RFC Ambrian

# Mineral Sands

## Taking Root

October 2012

## Contents



*All prices in this document are as of 4 October 2012*

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## Executive Summary

Long-term price outlook remains strong

In the decade leading up to 2010 it seems that at one time or another each commodity had its 'moment in the sun'. However, Mineral Sand commodities, namely Ilmenite, Leucoxene, Rutile (also known as Titanium Dioxide minerals) and Zircon were relatively flat during that period. Since 2010 this sector has seen significant appreciation in pricing and, based on demand and supply dynamics, the long-term price outlook remains strong.

Delay in price increase because Mineral Sands are used in the manufacturing of 'luxury goods'

The reason why Mineral Sand commodities were slower than the majority of other commodities to see prices appreciate was, in our opinion, related to their end use. Mineral Sands are predominantly used in household goods items, such as ceramics, paints, tiles, plastics and inks. As developing countries continue to transform and the wealth of the individuals in those countries has increased, so has their demand for household goods, and we see no reason why this trend will not continue in the future. You build a house before you paint it!

Another important development for the industry was that, prior to 2010, most Titanium Dioxide mineral production was subject to long-term 'cap and collar' contracts, which held prices at a very low level. Since 2010 very few of these agreements were renewed due to the buoyant nature of the market.

In the past six months, however, there has been a notable shift in market sentiment (and a significant fall in the majority of Mineral Sand companies' share prices). This sentiment was largely driven by comments from Iluka, the major global Mineral Sands producer, in its June quarterly report.

Whilst we acknowledge that most of Iluka's points were valid, we believe that they are only short-term issues as we take the view that prices will still remain at record highs in comparison to the long-term historical price for many years to come. Going forward, prices are likely to remain in a solid trading band rather than continuing to spike (as has been seen over the past couple of years).

Our top pick in the Mineral Sands space is Base Resources

Given the positive price outlook for the next few years, we would recommend investing in producers or near-term producers, particularly those producing a significant proportion of high-value Zircon or Rutile, to take full advantage of anticipated high profit margins. With this in mind, **our top pick in the Mineral Sands space is Base Resources**.

Base's Kwale Project is ranked as the number one project on a 2015 forecast revenue to cash costs basis

Base is currently fully financed to production in 2013. The company plans to utilise a low-risk, uncomplicated, high-margin dry mining technique and is, in our view, extremely undervalued by the market as it successfully navigates through the 'low newsflow' construction phase. The project is extremely robust under scenario analysis, close to infrastructure, and produces a significant proportion of high-value Rutile. Base's Kwale Project is ranked as the number one project on 2015 forecast revenue to cash costs.

## Mineral Sands Market Analysis

Mineral Sand commodities, namely Ilmenite, Leucoxene, Rutile (also known as Titanium Dioxide minerals) and Zircon were relatively flat over the last decade. Since 2010 this sector has seen significant appreciation in pricing and, based on demand and supply dynamics, the long-term price outlook remains strong.

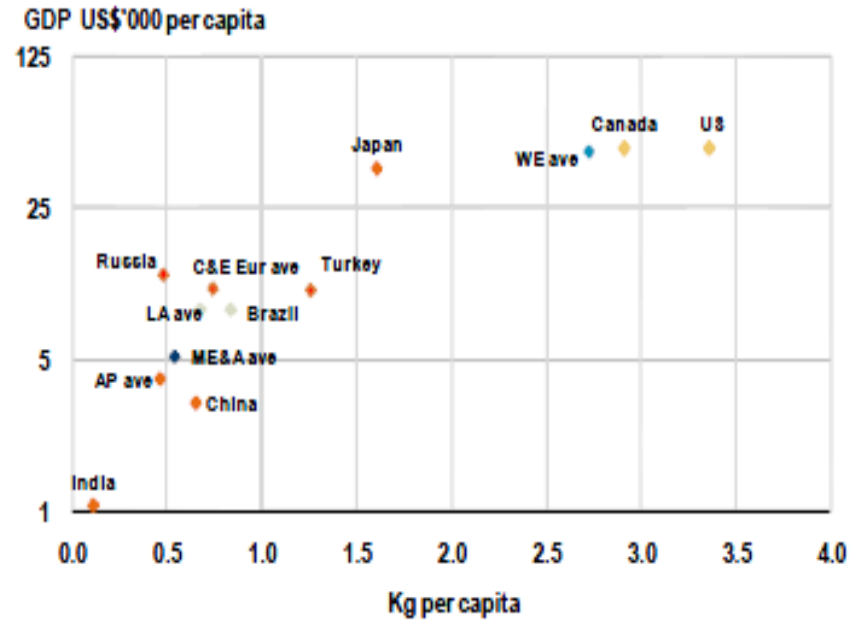
Delay in price increase because Mineral Sands are used in the manufacturing of decorations/finishings

Mineral Sands are predominantly used in household goods items, such as ceramics, paints, tiles, plastics and inks. Demand for these is generally delayed behind the more basic trappings of the modern world. However, as developing countries continue to transform and the wealth of the individuals in those countries increases, so does demand for household goods, and we see no reason why this trend will not continue in the future.

Another important development for the industry was that, prior to 2010, most Titanium Dioxide mineral production was subject to long-term 'cap and collar' contracts, which held prices at a very low level. Since 2010 very few of these agreements were renewed due to the buoyant nature of the market.

A strong indication of the potential for further demand in the Mineral Sand sector is given in the graph below, which shows the GDP per capita of a number of developed and developing countries vs. per kg consumption of Titanium Dioxide minerals. This graph shows the strong correlation between the wealth (GDP) of a nation and its consumption of Titanium Dioxide. Whilst we don't expect this to be matched in the short term as these countries are still developing, over time we do expect the developing countries, especially China and (in the longer term) India, to move closer to the developed nations and increase their Titanium Dioxide consumption.

**GDP per Capita vs. per kg Consumption of Titanium Dioxide**




Source: TZMI

## Mineral Sand prices to continue to rise

In the past six months there has been a notable shift in market sentiment (and a significant fall in the majority of Mineral Sand companies' share prices). This was largely driven by comments from Iluka, the major global Mineral Sands producer, in its June quarterly report. The key points highlighted by Iluka were:

- **Slowdown in China** — In China there has been an absence of direct policy adjustments to boost the property sector — with the attendant implications for property construction, completions and sales — and this has been compounded by a high finished ceramics inventory level in-country. These factors have led to a continuation of subdued customer confidence levels beyond that expected earlier in the year, albeit that China's Zircon demand saw the strongest regional recovery in the second quarter.
- **Eurozone weakness** — Europe saw continuing (and more pronounced) economic weakness and policy uncertainty in 2Q12. This has particularly affected the main ceramics export markets for Spain and Italy.
- **Arab Spring** — Turkey and Egypt, both within the top 10 global tile manufacturers, have been affected by the 'Arab Spring'; this has flowed through to continued fragile business confidence levels. From recent discussions with customers, this is forestalling expected bulk re-ordering patterns, including inventory replenishment, into 2H12 despite low Zircon sand inventories.
- **Stronger US dollar** — This has been especially significant in India (the world's third largest tile producer), where the rupee has weakened by 15% since March, making Zircon sand imports (and other tile making raw materials) significantly more expensive.

Whilst we acknowledge that most of these points are valid, we believe that they are only short-term issues as we think that prices will still remain at record highs in comparison to the long-term historical price. Going forward, prices are likely to remain in a solid trading band rather than continuing to spike (as has been seen over the past couple of years).

The main reasons for our optimism include:

- **Underinvestment** in the exploration for and the development of new Mineral Sand projects due to a history of poor financial returns.
- **Limited near-term supply** and depletion of lower-cost mines.
- **Long lead time for the development of new projects** makes it hard to respond quickly to increased demand with increased supply.
- **The lack of viable substitutes** for Zircon and Titanium Dioxide in most key end-user applications and the low proportion these raw materials represent in the total finished product manufacturing cost (eg, Zircon represents just 5% of tile production costs).
- **These products cannot be recycled.** Unlike steel and other commodities, pigment is hard to recycle.
- **Supply side discipline**, where the major suppliers (which dominate the market), in particular Iluka Resources, have clearly indicated and demonstrated a willingness to adjust production to match demand variations rather than drop prices.

For the above reasons, we believe Mineral Sand prices should continue to remain strong for the next few years before the supply side begins to catch up and prices begin to fall back (to levels still above the historical average). Any decrease will not be rapid, but gradual.

The best way to take advantage of this sector is exposure to either Zircon or Rutile companies with near-term production

We believe the best way to take advantage of this sector is exposure to those Mineral Sand companies either in production or commencing production within the next few years, particularly those that have a significant amount of revenue generated from either Zircon or Rutile, as these are the most profitable minerals.

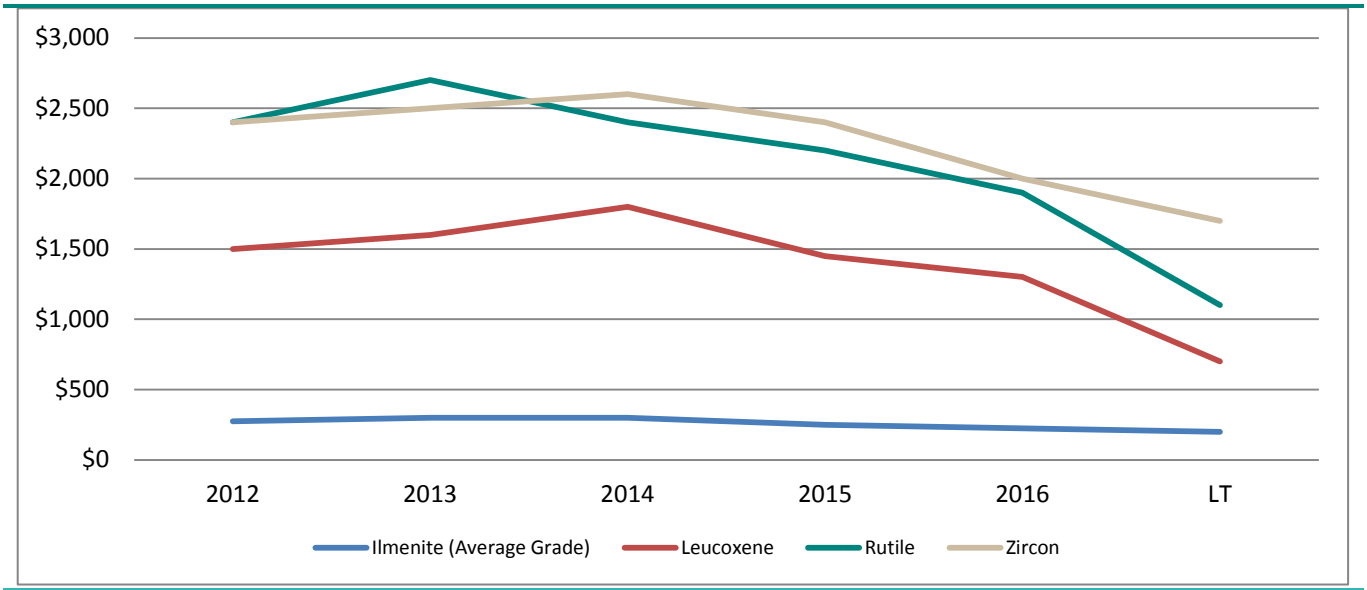
In the table below we highlight RFC Ambrian's forecast pricing for Ilmenite, Leucoxene, Rutile and Zircon, which we have based on a consensus view of the market's expectations.

**Pricing Assumptions (US$/t)**

| Commodity | 2012 | 2013 | 2014 | 2015 | 2016 | LT |
|---|---|---|---|---|---|---|
| Ilmenite (Average Grade) | 275 | 300 | 300 | 250 | 225 | 200 |
| Leucoxene | 1,500 | 1,600 | 1,800 | 1,450 | 1,300 | 700 |
| Rutile | 2,400 | 2,700 | 2,400 | 2,200 | 1,900 | 1,100 |
| Zircon | 2,400 | 2,500 | 2,600 | 2,400 | 2,000 | 1,700 |

Source: RFC Ambrian

**Forecast Price Assumptions**




Source: RFC Ambrian

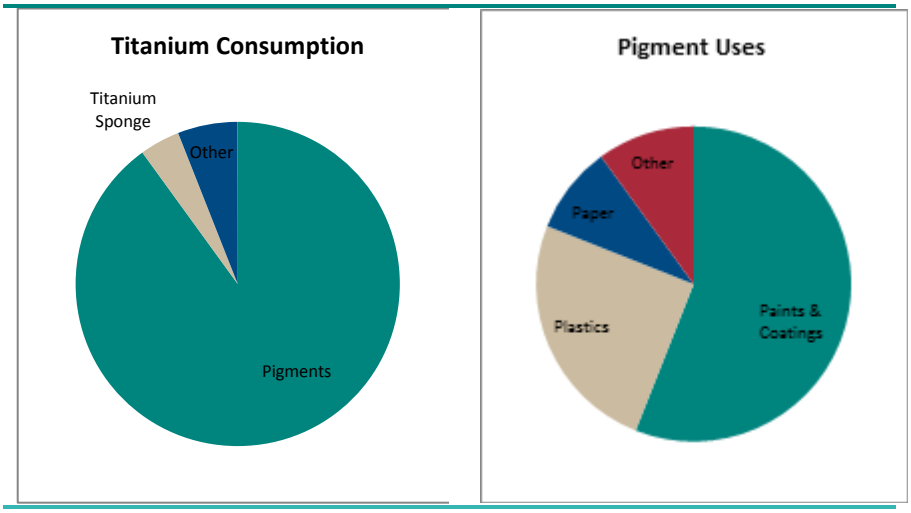
As the chart shows, our modelled Rutile, Leucoxene and Zircon prices look set to maintain elevated pricing to 2015 and then decline by 50% beyond 2017. These prices are (deliberately) somewhat conservative; we would generally expect pricing to be higher over the long term. Our modelled Ilmenite price shows significantly less volatility.

## Titanium Dioxide

The main use of Titanium Dioxide is for the production of white pigments that are used in paints, paper and plastic production

Titanium Dioxide products of Ilmenite, Rutile and Leucoxene are used principally as feedstocks for the production of white pigment and titanium metals, used in aerospace and other specialised industries. The diagram below illustrates the main uses of Titanium Dioxide products as well as their approximate consumption as at 2010.

### $TiO_2$ Consumption




Source: Mineral Deposits

Clearly, the largest consumption of Titanium Dioxide is from the pigment industry, which accounts for over 90% of production. This is used in the manufacturing of paints, plastics and paper. The reason why Titanium Dioxide materials are used in this way is because they have a high refractive index and are non-toxic.

Titanium Dioxide products are commonly used for the production of decorative and finishing goods

A high refractive index means that it is able to scatter and bend light strongly. When enough Titanium Dioxide pigment is used in a medium, almost all visible light will be reflected, giving the appearance of it being opaque, white and bright.

Titanium Dioxide can also absorb ultraviolet (UV) light, efficiently transforming destructive UV light energy into heat. When added to materials such as paints and plastics, it prevents UV degradation, including fading, peeling and cracking. It is also used in this way for sunscreens, cosmetics and skin care products to protect skin from UV damage.

Historically, the main consumers of Titanium Dioxide products were from the developed economies in Northern America and Europe, largely because Titanium Dioxide is used in luxury items. Whilst this demand is expected to slow, we believe significant growth will come from emerging markets such as China; as the size of the middle class and the wealth of individuals grows, so should the demand for Titanium Dioxide products.

Ilmenite is processed at mine to produce two products of differing grade and quality: Sulphate Ilmenite and Chloride Ilmenite. In general, lower-grade Ilmenite feedstock is usually sourced from hard rock deposits, while higher-grade Ilmenite is more commonly sourced from alluvial deposits (old rivers or beaches). The key constituents of each are outlined below.

### Sulphate Ilmenite

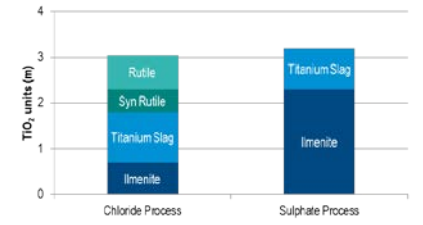
- Used in a sulphate pigment plant (sulphuric acid is used to separate the iron from the $TiO_2$).
- The traditional feedstock used in a smelter to produce chloride slag (85% $TiO_2$) that is used as a feedstock for chloride pigment or titanium sponge production (along with other high-grade feedstocks, such as Rutile and Synthetic Rutile UGS).

### Chloride Ilmenite

- Chloride refers to the chlorine gas that is used to separate iron from the $TiO_2$.
- Used by DuPont (and some metal producers) to produce $TiCl_4$ (and then pigment by DuPont) directly, but only for those that can dispose of the large quantities of iron chloride waste.
- Can be converted into Synthetic Rutile.
- Can be smelted into a higher-grade slag.
- Typically higher in U+Th than Sulphate Ilmenite (the U+Th tends to be associated with the weathered Ilmenite), and therefore tends to produce high U+Th slag/SR unless some further processing is performed (SREP for SR/or a leach for slag).

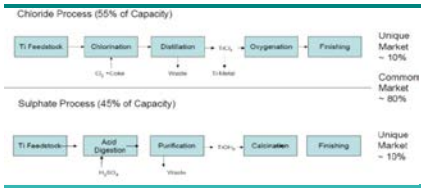
For the long term, analyst consensus sees a $TiO_2$ deficit developing in 2013/14. Pigment demand correlates well with global GDP growth, which currently sits at around 3% pa, so we expect some further growth in pigment supply in line with this growth. However, we remain slightly wary on oversupply in the Sulphate Ilmenite sector from 2015 as rock Ilmenite is produced as a by-product of Chinese domestic iron ore production.

## Feedstock Consumption by Process



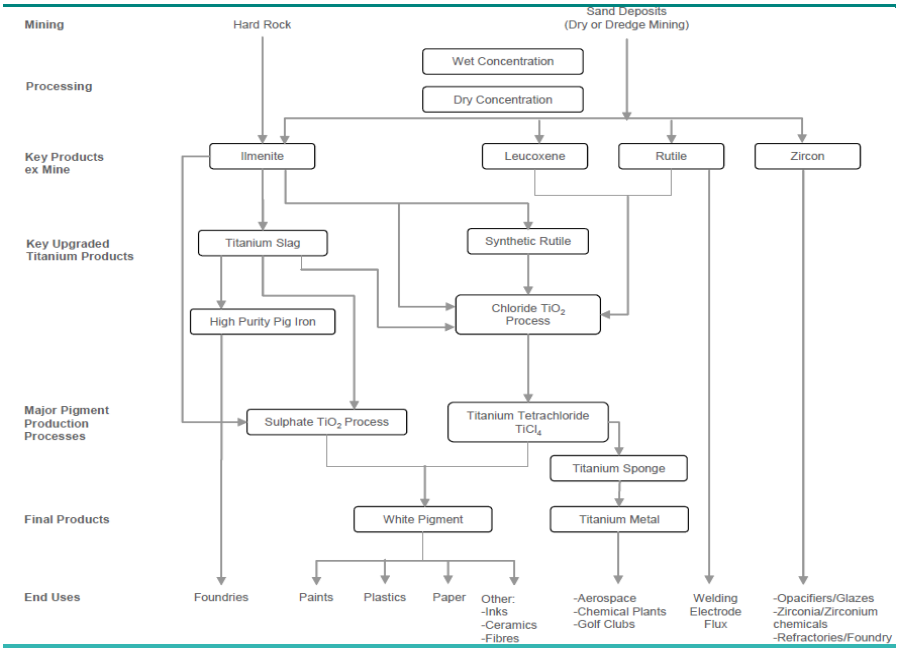

Source: Mineral Deposits Limited

## Chloride/Sulphate Process & Common Markets




Source: Iluka

## Titanium Feedstock Production Process




Source: Iluka

# Zircon

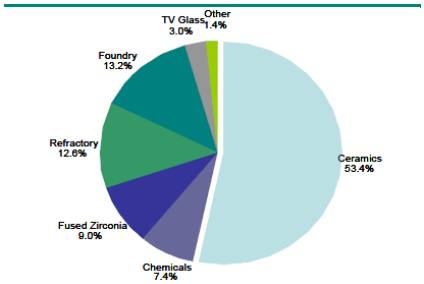
The main use of Zircon is for the enhancement of surface finishes in ceramics production

Zircon has a range of end-uses, the largest of which are in ceramics (about 53% of global consumption). The diagram below to the left illustrates the main uses of Zircon products and their approximate consumption.

The largest end-use of Zircon is as an opacifier in the manufacturing of ceramic products, including tiles, sanitary-ware and table-ware. A rapidly growing sector for the use of Zircon is the production of Zirconia, zirconium-based chemicals and zirconium metal. These compounds exhibit many different properties, making them suitable for diverse industrial and chemical applications, including nuclear power station fuel rods and rustproofing. The other main end-use markets for Zircon include refractories, foundries and CRT glass (television glass).

Due to its high melting point (2200°C) and corrosion resistance, Zircon is used as a foundry sand in moulds and as a milled 'flour', particularly in higher-temperature applications where maintaining the quality of the surface of the casting is important. The specialised area known as 'investment casting' is a growing application for Zircon in this industry.

**Traditional Zircon Consumption by Use**

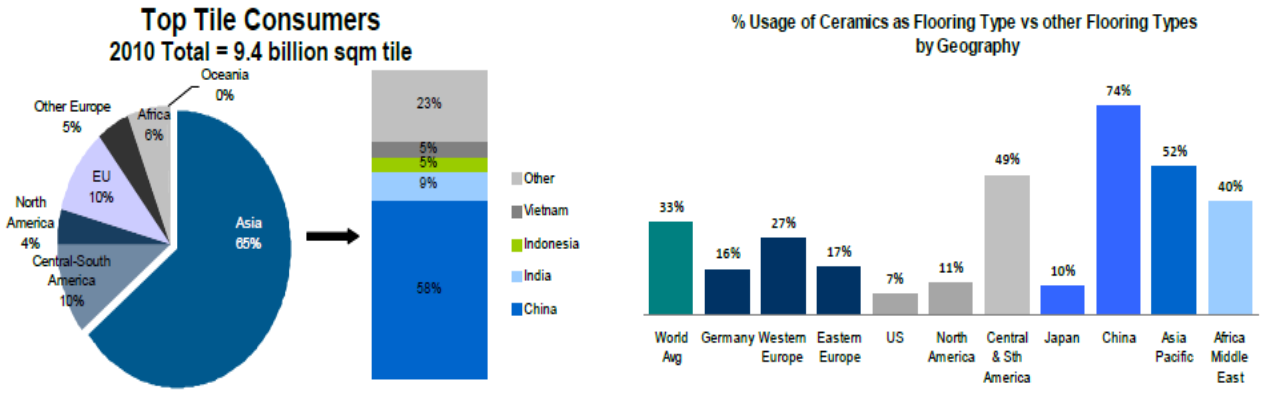



Source: TZMI, Iluka

Main potential consumer is China, with growing demand from other developing economies

While Europe is a major destination for Zircon, there are many potential customers in Asia — particularly in China — for Zircon products (namely tiles), and much of the future demand growth for Zircon is forecast to come from here. The diagram below illustrates the demand for tiles currently in China and the likelihood that this demand will continue to grow in the future; this is a strong indication that demand and — therefore — pricing for Zircon should remain strong.

**Developing Economies Higher Use of Tiles**



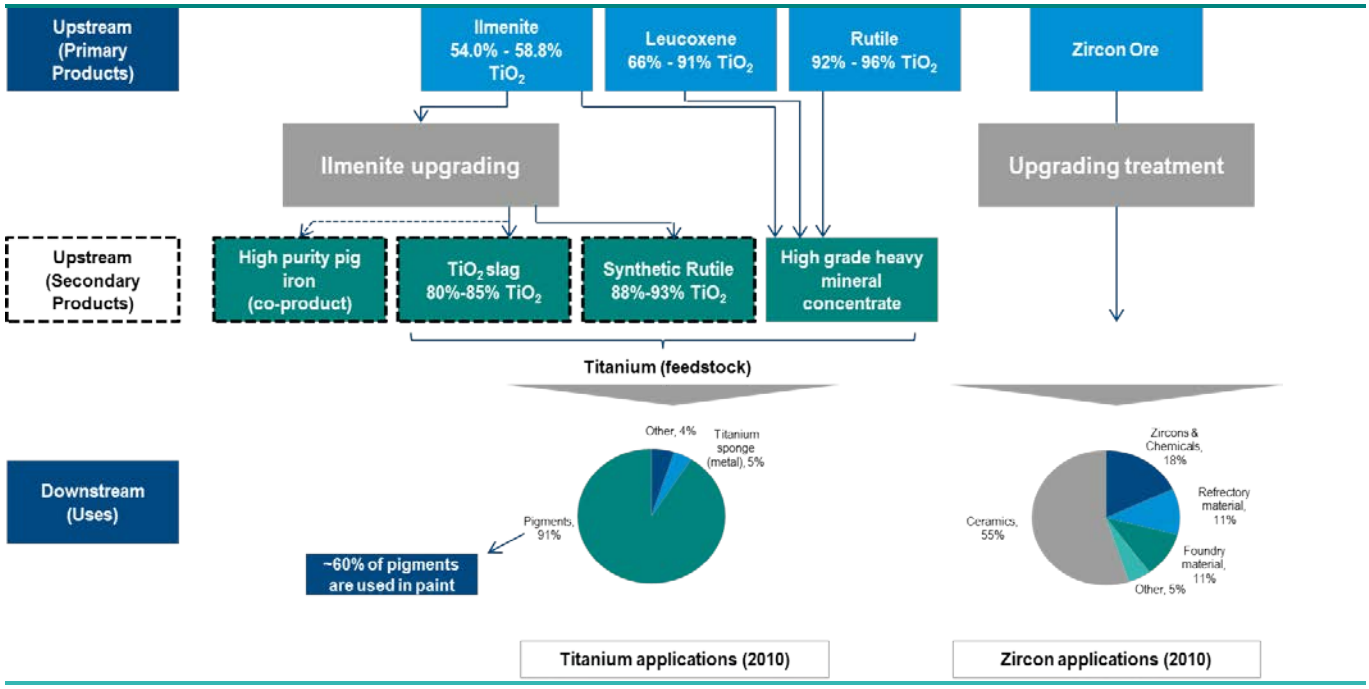

Source: Iluka, Madison, IMF, Ceramic World Review

# Minerals Sands Industry — A High Level Overview

## The Product Development Chain

A high level overview of the Mineral Sands industry is captured in the flow chart below. The upstream production of titanium feedstock sands/rock from mines generates products of Ilmenite, Leucoxene and Rutile. Zircon is also produced, although this product is utilised in a different market — largely in ceramics where over 55% of Zircon is consumed. When of sufficiently high-grade, Ilmenite can be used directly as feedstock in the $TiO_2$ pigment manufacturing process. Alternatively, it can be upgraded to feedstock quality through reduction in rotary kilns to manufacture synthetic rutile, or reductive melting in furnaces to produce $TiO_2$ slag. The feedstock sands/rocks, synthetic rutile and the $TiO_2$ slags can be used in pigment production (90% by use) or titanium metal manufacturing (10% by use). Of the pigment produced, over 60% is used to make paint.

