Pass facility bastnäsite ore is estimated to be as follows:

As of July 1, 2020, the consulting firm, SRK, estimated total proven reserves of 0.03 million short tons of REO contained in 0.3 million short tons of ore at Mountain Pass, with an average ore grade of 8.19%, and probable reserves of 1.47 million short tons of REO contained in 20.8 million short tons of ore, with an average ore grade of 7.04%. The total proven and probable reserves are estimated to have an average ore grade of 7.06%. In each case, these estimates use the estimated economical cutoff of 3.83% TREO.

It is interesting to contrast this with the reserve calculated by SRK Consulting as of February 6, 2010. At that time they estimated proven reserves at 88 mn pounds of REO contained in 0.48 million tons of ore, with an average ore grade of 9.38%, and probable reserves of 2.12 billion pounds of REO contained in 13.108 million tons of ore, with an average ore grade of 8.2%, in each case using a cut-off grade of 5%, at our Mountain Pass mine.

	Average Ore Grade	Ore (tons mns)	Contained REO (lbs mns)
Proven	9.38%	0.48	88
Probable	8.20%	13.108	2,122

Deficient in Heavies?

It is appropriate also to make clear that Mountain Pass can never be a universal solution to what ails the Rare Earth supply chain in the US. It is worth going back to the class-action lawsuit that was pursued in the wake of the Molycorp collapse. In *re Molycorp, Inc. Securities Litigation, Case No. 12-cv-292-WJM-KMT (D. Colo.)* the complainants sustained that the MCP management had mislead investors as to the Heavy Rare Earth endowment of Mountain Pass.

We note from article 96 of the pleading that *"According to a leading industry expert with extensive and decades of experience in the total rare earth supply chain, from the exploration to the manufacturing of end-use products utilizing and enabled by the electronic properties of REEs, Molycorp will never produce commercially significant volumes of HREE from the Mountain Pass ore body. The leading industry expert in the rare earth field advises the investment community and performs due diligence services for institutional investors with respect to technology metals supply and whether rare earth metal ventures*

will likely be a commercial success. This industry expert has visited the Mountain Pass mine prior to and during the Class Period. The industry expert has personal knowledge that Molycorp, prior to and during the Class Period, engaged in desperate efforts to purchase third-party companies with proven deposits of commercial volumes of HREEs because Molycorp's Mountain Pass mine ore body does not have commercially viable amounts of HREEs".

This issue is not one that we can consign to the past. We would note that the much-vaunted DoD tender was all about Heavy Rare Earths. The current management was involved in the solicitation and winning of a Phase I award from Cornerstone/DoD on Heavies separation program (along with Lynas). With Tb_4O_7 and Dy_2O_3 percentages of their bastnäsite ctd composition at, say, 0.03% and 0.06% respectively (with La/Ce at >80% combined and NdPr oxide at ~1/6), it's clear not much in the way of Heavies will be coming out from Mountain Pass (even if the Project Phoenix SX plant can be breathed back to life).

Mountain Pass – the First Go Around

Technically though, what went on at the mine between 2008 and 2015 was the Second Coming of this project. Discussion varied around the turn of last decade on the value of the infrastructure left at the Mountain Pass when it was "mothballed" in the early years of this century. Some claimed it was almost plug-and-play while others contended that the above ground facilities were little more than scrap metal. The real value was deemed to the pit and its great road/rail access to Los Angeles (and Las Vegas).

While many Rare Earth applications are relatively new (particularly the magnet usages) the most historic application was Cerium's usage in ceramics and glass manufacture and Lanthanum's usage in catalysts.

The production method at Mountain Pass consisted of bastnäsite ore being finely ground, and then subjected to froth flotation to separate the bulk of the bastnäsite from the accompanying barite, calcite, and dolomite. Marketable products include each of the major intermediates of the ore dressing process: flotation concentrate, acid-washed flotation concentrate, calcined acid-washed bastnäsite, and finally a Cerium concentrate, which was the insoluble residue left after the calcined bastnäsite had been leached with hydrochloric acid.

The lanthanides that dissolved as a result of the acid treatment were subjected to solvent extraction, to capture the europium, and purify the other individual components of the ore. A further product included a lanthanide mix, depleted of much of the Cerium, and essentially all of Samarium and heavier lanthanides.

The Mine Revival of 2008-15

The mine plan under the Molycorp Mark 2 regime envisioned an expansion of the open-pit mine both laterally to the west, southwest and north as well as deepening vertically. In addition to the existing overburden stockpile located west of the pit, which was to serve as the initial overburden stockpile when mining recommenced, the company needed to construct additional overburden stockpiles to the north or east of the pit to provide additional storage capacity sufficient to accommodate the remaining

overburden material for the existing permitted life of the mine.

The company decided to build a new mill instead of refurbishing the existing mill. Thus a plan was formulated which involved building new facilities, including the construction of a control lab, additional warehousing and raw material storage facilities. The new mill was sized for production of up to 2,000 metric tpd.

Molycorp also built a new paste tailings operation and new roads at the Mountain Pass facility. The capital cost for the paste tailings operation was originally estimated to be $10 million. Although the operating cost of the paste tailings operation is expected to be greater than it would be for a tailings pond, which is the method prior owners used at the Mountain Pass facility, the management at the time claimed that the increased water recycling and reduced environmental risks associated with the paste tailings facility would ultimately mitigate that additional cost. In addition, Molycorp intended to produce hydrochloric acid and sodium hydroxide at its own chlor-alkali plant at the Mountain Pass facility, thereby reducing its reliance on external sources of reagents. The reanimation of this plant now figures in the calculations of the Stage II of MPM's plans.

As is well-known though, costs spiraled out of control under the management at the time. In mid-2011, the company anticipated the cost to restart mining operations, construct and refurbish processing facilities and other infrastructure at the Mountain Pass facility and expand into metal and alloy production in connection with the initial modernization and expansion plan to be approximately US$531mn through 2012. Additionally, it estimated that it would probably face approximately US$250mn in additional capital costs through 2013 in connection with the second-phase capacity expansion plan (i.e. the doubling of capacity). These estimated capital expenditures of US$781mn did not include corporate, selling, general and administrative expenses, which it estimated to be an additional US$20mn to $25mn per annum.

The blow-out of costs though made these initial capex estimates look like chickenfeed and the project became a bloodbath just as Rare Earth prices went into a fall-scale retreat.

In February 2012 the sequential start-up of the new Project Phoenix rare earth manufacturing facility at Mountain Pass began with:

- Active mining at a full mine production rate of approximately 2,800 short tons of fresh rare earth ore per day
- Mechanical completion of the new Crushing Facility with fresh ore being fed into the system
- Mechanical completion of the initial Cracking Facility, steam testing completed, and feedstock from stockpiled material fed into the system

Few, inside or outside the Rare Earth industry, had any real grasp of the potential pitfalls as no major plant had been built for decades. Lynas, which was advancing its plant in Malaysia also ran into serious problems during construction with attendant cost overruns.

Other operations in the Project Phoenix facility that were brought online included: milling and mineral extraction; expanded cracking; impurities removal; rare earth oxide separations; product finishing; and paste tailings processing and storage.

In a bid to dispel any lingering doubts on the environmental footprint of the operation, the company testified in Congressional hearings that its new water recycling and treatment processes would reduce the mine's fresh water usage from 850 gallons per minute (gpm) to 30 gpm — a 96% reduction (an important factor in light of past events and the siting on the edge of the Mojave desert).

On the power front, the construction of a Combined Heat and Power (CHP) plant, fueled by natural gas, was expected to eliminate usage of fuel oil and propane. The revival of this plant is within the plans of MPMO.

Source: Molycorp

Capacity and Throughput

The Mountain Pass facility, in its Molycorp manifestation, operated pursuant to a conditional use permit that allowed feeding of ore to the mill at a rate of 2,400 tons per day. While the Mountain Pass facility historically required 2,000 tons of mill feed per day to manufacture approximately 19,050 mt of

REO per year, the then management expected that the much-vaunted new technologies it had developed would allow it to extract the same 19,050 mt of REO per year while only using approximately 1,100 to 1,200 tons of mill feed per day. This supposedly would have allowed the company to increase annual REO production from its initial plan of 19,050 mt of REO per year to up to 40,000 mt of REO per year without any change in the permit limit.

Extraction improvements were supposed to increase the processing facility's Rare Earth recovery rates to 95% (up from 60-65%) and decrease the amount of reagents needed by over 30%. Reagent recycling, through proprietary technology that Molycorp had developed, was mooted to provide even greater decreases in reagent use, according to the company.

These estimates were based on results achieved at the Mountain Pass facility in full scale mill test runs from 2001 to 2002, so even then the estimates were well out of date. In addition, Molycorp had claimed to have improved cracking technology at commercial scale (2,000 to 3,000 mt per annum production rate) between 2009 and 2012 and improved the performance of the solvent extraction at commercial scale (2,000 to 3,000 mt per annum production rate) as demonstrated in trials from 2007 to 2009.

Upon the completion of the initial "modernization plan", Molycorp told the markets that the project should have the ability to produce approximately 19,050 mt of REO per year at the Mountain Pass facility. In a further burst of enthusiasm it claimed that, by the end of 2013, it would have had the ability to produce up to approximately 40,000 mt of REO per year, or roughly double the amount envisaged in the company's initial plan.

Rare Earth Elements

	Estimated % in Bastnaesite Ore	
	2010	**2020**
Cerium	48.80%	49.10%
Lanthanum	34.00%	33.40%
Neodymium	11.70%	11.50%
Praseodymium	4.20%	4.30%
Samarium	0.79%	
Gadolinium	0.21%	
Europium	0.13%	
Dysprosium	0.05%	
Other REE (including Terbium)	0.12%	1.30%

It is interesting to note the distribution of the REEs in the bastnäsite ore at Mountain Pass. The two elements being touted as most linked with the fortunes of the EV "revolution are Nd/Pr and as is evident that only make up ~16% of the total of REEs in the ore.

Shenghe – Crying All the Way to the Bank

In connection with the acquisition and development of the Mountain Pass facility, MPMO entered into commercial arrangements with Shenghe Resources (Singapore) International Trading Pte., a subsidiary of Leshan Shenghe Rare Earth Co (whose ultimate parent is Shenghe Resources Holding Co., Ltd., a listed on the Shanghai Stock Exchange). Shenghe Resources and its affiliates primarily engage in the mining, separation, processing and distribution of Rare Earth products.

The original commercial arrangements with Shenghe Resources (Singapore) were entered into on May 22, 2017 (prior to MPMO's acquisition of the Mountain Pass facility). These agreements principally consisted of

- a technical services agreement (TSA)
- an offtake agreement (the original Offtake Agreement)
- a distribution and marketing agreement (the DMA)

MPMO also issued to Leshan Shenghe some 110.98 MPMO preferred units, which represent all of the issued and outstanding MPMO preferred units, constituting a 9.24% interest in the overall equity of MPMO.

Under the TSA, Shenghe provided technical services, know-how and other assistance to MPMO in order to facilitate Mountain Pass facility development and operations. In addition, both the TSA and the original Offtake Agreement imposed certain funding obligations on Shenghe. The original Offtake Agreement required Shenghe to advance to MPMO an initial $50 million and the TSA required Shenghe to fund any additional operating and capital expenditures required to bring the Mountain Pass facility to full operability.

Shenghe also agreed to provide additional funding in the amount of $30 million to MPMO for MPMO's acquisition of the Mountain Pass facility. The amounts funded by Shenghe constituted prepayments for the Rare Earth products to be sold to Shenghe under the original Offtake Agreement.

Under the original Offtake Agreement, MPMO sold to Shenghe on a firm "take or pay" basis, all of the Rare Earth products produced by the Mountain Pass facility. Shenghe in turn marketed these products to customers, and retained the gross profits earned on subsequent sales. The gross profits were credited against the prepayments, and provided the means by which MPMO repaid the amounts that had been loaned to it.

The original Offtake Agreement provided for an open book verification of Shenghe's gross profits. Interestingly, Shenghe was obliged to prioritize sales to U.S. and European markets and such other markets as designated by MPMO, provided such sales could be made on reasonably commercial terms. The latter sounds like the "get out" clause because the ore that MP sold needed to be upgraded by

Shenghe, which they only do within China so thus the MP ore essentially just became throughput for Shenghe's plant like any other Chinese-sourced ore.