### Mineral Sands Product Development Chain/Uses




Source: Mineral Deposits Limited, Iluka, RFC Ambrian

## Market Participants

Below we show the size of both the titanium and Zircon markets globally. Over 57% of titanium feedstocks are produced by five key players, and over 70% of Zircon is produced by four corporates. Regional supply is dominated by Australia and South Africa, with Zircon demand largely from China (41%). Titanium feedstocks are dominated by western producers in the Americas and Europe (53% combined).

### Supply & Demand

| | Titanium Feedstocks | Zircon |
|---|---|---|
| Market Size | Volume = 6.9m $TiO_2$ units<br>Value = US$7.9 billion | Volume = 1.4 Mt<br>Value = US$3.5 billion |
| Major Producers | RIO Tinto[1] 26%<br>Iluka 10%<br>Tronox 10%<br>Kronos 6%<br>Kenmare 5% | Iluka 37%<br>Tronox 15%<br>RIO Tinto[1] 14%<br>China 14%<br>Cristal 4% |
| Supply by Region | Australia 20%<br>South Africa 18%<br>China 12%<br>Canada 13%<br>India 9% | Australia 44%<br>South Africa 26%<br>China 12%<br>USA 6%<br>Mozambique 3% |
| Demand by Region | Europe 28%<br>Americas 25%<br>China 22%<br>Asia-Pac ex China 18% | China 41%<br>Europe 23%<br>Asis-Pac ex China 18%<br>Americas 13% |

Source: Mineral Deposits Limited

## Paint Producers are the Majority End Consumers

Below we detail the key players in the titanium feedstock sands/rock, pigment and paint industries. We view those downstream participants (paint producers) without vertical integration (ie, not having a secure supply of feedstocks) as more vulnerable, and hence the groups likely to consider consolidation or merging with upstream producers. Of the titanium pigment producers, Tronox, Du Pont, Cristal and Kronos own upstream operations with secure feedstock supplies from their existing mines.

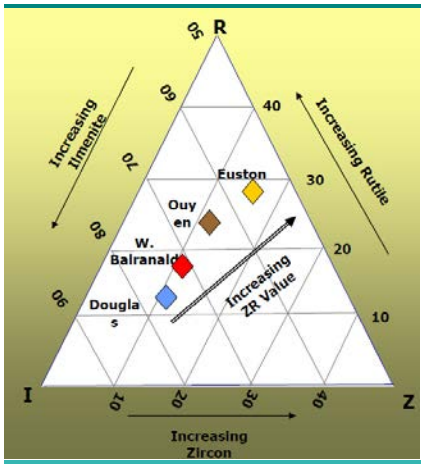
### Market Participants

| Titanium Feedstock | | $TiO_2$ Pigment | | Paint | |
|---|---|---|---|---|---|
| Major Producers | Market Share | Major Producers | Market Share | Major Producers | Market Share |
| Rio Tinto[1] | 26% | DuPont | 19% | AkzoNobel | 28% |
| Iluka | 10% | Cristal | 13% | PPG | 21% |
| Tronox | 10% | Huntsman | 9% | DuPont | 8% |
| Kronos | 6% | Kronos | 9% | Sherwin-Williams | 7% |
| Kenmare | 5% | Tronox | 6% | BASF | 7% |
| Ostchem | 5% | Sachtleben | 4% | Valspar | 7% |

Source: Mineral Deposits Limited

## Consolidation in the Mineral Sands Sector

### Mineral Assemblage vs. Value




Source: Iluka

The Mineral Sands sector is relatively 'tight', with few small-to-mid-sized developers and producers. It is quite likely that larger producers, such as Rio Tinto, Tronox and Iluka, could be looking to acquire additional producing and developing assets. These assets would be chosen on their relative weighting in a particular mineral that would complement the acquirer's own overall product weighting.

The sector has recently seen some corporate activity, including: Rio Tinto's recent acquisition of the remaining 37% stake of Richards Bay Minerals from BHPB for A$1.8bn, MDL's purchase of a 16% stake in Word Titanium Resources, Tronox's acquisition of Exxaro and Pala Investments acquired a 55% shareholding in Sierra Rutile after failing to complete a takeover.

In the recent past the sector has seen a number of M&A transactions, including Iluka's takeover of Basin Resources, Crystal's purchase of Capel Sands and Exxaro's takeover of Ticor Ltd. We see no reason why there cannot be further consolidation in the sector. In our view, World Titanium Resources is going to struggle to secure traditional funding for its Toliara Project due to perceived risk in Madagascar. As a consequence, there are clear synergies between a cashed-up producer/developer and WTR's quality end product. Mineral Deposits Limited owns 16% of WTR and we believe WTR's product would be well received at MDL's Norwegian smelter.

# Mineral Sands Overview

The term 'Mineral Sands' refers to concentrations of Heavy Minerals (HM) in an alluvial environment. There are nine minerals that are classified as Heavy Minerals, but the majority of these have little commercial value. The more valuable HM (VHM) include Ilmenite, Leucoxene and Rutile (also known as Titanium Dioxide minerals) and Zircon.

### Heavy Minerals Summary

| Mineral | Chemical Formula | Magnetic Separation | Specific Gravity | Appearance | End use |
|---|---|---|---|---|---|
| Ilmenite | $Fe.TiO_3$ | High | 4.5 | Black/dark grey opaque grains | White Pigments (paints, plastic paper) |
| Leucoxene | $Fe.TiO_3.TiO_2$ | Medium | 3.8 | Dull brown amorphous grains | Titanium Steel (aerospace, golf clubs) |
| Rutile | $TiO_2$ | Low | 4.2 | Reddish/translucent grains | Welding electrode, Flux agents |
| Zircon | $ZrSiO_4$ | Low | 4.7 | Clear/white transparent grains | Opacifiers/Glazes, Refractories, Zirconium, Metal Abrasives |

Source: Industry sources

## Geology

Minerals Sand deposits can be found throughout the world, and are generally found close to the coast line. Mineral Sand deposits have high specific gravity (greater than 2.85t/m³) and tend to lag or concentrate during storms when lighter components are carried offshore or along shore by strong littoral drift. HM accumulation occurs during periods of fair weather beach building, and it is this HM that provides the basis for the thicker HM strandlines formed during major storm events. Repeated storm erosion and reworking may also progressively enrich a Mineral Sand deposit. Simplistically, these deposits are just placer deposits that reflect the preferential concentration of minerals due to density.

The HM within a Mineral Sand deposit is eroded from a hardrock source. Once eroded into sediment the HM are transported to beach systems in a volume that exceeds the rate of removal from the trap site.

Mineral Sand orebodies generally fall into two categories based on the mode of deposition:

- Alluvial (formed by water) or
- Aeolian (formed by wind).

Alluvial deposits are further split into marine beach placers (or strandlines) and lacustrine HM accumulations. Aeolian deposits are generally closely associated with marine beach placers, having been formed by the erosion, transport and deposition of HM from adjacent marine beach placers by prevailing winds.

The size and grade of Mineral Sand deposits can also vary considerably. Marine placers are typically 100-200m wide, 5-15m thick and 2-20km long, and HM grades can vary from small percentages to 90%. Some marine placers comprise strandlines that are deposited in close proximity to each other and, as such, can form accumulated deposits up to 1km across strike.

Aeolian sand dune deposits close to the shore tend to be larger, more irregular in dimension and lower-grade.

**Trial Mining in Test Pit (2004)**

Source: Gunson Resources

## Mining

There are two different mining techniques that can be used in a Mineral Sands operation:

- Dry Mining or
- Wet Mining.

The deciding factor for the most appropriate mining method depends on the geography, geology, feed grade and tonnage being processed, the water table and the ground conditions. Dry mining is more accurate, so it is preferred on higher-grade and discontinuous orebodies. Wet mining is generally employed at larger tonnage orebodies, where the deposit is below the water table and the ground is not too consolidated (free flowing sands are best). Wet mining is also generally at a lower operating cost in comparison to dry mining; however, it is usually at a higher initial capital cost.

Below we highlight the most common techniques used in both wet and dry mining as well as some of the major requirements/conditions for each methodology.

### Wet Mining — Dredging

The most obvious key requirement for a dredging operation is sufficient water supply. The most preferable conditions for this would be for the deposit to be below the water table. Also, due to dredge pond requirements, the process is best suited to broad continuous orebodies and, as such, is more commonly used on dunal Mineral Sand deposits.

Dredging generally involves the dredge cutting the ore at the base of the ore face, allowing the mineral-bearing sands to collapse into an artificial freshwater dredge pond (which can be up to 1km in length). The mineral-bearing sand is then pumped by the dredges to the Wet Concentrate Plant (WCP), which floats in the dredge pond.

The method is generally the lowest cost in the Mineral Sands industry, but there is a higher risk as it is a less selective process (ie, higher dilution and lower grade for WCP) when compared to other mining techniques. Wet mining is especially susceptible to unexpected clay bands that can clog up the dredges.

Operations where dredging takes place include Kenmare's Namalope operation in Mozambique and Mineral Deposits' proposed Grande Côte Mineral Sands Project in Senegal.

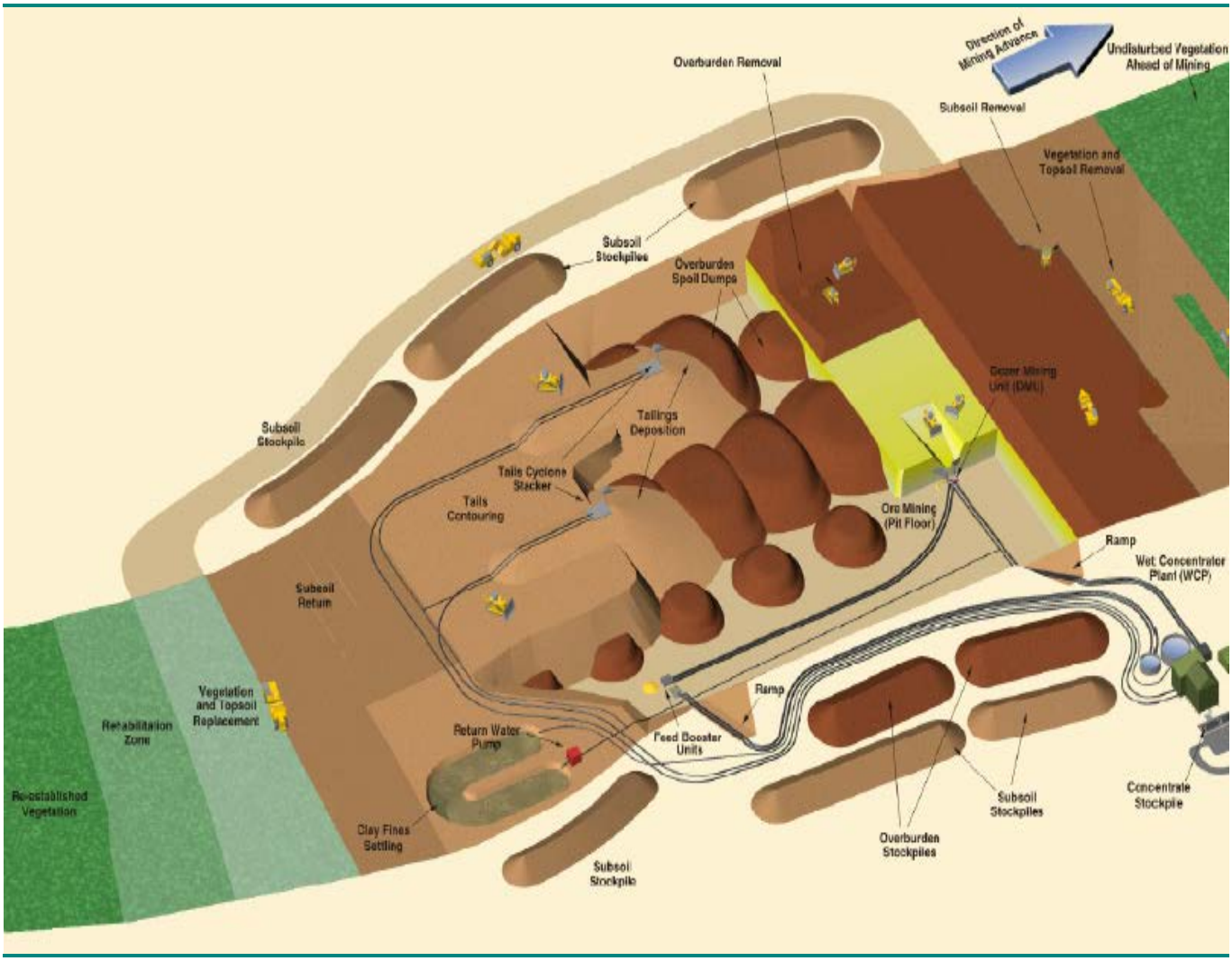
### Dry Mining — Dozer Trap Mining

Dozer Trap Mining is a simple, cost-effective method of mining that simplistically involves trucks (or scrapers) pushing the ore into traps (or bins) where the ore is then mixed with water and pumped to a WCP.

The ore is mined from the top of the face to the bottom and across the face to ensure a feed blend to the concentrator that is consistent in HM grade and sand and clay composition. A consistent mix ensures that processing through the primary screening circuits is maximised. If a deposit is too high in clay, the scrubbing circuit will bog down and become inefficient, and if too low the increased friction results in the problematic pumping of feed through the circuit.

This method is best suited to free-flowing and friable ore (ore that a dozer can push without drill & blast) as well as needing a continuous orebody. The diagram below illustrates a typical Dozer Trap Mining flow sheet.

### Typical Sequence of Mining Activities at a Dozer Trap Mining Operation




Source: Gunson Resources

The main benefits of the Dozer Trap Mining method, apart from the lower capital cost, are that it improves the flexibility of the operation, lowers the technical risk and increases the utilisation of the plant and the average feed-grade. Operations where Dozer Trap Mining is employed include Iluka's high-grade Jacinth Ambrosia operation in Australia. This method is proposed to be employed at Base Resources' Kwale Project in Kenya and Gunson Resources' Coburn Project in Australia.

## Processing

Most Mineral Sand projects use a conventional processing technique, with a Wet Concentrator Plant and a Mineral Separation Plant

The processing of all Minerals Sands is a conventional technique that involves both a Wet Concentrator Plant (WCP) and a Mineral Separation Plant (MSP). Further details of each process are given below.

**Spiral Concentrator**

Source: Proactive Investors

**Wet Concentrator Plant (WCP)**

A typical WCP consists of three modules: a Surge Bin, Spiral Plant and Thickener.

Typically ore will be received at the WCP via slurry pipelines. Slurried ore will be pumped to the surge bin, where water will be added to the bin to control the density of slurry pumped to the spiral plant.

The spiral plant will separate the Heavy Minerals (HM) from the waste sand using various stages of spiral concentrators to achieve a HM concentrate grade. The slurry from the surge bin is distributed to the top of each primary stage spiral concentrator, from where it will flow by gravity down the spiral sluice.

The spirals cause high specific gravity minerals to flow to the centre of the spiral, where they are removed as a concentrate. Materials with lower specific gravities, such as quartz, are forced to the outside of the spiral where they are removed as tailings.

Concentrate from each stage of the spirals will be further concentrated with each stage, producing a higher concentrate grade. The concentrate will be stockpiled for trucking to the MSP.

The thickener module does not affect the concentrate produced and is used to remove the fine clay minerals before being pumped to the tailings, as well as to reclaim water for the plant.

HM recoveries in the WCP are typically very high (+90%), other than for fine (slimes) sized mineral grains, which are either lost to tailings or require further processing to recover. The content of valuable HM in the HM concentrates is also typically high (+90%), but can be adversely affected by the presence of certain waste HM minerals such as garnet and monazite (which can also adversely affect final product qualities).

**Mineral Separation Plant (MSP)**

A typical MSP involves both wet and dry separation sections. A typical wet section involves passing the HM concentrate from the WCP through an up-current classifier. This will remove material as underflow (between 65-75% on average), which will then be stockpiled to pass through the specific mineral separation circuits.

The overflow material is then passed through a spiral concentrator (as discussed in the WCP) to remove lower specific gravity material (or non-economic materials) from the Valuable Heavy Minerals (VHM). The non-economic material is then trucked or pumped to the tailings whilst the VHM from the spiral joins the underflow VHM. This material is then stockpiled before passing through the specific mineral separation circuits.

The specific mineral separation circuits can vary significantly from operation to operation, depending on the grade of the product delivered from the WCP as well as the requirement of (and specifications of) the off-take requirement. Generally, specific mineral separation circuits include a combination of magnetic, electrostatic and gravity separation units.

Each product is processed to meet customer specifications and shipped to the customer.

## Clays and Deleterious Elements

Dredge mining requires relatively consistent geology as discontinuous bands and unexpected clay horizons can cause problems. Thick unexpected clay bands can block the dredges (as happened for Kenmare at its Moma mine). Clay bands can also become indurated (hardened), which will have obvious consequences for dredges that cannot mine around these bands. A small amount of clay is beneficial as it helps seal the base of the pond and maintains water levels required for dredging. Dry mining allows for selective mining around inconsistent geology.

High clay in a dredging operation will cause the pond water's suspended solids and viscosity to increase, which can affect spiral HM recovery at the concentrator. Clay in a dry mining scenario will be rejected during the scrubbing and screening process at the head of the WCP; however, hydrophobic clays will tend to ball and collect mineral in the scrubbing circuit, thus prematurely removing HM from the circuit when rejected as oversize.

A consistent sand/clay mix will ensure that processing through the primary screening circuits is maximised. If a deposit is too high in clay the scrubbing circuit will bog down and become inefficient, and if too low the increased friction results in problematic pumping of feed through the circuit.

The processing of Minerals Sands is primarily a non-chemical process, hence the intrinsic quality of the HM determines the saleability and recovery of each product. Deleterious elements in Mineral Sand operations include thorium and uranium. These elements are difficult to remove through beneficiation and consequently end up in the saleable product. The radioactive nature of these products will result in radioactive ceramics or paints, which is clearly not an ideal outcome. We have detailed the contaminants for each product in more detail below.

- **Premium or standard Zircon** — Al, Ti, U, Th, Fe.
- **Rutile specification** — Zr, Sn, Fe U+Th determine market options.
- **Ilmenite** — Intrinsic contaminants affect potential market options (chloride, sulphate or SR conversion). Iron is the key to the process throughput and, hence, the major unit cost driver (coal and reagents). Al and Si affect the degree of sintering, while Mn and Mg determines maximum Fe removal,
- **Slag products for $TiO_2$ pigment production** — The required feedstock quality ($TiO_2$ content and impurity level of individual oxides) depends on the pigment manufacturing process: chloride process or sulphate process. Due to the different processing routes, the chemical specifications differ for the two products. These impurity levels are all determined by their respective contents in the Ilmenite feedstock. The level of these impurities in the final slag product can be influenced by the quality of reductant, as well as the Ilmenite feedstock. In both processes, low U and Th content is necessary. Specific to each process:
    - *Chloride pigment production* — The product must be low in CaO and MgO. The level of $SiO_2$ and $Al_2O_3$ are also important for chloride pigment production.
    - *Sulphate pigment production* — Chrome causes problems for slag product marketability as it stains the pigment product yellow rather than the desired white colour (only as part of the sulphate process). In general, grades less than 0.1% $Cr_2O_3$ are required.

# Locations' Political Summary

## Australia

The mining sector and the mining services industries together represent ~20% of Australian GDP and have been the main source of economic growth over its recent history. The fiscal regime for the Australian mining sector has historically been stable. However, a series of changes on the 'watch' of the current government has upset that landscape due to the introduction of the Mineral Resources Rent Tax (a tax on 'super' profits) and the Carbon Tax, with the most recent change being the increase in mining royalties for coal miners in Queensland.

The total population was 20m in 2011, with GDP per capita of US$60,642, making it the seventh richest country per head. The last general election was held in August 2010. Elected terms are three years and the next elections are to be called by 30 November 2013.

## Kenya

Kenya gained independence from colonial rule in 1963, and until the early 1990s it was one of the most politically and economically stable African countries. Its economic demise led the IMF to suspend its promised programme of loans. More recently, a controversial election in 2007 was followed by the 'Kenyan Crisis', ending five years of strong economic growth. The political, economic and humanitarian crisis was started because the previous President, Mwai Kibaki, allegedly rigged the election to stay in power. The crisis peaked in early 2008 with violent protests that led to a power sharing agreement being negotiated with the opposition leader. As the president has remained jointly in power, smaller scale protests have continued, most recently in Somalian-provoked violence in the east. Presidential and parliamentary elections will be held in March 2013. These will be the first elections held under the new constitution.

Kenya has seen very limited mining activity in its recent history, with only Goldplats currently producing and a small number of developers and explorers, namely Base, Pacific Wildcat, Vaaldium and Kansai Mining. The total population was 42m in 2011, with GDP per capita of US$808.

## Madagascar

Since 2002 the 'I Love Madagascar' Party under President Ravalomanana has worked closely with the IMF and the World Bank to reform the economy, despite the president being rather unpopular. Since 2009 the country has been in something of a political crisis, which led to President Ravalomanana finally handing in his resignation to the army in spring 2012. Power was taken by his rival Andry Rajoelina (who's television channel he shut down in 2008). A track record still needs to be established.

There are two operational chromite mines operated by the Republic of Madagascar on the island, along with Pan African, Sherritt and Tantalus, who are exploring/developing. The population of Madagascar is currently doubling every 22 years; in 2011 it was 21m, with GDP per capita of US$467. Madagascar is the eleventh poorest country in Africa. Presidential and parliamentary elections are due in May/July 2013.

## Mozambique

Independence was gained from the Portuguese in 1975, which led to economic ruin as Portuguese nationals returned to Europe. This led to a civil war that stretched to 1992. Democratic elections were held in 1994, when the ruling FRELIMO party under Joaquim Chissano won, and again in 1999 and 2004 under a new president.

Mozambique has an established mining industry, with BHP, Baobab, Pathfinder and Vale with planned operations, and Tata, Noventa and Beacon Hill all currently producing. The total population was 23m in 2011, with GDP per capita of US$535. The elected term is five years, with the last presidential election held in 2009.

## Senegal

Senegal was formed from the Mali Federation following a breakaway in 1960. The country has had three peaceful transitions of power since independence, with the most recent president, Macky Sall, taking over this year.

Given the track record of peaceful elections since independence and that the new president is able to serve a seven-year term, we do not expect any forthcoming political uncertainty; however, we are aware that the current mining code is under review. We believe that the 10% free carry that has been implemented will not be increased, but the right to buy a further 25% 'based on independent valuation' remains a risk. The total population was 13m in 2011, with GDP per capita of US$1,119.

## Sierra Leone

The country gained independence from the UK in 1961. Following a stable start, the second prime minister's term was cut short by a series of coups in 1967. In 1968 Siaka Stevens won power, which he held until 1991 when civil war broke out amidst a ruined economy.

Since 2002 the country has seen stable growth, with a number of mining companies exploring and operating in the country, namely: Cluff Gold, African Minerals and London Mining. The total population in 2011 was 6m, with GDP per capita of US$374. Sierra Leone is the eighth poorest country in Africa. Presidential elections are due in November 2012.

# Companies

The nine companies featured in this report represent our global Mineral Sands universe. This report contains four initiations and two corporate clients. Three of the companies are developers, three are producers and one is an explorer. Please note the companies in the *Ones to Watch* section are not initiations and consequently do not have a valuation or recommendation. The pricing in this report is for 4 October 2012.