MPMO was obliged to sell all Mountain Pass output to Shenghe such time as the buyer had fully recouped all of its prepayment funding, at which point that agreement terminated automatically.

The DMA was to become effective upon termination of the original Offtake Agreement and provided a distribution/marketing arrangement between MPMO and Shenghe Resources. MPMO retained the right to distribute its products directly to certain categories of customers. As compensation for its distribution and marketing services, the DMA entitled Shenghe to 35% of the net profits from the sale of Mountain Pass's Rare Earth products.

Unwinding the Panda Hug

So, in early May 2020, MPMO and Shenghe (and its various parts) into a new agreement that restructured the previous arrangements and provided for, among other things, a revised funding amount and schedule to settle Shenghe's prepayment obligations to MPMO. The revised funding amount and the payment schedule covered the remaining (unfunded) portion of the $50 million initial advance under the original Offtake Agreement and an additional $35.5 million.

Under the amended offtake agreement MPMO issued to Shenghe a warrant exercisable for 89.88 MPMO preferred units, subject to certain restrictions. Shenghe's full satisfaction of its revised prepayment funding obligations, also automatically triggered the following other events:

- the termination of the TSA
- the termination of the DMA (which, by its own terms had never become effective) and, thereby, the termination of Shenghe Resources's right to a 35% share of the net profits from the sales of Mountain Pass's Rare Earth products
- the termination of both the Shenghe Guaranty and the Shenghe Pledge Agreement

Proceeds for the modification were the existing $37.5 million prepaid advances previously classified as deferred revenue and the $35.5 million of additional cash paid by Shenghe, as well as the termination of the DMA, with a fair value of $66.6 million. The debt obligation and warrant were recognized at their fair values. $85.7 million for the debt arrangement, net of an $8.3 million discount, further discussed below, and $53.8 million for warrant. The Company determined that the modified revenue arrangement, described in Note 2—Revenue Recognition, is at market, and as such, was not allocated any proceeds as a result of the modifications.

Moving Along?

It's worth noting that those who are saying that it will be business as usual even with Shenghe off the share register have seemingly failed to note the company's relationship with Greenland Minerals

(GGG.ax) which is trundling forward its Kvanefjeld project in Greenland at the current time. The Chinese group holds 10.5% in GGG.

The companies are seemingly getting along well though this might be because no-one else was ever inspired by the problematic location and mineral mix here. In 2017/18, Greenland Minerals undertook technical work programs with Shenghe that improved the metallurgical performance, simplified the development strategy and infrastructure footprint in Greenland, with optimised Feasibility Study outcomes announced in mid-2019. Other work programs are outlined below:

- a joint technical committee oversaw metallurgical work programs in China and Australia
- test work programs, major improvements to flotation, refinery circuits resulted in improved recoveries
- ~ 40% reduction in annual operating costs and unit costs of <USD 4/kg of REO, net of by-product credits
- technical optimisation was completed, with a focus on commercial development – "Europe strategy"

Clearly Shenghe running off with GGG in the short term is not a risk to MPM. Equally we remain amongst the biggest sceptics of Kvanefjeld due to its location in Greenland (a quasi-part of the EU) and the high Uranium content of this deposit. Also the lead time to production is exceedingly long indeed in light of all the logistical and environmental hurdles to be jumped through.

Mountain Pass – Mark 3

The current management hopes that it is a case of third time lucky. So far so good, would be ore assessment but the challenges are all ahead because the sale of product to Shenghe has been little more than a glorified quarrying operation with some concentration.

Utilizing technical assistance from Shenghe and MPMO's own engineers, changes were implemented in the milling, flotation and tailings management processes. Management also implemented a new, reagent scheme that improved mineral recovery and enabled operation at lower temperatures. These changes enhanced flotation reliability, throughput, recovery and production as well as tailings facility reliability and throughput at significantly lower cost per processed ton.

The prospectus claims that the company has consistently achieved "greater than 3.1x" the production volume of Rare Earth concentrate versus Molycorp's performance using the same capital equipment. They ascribe this to Molycorp's insufficient concentrate production driving downtime throughout the facility. The new approach supposedly has produced approximately 94% up time.

The company claims that it has achieved "world-class" (not that odious term again!) production cost levels for Rare Earth concentrate. What does that mean? Cheaper than Bayan Obo? Is that even doable

considering that the environmental cost is never factored into Bayan Obo? It would be an impressive feat indeed if it were true but without actually being told what the "world-class" standard is then we cannot judge is this be true or not.

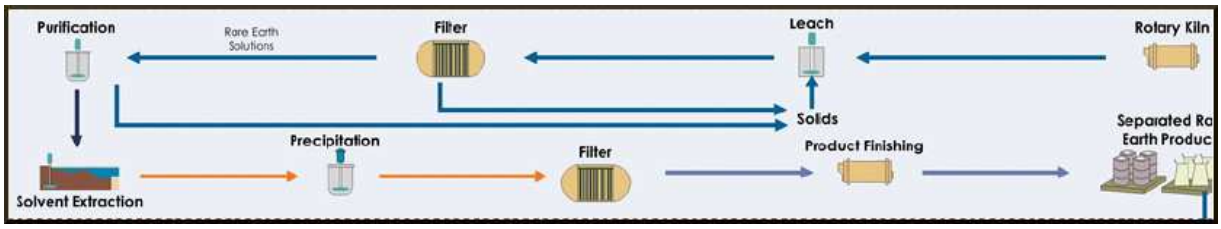
The company claims in the prospectus to have become cash flow positive, despite significant Chinese trade tariffs on ore and concentrates in place over the optimization period. These trade tariffs have recently been suspended, further enhancing the earnings power of the Stage I operations.

Stage II – The Rubber Hits the Road

The second stage II of the optimization plan is focused on advancing from concentrate production to the separation of individual REOs. This is undoubtedly the part where there can be "many a slip twixt cup and lip".

The project is in motion already with engineering, procurement, preliminary construction, and other recommissioning activities underway. Management claims that this stage involves upgrades and enhancements to the existing facility process flow to produce separated Rare Earth oxides "more reliably… at significantly lower cost"

The Stage II optimization plan includes the reintroduction a roasting circuit, reorienting the plant process flow, increasing product finishing capacity, improving wastewater management, and making other improvements to materials handling and storage.



Roasting of bastnäsite concentrate was pioneered at Mountain Pass in 1966 and continued to be practiced until 2008. Under the prior owner's operation, this practice was discontinued in order to maximize production of Cerium. The reintroduction of the oxidizing roasting circuit could allow subsequent stages of the production process to occur at lower temperatures, and with significantly lower volumes of materials and reagents, supporting lower operating and maintenance costs and higher uptime. Management expects that this will allow it to be a "low-cost producer" of NdPr (which represents a majority of the value contained in the ore).

The company argues that one of the unique attributes of bastnäsite is the ability to convert the trivalent form of Cerium in the mixed Rare Earth concentrate to tetravalent Cerium, which has a low propensity to dissolve, enabling Cerium to be separated expediently along with other insoluble gangue elements, without selective extraction.

Rightly, they claim that the removal of low-value Cerium early in the separations process allows for up to a 40% reduction in the mass of material to be separated and finished, thus significantly reducing the energy, reagents, and wastewater required to produce the higher-value NdPr.

The company claims that its Stage II optimization plan will materially increase the recovery of NdPr from concentrate, increase NdPr production and lower the cost of production, in each case, as compared to the prior owner's operations.

The currently idled natural gas-powered combined heat and power (CHP) facility includes two 15MW natural gas-fired turbines (that are each capable of producing up to 12MW at the complex's altitude and subject to weather conditions) to produce electricity and steam. Management plans to restart the CHP facility in 2021, producing low-cost electricity and steam while enhancing the reliability and redundancy of utility supplies. The investment in the CHP and required water pre-treatment asset restart is at a low-cost of ~$7mn and should generate annualized run-rate savings. When fully operational management claims that its cost of electricity will be approximately half the cost of electricity from the grid per MW consumed, not including the value of the steam produced.

The Mountain Pass site also is equipped with the aforementioned chlor-alkali facility to manufacture reagents used in Rare Earth separation and processing. Following completion of the Stage II optimization plan, management intends to bring this facility back on-line. They claim that this would further integrate operations, yield additional cost savings and supply redundancy, while enhancing the project's sustainability profile. The restart of the chlor-alkali facility is currently anticipated in 2023, subject to the timing of a capital plan, operational preparations and any permitting or other regulatory obligations. Reagents produced from the chlor-alkali facility would be used in the leach, solvent extraction, brine neutralization and finishing processes.

MPMO holds the necessary permits to operate the facility, including conditional use and minor use permits from San Bernardino County, California, and an associated environmental impact report, all of which were issued in 2004, which allow continued operation of the Mountain Pass facility through 2042. It also holds numerous other permits and approvals, including permits to operate from the Lahontan Regional Water Quality Control Board for groundwater treatment. They warn though that they may have to obtain new permits, including, air permits issued by the Mojave Desert Air Quality Management District and construction and occupancy permits issued by San Bernardino County to complete the Stage II optimization project.

Stage III – Blue Skies?

This phase is what management calls the "Downstream Expansion Opportunity". For those with longer memories this strategy used to be called "buying Magnequench, Silmet and Neo Materials". The old Molycorp thought it could buy this element of the value chain (and not reinvent the wheel) and it was not wrong in this. Silmet was certainly far from being modern, or even efficient, but it worked. Neo Materials was a very strategic chess piece indeed (in fact it was most of the non-Chinese half of the

chess board once Solvay/Rhodia-STER was out of the equation). So how, without going shopping for these businesses (which it can pick up in one fell swoop by buying Neo Performance) does it make this jump to control the "mine to magnets" without reminding investors that we have "been there, done that"?

The company claims that it wants to facilitate the "restoration of the full magnetics supply chain to the U.S.". It hopes it will then be in a position to integrate further downstream into the business of upgrading NdPr into metal alloys and magnets, ultimately expanding MP Materials' presence as a global source for Rare Earth magnetics. Hmmmm…. Noble words, indeed.

This downstream integration would be completed either via building a captive magnet production operation or investing in this capability via an acquisition, partnership or joint venture.

Home Truths on REE

The already well-documented fact is that Rare Earths aren't rare, or at least Cerium and Lanthanum, the main component of the Lanthanide Series are not rare. With the exception of the highly-unstable Promethium, Rare Earth elements are found in relatively high concentrations in the earth's crust, with Cerium being the 25th most abundant element in the earth's crust at 68 parts per million. In fact there is more Cerium in the Earth's crust than there is Copper. We would concede though that it does not appear in the same concentrations as Copper does.

The principal sources of Rare Earth elements are the minerals bastnäsite (Mountain Pass's primary mineral), xenotime (such as at Northern Minerals), monazite (much of its in mineral sands, and loparite (the Russian source of REEs) and the lateritic ion-adsorption clays (such as those of Biolantanidos). Despite their high relative abundance, Rare Earth minerals are more difficult to mine and extract than equivalent sources of transition metals (due in part to their similar chemical properties), making the Rare Earth elements relatively expensive. Their industrial use was very limited until efficient separation techniques were developed, such as ion exchange, fractional crystallization and liquid-liquid extraction during the late 1950s and early 1960s.

Once one gets beyond the basic reality check comes the more nuanced complications of REE. Chief amongst these are that:

- The real business is in the downstream processing
- Many of the new up-and-comers in the industry in the REE space have uranium and/or thorium to deal with in their mix
- Many of the projects are years away from production

This leads us then to the processing. At the moment ore is mined and concentrated at or near the mines but the biggest value-added is the processing or quasi-manufacturing phase. This is a phase which has been the downfall of all those who have struggled to reach production and for those that did not it was the eye-watering price tag on the CapEx that confounded their plans (as well as the Chinese sabotage of

the REE price post-2012).

However experience has shown that if the operators which have survived show one thing it is that mining REE ore is not the way that one can make substantial money from Rare Earths. Moreover, just mining and producing a concentrate is yet to be proven to be exceptionally profitable whereas the judges are still out as to whether Rare Earth mining will ever yield sufficient profits to justify the enthusiasm shown in 2009-12 for junior miners.