## Scenario Analysis

As part of our analysis of the companies we have modelled on an NPV basis, we have examined the effects on these companies under 'bullish' and 'bearish' scenarios. The purpose of this analysis is to determine which companies have the greatest upside and downside to their current valuations and to highlight reasons for this and trends that appear with valuations. Our scenario analysis assumptions are shown in the table below.

### Scenario Analysis Assumptions

| Assumptions | Pricing | Costs (%) | Capital (%) |
|---|---|---|---|
| Base Case | RFC Ambrian forecast | 0% | 0% |
| Bullish Case | 10% | -10% | -10% |
| Bearish Case | -10% | 10% | 10% |

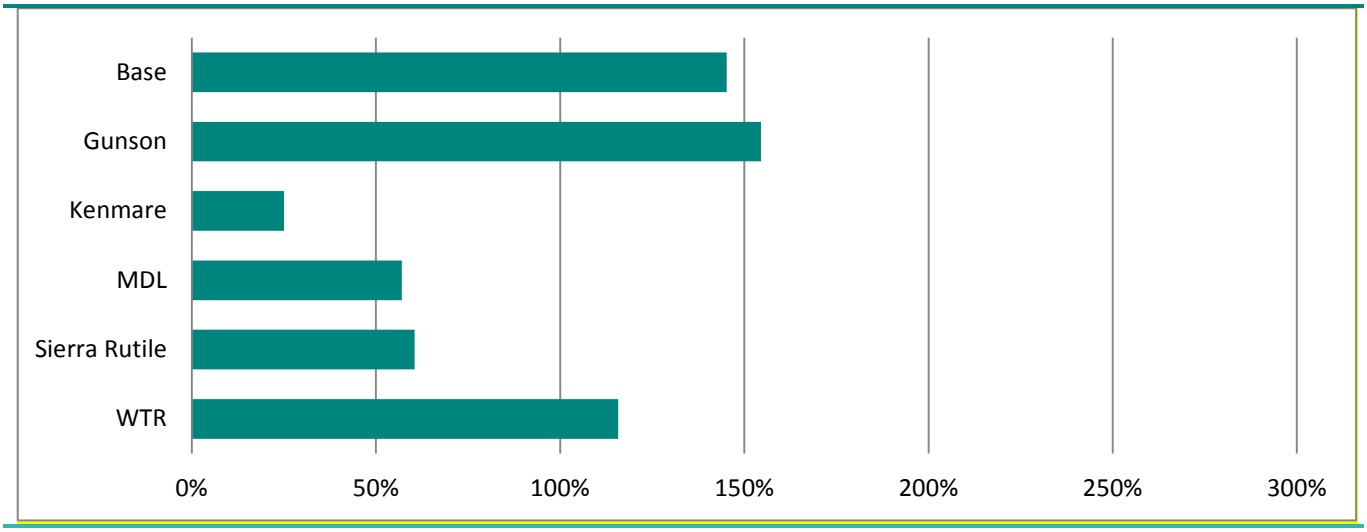
Source: RFC Ambrian

In our bullish case we assume a 10% price increase across the four major Mineral Sands commodities coincident with a 10% fall in costs and capex. Our bearish scenario assumes a 10% fall across the four major Mineral Sands commodities' price forecasts coincident with a 10% rise in costs and capex, while the base case scenario represents our modelled pricing, costs and resulting target price.

**Base Case**

In our base case scenario the greatest upside on an NPV basis is generally within developers; investors appear to be discounting these developers rather heavily based on perceived construction and financing risk. Whilst we agree there is risk with WTR and Gunson Resources (although Gunson potentially removed a significant portion of financing risk through the investment of POSCO), we would argue that there should be minimal risk discount applied by the market to Base Resources given that it is well advanced through construction and the financing risk is relatively limited.

### Base Case Analysis



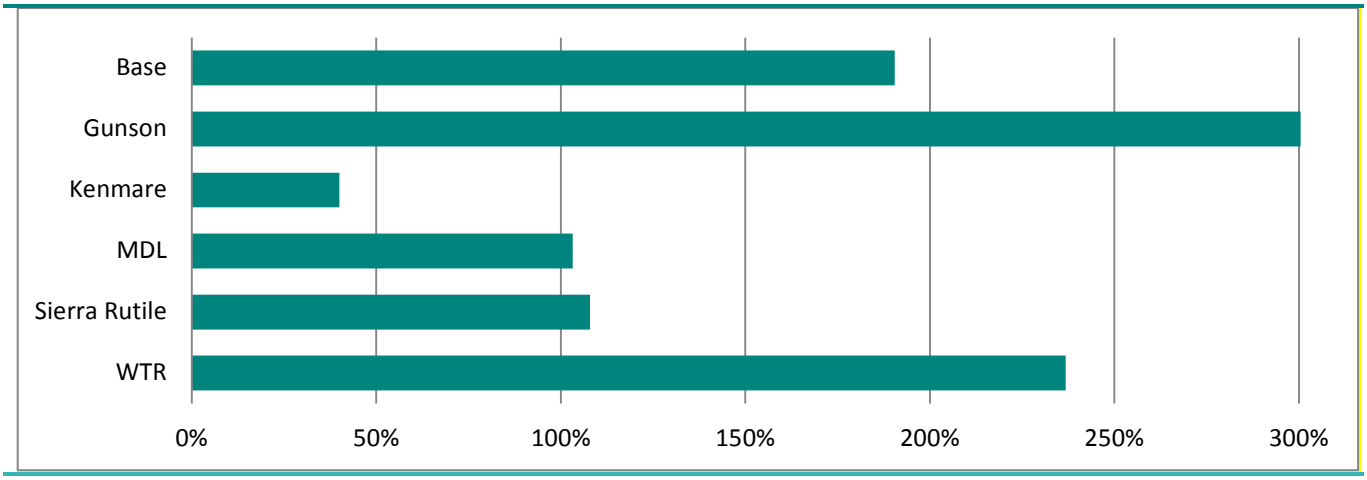

Source: RFC Ambrian

### Bullish

High-cost producers are better leveraged to our bullish scenario

The same development companies that had the largest percentage return from the base case also show the best return in the bullish case scenario. However, higher cost operators, such as Gunson, look to show better potential under a bullish scenario as they clearly stand to benefit most from higher prices and lower costs. Given our higher forecast Zircon prices, along with Gunson's expected commencement of production, this bodes well for the company.

**Bullish Scenario**



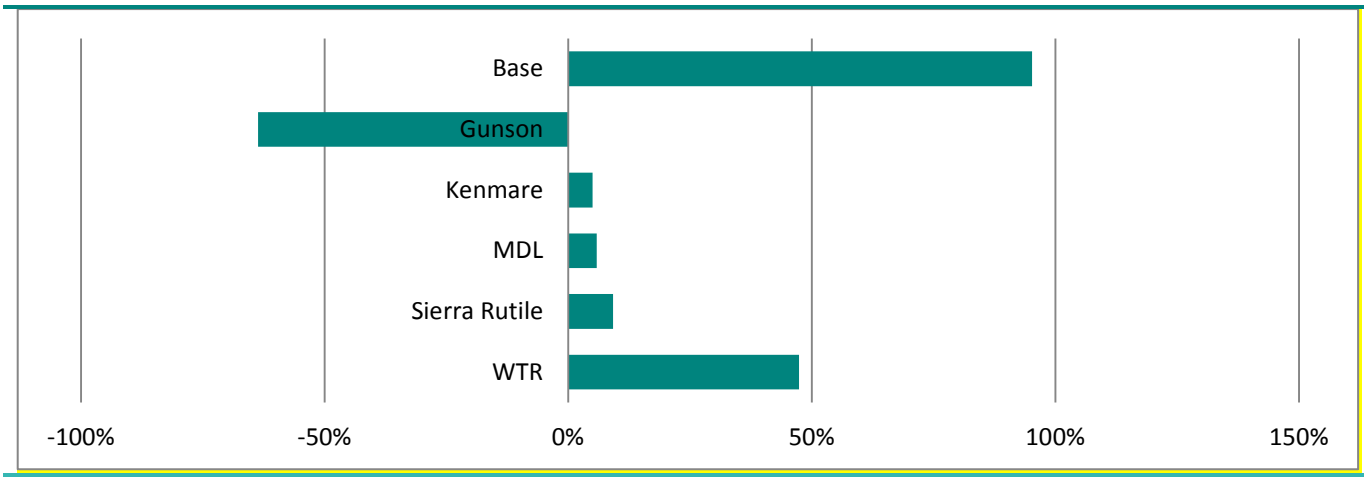

Source: RFC Ambrian

### Bearish

High-cost producers will cease production in our bearish scenario

In the downside scenario, Base and, to a lesser extent, WTR show robust valuations. This is probably due to the fact that they are expected to be relatively low-cost producers. Base in particular has a low capex project at Kwale. Current producers and a high-cost developer look to struggle under our bearish scenario, with the possibility that they would have to shut down operations under an extended bearish scenario.

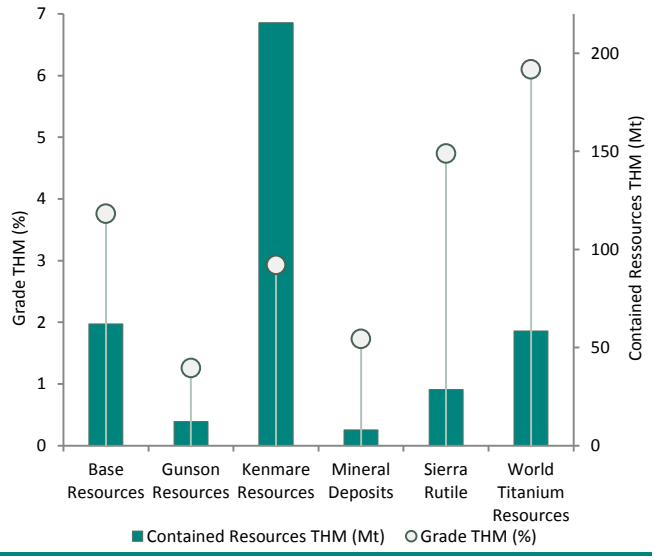
**Bearish Scenario**




Source: RFC Ambrian

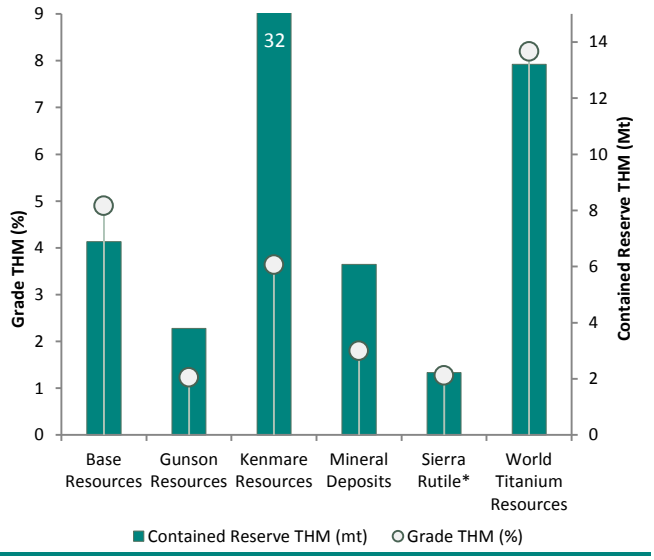
# Peer Comparisons

## Resources Contained THM & THM Grade



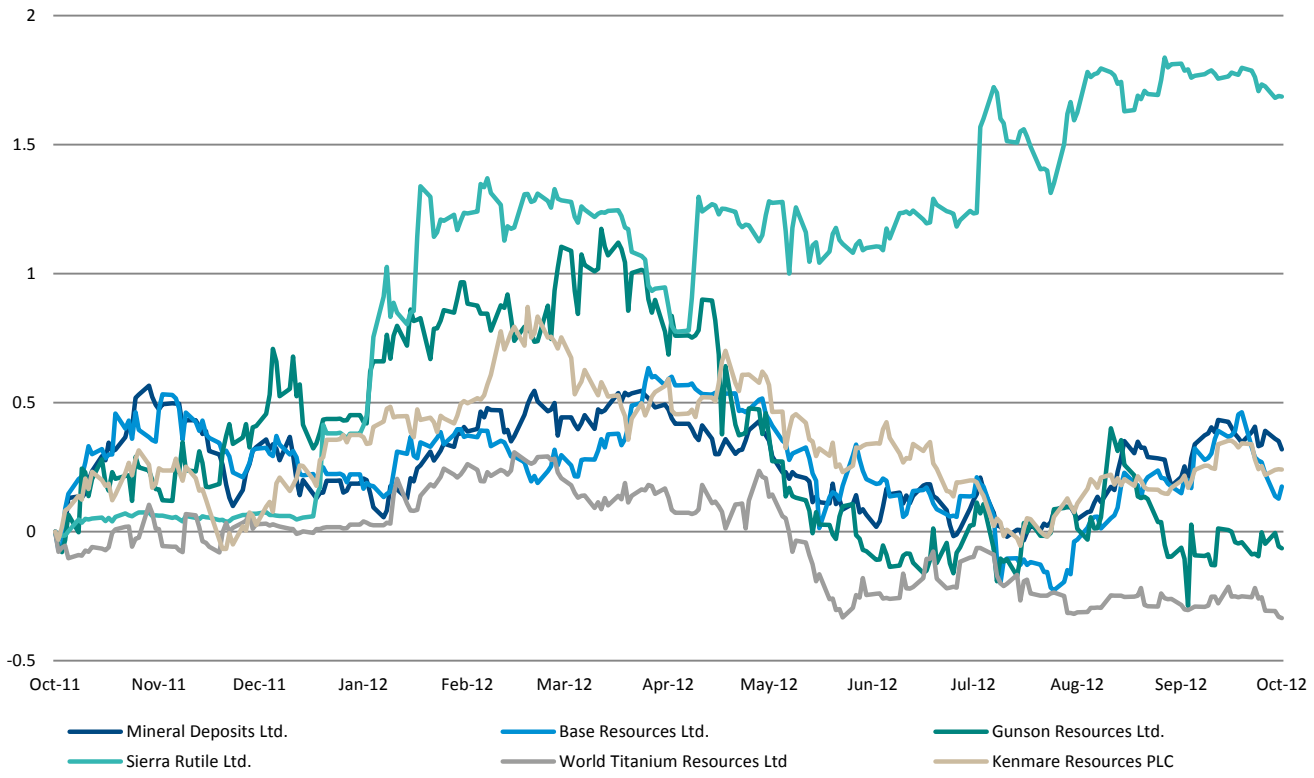

Source: Company data, RFC Ambrian

## Reserve Contained THM & THM Grade



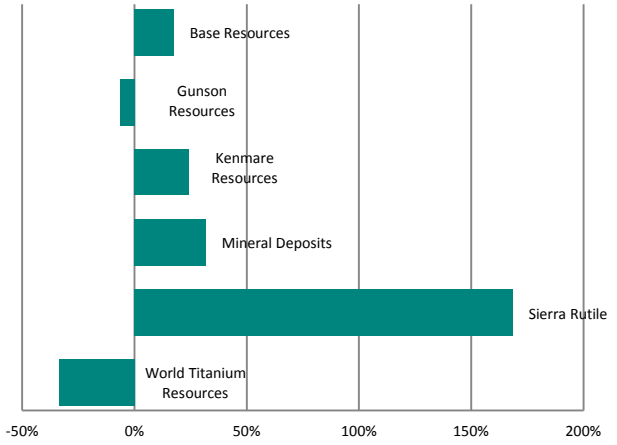

*RFC Estimate of 2005 Reserves; Source: Company data, RFC Ambrian

## Share Price Evolution — October 2011-October 2012



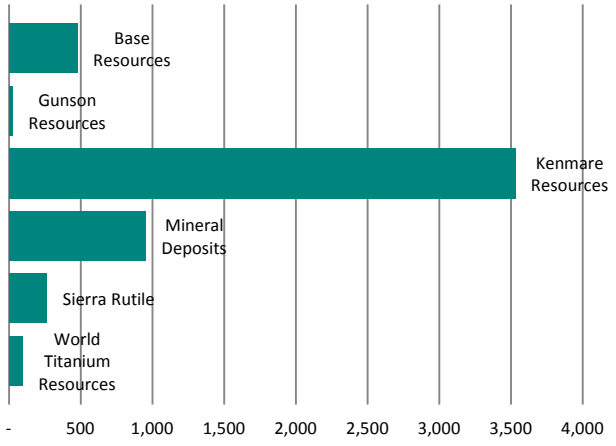

Source: Company data, FactSet, RFC Ambrian

## Share Price Performance — Year to Date



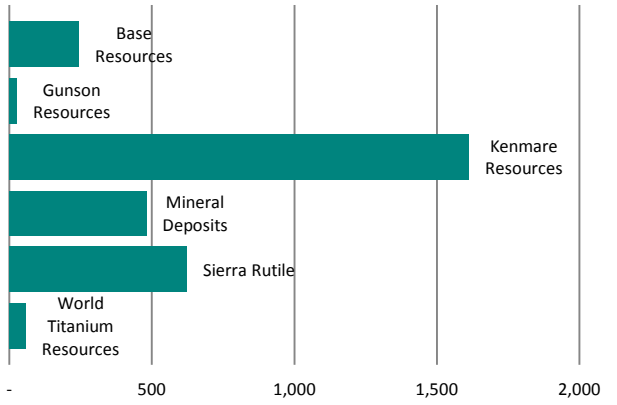

Source: Company data, FactSet, RFC Ambrian

## Liquidity: 3-month Average Daily Value (US$000)



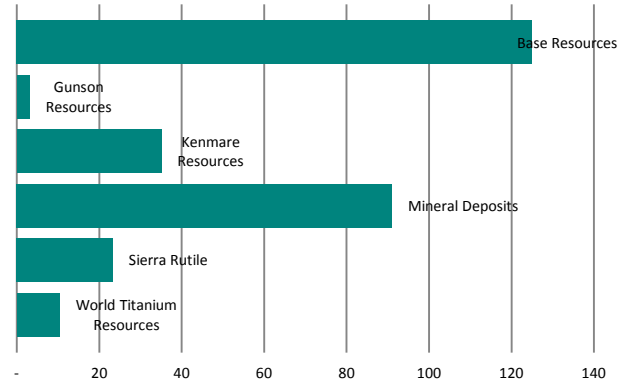

Source: Company data, FactSet, RFC Ambrian

## Market Cap (US$m)



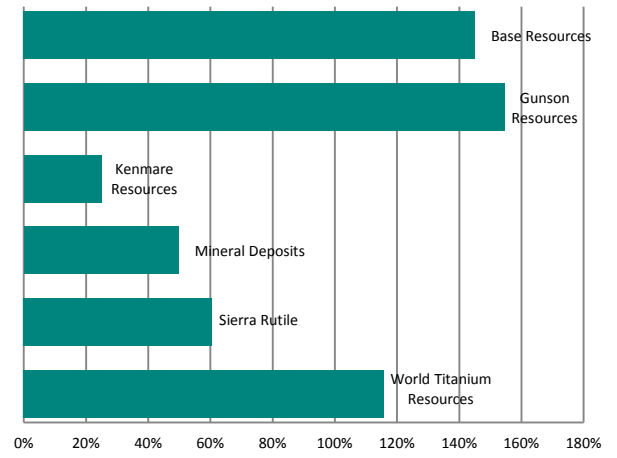

Source: Company data, FactSet, RFC Ambrian

## Cash (US$m)



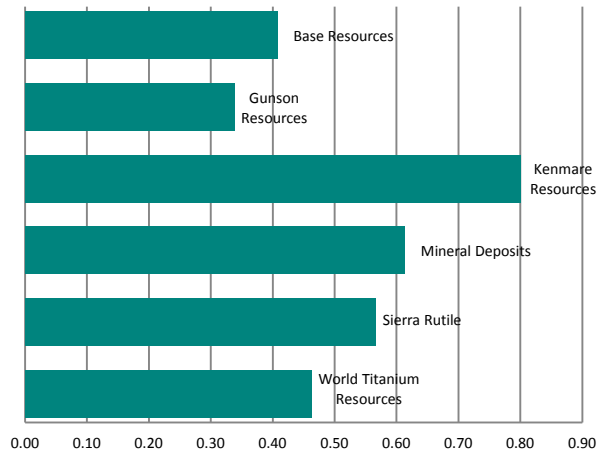

Source: Company data, FactSet, RFC Ambrian

## Implied Return (%)



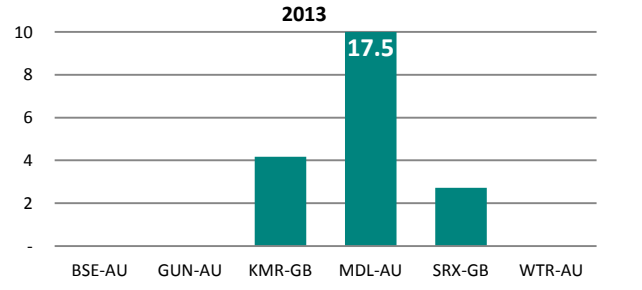

Source: Company data, FactSet, RFC Ambrian

## P/NAV (x)

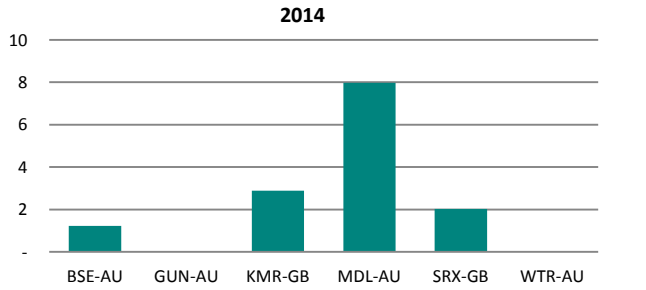



Source: Company data, FactSet, RFC Ambrian

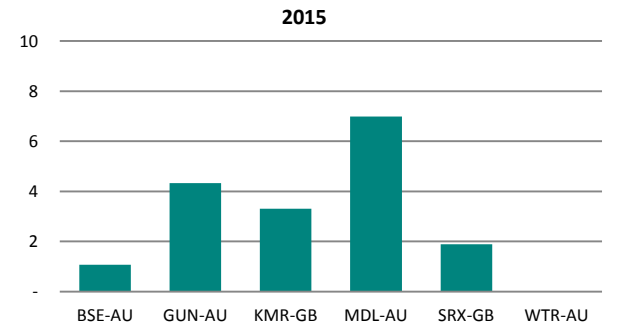
## P/E (x)




Source: Company data, FactSet, RFC Ambrian




Source: Company data, FactSet, RFC Ambrian

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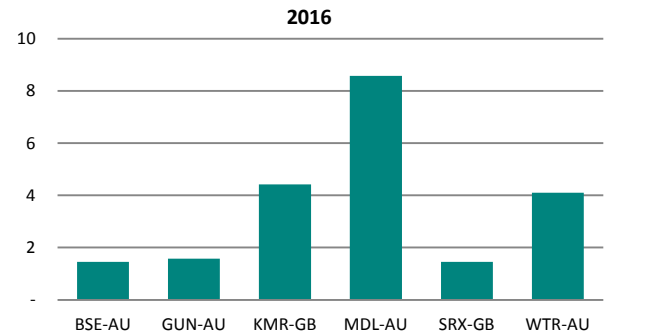
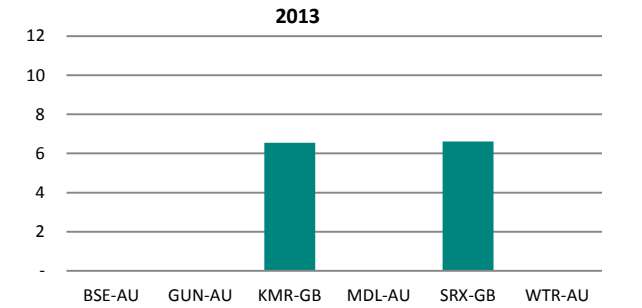



Source: Company data, FactSet, RFC Ambrian

## P/FCF(x)

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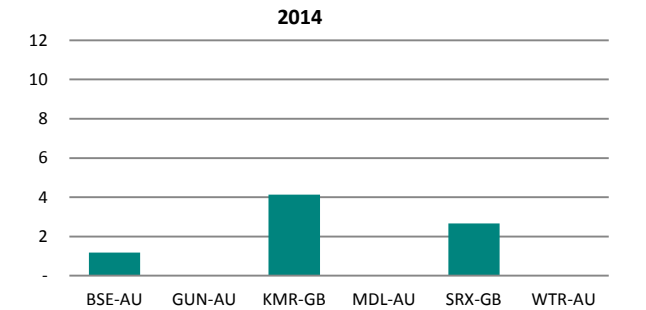


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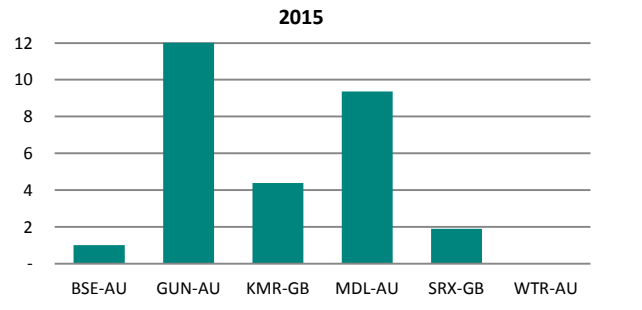
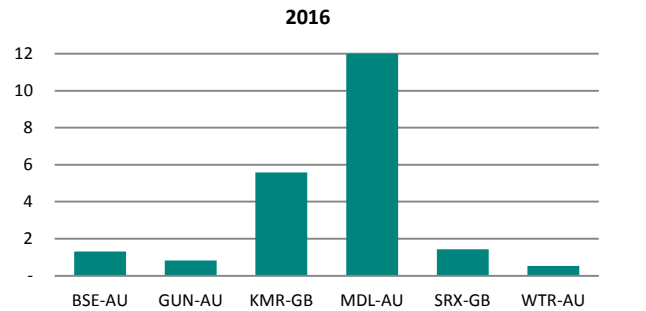
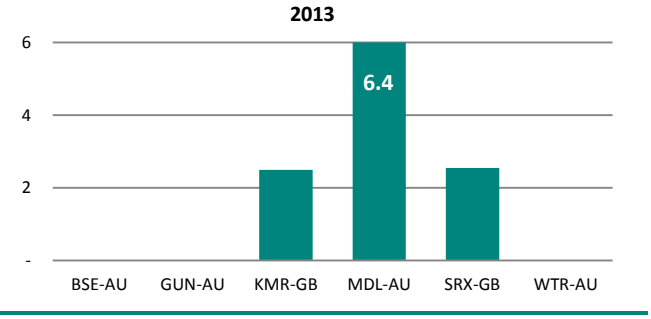



Source: Company data, FactSet, RFC Ambrian

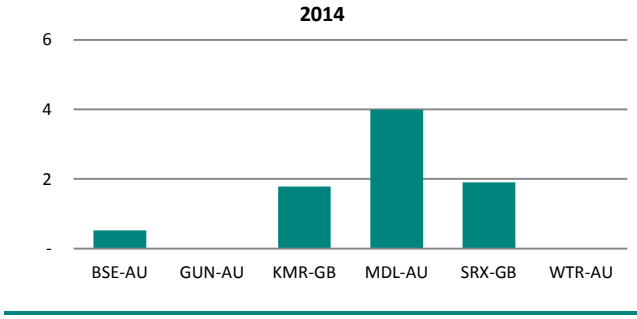



Source: Company data, FactSet, RFC Ambrian

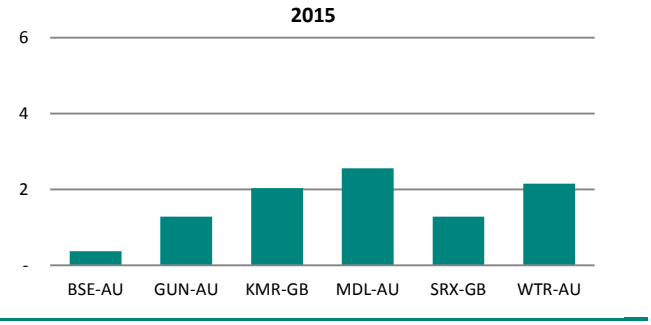
## EV/EBITDA (x)




Source: Company data, FactSet, RFC Ambrian




Source: Company data, FactSet, RFC Ambrian

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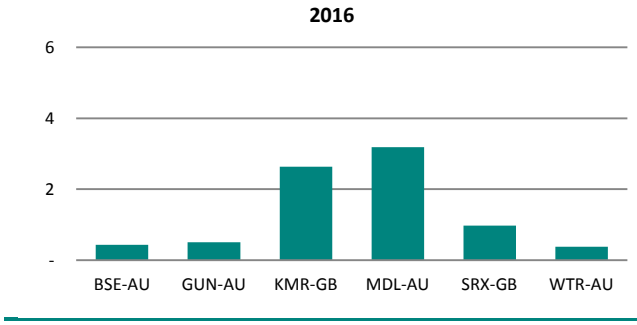
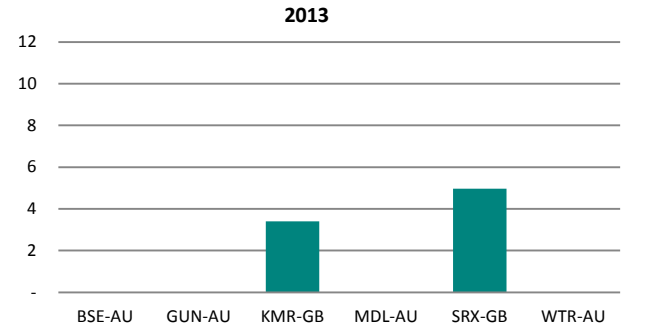
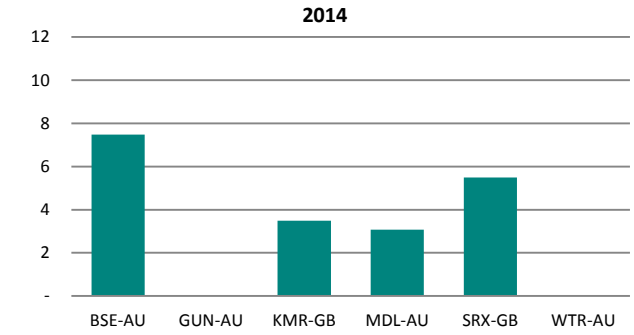



Source: Company data, FactSet, RFC Ambrian

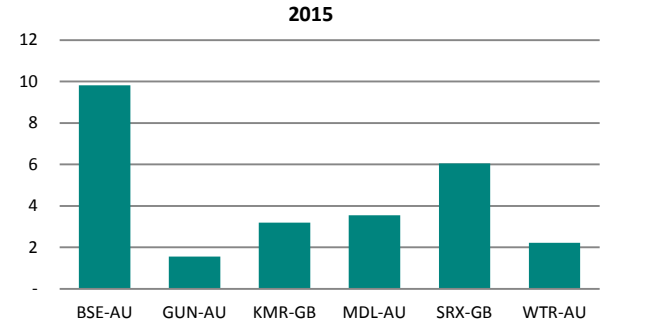
## Revenue/Cash Costs (x)




Source: Company data, FactSet, RFC Ambrian




Source: Company data, FactSet, RFC Ambrian

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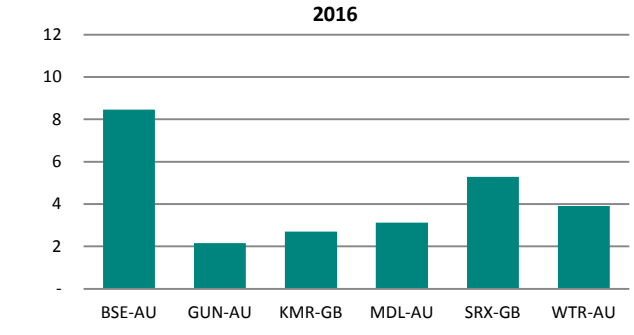



Source: Company data, FactSet, RFC Ambrian

## Comparative Asset Summary

| Company | Ticker | Rating | Price (lc) | Price Tg't (lc) | Imp'd Return (%) | Mkt Cap (US$m) | EV (US$m) | P/NAV (x) | LQ 3M-avg (local) | Attributable Production (tonnes Heavy Metals) FY12E | FY13E | FY14E | C1 Cash Cost (US$/t) FY12E | FY13E | FY14E | Contained VHM (Mt) P&P | MI&I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gunson Resources | GUN-AU | SB | 0.11 | 0.28 | 155 | 26 | 23 | 0.34 | 25 | - | - | - | - | - | - | 3.75 | 12.39 |
| Base Resources | BSE-AU | B | 0.42 | 1.03 | 145 | 235 | 115 | 0.41 | 459 | - | - | 307,694 | - | - | 4.33 | 6.83 | 62.08 |
| Mineral Deposits | MDL-AU | B | 5.63 | 8.84 | 57 | 470 | 381 | 0.60 | 915 | - | - | 179,257 | - | - | 1.91* | 6.08 | 8.03 |
| World Titanium Res | WTR-AU | SB | 0.19 | 0.41 | 116 | 57 | 47 | 0.46 | 91 | - | - | - | - | - | - | 12.17 | 59.16 |
| Sierra Rutile | SRX-GB | B | 0.76 | 1.22 | 61 | 387 | 391 | 0.57 | 162 | 110,842 | 139,934 | 173,300 | 5.95 | 5.03 | 4.55 | 2.22 | 28.66 |
| Kenmare Resources | KMR-GB | B | 0.40 | 0.50 | 24 | 1,022 | 1,168 | 0.81 | 2,179 | - | 926,201 | 1,279,039 | - | 3.06 | 2.96 | 31.85 | 218.93 |
| **Average** | | | | | **93** | | | **0.53** | | **110,842** | **533,067** | **484,822** | **6.0** | **4.0** | **3.5** | | |

*GC production cost (excludes Tyssedal smelter); Source: Company data, RFC Ambrian

## Comparative Valuations

| Company | Ticker | Price (lc) | P/FCF(x) FY12E | FY13E | FY14E | P/E (x) FY12E | FY13E | FY14E | EV/EBITDA (x) FY12E | FY13E | FY14E | Target Price Sensitivity Bull | Bear | P/NAV (x) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gunson Resources | GUN-AU | 0.11 | NM | NM | NM | NM | NM | NM | NM | NM | NM | 0.51 | 0.04 | 0.34 |
| Base Resources | BSE-AU | 0.42 | NM | NM | 1.2 | NM | NM | 1.2 | NM | NM | 0.5 | 1.22 | 0.82 | 0.41 |
| Mineral Deposits | MDL-AU | 5.63 | NM | NM | NM | 18.6 | 17.5 | 7.6 | 9.7 | 6.4 | 3.8 | 11.44 | 5.96 | 0.60 |
| World Titanium Res | WTR-AU | 0.19 | NM | NM | NM | NM | NM | NM | NM | NM | NM | 0.64 | 0.28 | 0.46 |
| Sierra Rutile | SRX-GB | 0.76 | 7.1 | 6.6 | 2.7 | 5.0 | 2.7 | 2.0 | 4.5 | 2.5 | 1.9 | 1.58 | 0.83 | 0.57 |
| Kenmare Resources | KMR-GB | 0.40 | | 6.6 | 4.2 | | 4.2 | 2.9 | | 2.5 | 1.8 | 0.56 | 0.42 | 0.81 |
| **Average** | | | **7.1** | **6.6** | **2.7** | **11.8** | **8.1** | **3.4** | **7.1** | **3.8** | **2.0** | | | **0.53** |

Source: Company data, RFC Ambrian

## RFC Ambrian Peer Assessment — Using a Traffic Light Code

| | Producing | Financed | Off-take in place | Mine Flexibility | M&A Target | Political Risk Rank | Mine Life | # Operations/ Mines | Revenue-to-Cost Ratio | Remaining*** Attributable Capex (US$m) | Key Price Leverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gunson Resources | No | 40% Conditional | ✓ | High | Neutral | Low | High | 1 | 2.2 | 115 | Zircon |
| Base Resources | ~2014 | ✓ | ✓ | High | High | Moderate | Moderate | 1 | 8.5 | 228 | Rutile |
| Mineral Deposits | ✓ | ✓ | | Low | Low | Neutral | Moderate | 2 | 3.1** | 261 | Titanium slag/Ilmenite |
| World Titanium Res | No | No | No | High | High | High | High | 1 | 3.9 | 191 | Ilmenite |
| Sierra Rutile | ✓ | ✓ | | Low* | Neutral | Moderate | High | 1 | 5.3 | 253 | Rutile |
| Kenmare Resources | ✓ | ✓ | | Moderate | Neutral | Moderate | High | 1 | 2.70 | 130 | Ilmenite |

*A dry mine is under construction, due for operation by 4Q12; **Revenue-to-cost ratio for Grande Côte only (excludes Tyssedal smelter); ***Company or RFC Ambrian estimated capex remaining to be spent; Notes: **Off-take** — For developers we view off-take as positive, while for producers we see it as limiting upside from reduced exposure to commodity prices; **Mine Flexibility** — The higher the mine flexibility, the lower the risk. Wet mining is low flexibility, dry mining is high flexibility**; M&A Target** — High indicates RFC Ambrian's belief that the company may be a M&A target; **Political Risk** — Low represents low political risk, which is favourable; **Mine Life —** Based on reserves, +20-year is high, 10-20-year is moderate and <10-year is low; **Revenue/Cost Ratio —** Higher is better. Ratio is based on 2016 (when all operations are at steady-state); Source: Company data, RFC Ambrian

# Company Analyses

4 October 2012

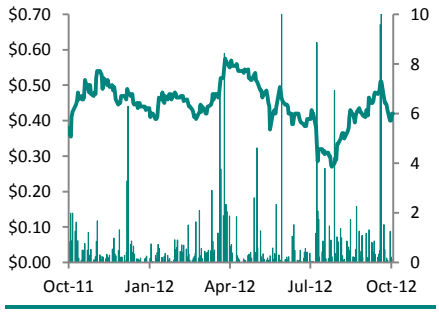
# Base Resources

## Buy

## First Draw-down Final Major Catalyst

| | |
|---|---|
| **Price (A$)** | **0.42** |
| Target Price (A$) | 1.03 |
| Ticker | BSE-AU |
| Market cap (A$m) | 235 |
| Estimated cash (A$m) | 120 |
| Estimated debt (A$m) | 0 |
| **Shares in issue** | |
| Basic (m) | 560 |
| Fully diluted (m) | 578 |
| **52-week** | |
| High (A$) | 0.58 |
| Low (A$) | 0.27 |
| 3m-avg daily vol (000) | 1,155 |
| 3m-avg daily val (A$000) | 459 |
| **Top shareholders (%)** | |
| Pacific Road Capital | 19.2 |
| Taurus Funds Mgmt | 12.4 |
| Acorn Capital | 8.7 |
| L1 Capital | 7.9 |
| **Total** | **48.2** |
| **Management** | |
| Andrew King | NE Chair |
| Tim Carstens | MD |
| Colin Bwye | ED |
| Sam Willis | NED |
| Winston Willesee | NED |

### Share Price Performance (A$)




Source: FactSet

*RFC Ambrian acts as Financial Adviser to this company*

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**As with all things, timing is everything.** We believe Base timed the acquisition of Kwale and will start production (due to commence in 2H13) at the perfect moment.

| Assets | Country | Status | Resource (contained HMt) |
|---|---|---|---|
| Kwale | Kenya | Development | 9.6 |
| Kilifi | Kenya | Exploration | 31.0 |
| Mambrui | Kenya | Exploration | 21.6 |

Source: Company data

**We were on site at Base's Kwale Mineral Sands Project in Kenya in February this year.** What struck us most about the project was: how simple the operation is going to be once in production; how supportive the government and community are of the project; and how much positive cashflow it is set to generate over its life.

**Base completed project financing for the development of Kwale through a debt facility and equity placement in 2H11.** The company recently commenced construction of the project and its supporting infrastructure requirements.

**Base has completed all the key Conditions Precedent (CP) to draw down on its US$170m debt facility.** We expect the first draw-down to occur before the end of 2012.

**The company has significantly reduced financing risk through to production** through the completion of a A$40m equity raise in October 2012.

**Our scenario analysis shows that Base is the most robust company in our Mineral Sands universe**, with significant upside demonstrated under the current, bullish and bearish scenarios. This is not surprising given its dominant performance in our analysis on a revenue to cost basis.

**Base has commenced exploration at Kilifi and Mambrui, which are located to the north of Kwale in Kenya.** A decision will be made later in 2012 as to which project will be advanced to PFS.

### Recommendation — BUY; Target Price A$1.03

**We maintain coverage of Base Resources with a BUY rating and a target price of A$1.03.** Catalysts for 2012 include:

- Project development updates at Kwale — Ongoing
- Exploration update — 2H12

RFC Ambrian

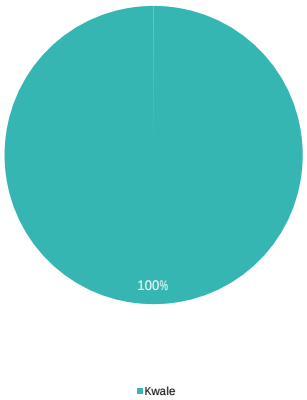
| | |
|---|---|
| **Ticker** | BSE-AU |
| **Recommendation** | **BUY** |
| **Target Share Price (A$)** | 1.03 |
| **Current Share Price (A$)** | 0.42 |
| **Implied Return (%)** | 145% |
| **P/NAV (x)** | 0.41 |

| | |
|---|---|
| **Financial Yr. End** | 30 June |
| **Shares on issue (m)** | 560.4 |
| **Market Cap (A$m)** | 235.4 |
| **EV (A$m)** | 115.4 |
| **Cash (A$m)** | 120.0 |
| **Debt (A$m)** | 0.0 |

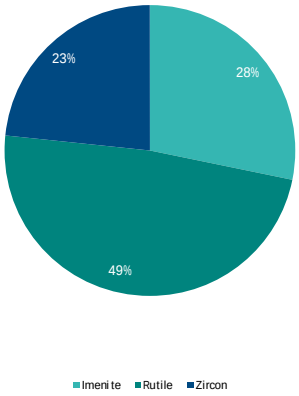
## Valuation

| Asset | Discount rate | NAV "X" Factor | NAV Target (A$m) | Target SP (A$) |
|---|---|---|---|---|
| Kwale | 10% | 0.9 | 576.9 | 1.03 |
| **Total NAV** | | | **576.9** | **1.03** |
| Commodity Stats | Imenite | Rutile | Zircon | |
| Revenue Generated (LOM) | 28% | 48% | 23% | |

**Valuation Split**




**Revenue Split**




## Profit & Loss (US$m)

| | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Gross Profit | 0.0 | 241.4 | 335.6 | 288.0 |
| EBITDA | (-4.0) | 223.5 | 313.0 | 267.6 |
| Net Profit before tax | (-3.6) | 191.7 | 287.4 | 248.2 |
| Tax Payable | 0.0 | 0.0 | (-69.1) | (-86.1) |
| Profit after tax | **(-3.6)** | **191.7** | **218.3** | **162.0** |

## Balance Sheet (US$m)

| | | | | |
|---|---|---|---|---|
| Assets | | | | |
| Cash | (-4.7) | 204.0 | 374.8 | 489.7 |
| Total Current Assets | 306.2 | 298.1 | 282.0 | 265.4 |
| PPE & Exp & Dev | (-4.4) | 204.3 | 375.1 | 490.0 |
| **Total Assets** | **302.2** | **502.7** | **657.4** | **755.7** |
| Liabilities | | | | |
| Senior Debt | 175.0 | 175.0 | 111.4 | 47.7 |
| **Total Liabilities** | **175.9** | **175.9** | **112.2** | **48.6** |

## Ratios and key financial data

| | | | | |
|---|---|---|---|---|
| EPS (A$) | (-$0.01) | $0.34 | $0.39 | $0.29 |
| FCFPS (A$) | (-$0.41) | $0.36 | $0.42 | $0.32 |
| P/E (x) | NM | 1.2 | 1.1 | 1.5 |
| P/FCF (x) | NM | 1.2 | 1.0 | 1.3 |
| EV/EBITDA (x) | NM | 0.5 | 0.4 | 0.4 |
| Rev/Cash Costs (x) | 0.0 | 7.5 | 9.8 | 8.5 |

## Other (US$m)

| | | | | |
|---|---|---|---|---|
| Capex | 229.9 | 11.9 | 3.0 | 3.0 |
| Equity Requirement | 2.6 | 8.9 | 0.0 | 0.0 |
| Shares on issue (m)* | 566.6 | 587.8 | 587.8 | 587.8 |

* Assumed placement price is the current share price

## Directors & Management

Non-Executive Chairman -Andrew King

Managing Director - Tim Carstens

Exe. Director - Colin Bwye

Non Exe. Director - Sam Willis

Non Exe. Director - Winton Willesee

Non Exe. Director - Trevor Schultz

Non Exe. Director - Michael Anderson

## Major Shareholders

| | % |
|---|---|
| Pacific Road | 19.2% |
| Taurus Fund | 12.4% |
| Acorn | 8.7% |
| L1 Capital | 7.9% |
| **Total** | **48.2%** |

## Reserve and Resource Statement

| | Mt | grade (%) | Contained VHM (Mt) | EV / tonne (US$) |
|---|---|---|---|---|
| Total Reserves | 140.6 | 4.9% | 6.8 | 16.89 |
| M&I only | 1,257.1 | 3.9% | 48.4 | 2.38 |
| Total Resource | 1,534.8 | 3.9% | 59.7 | 1.93 |

## Production Profile (t)

| Commodity | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Imenite | 0 | 234,161 | 353,130 | 356,017 |
| Rutile | 0 | 52,128 | 74,784 | 75,721 |
| Zircon | 0 | 21,405 | 31,594 | 31,957 |
| **Total** | **0** | **307,694** | **459,507** | **463,695** |

## Revenue (Avg Price) (US$/t)

| | | | | |
|---|---|---|---|---|
| Imenite | 0 | 299 | 287 | 240 |
| Rutile | 0 | 2,935 | 2,581 | 2,240 |
| Zircon | 0 | 2,603 | 2,514 | 2,241 |

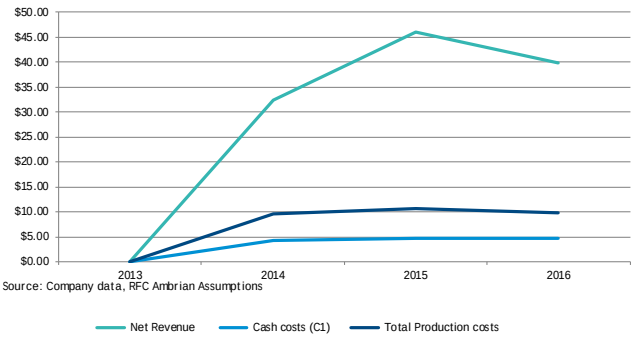
## Cash cost (US$/t of ore)

| | | | | |
|---|---|---|---|---|
| Net Revenue | 0.00 | 32.40 | 46.05 | 39.78 |
| Cash costs (C1) | 0.00 | 4.33 | 4.69 | 4.70 |
| Total Production costs | 0.00 | 9.67 | 10.62 | 9.81 |

## Scenario Analysis

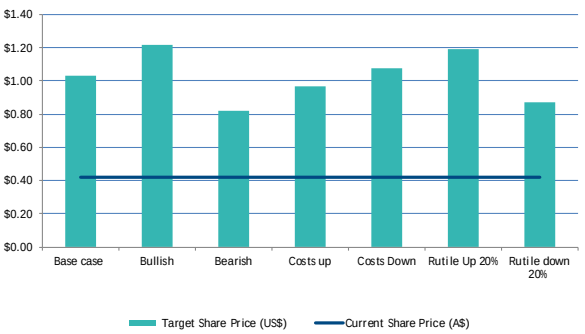
| Scenario | NAV Target (US$m) | Target Share Price (US$) | variance from base case (%) | variance from current SP(%) |
|---|---|---|---|---|
| Base case | 576.9 | 1.03 | | 145% |
| Bullish | 681.6 | 1.22 | 18% | 190% |
| Bearish | 460.4 | 0.82 | -20% | 96% |
| Costs up | 541.1 | 0.97 | -6% | 130% |
| Costs Down | 604.3 | 1.08 | 5% | 157% |
| Rutile Up 20% | 667.6 | 1.19 | 16% | 184% |
| Rutile down 20% | 487.2 | 0.87 | -16% | 107% |

**Revenue/Cash Cost Per Tonne**




Source: Company data, RFC Ambrian Assumptions

**Current Share Price vs. Various Scenarios**



## Recommendation and Valuation

**BUY** recommendation with a target price of A$1.03

We maintain our **BUY** recommendation on Base Resources, but have lowered our **target price from A$1.25 to A$1.03** to account for dilution from the latest share issue. From our previous valuation we have removed the effects of the exploration properties, which we previously valued at A$0.11/share. A summary of the valuation is shown in the table below.

| Asset | NAV (A$m) | NAV (x) | NAV Target (A$m) | Target SP (A$) |
|---|---|---|---|---|
| Kwale | 641.0 | 0.90 | 576.9 | 1.03 |
| **Total** | | | | |

Source: RFC Ambrian

## Kwale — Definitive Feasibility Study

Kwale valuation of A$641.0m

Based on the information in the definitive feasibility study, we calculate an unrisked NAV value of A$641m. This was done using a 10% DCF model. The key assumptions of our analysis are highlighted in the table below.

### Key Modelling Assumptions

| Description | Assumption |
|---|---|
| **Mining and Processing Assumptions** | |
| Total Ore Mined (Mt) | 140.6 |
| Avg Grade Mined - THM (%) | 4.9 |
| Avg Grade Mined - Ilmenite (%) | 2.6 |
| Avg Grade Mined - Rutile (%) | 0.6 |
| Avg Grade Mined – Zircon (%) | 0.3 |
| Sales - Ilmenite -Total | 3,404,000t |
| Sales – Rutile - Total | 810,000t |
| Sales - Zircon - Total | 323,000t |
| **Financial Assumptions (Avg Rev/Cost per tonne of ore)** | **US$/t** |
| Avg Revenue per tonne | 19.55 |
| Mine Production Expense | **3.92** |
| Mining | 1.15 |
| Tailings and Rehab | 0.30 |
| Wet Plant | 0.64 |
| Dry Plant | 0.77 |
| Product Handling | 0.33 |
| Overheads | 0.73 |
| Other Operating Expenses | **3.77** |
| Royalty | 0.98 |
| Depreciation Expense | 2.57 |
| Interest Expense | 0.22 |
| Pre-production Capex | 298.1 |

Source: Base Resources, RFC Ambrian

Discounted to A$576.9m for construction risk

Given that the project is still under construction, we feel it is prudent to discount our NAV by 0.9x. This lowers our valuation to A$576.9m, or A$1.03/share. On completion of construction and commencement of production we will remove this discount. This would increase the valuation by an additional A$0.11/share and raise our target price to A$1.14.