Back in the first flush of the Rare Earth boom, in the scramble to make some sort of cogent story, many of the more advanced explorers aimed to include part of the on-processing of the ores into concentrates and the elusive "value-added product" into their Feasibility Studies. Most of the budgets of that time talked of US$200mn-plus CapEx for the concentrating process, largely at the mine. Then those who wished to move on the separation saw budgets of $500mn plus with a number topping $1bn. These projections only worked, at a stretch, if Cerium and Lanthanum were at the crazy prices that reigned in 2010-11.

This leaves us wondering whether if prices go up significantly that it might be best for miners to get their mines going and sell ore to on-processors who would bear (or have borne already) the heaviest part of the capex rather than wait around trying to build all-singing, all-dancing integrated REE complexes. Our mantra in the 2009-12 period was that the race in REE would go to those first in production and the vast bulk of companies would end up as fossils in the equities markets' equivalent of the La Brea Tar Pits. How prescient that was. Just getting into production is no silver bullet though. Molycorp got there (and died in the process), while Lynas has had several near-death experiences and the flapping of vulture's wings had been heard around Northern Minerals.

Production thus must be matched with the right cost profile and a good tailwind from prices. Most scenarios for bullish Rare Earths prices have switched from being dependent on green energy (largely wind turbines) to rubbing the lucky rabbit's foot of EV's and hoping they arrive… and on time. With consumer in a virus-induced swoon the purchasing of big-ticket autos is far from the minds of most, particularly as long as oil prices remain in the dumpster.

Revenues

The *Red Herring* for the merger transaction contains some nuggets of information that management have been willing to throw to the waiting masses. Amongst these is a revenue and cash projection which makes interesting reading but leaves an analyst with as many questions as it answers.

The projections are shown in the table on the following page. The company has a December-end FY. The projections for 2020 included actual results for 1Q20, and assumed production and sales of mixed Rare Earth concentrate at approximately the same levels as during 1Q20 at the then-prevailing market price of $3,444 per metric tonne of REO (before value added tax and import duties).

The company's projections for FY21, assumes that MPMO continues to produce its Stage I product of

Rare Earth concentrate with a planned increase in REO production and sales volumes of approximately 10% YoY. The blue-sky element that management throws into the mix is an assumption that, due to tightening supply and demand for NdPr and Rare Earth concentrate primarily driven by expected growth in demand for magnets for electric vehicles, market prices were estimated at approximately $4,700 per metric tonne of REO (before value added tax and import duties). This reflects management's expectation of Rare Earth concentrate pricing supported by an estimated Chinese domestic NdPr oxide price of $50 per kg.

MPM Revenues

US$ mns	2020 e	2021 e	2022 e	2023 e
Revenue	102	171	349	415
Adjusted EBITDA	29	82	172	252
CapEx	35	149	10	42
Free cash flow	-36	-96	102	138
Cash Balance	512	367	429	566

This posits ~36% uplift in the price of their REE basket on the back of a EV rebound, in the midst of the Covid-induced crisis, with US uptake of EVs being still flaccid, to say the least. This is the point where we see disappointment coming down the track like an express train at full pelt. Have anyone's expectations of 36% uplift in REE prices ever been satisfied?

The other unanswered question here is how shifting from selling to Shenghe to selling to an amorphous new client base can be achieved at the same time as a volume AND a price uplift?

When we get to the projections for 2022, we note that management assumes completion of the Stage II optimization and a change to production and sales of separated Rare Earth oxides in place of Rare Earth concentrate. This is where performance risk is added to price risk and Mountain Pass has not fared well on that combo in the last decade.

NdPr production/sales have been estimated at 6,075 metric tonnes and other REO production and sales were estimated at approximately 15,000 metric tonnes. Realized pricing for NdPr was assumed to be $52.34/kg, reflecting a Chinese domestic price of $65/kg and two-thirds of NdPr sales subject to Chinese value added tax and tariffs, while other REO prices were assumed to be $1.99/kg.

Does this imply that two thirds of the company's NdPr sales will be to China? Some interesting questions will be raised by this factoid if the company is still the recipient of DoD grants by this stage.

Finally, the projections for 2023 assumed flat year-over-year production and sales volumes, but an

improvement in realized NdPr and other REO prices to $63.18/kg (reflecting a $70/kg Chinese domestic price and one-third of sales subject to Chinese tariff and value added tax) and $2.02/kg, respectively.

This is the "lay back and enjoy the sunshine" stage in the project's evolution. This needs not only the sun/shade to be at the right angle, but also a fair number of planets to align.

Our Projections

On the following page can be seen our estimates for earnings going forward. The area where we differ most dramatically from the company's projections is that we do not subscribe to their irrationally exuberant Rare Earth price projections.

MPM Financials

US$ mns

	FY18	1H19	2H19	FY19	1H20	FY20e	FY21e	FY22e
Revenues	67.418	25.447	47.964	73.411	51.11	102.00	123.00	274.00
Operating costs	76.302	36.589	44.442	81.031	43.09	87.00	105.00	183.00
Operating Result	-8.884	-11.142	3.522	-7.62	8.017	15.0	18.00	91.00
Shenghe settlement					66.62	66.62		
Interest expense	5.42	1.846	1.566	3.412	1.87	-2.00	-5.60	-4.30
Other expense (Income)	-0.839	-2.385	-1.893	-4.278	-0.237	-1.40	-3.00	-2.80
	-13.465	-10.603	3.849	-6.754	-60.23	-48.215	26.60	98.10
Income tax expense	0.001	0.001	0.00	0.001	0.34	0.84	3.30	8.40
	-13.466	-10.604	3.849	-6.755	-60.57	-49.06	23.30	89.70
Fully Diluted						147.331	147.331	147.331
EPS						-0.33	0.16	0.61
REO Sales (in tonnes)	13,378	8,408	18,413	26,821	18,618	37,000		
Realised price REO per tonne	$3,382	$2,998	~$2600	$2,793	$2,848	$2,800	$2,900	

That being said we still foresee a rise in volume sales in FY21 and a gradual transformation of the mix from cons to oxides and from sales into China to sales to other parties outside China. Whether this will be a smooth transition without price disputes or fallow sales periods cannot be guaranteed. If these occur (or not), when and their impact remains an unknown to us.