We also note that there is further potential upside in the valuation as only the Central and Southern deposits have defined resources at this point; it is probable that the Northern Dune will also be mined towards the end of the mine life. This should further improve the project economics, thus boosting Base's long-term valuation.

## Investment Case

Significant advancement since acquisition two years ago, with impressive management team

As with all things, timing is everything. We believe Base timed the acquisition of Kwale and will start production (due to commence in 2H13) at the perfect moment.

Base originally acquired Kwale in 2010 for US$3m, which was just before the Mineral Sands sector began to 'hot up'. Since then there has been a significant appreciation in Mineral Sand prices, particularly for the Rutile price, which is expected not only to remain at all-time highs, but also to push slightly higher over the next few years (just as Base is due to commence mining).

Whilst it must be said there was an element of good fortune in acquiring the project just before the sector took off, the company also made its own luck by working very hard to get itself where it is today.

The company has completed numerous studies, negotiated licences with the government, financed the project's construction (which would be extremely difficult to do in the current environment) and began construction of the project in less than two years; this is a massive achievement and shows the strength of the management team.

While Mineral Sands projects are generally relatively simple to mine, with an average strip ratio of just 0.1:1 and very low cash costs, Kwale is simpler than most. Kwale also has the advantage of being in close proximity to existing infrastructure, which has substantially decreased the upfront capital requirement. With the major highway from Tanzania to Mombasa (East Africa's largest port) only 8km from the project and access to Kenya's national power grid, a substantial amount of capital has been saved on the development of Kwale. Also, Mineral Sands projects require access to a large amount of water, and Kwale is able to source water from the nearby river, which will be dammed, as well as from a borefield on a local aquifer.

At our initiation of coverage (please see *Base Resources Ltd — Treble the Base*, 7 March 2012), we highlighted the last major re-rating event for Base (prior to commencing production) would be the completion of the Conditions Precedent (CP) that would enable the company to draw down on debt. It has now completed all the CPs and should draw down on the facility before the end of 2012.

The only 'blip' thus far for Base has been the recently-announced increase in capital costs (up by 14%). However, capex being higher than originally forecast is common in the mining industry (particularly in the bulks industry) and the market reacted sensibly to the news.

The recent capital raise has reduced our target price due to dilution, but provides a clear path to construction with the project now fully funded through debt and equity. The removal of financing risk puts Base in a much stronger position than other developers in the sector.

Our scenario analysis shows that Base is the most robust company in our Mineral Sands universe, with significant upside demonstrated under the current, bullish and bearish scenarios. This is not surprising given its dominant performance in our analysis on a revenue to cost basis.

# Company Overview

## Background

Base Resources is an ASX-listed Mineral Sand development and exploration company that trades under the ticker of BSE and is based in Perth, Western Australia.

Current cash balance — A$120m

To fund the development of the Kwale Project, Base completed a debt and equity fundraising in 2011. Base raised a total of A$162m at A$0.55/share in a placement to institutional and existing shareholders and an underwritten rights issue. Cornerstone shareholders in the placement included Pacific Road Capital and Taurus Fund Management. Base completed another equity raise in October for A$40m through a share placement and entitlement offer for 100m shares to institutional investors and existing investors. As at the time of writing, we estimate Base has a cash balance of A$120m.

US$170m debt facility — first draw-down expected by the middle of 2012

The Project Finance Facility was completed in November 2011 and comprised a US$150m senior debt facility and a US$20m cost overrun facility. The debt providers consisted of six banks in total. Base recently met all Conditions Precedent to draw on the debt. We expect first draw-down later this year.

## Kwale Project

### Project Location


Source: Base Resources

The Kwale Project covers an area of 56km² and is located in Kenya, approximately 50km south of Mombasa and 10km inland from the Indian Ocean. The project is well supported by existing infrastructure, with roads and tracks giving good access to the site from the main coastal highway.

The project is comprised of two areas, separated by the Mukurumudzi River, that contain economically exploitable concentrations of Heavy Minerals (HM). These are the Central Dune and the South Dune. A third dune, the North Dune, is not currently included in the resources comprising the Kwale Project.

The mineralisation within these three zones lies within poorly stratified Aeolian sands of the Magarini Formation and consists mainly of Rutile, Zircon and Ilmenite. The Magarini Sands formation forms a low ridge of hills running parallel to the coast. The Kwale Project has a current reserve of 146Mt at 4.93% VHM and a resource of 262Mt at 3.66% VHM, as shown in the table below. Whilst the project size is relatively small for a Mineral Sands project, the grade, particularly the Rutile, is exceptionally high.

### Reserve and Resource Statement

| | Resource | HM | | Ilmenite | | Rutile | | Zircon | |
|---|---|---|---|---|---|---|---|---|---|
| Category | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) |
| Proven | 86.20 | 5.50 | 4.80 | 3.05 | 2.63 | 0.75 | 0.65 | 0.33 | 0.29 |
| Probable | 59.80 | 4.00 | 2.40 | 1.91 | 1.14 | 0.50 | 0.30 | 0.22 | 0.13 |
| **Total Reserve** | **146.00** | **4.93** | **7.20** | **2.58** | **3.77** | **0.65** | **0.95** | **0.29** | **0.42** |
| Measured | 86.20 | 5.50 | 4.80 | 3.05 | 2.63 | 0.75 | 0.65 | 0.33 | 0.29 |
| Indicated | 175.80 | 2.80 | 4.80 | 1.31 | 2.31 | 0.30 | 0.53 | 0.15 | 0.26 |
| Inferred | - | - | - | - | - | - | - | - | - |
| **Total Resource** | **262.00** | **3.66** | **9.60** | **1.89** | **4.94** | **0.45** | **1.18** | **0.21** | **0.55** |

Source: Base Resources

## Definitive Feasibility Study

In May 2011 Base completed a positive enhanced definitive feasibility study (EDFS) on the Kwale Project. The study examined a 13-year mine life to mine 140Mt and produce 4.7Mt of final product (a combination of Ilmenite, Rutile and Zircon). Ore mining and production are scheduled to commence in July 2013. During the first four years the mine will operate at 8.8Mtpa before increasing to 12.5Mtpa as grade declines. The key financial results of the EDFS are highlighted in the table below.

### Enhanced Definitive Feasibility Study — Key Statistics

| | Analysis |
|---|---|
| IRR | 42% |
| NPV (10%) (US$m) | 395 |
| LOM FCF (post tax) (US$m) | 930 |
| Capital Payback (months) | 23 |

Source: Base Resources

### A14 Highway that will be Used to Transport Ore

Source: RFC Ambrian

### Site of Port Facility

Source: RFC Ambrian

### Mining

Kwale will be mined via the Dozer Trap Mining Unit (DMU) method. Mining will commence in the higher-grade Central Dune before moving to the lower-grade South Dune in the eighth year of operations. Base is doing this to benefit from the higher prices in Minerals Sands expected over this time, which should ensure a speedy payback of the debt facility and provide a capital base to exploit future opportunities for growth.

### Processing

The processing methodology to be employed at Kwale is the conventional Mineral Sands processing technique, with a Wet Concentrator Plant (WCP) and a Mineral Separation Plant (MSP). Construction works commenced in 2Q12.

Once ore has passed through the WCP it runs through the MSP, which comprises of a Rutile dry circuit, Ilmenite dry circuit, wet Zircon circuit and a Zircon dry circuit. The plant will operate at a maximum feed rate of 80tph from the HMC stockpile, giving a maximum production rate of approximately 350,000tpa Ilmenite, 80,000tpa Rutile and 30,000tpa Zircon.

### Trucking Concentrate from Site to Port

Ore will be transported from Kwale to the port in trucks along the existing A14 highway, which is a sealed road and the main transport link between Kenya and Tanzania. The road is generally in good condition and services similar sized trucks that commute between Kenya and Tanzania. We believe minimal maintenance upgrades will be required along the road.

### Port

A bulk storage and shipping terminal will be established at Likoni in the city of Mombasa, which is approximately 50km north of the Kwale operation. The shipping terminal at Likoni is part of the Mombasa Port, which is the largest in East Africa. Base owns land at the port and has received all the required approvals to date. Base plans to commence construction of its port in April.

Rutile and Ilmenite will be stockpiled in a shed while Zircon will be exported in containers using the main Mombasa terminal. A small amount of Rutile will also be exported in this manner. On average, Base expects to ship twice every month.

4 October 2012

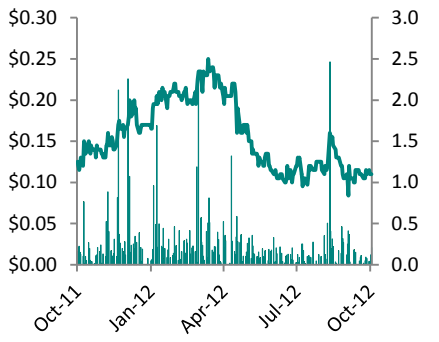
# Gunson Resources

## Speculative Buy

## POSCO Deal Done — Now for Financing

| | |
|---|---|
| **Price (A$)** | **0.11** |
| Target Price (A$) | 0.28 |
| Ticker | GUN-AU |
| Market cap (A$m) | 26 |
| Estimated cash (A$m) | 3 |
| Estimated debt (A$m) | 0 |
| **Shares in issue** | |
| Basic (m) | 238 |
| Fully diluted (m) | 244 |
| **52-week** | |
| High (A$) | 0.25 |
| Low (A$) | 0.08 |
| 3m-avg daily vol (000) | 154 |
| 3m-avg daily val (A$000) | 25 |
| **Top shareholders (%)** | |
| Grey Willow | 7.0 |
| Sunzone | 5.5 |
| John Tilbrook | 4.9 |
| Investors Mutual | 4.9 |
| **Total** | **22.3** |
| **Management** | |
| David A Craig | Chairman |
| David N Harley | MD |
| Peter C Harley | NED |

### Share Price Performance (A$)




Source: FactSet

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**Gunson recently completed a major milestone when it concluded discussions and agreed terms with POSCO, the world's fourth largest steel producer**, regarding the acquisition of 40% of the Coburn Project for A$28m. The major (and final) hurdle to be overcome for this transaction to be completed is to ensure the remainder of the financing is agreed before the end of 2012.

| Assets | Commodity | Location | Status |
|---|---|---|---|
| Coburn | Mineral Sands | WA - Australia | DFS done/Project financing |
| Mt Gunson | Au/Cu | SA - Australia | Adv Exploration |
| Tennant Creek | Au/Cu | NT - Australia | Exploration |
| Fowler's Bay | Nickel | SA - Australia | Exploration |

Source: Gunson Resources

**We visited Gunson's Coburn Mineral Sands Project in Western Australia (WA)**, and were impressed by the progress the company has made recently. It has commenced clearing of the haul road to site, begun negotiations on long lead capital items and has already made a number of key personnel appointments.

**The Coburn Project has a long mine life (+20 years) and low technical risks**, providing excellent exposure to the long-term growth in demand for Zircon and Titanium Minerals, which is being driven by the burgeoning middle classes in developing countries such as China and India. The broad dunal-style orebody with very low slimes (fine clay) levels provides for low-risk mining and processing. The Ilmenite off-take agreement with DuPont and the low level of radioactive elements (U+Th) in products minimises marketing risks.

**Gunson completed a DFS on the project in 2010 based on a mining rate of 17.5Mtpa** over a 24-year mine life to produce on average 40,000tpa Zircon, 90,000tpa Ilmenite and 16,000tpa of HiTi, which is a mixed Rutile and Leucoxene product grading 90% $TiO_2$.

### Recommendation — SPECULATIVE BUY; Target Price A$0.28

**We maintain coverage of Gunson Resources with a SPECULATIVE BUY rating and a target price of A$0.28.** We rate Gunson as a SPECULATIVE BUY at this time pending formalisation of the POSCO investment in a binding joint-venture agreement and the conclusion of arrangements for the balance of the funding. However, the endorsement of POSCO is a significant positive for the project and substantially reduces Gunson's funding requirement (while it maintains project control). In the event of any further positive news on the funding front we will review our recommendation with the potential to upgrade it to a full Buy. Catalysts for 2012 include:

- Formalisation of POSCO investment
- Funding update — Ongoing
- Off-take agreements for Zircon and HiTi — Ongoing

RFC Ambrian

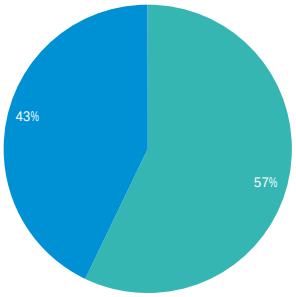
| | |
|---|---|
| **Ticker** | GUN-AU |
| **Recommendation** | **SPEC BUY** |
| **Target Share Price (A$)** | 0.28 |
| **Current Share Price (A$)** | 0.11 |
| **Implied Return (%)** | 155% |
| **P/NAV (x)** | 0.34 x |

| | |
|---|---|
| **Financial Yr. End** | 30 June |
| **Shares on issue (m)** | 238.3 |
| **Market Cap (A$m)** | 26.2 |
| **EV (A$m)** | 23.2 |
| **Cash (A$m)** | 3.0 |
| **Debt (A$m)** | 0.0 |

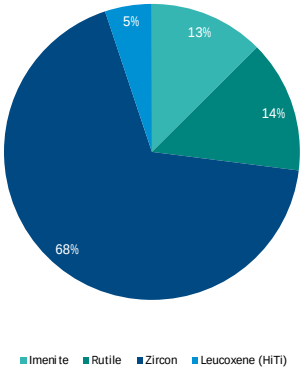
## Valuation

| Asset | Discount rate | NAV "X" Factor | NAV Target (A$m) | Target SP (A$) |
|---|---|---|---|---|
| Coburn | 10% | 0.75 | 37.2 | 0.16 |
| Cash for sale of % in Coburn Project | | 1.00 | 28.0 | 0.12 |
| **Total NAV** | | | **65.2** | **0.28** |
| Commodity Stats | Imenite | Rutile | Zircon | Leucoxene (HiTi) |
| Revenue Generated (LOM) | 13% | 14% | 68% | 5% |

**Valuation Split**




**Revenue Split**




## Reserve and Resource Statement

| | Mt | grade (%) | Contained VHM (Mt) | EV / tonne (US$) |
|---|---|---|---|---|
| Total Reserves | 308.0 | 1.2% | 3.7 | 6.16 |
| M&I only | 718.0 | 1.2% | 8.7 | 2.65 |
| Total Resource | 979.0 | 1.3% | 12.4 | 1.87 |

## Production Profile (t)

| Commodity | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Imenite | 0 | 0 | 27,663 | 48,542 |
| Rutile | 0 | 0 | 2,709 | 5,941 |
| Zircon | 0 | 0 | 16,739 | 25,986 |
| Leucoxene (HiTi) | 0 | 0 | 2,265 | 4,632 |
| **Total** | 0 | 0 | 47,110 | 80,468 |

## Revenue (Avg Price) (A$/t)

| | | | | |
|---|---|---|---|---|
| Imenite | 0 | 0 | 239 | 200 |
| Rutile | 0 | 0 | 2,738 | 2,486 |
| Zircon | 0 | 0 | 2,734 | 2,502 |
| Leucoxene (HiTi) | 0 | 0 | 1,646 | 1,559 |

## Cash cost (A$/t of ore)

| | | | | |
|---|---|---|---|---|
| Net Revenue | 0.00 | 0.00 | 7.36 | 9.34 |
| C1 Cash Costs | 0.00 | 0.00 | 4.72 | 4.33 |
| Total Production costs | 0.00 | 0.00 | 5.97 | 5.65 |

## Profit & Loss (A$m)

| | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Gross Profit | 0.0 | 0.0 | 23.3 | 52.8 |
| EBITDA | (-2.0) | (-2.0) | 18.1 | 45.9 |
| Net Profit before tax | (-1.9) | (-2.0) | 13.1 | 40.4 |
| Tax Payable | 0.0 | 0.0 | (-2.7) | (-11.9) |
| Profit after tax | **(-1.9)** | **(-2.0)** | **10.4** | **28.5** |

## Balance Sheet (A$m)

| | | | | |
|---|---|---|---|---|
| Assets | | | | |
| Cash | 1.1 | (-0.8) | 12.1 | 35.5 |
| Total Current Assets | 1.3 | (-0.6) | 12.2 | 35.6 |
| PPE & Exp & Dev | 18.7 | 104.9 | 115.8 | 113.4 |
| **Total Assets** | **48.5** | **132.8** | **155.9** | **176.2** |
| Liabilities | | | | |
| Senior Debt | 0.0 | 30.0 | 30.0 | 21.8 |
| **Total Liabilities** | **0.7** | **30.7** | **30.7** | **22.5** |

## Ratios and key financial data

| | | | | |
|---|---|---|---|---|
| EPS (A$) | (-$0.00) | (-$0.00) | $0.03 | $0.07 |
| FCFPS (A$) | (-$0.08) | (-$0.37) | $0.00 | $0.13 |
| P/E (x) | NM | NM | 4.3 | 1.6 |
| P/FCF (x) | NM | NM | 43.2 | 0.8 |
| EV/EBITDA (x) | NM | NM | 1.3 | 0.5 |
| Rev/Cash Costs (x) | 0.0 | 0.0 | 1.6 | 2.2 |

## Other (A$m)

| | | | | |
|---|---|---|---|---|
| Capex | 18.7 | 86.2 | 13.4 | 0.6 |
| Equity Requirement | 18.0 | 29.0 | 0.0 | 0.0 |
| Shares on issue (m)* | 407.3 | 919.2 | 1,035.5 | 1,035.5 |

* Assumed placement price is the current share price

## Directors & Management

Chairman - David Craig
Managing Director - David Harley
Exe. Director - Peter Harley

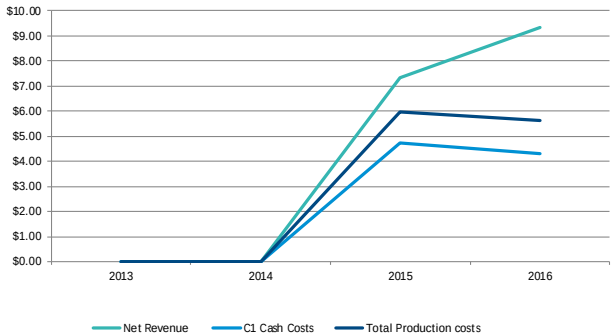
## Major Shareholders

| | % |
|---|---|
| Grey Willow Pty Ltd | 7.0% |
| Sunzone | 5.5% |
| John Tilbrook | 4.9% |
| Investors Mutual | 4.9% |
| **Total** | **22.3%** |

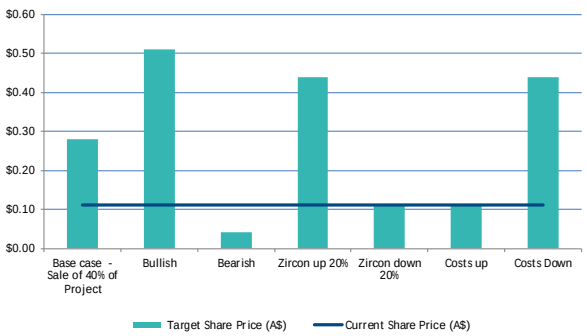
## Scenario Analysis

| Scenario | NAV Target (A$m) | Target Share Price (A$) | variance from base case (%) | variance from current SP(%) |
|---|---|---|---|---|
| Base case - Sale of 40% of Project | 65.2 | 0.28 | | 155% |
| Bullish | 120.7 | 0.51 | 82% | 364% |
| Bearish | 9.7 | 0.04 | -86% | -64% |
| Zircon up 20% | 105.0 | 0.44 | 57% | 300% |
| Zircon down 20% | 25.4 | 0.11 | -61% | 0% |
| Costs up | 26.0 | 0.11 | -61% | 0% |
| Costs Down | 104.6 | 0.44 | 57% | 300% |

**Revenue/Cash Cost Per Tonne**




**Current Share Price vs. Various Scenarios**




Source: Company data, RFC Ambrian Assumptions

## Recommendation and Valuation

**SPECULATIVE BUY** rating with a target price A$0.28

We maintain coverage of Gunson Resources with a **SPECULATIVE BUY** recommendation and a **target price of A$0.28**. A breakdown of our valuation is given below.

| Asset | NAV (A$m) | NAV (x) | NAV Target (A$m) | Target SP (A$) |
|---|---|---|---|---|
| Coburn | 49.7 | 0.75 | 37.2 | 0.16 |
| Cash for sale of % in Coburn | 28.0 | 1.00 | 28.0 | 0.12 |
| **Total NAV** | **77.7** | | **65.2** | **0.28** |

Source: RFC Ambrian

Based on the information in the definitive feasibility study and discussions with management, we calculate an $NAV_{10\%}$ value of A$65.2m for the Coburn Project. The key assumptions of our analysis are highlighted below.

### Key Modelling Assumptions

| Description | Assumption |
|---|---|
| **Mining and Processing Assumptions (100% basis)** | |
| Total Ore Mined (Mt) | 421.4 |
| Avg Grade Mined - THM (%) | 1.26 |
| Avg Grade Mined - Ilmenite (%) | 0.61 |
| Avg Grade Mined - Rutile (%) | 0.10 |
| Avg Grade Mined – Zircon (%) | 0.27 |
| Avg Grade Mined – Leucoxene (%) | 0.07 |
| Sales - Ilmenite –Total (000t) | 1,224 |
| Sales – Rutile - Total (000t) | 171 |
| Sales - Zircon - Total (000t) | 559 |
| Sales - Leucoxene - Total (000t) | 93 |
| **Financial Assumptions (Avg Rev/Cost per tonne of ore)** | **A$/t** |
| Avg Revenue per tonne | 7.14 |
| Mine Production Expense | **4.22** |
| Mining | 1.73 |
| Wet Concentration Plant | 0.70 |
| Mineral Separation Plant | 0.46 |
| Product Handling | 0.25 |
| Port costs | 0.09 |
| Mine site Admin & Overheads | 1.00 |
| Total Other Operating Expense | **0.98** |
| Royalty | 0.36 |
| Depreciation Expense | 0.31 |
| Interest Expense | 0.03 |
| Exploration Expense | 0.07 |
| Corporate Expense | 0.22 |
| Pre-production Capex (A$m) | 117.7 |
| Ownership | 60% |

Source: RFC Ambrian

## Investment Case

As we highlighted at the time of our initiation of coverage (*Gunson Resources — Finger on the Trigger*, 1 June 2012): "The key short-term event for Gunson will occur in August 2012, when an announcement regarding the potential divestment of a large minority interest to POSCO is made… we believe that — if a deal is concluded — Gunson's share price will have a significant re-rating as the project would be significantly de-risked from our largest concern — project finance."

Gunson managed to achieve this objective within the financial parameters (A$27-38m) we expected, which represented a terrific result given the current uncertainty in the equity markets.

However, the share price (with the exception of a short-term spike after the initial announcement) has remained relatively flat. We believe the lack of share price appreciation is largely because the market is operating with a 'low-risk' mentality with regard to any development projects that require substantial funding. Even with the conditional payment and capital contribution from POSCO, Gunson still requires some A$95m to fund its portion of the project development, which is approximately 3x the current market cap.

Given the current environment, we believe the company would find it difficult to raise this predominantly from the equity markets without excessively diluting the value for existing shareholders. After speaking at length with management, we understand the company is in advanced discussions with a number of institutions that would provide the majority of funding from a 'non-equity source', with only a small portion of the project finance coming from the equity capital markets. POSCO's involvement in the project, a well-capitalised leading global steelmaker and industrial group, will substantially enhance the attractiveness of the funding opportunity for potential financiers.

If the company is successful in arranging the majority of financing from a non-equity source — and given POSCO's contribution — we believe any overhang would be readily supported by the market.

Another reason for Gunson's recent share price lag is because it has been to the market on two separate occasions this year for small equity raisings. Whilst these financings were required to ensure work continued on the development of Coburn and were small in the hope of preventing unnecessary dilution, an overhang does exist on the stock as investors know a further (and much larger) raise is probably required and this has put pressure on the share price. Unfortunately, this pressure will remain until the majority of the project is financed (as discussed above).

On saying that, the fact that POSCO will be a partner in the project illustrates its robustness and will give the market confidence that the project will be developed. This is in addition to Gunson executing a 'take or pay' contract for the sale of its Chloride Ilmenite production over a five-year period with DuPont, the world's largest manufacturer of Titanium Dioxide, earlier in the year. Furthermore, a recent updated study undertaken by Gunson is well timed and should assure potential investors of the project's robustness. The operating cost review and Front End Engineering Design (FEED) value study has significantly reduced any project cost overrun risk. While a conservative approach was taken, resulting in a 7.5% (~A$12m) increase in capital costs and an increase in operating costs, this does not reflect potential cost reductions due to the improving contractor/cost environment in WA as iron ore and other mining activity slows. Work is ongoing, with Gunson optimising the mine plan, which management thinks will deliver significant improvements.