The difference in the bottom line between us and management is quite dramatic and in FY22, in particular, is rather breathtaking. Compounding higher volumes with ritzy price expectations can do that for projections. We know few amongst those scarred by 2009-12 who would posit the types of price rises that management have suggested here.

The Revolution Will be Delayed

The prospectus notes that none of the financial projections assumed implementation of MPMO's Stage

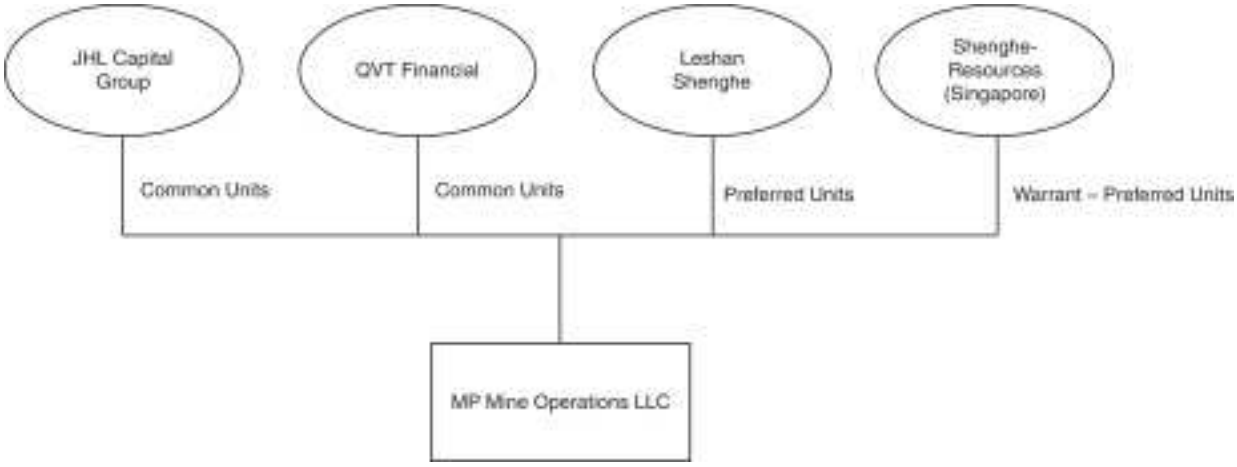
III downstream expansion strategy into the production of Rare Earth metal alloys and finished magnets.

However, achievement of Stage III, despite our scepticism on its doability (short of buying Neo Performance) is pretty much a *sine qua non* of becoming liberated from China-dependency for both the US economy AND for MPM. To achieve the latter the US EV market will have to grow massively and displace China as the taker of MPM's NdPr output. If oil prices stay in their current price range and with the major US automakers pulling their punches on EV adoption, we do not see an EV "revolution" until the second half of the decade (at best). US consumers seem content to sit on their hands regarding any decision to "go electric" and straightened economic circumstances only reinforce this sentiment.

Ownership Structure – Before & After

The business combination brings together the SPAC, with Secure Natural Resources (SNR) and MPMO. Essentially the assets of SNR and MPMO will be sold into FVAC thus recombining the mineral rights with the mining/processing assets.

The current structure of MPMO is shown in the diagram below:



The Chicago asset management firm, JHL Capital Group Holdings One LLC, currently holds:

- approximately 72.6% of the interests in SNR
- approximately 60% of the interests, on a fully diluted basis, in MPMO

and will thus receive, respectively, shares in MPMC Class A of:

- approximately 14.5 million shares
- approximately 43.1 million shares

and a contingent right to receive shares of MPMC Class A common stock as Earn-out consideration (to be discussed in following section).

JHL Capital was owed approximately $4.6mn (principal and accrued interest) under the MPMO Unsecured Note and approximately $10.7mn (principal and accrued interest) under the MPMO Secured Note, both of which will be fully repaid by the combined company at the closing of the merger.

Saratoga Park Ltd., QVT Family Office Onshore LP, Fourth Avenue FF Opportunities LP – Series E (QVT Holders) collectively currently hold:

- approximately 16.2% of the interests in SNR
- approximately 23.3%, on a fully diluted basis, of the interests in MPMO

and will thus receive, respectively, shares in MPMC Class A of:

- approximately 3.2 million shares of common stock
- approximately 16.8 million shares of MPMC Class A common stock

and a contingent right to receive shares of MPMC Class A common stock as Earn-out consideration.

The Earn-out Shares

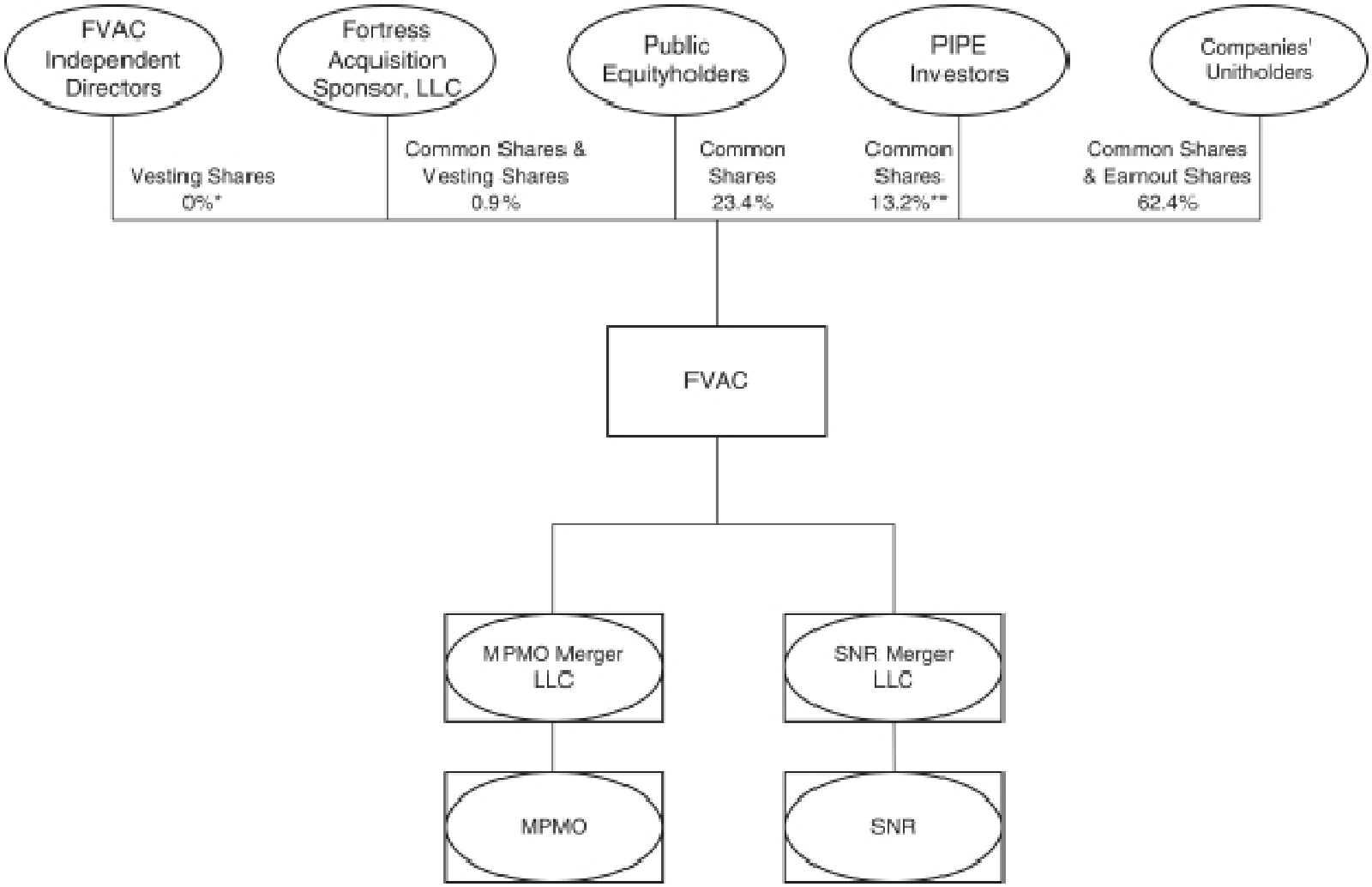
There is also a class of securities to be issued called Earn-out Shares. The holders of MPMO HoldCo preferred stock, MPMO HoldCo common stock and SNR HoldCo common stock immediately prior to the closing of the RTO will have the right to receive Earn-out Shares if, after the closing of the RTO and on or before the tenth anniversary thereof, the VWAP of MPMC Class A common stock exceeds certain thresholds.

Some 6,430,000 Earn-out Shares will be issued if the VWAP of MPMC Class A common stock exceeds $18.00 for any twenty trading days within any thirty trading day period.

A further 6,430,000 Earn-out Shares will be issued if the VWAP of MPMC Class A common stock exceeds $20.00 for any twenty trading days within any thirty trading day period. The price targets and the number of Earn-out Shares issued shall be adjusted for any stock dividend, subdivision, reclassification, recapitalization, split, combination or exchange of shares, or any similar event affecting MPMC Class A common stock.

It would not actually take much of a move from the recent highs in the price to have triggered the first Earn-out payment. The retreat to $12 has lessened the chance of this in the short-term.

The chart on the following page shows the (fully diluted) capital structure once all the transaction is completed.


FVAC Independent Directors
Fortress Acquisition Sponsor, LLC
Public Equityholders
PIPE Investors
Companies' Unitholders
Vesting Shares 0%*
Common Shares & Vesting Shares 0.9%
Common Shares 23.4%
Common Shares 13.2%**
Common Shares & Earnout Shares 62.4%
FVAC
MPMO Merger LLC
SNR Merger LLC
MPMO
SNR

Risks

All one needs is a history book, or rather some old equity research on Molycorp to know the potential pitfalls that may await an investor in this venture. We trust that some lessons have been learnt and in some ways, the whole Rare Earth industry finds itself in a different world with some constants from before, but also quite a few things have changed. However it is worth enumerating some of the risks that may be faced:

- An extended period of weakness in Rare Earth prices
- Financing difficulties for expansion into downstream
- Cost over-runs on processing build-out/reactivation
- The metal flow is still controlled largely by China and instead of being a partner Shenghe could very well be converted to a competitor
- Failure of demand to match rising production (i.e. build it and no-one comes)
- Excessive number of competing projects could crowd the scene and investors attention in the event that REE prices turn up
- A more HREE deposit in the US comes to fruition

Rare Earth prices are not likely to go down, but there is no guarantee that they are going to go up any time soon. The Chinese have learnt their lesson from 2009-11 and that lesson is that the best way to maintain control and discipline market players is by aggressive predatory pricing. Even now there is talk swirling of the Chinese pondering ramping down (!) LREE prices. The ~36% uplift in prices that MPM is factoring in for 2021 looks optimistic indeed.

As for financing, the company goes into its Stage II buildout (post-merger) with a fairly well-padded capital situation with around $525mn in cash on hand . If (the big “if”) it manages to keep within budget it should be able to meet its foreseeable needs. Stage III though is another kettle of fish and an imponderable.

When reminiscing on the downfall of Molycorp, some part of its fate can be linked to tumbling Rare Earth prices (but the prices of 2009-12 were never based on reality anyway) and the other half of the blame can be apportioned to cost overruns and technical SNAFUs related to Project Phoenix, which turned out to be a flightless bird indeed. Allusions have been made to reactivating the downstream plant and adding value to the ore from Mountain Pass. MPM are arguing they are going to revive much of Molycorp's old kit but NOT have the same problems.... like second marriages this sounds like the triumph of hope over experience!

Shenghe and the Chinese have been “inside the tent” for the last few years and thus MP has not been

subject to the well-rehearsed Chinese practice of predatory pricing.

On the demand side, if MPM can get into the separation business it will have a guaranteed market in the US for its Lanthanum output, but likely be producing more Cerium than would be required by US users. Its Nd/Pr would find buyers in-country, or outside, but ultimately we would see it limited in supplying a rip-roaring EV boom with magnet metals, should such a ferocious beast come into existence. The likes of Elon Musk would have us believe that he is working furiously to displace REEs from EVs. But then again his credibility is a busted flush in our circles.