We are confident that Gunson can raise the required funds within the timeframe set by POSCO (by December 2012). However, the timing is likely to be tight and we are unlikely to see much positive share price movement until the majority of the funds are raised; once all the funds are raised a significant share price re-rating should be almost inevitable.

## Company Overview

### Background

Gunson Resources is an ASX-listed Mineral Sand development and mineral exploration company that trades under the ticker GUN and is based in Perth, Western Australia.

Gunson owns a number of mineral projects throughout Australia, the most advanced of these being the Coburn Zircon Project, where the company is currently arranging financing for the project's development and hopes to be in production by early 2014.

In addition to the Coburn Project, Gunson owns the Mount Gunson Copper Project in South Australia. This project is in a joint-venture agreement with Xstrata, which is earning a 75% interest in the project by spending A$10m by June 2013. To date Xstrata has spent A$6.0m.

The company also owns 100% of the Fowler's Bay Nickel Project in South Australia and the Tennant Creek Gold-Copper Project in the Northern Territory. Both are prospective, early-stage exploration projects.

**Project Location**


Source: Gunson Resources

### Coburn Project Overview

The Coburn Project covers an area of 1,195km² and is located adjacent to the Shark Bay World Heritage Property in Western Australia. The project is approximately 250km north of the regional centre and port of Geraldton, and 670km north of the state capital (Perth). The region is well supported by existing infrastructure, including roads and port facilities, which have sufficient capacity to support the Coburn Project.

To date Gunson has defined a resource of 979Mt at 1.26% HM and a reserve of 308Mt @ 1.2% HM, as shown in the table below.

**Reserve and Resource Statement**

| | HM | | Zircon | | Ilmenite | | Rutile | | Leucoxene | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) |
| Proven | 53 | 1.30 | 0.7 | 0.31 | 0.17 | 0.60% | 0.32 | 0.07% | 0.03 | 0.08% | 0.04 |
| Probable | 255 | 1.20 | 3.1 | 0.28 | 0.70 | 0.58% | 1.47 | 0.08% | 0.21 | 0.05% | 0.12 |
| **Total Reserve** | **308** | **1.20** | **3.8** | **0.28%** | **0.87** | **0.58%** | **1.79** | **0.08%** | **0.24** | **0.05%** | **0.16** |
| Measured | 119 | 1.30 | 1.5 | | | | | | | | |
| Indicated | 599 | 1.20 | 7.2 | | | | | | | | |
| Inferred | 261 | 1.40 | 3.6 | | | | | | | | |
| **Total Resource** | **979** | **1.26** | **12.3** | | | | | | | | |

Source: Gunson Resources

In addition to the ore reserves highlighted above, Gunson has modelled a potentially mineable resource of 106Mt at 1.3% HM from the inferred resource in the northern third of the Amy Zone. This would extend the Coburn mine life by six years to a total of 24 years.

Importantly, the Coburn Project also has very low levels (<3%) of fine 'slimes' or clay particles (<45 micron). This significantly reduces processing risks and facilitates low-cost tailings disposal methods.

## Definitive Feasibility Study

In January 2010 Gunson completed a DFS on the project

In January 2010 Gunson completed a DFS on the Coburn Project. The study examined the operation running for a 24-year mine life and returned an $NPV_{8\%}$ of A$139m. Due to the significant increase in Zircon and Titanium Dioxide minerals prices since 2010, and higher forecast prices from TZMI research, in November 2011 Gunson reviewed its revenue and expenses assumptions, which resulted in the $NPV_{8\%}$ increasing to A$223m. The revised study in September 2012 reduced this to A$211m.

The DFS examined a mining rate of 17.5Mtpa over a 24-year mine life to produce on average 40,000tpa Zircon, 90,000tpa Ilmenite and 19,000tpa of HiTi, which is a mixed Rutile and Leucoxene product grading 90% $TiO_2$.

### Mining

There will be two DMUs on site, one being moved while the other is being fed by bulldozers pushing ore into the feeder system of the DMU, where it is then transferred into a feed box to form slurry and passed over a screening deck. Underflow from the screen is pumped through to the Wet Concentration Plant (WCP), leaving the oversize (3.5%) to be discharged onto the ground via an oversize chute.

The overburden thickness at the project varies from 0-24m and is typically about 9m. The ore zone thickness ranges from 4-36 m, typically 15m.

**Trial Mining in Test Pit (2004)**

Source: Gunson Resources

### Processing

The process methodology to be employed at Coburn is a conventional processing technique, with a Wet Concentrator Plant (WCP) and a Mineral Separation Plant (MSP).

The WCP will be constructed as three modules: a Surge Bin, Spiral Plant and Thickener. The plant will be constructed as three separate modules so it can be easily disconnected and relocated as the orebody is mined and sequentially moves. The plant will be moved at between 1-3 year intervals.

All products will be trucked from the mine to Geraldton for storage before being exported to customers.

## Strategic Partner

Gunson announced that it had signed a non-binding term sheet in November 2011 with PSOCO

In August Gunson Resources advised that POSCO has approved an investment in its Coburn Zircon Project. POSCO's investment in the project will be within an unincorporated JV structure, through a special purpose investment vehicle, majority-owned by POSCO, with a minority interest held by a Korean-based resource investment fund.

The POSCO SPV will have a 40% interest in the project, contributing its proportionate share of mine development expenditure and ongoing operating costs. It will earn its 40% interest by making a A$7m initial payment to Gunson and then contributing the first A$21m of Gunson's share of mine development expenditure. Each JV party will be entitled to its proportional share of the proposed production from the project, being Zircon (estimated 65% of revenue), Chloride Ilmenite (20%) and HiTi90 (15%). The POSCO SPV's investment in the project is contingent upon Gunson raising its 60% equity share of the mine development costs, less the A$28m earn-in expenditure by the POSCO SPV, by the end of 2012.

4 October 2012

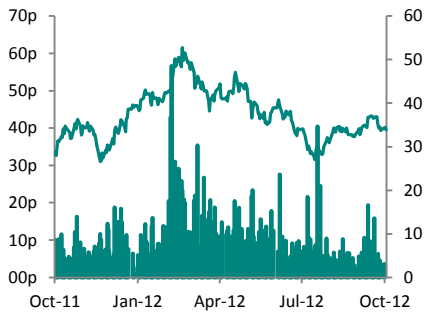
# Kenmare Resources plc

## Buy

## Moma Mia — Here We Grow Again

| | |
|---|---|
| **Price (p)** | **40** |
| Target Price (p) | 50 |
| Ticker | KMR-GB |
| Market cap (£m) | 1,022 |
| Estimated cash (US$m) | 95 |
| Estimated Debt (US$m) | 319 |
| **Shares in issue** | |
| Basic (m) | 2,530 |
| Fully diluted (m) | 2,595 |
| **52-week** | |
| High (p) | 62 |
| Low (p) | 31 |
| 3m-avg daily vol (000) | 5,698 |
| 3m-avg daily val (£000) | 2,179 |
| **Top shareholders (%)** | |
| M&G | 20.0 |
| BlackRock | 9.5 |
| Capital Corp | 7.5 |
| JP Morgan | 4.0 |
| Fidelity | 3.0 |
| **Total** | **44.0** |
| **Management** | |
| Justin Loasby | CHR |
| Michael Carvill | MD |
| Jacob Deysel | DIR |
| Terence Fitzpatrick | DIR |
| Tony McCluskey | FD |

### Share Price Performance (p)




Source: FactSet

**Kenmare is well advanced with its Phase 2 expansion project**, which is designed to grow production by 50% at its Moma Operation in northern Mozambique.

| Asset | Commodity | Location | Status |
|---|---|---|---|
| Moma | Mineral Sands | Mozambique | Production |

Source: Kenmare

**Kenmare represents one of the few opportunities to invest in a mid-tier Mineral Sands producer.** With favourable product pricing and a positive outlook for the sector, now is a good time to be in production.

**Kenmare is in the process of expanding its operation to increase production by 50%.** The expansion is expected to ramp production up to 1.2Mtpa Ilmenite, 75,000tpa Zircon and 21,000tpa Rutile from 2H13.

**The Moma Project has the potential to support over 100 years of mine life**, with a 7.4Bt resource defined at an average grade of 3.0% VHM.

**The potential for large volumes of low-cost production, enviable production upside and expansion opportunities** may well put Kenmare high up on the list for would be acquirers wishing to consolidate a position in the Mineral Sands space.

**Despite all this potential, Kenmare encountered a number of challenges in 2012** as it looked to mine clay bands within its Mineral Sands deposit. Kenmare has also met with cost blow-outs whilst constructing its Phase 2 expansion infrastructure. While we are positive on the company, it is worth remembering that there will be things to keep an eye on going forward.

### Recommendation — BUY; Target Price £0.50

**We initiate coverage of Kenmare Resources with a BUY rating and a target price of £0.50.** We rate Kenmare as a BUY based on risked $NAV_{10\%}$ incorporating a DCF valuation of the Moma Project and cash reserves. Catalysts for 2012/13 include:

- Phase 2 expansion complete — End 2012
- Ramp-up in production — 2013
- Decision on Phase 3 expansion — 2014

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RFC Ambrian

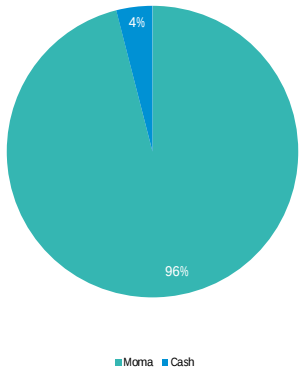
| | |
|---|---|
| **Ticker** | KMR-GB |
| **Recommendation** | **BUY** |
| **Target Share Price (£)** | 0.50 |
| **Current Share Price (£)** | 0.40 |
| **Implied Return (%)** | 24% |
| **P/NAV (x)** | 0.81 |

| | |
|---|---|
| **Financial Yr. End** | 31 December |
| **Shares on issue (m)** | 2,530.2 |
| **Market Cap (£m)** | 1,022.2 |
| **EV (£m)** | 1,168.0 |
| **Cash (£m)** | 61.8 |
| **Debt (£m)** | 207.6 |

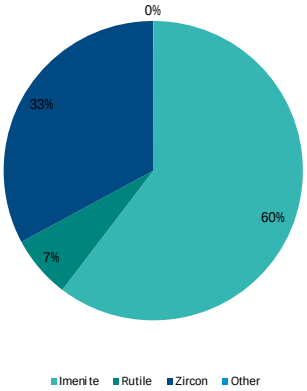
## Valuation

| Asset | Discount rate | NAV "X" Factor | NAV Target (£m) | Target SP (£) |
|---|---|---|---|---|
| Moma | 10% | 1.0 | 1,224.1 | 0.48 |
| Cash | 0% | 1.0 | 61.8 | 0.02 |
| **Total NAV** | | | **1,285.9** | **0.50** |
| Commodity Stats | Ilmenite | Rutile | Zircon | Other |
| Revenue Generated (LOM) | 58% | 7% | 32% | 0% |

Valuation Split




Valuation Split




## Profit & Loss (US$m)

| | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Gross Profit | 307.9 | 428.4 | 377.6 | 292.5 |
| EBITDA | 302.4 | 421.5 | 370.7 | 285.6 |
| Net Profit before tax | 242.4 | 351.2 | 307.8 | 230.3 |
| Tax Payable | 0.0 | (-1.4) | (-1.6) | (-1.5) |
| Profit after tax | **242.4** | **349.8** | **306.1** | **228.7** |

## Balance Sheet (US$m)

| | | | | |
|---|---|---|---|---|
| Assets | | | | |
| Cash | 208.5 | 549.7 | 873.6 | 1,121.3 |
| Total Current Assets | 280.9 | 622.1 | 945.9 | 1,193.7 |
| PPE & Exp & Dev | 846.8 | 820.0 | 770.9 | 720.6 |
| **Total Assets** | **1,133.2** | **1,447.6** | **1,722.3** | **1,919.8** |
| Liabilities | | | | |
| Senior Debt | 172.6 | 137.2 | 105.9 | 74.6 |
| **Total Liabilities** | **205.6** | **170.2** | **138.9** | **107.6** |

## Ratios and key financial data

| | | | | |
|---|---|---|---|---|
| EPS (£) | £0.10 | £0.14 | £0.12 | £0.09 |
| FCFPS (£) | £0.06 | £0.10 | £0.09 | £0.07 |
| P/E (x) | 4.2 | 2.9 | 3.3 | 4.5 |
| P/FCF (x) | 6.6 | 4.2 | 4.4 | 5.6 |
| EV/EBITDA (x) | 2.5 | 1.8 | 2.0 | 2.7 |
| Rev/Cash Costs (x) | 3.4 | 3.5 | 3.2 | 2.7 |

## Other (US$m)

| | | | | |
|---|---|---|---|---|
| Capex | 48.0 | 35.0 | 15.0 | 15.0 |
| Equity Requirement | 0.0 | 0.0 | 0.0 | 0.0 |
| Shares on issue (m) | 2,530.2 | 2,530.2 | 2,530.2 | 2,530.2 |

## Reserve and Resource Statement

| | Mt | VHM Grade (%) | Contained VHM (Mt) | EV / tonne (US$) |
|---|---|---|---|---|
| Total Reserves | 869.0 | 3.7% | 31.9 | 44.78 |
| M&I only | 517.0 | 3.2% | 16.4 | 87.18 |
| Total Resource | 7,354.0 | 3.0% | 218.9 | 6.51 |

## Production Profile (t)

| Commodity | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Ilmenite | 856,800 | 1,183,200 | 1,183,200 | 1,183,200 |
| Rutile | 15,137 | 20,903 | 20,903 | 20,903 |
| Zircon | 54,264 | 74,936 | 74,936 | 74,936 |
| Leucoxene | 0 | 0 | 0 | 0 |
| **Total** | 926,201 | 1,279,039 | 1,279,039 | 1,279,039 |

## Revenue (Avg Price) (US$/t)

| | | | | |
|---|---|---|---|---|
| Ilmenite | 300 | 294 | 268 | 225 |
| Rutile | 2,821 | 2,813 | 2,389 | 2,095 |
| Zircon | 2,521 | 2,578 | 2,437 | 2,056 |
| Leucoxene | 0 | 0 | 0 | 0 |

## Cash cost (US$/t of ore)

| | | | | |
|---|---|---|---|---|
| Net Revenue | 10.39 | 10.35 | 9.47 | 8.01 |
| C1 Cash Costs | 3.06 | 2.96 | 2.96 | 2.96 |
| Total Production costs | 4.65 | 4.40 | 4.39 | 4.36 |

## Directors & Management

Non-Executive Chairman - Justin Loasby
Managing Director - Michael Carvill
Exe. Director - Jacob Deysel
Exe. Director - Tony McCluskey

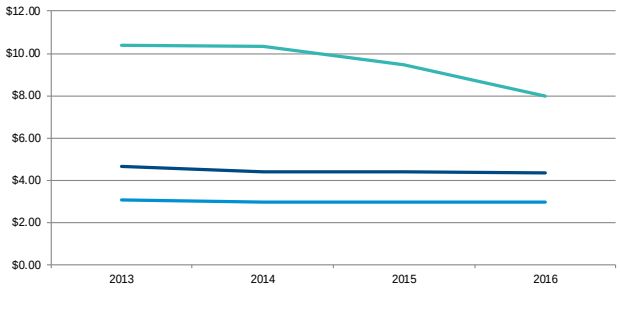
## Major Shareholders

| | | % |
|---|---|---|
| Fund 1 | M&G | 20.0% |
| Fund 2 | Black Rock | 9.5% |
| Fund 3 | Capital Corp | 7.5% |
| Fund 4 | JP Morgan | 4.0% |
| **Total** | | **41.0%** |

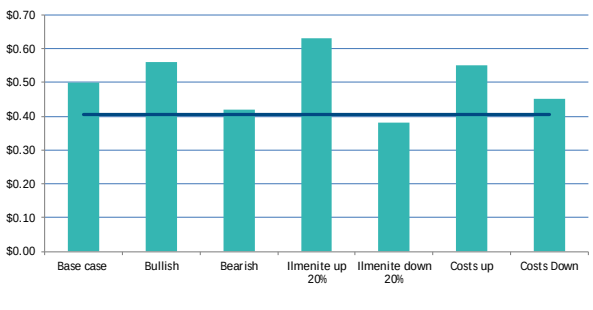
## Scenario Analysis

| Scenario | NAV Target (US$m) | Target Share Price (US$) | variance from base case (%) | variance from current SP(%) |
|---|---|---|---|---|
| Base case | 1,285.9 | 0.50 | | 24% |
| Bullish | 1,436.9 | 0.56 | 12% | 39% |
| Bearish | 1,070.6 | 0.42 | -16% | 4% |
| Ilmenite up 20% | 1,604.2 | 0.63 | 26% | 56% |
| Ilmenite down 20% | 967.6 | 0.38 | -24% | -6% |
| Costs up | 1,400.2 | 0.55 | 10% | 36% |
| Costs Down | 1,147.1 | 0.45 | -10% | 11% |

Revenue/Cash Cost Per Tonne




Current Share Price vs. Various Scenarios




Source: Company data, RFC Ambrian Assumptions

## Recommendation and Valuation

We initiate coverage of Kenmare Resources with a **BUY** rating and a target price of £0.50

We initiate coverage of Kenmare Resources with a **BUY** recommendation and a **target price of £0.50**.

A breakdown of our valuation is shown below.

| Asset | NAV (US$m) | NAV (x) | NAV Target (£m) | Target SP (p) |
|---|---|---|---|---|
| Moma | 1883.2 | 1.0 | 1,224.1 | 48 |
| Cash | 95.1 | 1.0 | 61.8 | 2 |
| **Total NAV** | **1978.3** | | **1,285.9** | **50** |

Source: RFC Ambrian

We have only modelled the project to 2042

Based on the company's financial accounts and discussions with management, we calculate a $NPV_{10\%}$ value of £1,224.1m for the Moma Project. The key assumptions of our analysis are highlighted below. Despite the 120-year mine life indicated by current reserves and resources, we have only modelled the project to 2042.

When cash is included, the risked NAV for Kenmare Resources is £1,285.9m, or 50p/share.

We have not attributed any value to a potential Phase 3 expansion

We have not attributed any value to a potential Phase 3 expansion and view this as potential upside.

### Key Modelling Assumptions

| Description | Assumption |
|---|---|
| **Mining and Processing Assumptions** | |
| Total Ore Mined (Mt) | 1,713 |
| Avg Grade Mined - THM (%) | 3.2 |
| Avg Grade Mined - Ilmenite (%) | 3.0 |
| Avg Grade Mined - Rutile (%) | 0.05 |
| Avg Grade Mined – Zircon (%) | 0.19 |
| Sales - Ilmenite –Total (000t) | 34,945 |
| Sales – Rutile - Total (000t) | 617 |
| Sales - Zircon - Total (000t) | 2,213 |
| **Financial Assumptions (Avg Rev/Cost per tonne of ore)** | **US$/t** |
| Avg Revenue per tonne | 7.35 |
| Mining | 0.21 |
| Wet Concentration Plant | 0.60 |
| Mineral Separation Plant | 1.19 |
| Product Handling | 0.44 |
| Mine Site Admin & Overheads | 0.68 |
| **Mine Production Expense** | **3.13** |
| Royalty | 0.17 |
| Depreciation | 0.83 |
| Interest Expense | 0.05 |
| Corporate Expense | 0.04 |
| **Total Operating Expense*** | **4.22** |
| Remaining Phase 2 Capex (US$m) | 110 |
| LoM Capex (US$m)** | 466 |
| Ownership | 100% |

*Includes production expenses; **Excludes Phase 2 capex; Source: RFC Ambrian

## Investment Case

Kenmare represents one of the few opportunities to invest in a mid-tier Mineral Sands producer

Kenmare represents one of the few opportunities to invest in a mid-tier Mineral Sands producer. Given the recent buoyant product pricing and our expectations of further price improvements, Kenmare looks well set to generate significant margins and, consequently, cashflow from production of Ilmenite and Zircon products.

Currently no value is ascribed to a potential Phase 3 upgrade

There is currently no value ascribed to a potential Phase 3 upgrade; once a clearer picture of this is generated there may be scope to increase our valuation. Kenmare also has an enormous resource that we have not valued and this could also be viewed as upside.

Kenmare should be able to position itself as a low-cost Mineral Sands producer

Wet mining, if effectively implemented, is a low-cost mining technique. Low power costs within Mozambique should also be beneficial for cash costs. With the bulk of the capex already spent on mine infrastructure, Kenmare should be able to position itself as a low-cost Mineral Sands producer.

The company has faced a number of challenges

The company has faced a number of challenges, largely through the mining of clay bands that clog up the dredges. These geological problems are unlikely to go away. The challenges have forced Kenmare to utilise more costly dry mining to maintain production, and this has, of course, added to cash costs. The company has decided to purchase a larger dredge, which it believes will be better placed to deal with these clay horizons. This should result in an additional US$20m in capex in 2014, but should also reduce cash costs going forward.

In the near term, Kenmare's cash balance looks set to fall. With an estimated cash position of US$95m and expected capex in the region of US$100m for the remainder of the Phase 2 construction, we expect Kenmare's cash balance to fall in late 2012. It is important to note that the company's tax arrangements are extremely generous; these have a significant impact on the company's current valuation. Should Mozambique choose to review its tax arrangement with Kenmare, this would have a relatively significant impact on our valuation.

Moma operation will be around for many years to come

In the current mine plan a drop in overall head-grade is expected when the lower-grade Nataka Reserve is mined. However, it seems likely the lower-grade reserves will be mined at the same time as the currently mined higher-grade reserves and blended, or grade could improve as higher-grade resources are upgraded and incorporated in the mine schedule.

Despite a possible fall in grade, the company has extremely extensive resources that remain open and provide comfort that the Moma operation will be around for many years to come. With this in mind — and given the lack of other mid-tier producers in the sector — we would not be surprised if a larger producer is looking at Kenmare as an opportunity to consolidate within the sector.

Assuming the ramp-up goes smoothly, Kenmare will be in the enviable position of benefiting from forecast strong demand

Kenmare only has one project and is consequently unable to diversify technical, sector or country risk. However, as outlined previously, the company is one of few producers in the sector and, assuming the ramp-up to Phase 2 goes smoothly, it will be in the enviable position of benefiting from current prices and forecast strong demand in the sector. It is our view that the company is in a position to overcome geological and technical challenges at Moma, but we would like to see consistent low-cost production over the next few quarters.

# Company Overview

## Background

Kenmare Resources is a London- and Dublin-listed Mineral Sands mining company that trades under the ticker KMR in London.

Kenmare owns (100%) and operates the Moma Mine in northern Mozambique. The mine is currently operating at production levels of 800,000tpa of Ilmenite, 50,000tpa Zircon and 14,000tpa Rutile. Kenmare is in the process of expanding the operation to enable a 50% increase in production. Current reserves and measured and indicated resources look set to support 32 years of production at Phase 2 production rates.

**Dredging at Moma**

Source: Kenmare

## Financial Overview

On 20 July 2012 Kenmare completed a placement of 120m shares at 32p/share for total proceeds of US$60m to finance a cost overrun on its Phase 2 expansion programme. On completion of the placement we estimate Kenmare had a cash balance of US$95m, with debt of US$319m. The debt comprises senior debt of US$119m and subordinated debt of US$200m. The debt is provided through a club of lenders and has varying maturities between 2015 and 2019 at an average current interest rate of 8.5%. Sales are largely unhedged, with products sold on six-monthly contracts.

The remaining capex on the Phase 2 expansion is estimated at US$100m, which is due to be funded by the end of the year. This is expected to be funded from current cash reserves and cashflow to the end of the year. From 2013 onwards we expect significant cashflow to be generated from operations.

## Project Overview

The Moma Mine is located on the isolated north-east coast of Mozambique. Despite the relative lack of infrastructure, the project is located close to the sea and utilises the nearby beach to ship product and bring in the bulk of its supplies.

To date Kenmare has defined a resource of 7,354Mt at 3.0% VHM and a reserve of 869Mt @ 3.7% VHM, as shown in the table below. The reserve supports a 21-year mine life at a mining rate of 1.2Mtpa of Ilmenite. A detailed summary of the resource and reserve is highlighted below.

**Reserve and Resource Statement**

| | | HM | | Ilmenite | | Rutile | | Zircon | |
|---|---|---|---|---|---|---|---|---|---|
| Category | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) | (%) | Tonnes (m) |
| Proven | 250 | 4.4 | 11.0 | 3.6 | 9.0 | 0.09 | 0.21 | 0.26 | 0.66 |
| Probable | 619 | 3.4 | 20.9 | 2.8 | 17.4 | 0.05 | 0.34 | 0.18 | 1.1 |
| **Total Reserve** | **869** | **3.7** | **31.9** | | | | | | |
| Measured | 167 | 3.3 | 5.5 | 2.5 | 4.2 | 0.06 | 0.10 | 0.24 | 0.4 |
| Indicated | 350 | 3.1 | 10.9 | 2.5 | 8.7 | 0.06 | 0.21 | 0.18 | 0.60 |
| Inferred | 6,837 | 3.0 | 202.6 | 2.4 | 165.7 | 0.05 | 3.7 | 0.17 | 11.4 |
| **Total Resource** | **7,354** | **3.0** | **218.9** | | | | | | |

Source: Kenmare

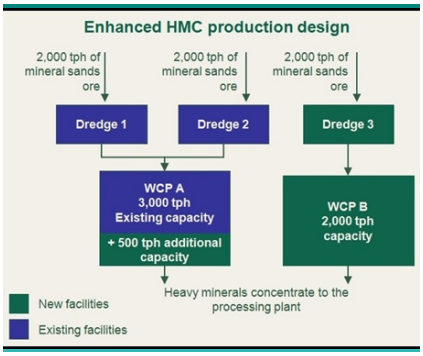
The grade of Ilmenite, Rutile and Zircon is significantly lower at the 445Mt Nataka Reserve, with Ilmenite falling from 3.6% to 2.7%. If the current 424Mt reserve at Namalope was completely mined out before mining commences at the Nataka Reserve, then a drop in grade can be expected in Year 13. However, it seems likely the reserves will be mined at the same time and blended; it is also likely that grade could improve as higher-grade resources are upgraded and incorporated in the mine schedule.