Finally, there is the issue of competing projects. Only Bear Lodge carries any weight with us in the US space, with the other lightweights (pardon the pun, yet again) likely to blow away like tumbleweeds. The Canadian projects have a few contenders to be real, but most of the promoters there remind us of Mark Twain's definition of miners, except they don't even have a hole to stand at the top of. Projects farther away (and we don't mean Greenland or Angola) stand some prospect (particularly if located on the territory of US allies, i.e. Australia) of being seen as being "as good as onshore".

Conclusion

The RTO of MP Materials onto the NYSE raises the issue if Molycorp Mark 1 (pun intended) was Project Phoenix... is MPM then Re-Phoenix? Or maybe is this *déjà vu* all over again?

On a more serious note, we have been here before and it was not pretty. Enough time has gone by for many to have forgotten what occurred the first time. The investment bank most closely associated with the first reincarnation is not evident this time around maybe for fear of stirring up old memories. Another investment bank redolent of the past, that is mentioned as an advisor in the latest prospectus, had a role in underwriting Molycorp debt and then pulled the rug (after years of Buy notes) by publishing a Sell note only when it appeared that MCP's gig was up. Wash and repeat!

Certainly doing the deal as an RTO into a SPAC removes "tombstone risk" of having names that generate unfavorable memories figuring again.

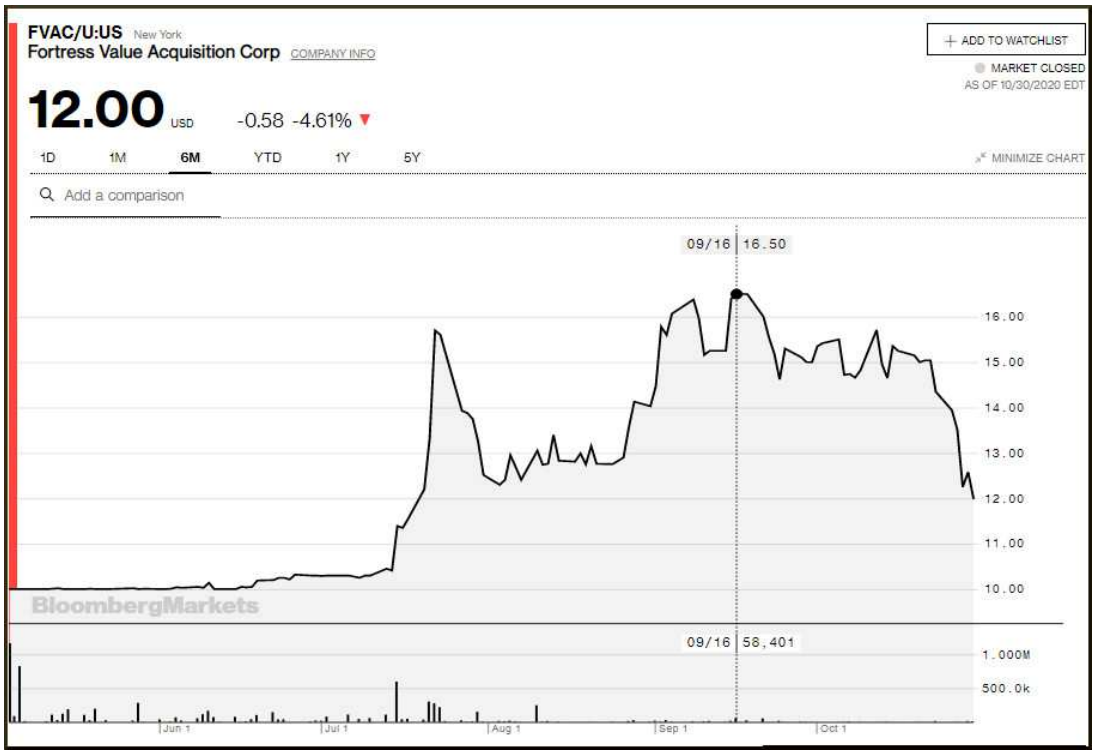
The big issues here are whether the wholesale shift from having Shenghe as sole client (to getting down and dirty in the global REE market) is doable and then there is the issue of whether the value-added will be just that or a massive hole in the finances (as it was for Molycorp). The company says it can do both. Easier said than done, is our response to that. The shortcomings of Mountain Pass from the REE-mix point of view have not gone away and we have heard of no great innovation that obviates this, while converting Shenghe from fellow traveler to competitor also sounds somewhat fraught.

On the political front the *annus horribilis* of President Trump may be shortly drawing to a close and with it the future stretches in front of the critical metals sector with the scorched earth (or not) of a Democratic regime with its traditional Sinosycophancy. This might spell thin pickings for those touting resource-independence.

Some might say we have a jaundiced view of Mountain Pass, to which we would respond that it has history stacked against it. The current project, even with the mooted later phases, cannot change the basic mineralogy from being heavily weighted to the LREE segment. In that alone it does not solve the supply gaps that the DoD would seek to plug. In 2017, the United States imported more than 17,000 tons of Rare Earth compounds, of which 10,000 tons of Lanthanum compounds and 3,600 tons of Cerium compounds were from China. The perspective for import replacement is good with MP well positioned in these, albeit low-priced, REEs. While we are less bullish on the ten-year outlook for EVs in the US than elsewhere (Europe and East Asia) there will be rising demand for magnet metals from that corner of the industrial world and, if it's technological ducks get in a row, then Mountain Pass's NdPr could supply the demand for the middle of this decade. As to providing for much expanded NdPr demand, we can see limitations. It will need to acquire another REE mine, somewhere.

Beyond its own activities we might note that we only find Bear Lodge as a credible entrant to the Rare Earth space and even that is ten years behind where MPM have advanced to. The rest of the US pretenders to be producers are exactly that. Next….

With a pro-forma market cap of US$1.7bn or more, the company really does need to rub the REE pricing lamp furiously and hope the pricing *genie* it longs for pops forth. Rare Earth prices have had a tendency to disappoint in recent times. It is the ritzy REE price rise projections that underpin the bottom line projections (which presumably) underpin the valuation. Therefore we now rate MP Materials as a **Neutral** position with a 12-month target price of USD$12.50.



Important disclosures

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