The main advantage of dredge mining is its lower cost of production

Mining is undertaken using dredges that float in an artificial mining pond. Kenmare is currently mining the Namalope Deposit. Mining is carried out by two dredges. The main advantage of dredge mining is its lower cost of production compared to alternative mining methods, such as dry mining. This is further enhanced by the low cost of power in Mozambique. These dredges pump the Mineral Sands that form the wall of the pond in to a floating Wet Concentrator Plant (WCP). A Heavy Mineral Concentrate (HMC) is produced, which is then pumped to a nearby a Minerals Separation Plant (MSP), where it is separated into final products for export via a transhipment barge, where the product is loaded onto the customer's vessel. The MSP contains circuits that use magnetic, gravity and electrostatic methods to separate HMC into various grades of the finished products — Ilmenite, Zircon and Rutile. The final Ilmenite product is suitable for both sulphate and chloride end products.

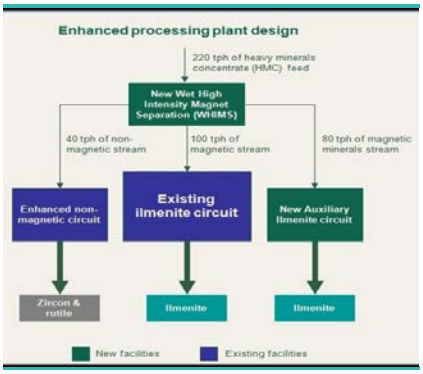
Mining at Moma has been quite challenging as unexpected bands of clay have disrupted dredging. The company has been forced to supplement feed to the WCP with more costly dry mining. Kenmare is also looking to purchase a larger dredge (at capital a cost of US$20m) that should cope better with the clay-rich bands in the deposit, and this should result in the suspension of dry mining.

**Phase 2 Expansion: Mining**




Source: Kenmare

**Phase 2 Expansion: Processing**




Source: Kenmare

## Phase 2 Expansion

Expansion of the Moma Mine and processing facility is financed and due for completion by end-2012. The expansion will increase design capacity by approximately 50%, resulting in an increase in production of Ilmenite from 800,000tpa to 1.2Mtpa, Zircon from 50,000tpa to 75,000tpa and Rutile from 14,000tpa to 21,000tpa.

The main elements of the expansion currently underway are:

- **An upgrade of the capacity** of the existing two dredges and WCP to increase spiral feed capacity from 3,000tph to 3,500tph.
- **The installation of a second WCP** with a spiral feed capacity of 2,000tph in a separate dredge pond, utilising a new third dredge on the Namalope Reserve.
- **The addition of a Wet High Intensity Magnetic Separation (WHIMS) circuit** at the front of the Ilmenite circuit of the MSP. WHIMS will be used to separate magnetic and non-magnetic fractions within the HMC whilst in a wet state. This will replace the dry primary separation stage and its associated costs.
- **The existing MSP will require some modifications**, including an auxiliary 80tph Ilmenite circuit, to increase throughput capacity from 135tph to 220tph.

The company is currently considering a further (Phase 3) expansion, which we expect a decision on in 2014.

4 October 2012

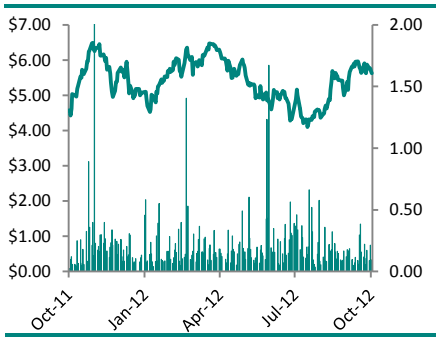
# Mineral Deposits Limited

## Buy

## Senegal Sands

| | |
|---|---|
| **Price (A$)** | **5.63** |
| Target Price ($A) | 8.84 |
| Ticker | MDL-AU |
| Market cap (A$m) | 470 |
| Estimated cash (US$m) | 91 |
| Estimated debt (US$m) | 0 |
| **Shares in issue** | |
| Basic (m) | 83.5 |
| Fully diluted (m) | 84.4 |
| **52-week** | |
| High (A$) | 6.49 |
| Low (A$) | 4.10 |
| 3m-avg daily vol (000) | 183 |
| 3m-avg daily val (A$000) | 915 |
| **Top shareholders (%)** | |
| Fidelity Mgmt & Research Co | 11.0 |
| BlackRock Invest Mgmt | 9.0 |
| Colonial First SFAM | 8.0 |
| UBS Global Asset Mgmt | 5.0 |
| JP Morgan Asset Mgmt | 4.0 |
| **Total** | **37.0** |
| **Management** | |
| Rick Sharpe | MD & CEO |
| Nic Limb | Exec CHR |
| Martin Ackland | Exec D |
| Bobby Danchin | Dep CHR |

### Share Price Performance (A$)




Source: FactSet

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**Mineral Deposits Limited (MDL) and Eramet are joint owners of a vertically-integrated titanium slag producer that has a secure feedstock of Ilmenite from the currently under construction Grand Côte Mine.** MDL is an ASX-listed company with a 50% ownership in TiZir (Eramet, a ~€2.6bn Euronext Paris-listed company, holds the remaining 50%). TiZir owns 100% of the vertically-integrated Norwegian Tyssedal Ilmenite upgrading smelter and 90% of the Senegalese Grand Côte Mineral Sands Mine.

| Asset | Status | Ownership |
|---|---|---|
| Tyssedal Smelter | Production | 50% |
| Grande Côte Mine | Construction | 45% |
| World Titanium Resources* | - | 16% |
| Teranga Gold* | - | 15% |

*Ownership represents MDL's shareholding in these listed companies; Source: MDL

**MDL is a vertically-integrated business with plans to expand the Tyssedal furnace to become the second largest titanium slag producer globally.** TiZir is primarily a $TiO_2$ feedstock producer; 90% of $TiO_2$ produced is used in the pigment industry, of which ~60% of $TiO_2$ pigments is used to make paint. On the supply side, the majority of titanium slag is supplied by Rio Tinto (~70%), with Exxaro and China delivering most of the remainder (20%).

**In addition to the Grand Côte growth story, the Tyssedal smelter should also increase production.** Plans include a refurbishment in 2014 to increase production by 20,000tpa to 220,000tpa. TiZir also commenced a feasibility study for a new furnace to produce chlorite slag from the Grand Côte Ilmenite feedstock. The secure supply of Ilmenite feedstock from this mine and a third-party Norwegian Ilmenite mine diversifies supply risks and secures off-take in a supply-restricted market.

**MDL believes the Grand Côte mine construction is currently within budget; the construction timeline is on schedule for production in late 2013.** The project is now fully financed from debt, available equity and organic cashflows from the Tyssedal operation. TiZir recently completed a senior secured bond issue of US$150m, with a further US$45m to be loaned by Eramet to TiZir next year.

**MDL previously explored, developed, commissioned and operated the Sabodala Gold Mine in Senegal.** Its experience, practical expertise and network of contacts with businesses and personnel should significantly assist the development and operation of Grand Côte.

### Recommendation — BUY; Target Price A$8.84

**We initiate coverage of MDL with a BUY rating and a target price of A$8.84**, or A$738.9m based on a risked $NPV_{10\%}$ of its assets. Upcoming catalysts include:

- 3Q12 report — 4Q12
- Commissioning of the Grand Côte Mine — 2H13

RFC Ambrian

| | |
|---|---|
| **Ticker** | MDL-AU |
| **Recommendation** | **BUY** |
| **Target Share Price ($A)** | 8.84 |
| **Current Share Price ($A)** | 5.63 |
| **Implied Return (%)** | 57% |
| **P/NAV (x)** | 0.60 x |

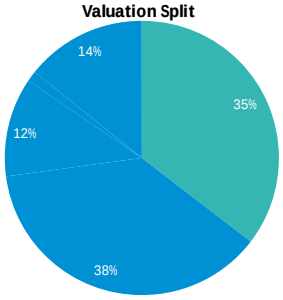
| | |
|---|---|
| **Financial Yr. End** | 31 December |
| **Shares on issue (m)** | 83.5 |
| **Market Cap ($Am)** | 470.3 |
| **EV ($Am)** | 381.1 |
| **Cash ($Am)** | 89.2 |
| **Debt ($Am)** | 0.0 |

## Valuation

| Asset | Discount rate | NAV "X" Factor | NAV Target ($Am) | Target SP ($A) |
|---|---|---|---|---|
| Tyssedal | 10% | 1.0 | 261.6 | 3.13 |
| Grande Côte | 10% | 0.9 | 276.4 | 3.31 |
| Teranga Gold | 10% | 1.0 | 86.3 | 1.03 |
| Word Titanium Resources | 10% | 1.0 | 9.5 | 0.11 |
| Cash | 0% | 1.0 | 105.1 | 1.26 |
| **Total NAV** | | | **738.9** | **8.84** |

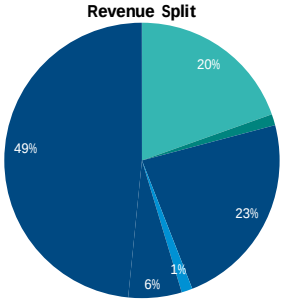
| Commodity Stats | Imenite | Rutile | Zircon | Leucoxene | Pig Iron | Titaniur |
|---|---|---|---|---|---|---|
| Revenue Generated (LOM) | 10% | 1% | 12% | 1% | 3% | |

**Valuation Split**




Tyssedal
Grande Côte
Teranga Gold
Word Titanium Resources
Cash

**Revenue Split**




Imenite
Rutile
Zircon
Leucoxene
Pig Iron
Titanium Slag

## Profit & Loss (US$m) (MDL's share of TiZir P&L)

| | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Gross Profit | 42.9 | 62.3 | 103.7 | 160.4 |
| EBITDA | 39.9 | 59.3 | 100.7 | 157.4 |
| Net Profit before tax | 41.4 | 59.7 | 101.1 | 158.2 |
| Tax Payable | (-0.4) | (-0.1) | (-0.1) | (-0.2) |
| Profit after tax | 41.0 | 59.6 | 101.0 | 157.9 |

## MDL - Balance Sheet (US$m)

| | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Assets | | | | |
| Cash | 29.9 | 27.1 | 24.3 | 133.3 |
| Total Current Assets | 118.3 | 115.5 | 112.7 | 221.7 |
| Non-Current Assets | 351.5 | 413.8 | 517.6 | 566.2 |
| **Total Assets** | **469.9** | **529.3** | **630.2** | **788.0** |
| Liabilities | | | | |
| Senior Debt | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total Liabilities** | **5.6** | **5.6** | **5.6** | **5.6** |

## MDL - Ratios and key financial data

| | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| EPS (A$) | $0.30 | $0.32 | $0.74 | $0.84 |
| FCFPS (A$) | (-$0.78) | (-$0.02) | (-$0.02) | $0.63 |
| P/E (x) | 18.6 | 17.5 | 7.6 | 6.7 |
| P/FCF (x) | NM | NM | NM | 8.9 |
| EV/EBITDA (x) | 9.7 | 6.4 | 3.8 | 2.4 |
| GC - Rev/Cash Costs (x) | 0.0 | 0.0 | 3.1 | 3.5 |

## Other (US$m)

| | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| TiZir - Capex | 21.0 | 21.0 | 21.0 | 21.0 |
| MDL - Equity Requirer | 0.0 | 0.0 | 0.0 | 0.0 |
| MDL - Shares on issue | 117.7 | 117.7 | 117.7 | 117.7 |

* Assumed placement price is the current share price

## Grand Côte Reserve and Resource Statement

| | Mt | grade (%) | Contained VHM (Mt) | EV / tonne (US$) |
|---|---|---|---|---|
| Total Reserves | 338.0 | 1.8% | 6.1 | 58.52 |
| M&I only | 463.5 | 1.7% | 8.0 | 44.34 |
| Total Resource | 463.5 | 1.7% | 8.0 | 44.34 |

## Attributable Production Profile (t)

| Commodity | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Imenite | 0 | 0 | 156,041 | 249,919 |
| Rutile | 0 | 0 | 1,550 | 2,483 |
| Zircon | 0 | 0 | 21,665 | 34,699 |
| Leucoxene | 0 | 0 | 2,463 | 3,944 |
| **Total** | **0** | **0** | **179,257** | **287,102** |
| Pig Iron | 50,150 | 55,000 | 38,500 | 60,500 |
| Titanium slag | 83,350 | 100,000 | 70,000 | 110,000 |

## Grand Côte - Cash cost (US$/t of ore)

| | | | | |
|---|---|---|---|---|
| Net Revenue | 0.00 | 0.00 | 5.88 | 6.89 |
| C1 Cash Costs | 0.00 | 0.00 | 1.91 | 1.94 |
| Total Production costs | 0.00 | 0.00 | 3.06 | 3.01 |

## Tyssedal - Cash cost (US$/t of slag)

| | | | | |
|---|---|---|---|---|
| Net Revenue | 1,241 | 1,380 | 1,354 | 1,232 |
| Cash Costs | 670 | 700 | 685 | 685 |
| Total Production costs | 708 | 740 | 726 | 728 |

## Revenue (Avg Price) (US$/t)

| | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Imenite | 0 | 0 | 293 | 267 |
| Rutile | 0 | 0 | 2,750 | 2,383 |
| Zircon | 0 | 0 | 2,511 | 2,385 |
| Leucoxene | 0 | 0 | 1,719 | 1,456 |
| Titanium Slag | 1,241 | 1,380 | 1,354 | 1,232 |
| Pig Iron | 395 | 356 | 348 | 308 |

## Directors & Management

| | |
|---|---|
| Non-Executive Chairman - Nic Limb | |
| MD & CEO - Rick Sharpe | |
| Exe. Director - Martin Ackland | |
| NED & Dep. Chairman - Bobby Danchin | |

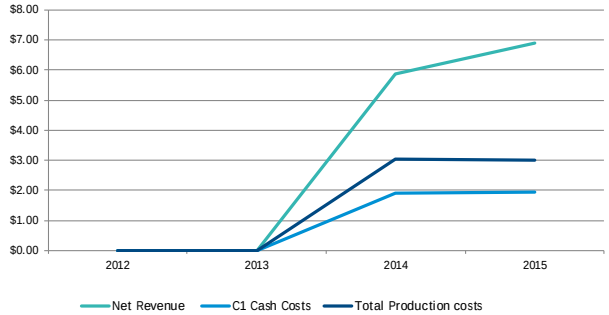
## Major Shareholders

| | % |
|---|---|
| Fidelity Management & Research | 11.0% |
| BlackRock Investment Managem | 9.0% |
| Colonial First State Global Asset | 8.0% |
| **Total** | **28.0%** |

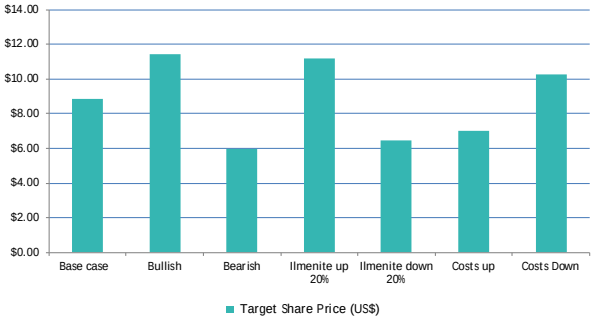
## Scenario Analysis

| Scenario | NAV Target (US$m) | Target Share Price (US$) | variance from base case (%) | variance from current SP(%) |
|---|---|---|---|---|
| Base case | 738.9 | 8.84 | | 57% |
| Bullish | 956.2 | 11.44 | 29% | 103% |
| Bearish | 498.2 | 5.96 | -33% | 6% |
| Ilmenite up 20% | 936.8 | 11.21 | 27% | 99% |
| Ilmenite down 20% | 541.6 | 6.48 | -27% | 15% |
| Costs up | 585.0 | 7.00 | -21% | 24% |
| Costs Down | 856.3 | 10.25 | 16% | 82% |

**Grande Côte - Revenue/Cash Cost Per Tonne**




**Current Share Price vs. Various Scenarios**




Source: Company data, RFC Ambrian Assumptions

# Valuation and Investment Case

## Valuation

We initiate coverage of MDL with a **BUY** rating and a **target price of A$8.84**. A breakdown of our valuation is given below.

| Asset | NAV (A$m) | NAV (x) | NAV Target (A$m) | Target SP (A$) |
|---|---|---|---|---|
| Tyssedal Smelter | 261.6 | 1.00 | 261.6 | 3.13 |
| Grande Côte Mine | 325.2 | 0.85 | 276.4 | 3.31 |
| Teranga Gold (TGZ:TSX) | 86.3 | 1.00 | 86.3 | 1.03 |
| Word Titanium Resources (WTR:ASX) | 9.5 | 1.00 | 9.5 | 0.11 |
| Cash | 105.1 | 1.00 | 105.1 | 1.26 |
| **Total NAV** | **787.7** | | **738.9** | **8.84** |

Source: RFC Ambrian

We value the producing Tyssedal smelter operation using a DCF and determine an un-risked $NPV_{10\%}$. We applied a 0.85x risked multiple to our Grand Côte $NPV_{10\%}$ valuation due to the execution risk and project financing being subject to internal cashflow generation from the Tyssedal smelter.

## Investment Case

**Adversity into fortune** — MDL has recreated itself from being a Senegalese gold producer into a vertically-integrated titanium and Zircon supplier through the end-2011 TiZir joint-venture deal, executed with 50% JV partner Eramet. Few at the time would have imagined the progress MDL has achieved since the demerger of Sabodala Gold (into Teranga Gold). MDL was then exiting a bull gold market to develop another Senegalese mine, the little thought of Grande Côte Minerals Sands Project. Today, management has proved itself to be a shrewd Minerals Sands operator, having potentially created a key industry titanium slag producer almost overnight.

One of Grand Côte's major products — 400,000tpa of Sulphate Ilmenite — has deleterious levels of $Cr_2O_3$ that affect the sulphate pigment making process; this issue has been partially resolved by the TiZir transaction ensuring Grand Côte has off-take from its 100%-owned Tyssedal smelter. However, although MDL has the volume of Ilmenite to feed future Tyssedal growth, Ilmenite quality is likely to be an issue solved only by building a second furnace that can produce chloride slag — this smelter process is not affected by $Cr_2O_3$ levels.

Should MDL fail to build another furnace, it may be left trying to find a buyer for its chrome-contaminated Ilmenite feed. If it succeeds, it is well positioned to become the second largest titanium slag producer in the world (there are very few titanium pigment feedstock suppliers). The TiZir transaction has created a strategic asset that has greater value as a vertically integrated company than as individual assets — a strong asset base from which to grow.

**Executing expansion plans** — MDL has a critical two years ahead; construction and production ramp-up to early 2015 at Grande Côte is funded, and we feel MDL is well positioned to execute this growth given that management has previously built a mine. Furthermore, dilutive equity funding for expansion is unlikely. We believe MDL's furnace growth plans are required to ensure Grande Côte revenues are guaranteed, and to this end, Tyssedal's production should increase to 220,000tpa beyond its shutdown in 2014. TiZir has also commenced a feasibility study for a second furnace. If plans are executed, MDL will have created a strong industry participant with increased pricing power and strategic assets.

## Key Model Assumptions

| Description | Assumption |
|---|---|
| Mining **and Processing** Assumptions | |
| Total Ore Mined (Mt) | 753 |
| Avg Grade Mined - | |
| THM (%) | 1.71 |
| Rutile (%) | 0.04 |
| Zircon (%) | 0.18 |
| Sales - Ilmenite –Total (Mt) | 4.04 |
| Sales – Rutile – Total (Mt) | 0.04 |
| Sales - Zircon – Total (Mt) | 0.56 |
| Sales - Leucoxene – Total (Mt) | 0.64 |
| **Smelting Assumptions** | |
| Total Ore Smelted (Mt) | 6.98 |
| Sales –Titanium Slag Total (Mt) | 4.19 |
| Sales – Pig Iron –Total (Mt) | 2.31 |
| **Financial Assumptions** | |
| **Grande Côte** | **US$/$t_{Ore}$** |
| Avg Revenue per tonne | 11.50 |
| Mine Production Cost | 1.90 |
| Other Operating Expenses | |
| Royalty | 0.26 |
| Depreciation Exp | 0.74 |
| Interest Expense | 0.05 |
| Pre-production Capex * | 331 |
| Sustaining Capex | 210 |
| **Tyssedal** | **US$/$t_{Slag}$** |
| Avg Revenue per tonne | 1,129 |
| Smelter Production Cost | 685 |
| Other Operating Expenses | |
| Depreciation Exp | 104 |
| Sustaining Capex | 119 |

*Excludes capex spent pre-2012

Source: MDL, RFC Ambrian estimates

## Company Overview

In the last decade MDL was focused on the Senegalese Sabodala Gold Mine development; this was spun out into the TSX/ASX-listed vehicle Teranga Gold in late 2010.

In September 2009 Eramet and MDL completed a joint-venture transaction whereby Eramet contributed 100% of its shares in ETI (the Tyssedal Ilmenite upgrading smelter) to the JV and cash of US$30m; MDL contributed its 90% participation in the Grande Côte Mineral Sands Project. This created a significant new Mineral Sands producer, with a vertically-integrated titanium slag producer accessing a secure Ilmenite supply from the Grande Côte (GC) Mine development. The security of Ilmenite supply for Tyssedal provides future expansion opportunities.

MDL was selected by the Government of the Republic of Senegal (GOS) to explore and develop the GC and the Sabodala Mine in late 2004. MDL is well positioned to leverage its experience gained from working in Senegal on the Sabodala Mine, commissioned in 2009.

### Financial Position

MDL's balance sheet at 30 June 2012 showed cash of US$91m and no debt. Of the US$521m GC capex budget, ~US$300m has been spent. JV partner Eramet is to contribute a US$45M loan and TiZir has completed a US150m senior secured bond issue with a 9% coupon (due September 2017). MDL also own 16% (~US$88m) of Teranga Gold and 15% (~US$9.7m) of Madagascar Mineral Sands junior Word Titanium Resources (WTR:ASX). Looking ahead, the cashflows from Tyssedal lower the risk of unfunded capex increases.

### Grande Côte Mineral Sands Mine (45%)

#### Project Overview

The GC development in West Africa is located on the coast of Senegal, commencing 50km north of Dakar and extending to the north for over 100km. According to MDL, the mine has over 20 years LoM on current reserves and will produce on average approximately 85,000tpa of Zircon and 575,000tpa of Ilmenite (plus 6,000tpa Rutile and 10,000tpa Leucoxene). MDL believes Zircon and Ilmenite output will represent ~7% and ~10% of global production respectively. By our estimates, Zircon accounts for ~23% of LoM revenues. On-site construction of the project commenced in late 2011 and it is expected to be in production by late 2013; to date, the project timeline remains on target.

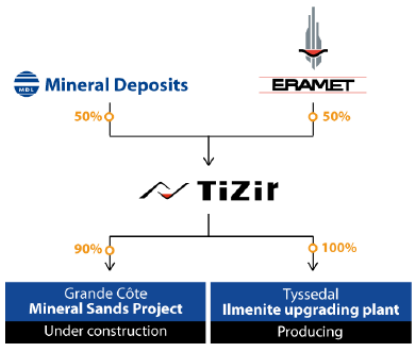
#### Government Fiscal Terms

GC is subject to a 5% gross production royalty payable to the GOS, although there is a 15-year tax exemption. While the GOS has a 10% free-carry, no dividends are paid until the project's capital costs and associated shareholder loans have been recovered. Additionally, the GOS is entitled to 10% of production on a cost plus formula.

#### Infrastructure & Construction

The project can be easily accessed, and existing roads, rail and port infrastructure exist. A main road lies 20km to the east and a rail line (under construction) will receive Ilmenite transported 25km by road to the railhead for transfer to the port of Dakar.

**Corporate Structure**




Source: MDL

**Power Station**

Source: MDL

## Dredge & Dredge Site

Source: MDL

MDL has significant practical and operational experience in Senegal, with the community accustomed to mining; there is an existing phosphate mine adjacent to the nearby town of Mboro (25km to the south).

The project is over a year into development, with EPCM contractor SNC Lavalin appointed to deliver the 55Mtpa floating (wet) concentrator and Mineral Separation Plant. A 36MW tri-fuel (HFO, diesel and gas) power plant is under construction, with gen sets recently delivered. The rail spur civil works are complete, with the rail line currently being laid.

### Resource & Reserves

The mineralised dune system averages 4km in width and contains largely un-vegetated sand masses. The resource consists of five Heavy Mineral deposits, and there is potential to expand resources and reserves. Grades of the various minerals are difficult to estimate, with the ranges in the table below from bulk samples and drill hole composite samples; they are considered reasonable estimates on which the mine plan has been designed.

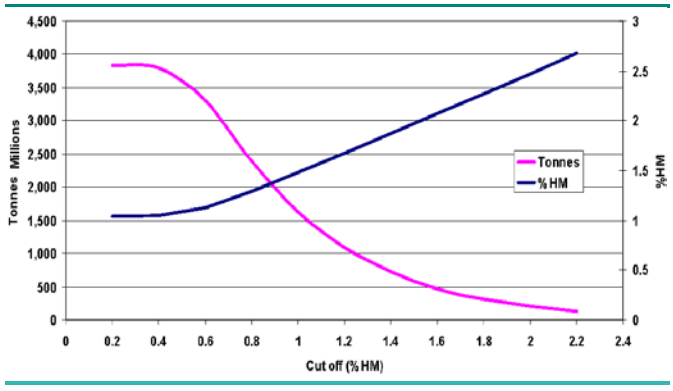
## 43-101 Resource and Reserves

| | 43-101 | | | Non-43-101 Estimate | | | |
|---|---|---|---|---|---|---|---|
| Classification | Tonnes (m) | HM (%) | HM (000t)* | Ilmenite (%)* | Zircon (%)* | Rutile (%)* | Leucoxene (%)* |
| **Proved and Probable Reserves** | **751** | **1.8** | **13,500** | **N/A** | **N/A** | **N/A** | **N/A** |
| Measured | 980 | 1.73 | 16,954 | 1.29 | 0.18 | 0.04 | 0.06 |
| Indicated | 50 | 1.77 | 885 | 1.32 | 0.19 | 0.04 | 0.06 |
| **Measured & Indicated** | **1,030** | **1.73** | **17,819** | **1.29** | **0.18** | **0.04** | **0.06** |

*Assays are not 43-101, they are based on bulk samples and drill hole composite samples; Source: MDL

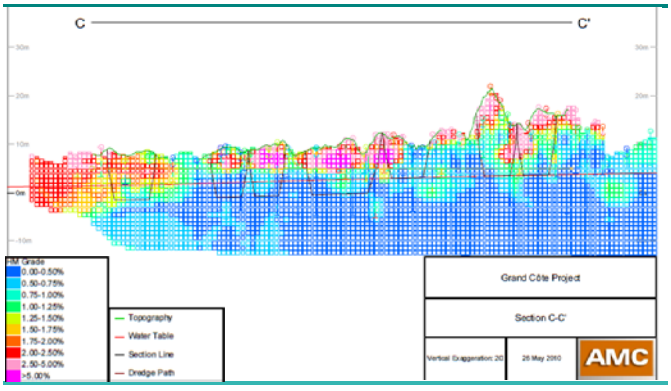
The reserves were estimated during April 2010 when Minerals Sand prices were much lower than today, hence the current resource cut-off grade is 1.25% HM. The deposit is sensitive to cut-off grade, so a lower cut-off grade of 0.75% HM would increase the measured resource to ~2.9Bt at a grade of ~1.2% (see the chart and cross section below).

## Grade Tonnage Curve for the Measured Resource




Source: MDL

## Longsection Grade Distribution




Source: MDL

### Mining

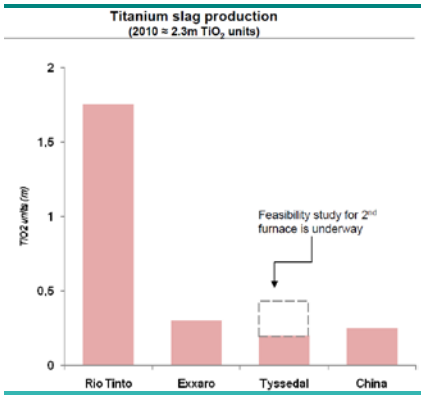
The mine plan identifies a dredge path over the first 14 years of operation on 40% of the mine lease; MDL believes ten years of production beyond current reserves is achievable with further drilling. Mining will be undertaken by dredging a continuous path through the dunes, utilising a 55Mtpa (7,000tph) dredge that is considerably larger than the norm. The dredge will advance at around ~20m per day, with 98% of the mined sands being returned to the rear of the mined artificial pond once processed through the wet concentrator.

## Saleable Products

| Product | Tonnes |
|---|---|
| Zircon | 79,500 |
| - Premium | 32,000 |
| - Intermediate | 25,000 |
| - Standard | 20,000 |
| - Secondary | 2,500 |
| Ilmenite | 575,000 |
| - Sulphate | 400,000 |
| - Chloride | 175,000 |
| Rutile | 6,000 |
| Leucoxene | 11,000 |

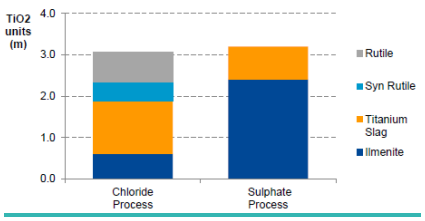
Source: MDL

## Titanium Slag Producers




Source: MDL

## Chloride and Sulphate Feedstock Consumables by Process




Source: MDL

### Processing

The processing circuit comprises three separate circuits: the wet (floating) concentrator, a Zircon dry circuit and an Ilmenite dry circuit. The wet concentrator is a conventional spiral circuit that concentrates HM into ~2% of the feed mass. The concentrate is then trucked for further processing in the Zircon and Ilmenite plants, where a series of wet high intensity magnetic separators, wet tables, high tension roll separators, electrostatic plate separators and induced roll magnetic separators produce two Ilmenite products — Rutile and Leucoxene — and various grades of Zircon (see table on the left). Overall, ~82% HM recoveries are achieved. At full production, the capacities of the various plants are: wet plant 240,000tpa, dry mill 105,000tpa and Ilmenite dry plant 680,000tpa. Once in production, GC will expand TiZir's product range to include 175,000tpa of chloride-grade Ilmenite and 80,000tpa of Zircon. The 400,000tpa of sulphate-grade Ilmenite can be used to produce 240,000tpa of chloride-grade slag in the existing furnace (or the new one).

## Tyssedal Ilmenite Upgrading Plant (50%)

### Tyssedal History

The smelter is located on the west coast of Norway and was purchased by Eramet in mid-2008 via the acquisition of Norwegian company Tinfos for €593m. The Tyssedal plant has been operational since 1986, producing titanium slag (also referred to as upgraded Ilmenite) and a high-purity pig iron by-product that receives a premium (~200%) to standard pig iron.

### Operations

The smelter is one of only five such plants (and the only plant in Europe); it sources Ilmenite feedstock from the operational Tellnes mine in Norway (Kronos Worldwide). Ilmenite is fed into the smelter at a rate of 335,000tpa, ore is upgraded from ~44% $TiO_2$ to ~80% $TiO_2$. The electric arc furnace (smelter) sources cheap power via a nearby hydropower plant; power costs are only ~11% of operating costs. Tyssedal has the capacity to produce over 200,000tpa of titanium slag and ~110,000tpa of pig iron. Due to the high levels of $Al_2O_3$, CaO and MgO in the Ilmenite, slag is used in plants using the sulphate process (it is not suitable for the chloride process).

### Outlook and Strategy

The addition of the Grande Côte Project provides the JV group, TiZir, with an opportunity to double the Tyssedal plant capacity. To this end, a feasibility study for a second furnace is underway. Production guidance for 2012 is 170-175,000t of titanium slag due to planned maintenance carried out last quarter. Nameplate capacity is 200,000tpa; Tyssedal produced 178,100t in 2011, and production should return to 190,000t in 2013, declining to 140,000t in 2014 due to extensive maintenance and an upgrade to achieve 220,000tpa of sulphate slag production.

### Upgraded Ilmenite (Titanium Slag) and Pig Iron Markets

The Titanium Dioxide slag is used in the white titanium pigments industry. Tyssedal is the only European producer of slag and a significant consumer of Ilmenite. The majority of titanium slag is supplied by Rio Tinto (~70%), with Exxaro and China delivering most of the remainder (20%). Titanium slag is used in both sulphate and chloride processing — which uses over 90% of titanium minerals — to produce titanium pigments, predominately used in paints (~60%). The high-purity pig iron is sold to ductile iron foundries, commonly for production of windmill parts.

4 October 2012

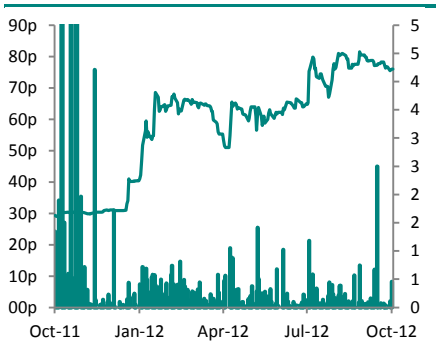
# Sierra Rutile

## Buy

## Production Records — What's Next

| | |
|---|---|
| **Price (p)** | **76** |
| Target Price (p) | 122 |
| Ticker | SRX-GB |
| Market cap (£m) | 387 |
| Estimated cash (£m) | 14.8 |
| Estimated debt(£m) | 19.5 |
| **Shares in issue** | |
| Basic (m) | 509 |
| Fully diluted (m) | 531 |
| **52-week** | |
| High (p) | 82 |
| Low (p) | 23 |
| 3m-avg daily vol (000) | 205 |
| 3m-avg daily val (£000) | 162 |
| **Top shareholders (%)** | |
| Pala Investments | 55.0 |
| M&G | 20.0 |
| JPMorgan Asset Management | 9.0 |
| Neon Liberty Capital | 7.0 |
| Investec Asset Management | 5.0 |
| **Total** | **96.0** |
| **Management** | |
| John Sisay | CEO |
| Joe Connolly | CFO |
| Jan Castro | NE CHR |
| Andy Taylor | Head of Ops |
| Gerald Boting | COO |

### Share Price Performance (p)




Source: FactSet

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**Sierra Rutile is a significant Rutile producer, supplying over 14% of the global market in 2011, and also produces minor amounts of Ilmenite and Zircon.** The Sierra Leone mine has underperformed since the ~30-year old operation was refurbished in 2005, although Sierra now looks to have turned the corner. A significant catalyst has been a re-capitalisation and investment in operations, together with a supportive new significant shareholder — 55%-owner Pala Investments.

| Asset/Project | Status | Capex (US$m) | Opex* (US$/t) | Resource (Mt) | LoM (Yrs) |
|---|---|---|---|---|---|
| D1 – Existing dredge | Operating | - | 617 | 412** | +30 |
| D1 – Dry mine expansion | Construction | 40 | 680 | 28.1 | 7 |
| D2 – Tails development | Financing | 25 | 580 | 22 | 10 |
| D3 – Large dredge | BFS | 169 | 394 | 192** | * |

*Cost of sales less depreciation and Ilmenite credit; **RFC Ambrian estimate; Source: Sierra Rutile

**In 2011 Sierra finalised its corporate and operational re-structuring, which was well timed given the appreciation of Rutile prices.** The alignment of shareholder interests with that of the company, as well as a board reshuffle to strengthen corporate strategy initiatives, has benefited operations through renewed capital investment and expansion programmes.

**At the start of this year Sierra freed itself from its 2005 legacy Rutile contracts.** This has come at the same time as significant global Rutile price appreciation; Sierra has experienced a substantial rise in average Rutile prices received (+340%) over the last six months.

**Sierra undertook a broad strategic review in 2011, culminating in the delivery of key value-accretive projects.** The outcome has been the delivery of three expansion projects, including the recently-released BFS for the new large dredge (D3) and improved operations performance. Operations have benefited recently from the increased capex undertaken in 2011 and 2012. To illustrate the effectiveness of the essential maintenance and investment, following a major planned maintenance shutdown completed in June 2012, record production was achieved over the following month.

**Sierra's performance this year, operationally and financially, instils confidence that it has the ability to execute and deliver targets.** However, we remain somewhat cautious, and look to further consecutive quarters of profitability whilst also achieving production guidance (given Sierra's historic underperformance).

### Recommendation — BUY; Target Price £1.22

**We initiate on Sierra with a BUY rating and a target price of £1.22**, or £618m based on a risked $NPV_{10\%}$. Upcoming catalysts include:

- 30-35,000tpa dry plant commissioning — 4Q12
- D2 and D3 construction contracts signed — 2H12
- D2 production commences — 2H13

RFC Ambrian

| | |
|---|---|
| **Ticker** | SRX-LN |
| **Recommendation** | **BUY** |
| **Target Share Price (£)** | 1.22 |
| **Current Share Price (£)** | 0.76 |
| **Implied Return (%)** | 61% |
| **P/NAV (x)** | 0.57 x |

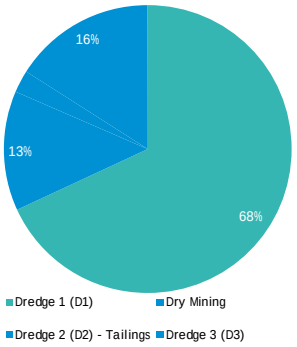
| | |
|---|---|
| **Financial Yr. End** | 31 December |
| **Shares on issue (m)** | 509.3 |
| **Market Cap (£m)** | 387.0 |
| **EV (£m)** | 391.7 |
| **Cash (£m)** | 14.8 |
| **Debt (£m)** | 19.5 |

## Valuation

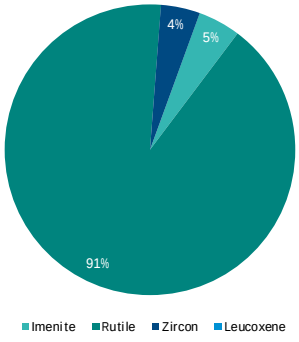
| Asset | Discount rate | NAV "X" Factor | NAV Target (£m) | Target SP (£) |
|---|---|---|---|---|
| Dredge 1 (D1) | 10% | 1.0 | 411.3 | 0.81 |
| Dry Mining | 10% | 0.8 | 80.1 | 0.16 |
| Dredge 2 (D2) - Tailings | 10% | 0.4 | 13.6 | 0.03 |
| Dredge 3 (D3) | 10% | 0.8 | 98.1 | 0.19 |
| Cash | 0% | 1.0 | 15.2 | 0.03 |
| **Total NAV** | | | **618.3** | **1.22** |

| Commodity Stats | Imenite | Rutile | Zircon | Leucoxene |
|---|---|---|---|---|
| Revenue Generated (LOM) | 5% | 91% | 4% | 0% |

**Valuation Split**




**Revenue Split**




## Profit & Loss (US$m)

| | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Gross Profit | 155.2 | 263.3 | 346.4 | 506.3 |
| EBITDA | 134.0 | 238.5 | 318.8 | 473.3 |
| Net Profit before tax | 121.1 | 220.2 | 296.1 | 446.3 |
| Tax Payable | 0.0 | 0.0 | 0.0 | (-129.6) |
| Profit after tax | **121.1** | **220.2** | **296.1** | **316.7** |

## Balance Sheet (US$m)

| | | | | |
|---|---|---|---|---|
| Assets | | | | |
| Cash | 100.3 | 183.6 | 400.9 | 709.8 |
| Total Current Assets | 156.1 | 239.4 | 456.7 | 765.6 |
| PPE & Exp & Dev | 154.0 | 284.4 | 356.7 | 357.9 |
| **Total Assets** | **320.0** | **532.8** | **821.5** | **1,130.7** |
| Liabilities | | | | |
| Senior Debt | 22.3 | 14.9 | 7.4 | 0.0 |
| **Total Liabilities** | **42.7** | **35.3** | **27.8** | **20.4** |

## Ratios and key financial data

| | | | | |
|---|---|---|---|---|
| EPS (£) | £0.15 | £0.28 | £0.38 | £0.40 |
| FCFPS (£) | £0.11 | £0.11 | £0.28 | £0.40 |
| P/E (x) | 5.0 | 2.7 | 2.0 | 1.9 |
| P/FCF (x) | 7.1 | 6.6 | 2.7 | 1.9 |
| EV/EBITDA (x) | 4.5 | 2.5 | 1.9 | 1.3 |
| Rev/Cash Costs (x) | 3.9 | 5.0 | 5.5 | 6.0 |

## Other (US$m)

| | | | | |
|---|---|---|---|---|
| Capex | 48.0 | 147.9 | 96.4 | 34.0 |
| Equity Requirement | 0.0 | 0.0 | 0.0 | 0.0 |
| Shares on issue (m)* | 509.3 | 509.3 | 509.3 | 509.3 |

* Assumed placement price is the current share price

## Reserve and Resource Statement

| | | | Contained VHM | |
|---|---|---|---|---|
| | Mt | Grade (%) | (Mt) | EV / tonne (US$) |
| Total Reserves | 175.5 | 1.3% | 2.23 | n/a |
| M&I only | 441.0 | 6.1% | 27.08 | n/a |
| Total Resource | 604.9 | 4.7% | 28.66 | n/a |

## Production Profile (t)

| Commodity | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Imenite | 20,153 | 20,153 | 20,153 | 71,493 |
| Rutile | 85,222 | 108,847 | 142,222 | 236,567 |
| Zircon | 5,467 | 10,934 | 10,934 | 16,294 |
| Leucoxene | 0 | 0 | 0 | 0 |
| **Total** | 110,842 | 139,934 | 173,309 | 324,354 |

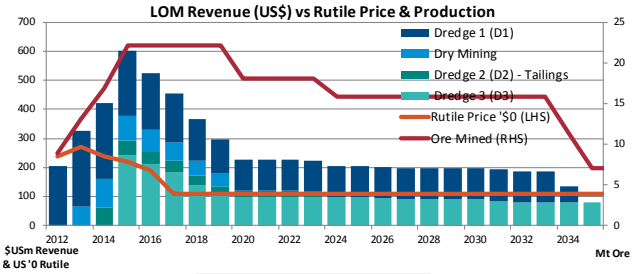
## Revenue (Avg Price) (US$/t)

| | | | | |
|---|---|---|---|---|
| Imenite | 269 | 300 | 294 | 268 |
| Rutile | 2,280 | 2,822 | 2,813 | 2,389 |
| Zircon | 1,203 | 1,258 | 1,289 | 1,018 |
| Leucoxene | 0 | 0 | 0 | 0 |

## Cash cost (US$/t of ore)

| | | | | |
|---|---|---|---|---|
| Net Revenue | 23.22 | 24.93 | 25.01 | 27.29 |
| C1 Cash Costs | 5.95 | 5.03 | 4.55 | 4.52 |
| Total Production costs | 9.40 | 7.87 | 7.06 | 6.90 |

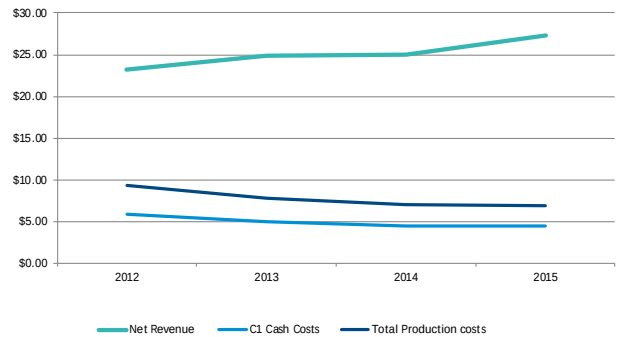
**LOM Revenue (US$) vs Rutile Price & Production**



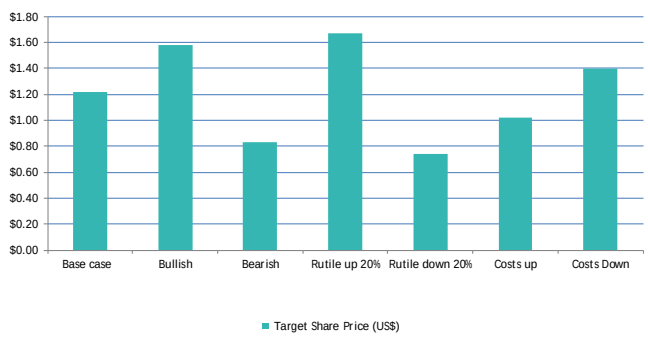

## Scenario Analysis

| Scenario | NAV Target (US$m) | Target Share Price (US$) | variance from base case (%) | variance from current SP(%) |
|---|---|---|---|---|
| Base case | 618.3 | 1.22 | | 61% |
| Bullish | 810.5 | 1.58 | 30% | 108% |
| Bearish | 423.9 | 0.83 | -32% | 9% |
| Rutile up 20% | 855.2 | 1.67 | 37% | 120% |
| Rutile down 20% | 380.2 | 0.74 | -39% | -3% |
| Costs up | 519.5 | 1.02 | -16% | 34% |
| Costs Down | 714.6 | 1.40 | 15% | 84% |

**Revenue/Cash Cost Per Tonne**




**Current Share Price vs. Various Scenarios**



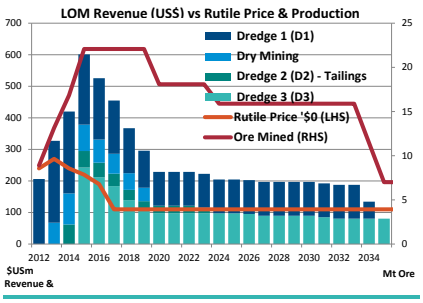

Source: Company data, RFC Ambrian Assumptions

## Key Model Assumptions

| Description | Assumption |
|---|---|
| Mining **and Processing** Assumptions | |
| Total Ore Mined (Mt) | 342.2 |
| Avg Grade Mined - | |
| THM (%) | 1.00 |
| Ilmenite (%) | 0.16 |
| Rutile (%) | 1.47 |
| Zircon (%) | 0.21 |
| Sales - Ilmenite –Total (Mt) | 0.70 |
| Sales – Rutile – Total (Mt) | 6.25 |
| Sales - Zircon – Total (Mt) | 0.890 |
| Sales - Leucoxene – Total (Mt) | - |
| **Financial Assumptions** | **US$/$t_{Ore}$** |
| Avg Revenue per tonne | 15.59 |
| Mine Production Expense | 4.52 |
| Other Operating Expenses | 3.01 |
| Capex (excl sustaining) | 253 |
| Sustaining Capex | 357 |

Source: Sierra Rutile, RFC Ambrian estimates

## Production Profile — Rutile Price Correlates to Production




Source: RFC Ambrian

# Valuation and Investment Case

## Valuation

We initiate coverage of MDL with a **BUY** rating and a **target price of £1.22**. A breakdown of our valuation is given below.

| Asset | NAV (US$m) | NAV (x) | NAV Target (£m) | Target SP (£) |
|---|---|---|---|---|
| Dredge 1 (D1) | 637.4 | 1.00 | 411.3 | 0.81 |
| Dry Mining | 155.2 | 0.80 | 80.1 | 0.16 |
| Dredge 2 (D2) - Tailings | 52.9 | 0.40 | 13.6 | 0.03 |
| Dredge 3 (D3) | 190.0 | 0.80 | 98.1 | 0.19 |
| Cash | 23.5 | 1.00 | 15.2 | 0.03 |
| **Total NAV** | **1,059** | | **618.3** | **1.22** |

Source: RFC Ambrian

We value Sierra on a DCF basis plus cash. We use a 1x unrisked $NPV_{10\%}$ for the existing operation (Dredge 1). We use 0.4x and 0.8x risked $NPV_{10\%}$ to reflect the higher risk level of technical and economic studies undertaken on the pipeline development projects (Dry mine, D2 and D3). While the projects are somewhat de-risked, given the company's history, management is still yet to prove its project development capability.

## Investment Case

**Turning the corner** — Sierra commissioned operations in mid-2006, one year after its AIM IPO. Whilst in the midst of a capex programme some two years into its operational life, its dredge capsized. This catastrophe overlapped with the global downturn and restricted Sierra's ability to recapitalise for further investment in operations. Sierra struggled, hit further by external disputes with the Sierra Leone Government and internal disputes with its significant shareholder and board member — a supposed white knight — until a corporate shake-up gave the company a rebirth. An upturn followed, with the introduction of Pala Investments, a new government deal, new management and a coincident rise in Mineral Sand prices; Sierra was finally able to harness the mine site's value. Today Sierra is a highly profitable company with strong cashflows, a healthy resource of extensive size and infrastructure that is ~50% under-utilised.

**Aligned interests to execute expansion** — Sierra has a strong 55% majority shareholder and an alignment of board strategy, centred on an operational game plan to increase production. Sierra has identified three projects to increase production and utilise the spare capacity that it had envisaged filling by late 2007 (as per its AIM admission statement). While Sierra cannot escape its past and its failure to deliver in what were difficult circumstances, the new focus, to be executed with the assistance of savvy resource specialists Pala Investments, provides it with a road map to increase production from 85,000tpa of Heavy Minerals to in excess of its current infrastructure capacity of 200,000tpa. As we discuss next, its plans are higher risk.

**High Rutile price exposure and higher risks** — Sierra can generate significant cashflows from peak production at peak Rutile prices, and has a tax-free period ending December 2014 (see chart left). While current production guidance is achievable (maintenance investments have been ongoing for the last 18 months), expansion plans are higher risk for all projects other than D3. While a BFS has been completed for D3, the other project plans have been delivered at a scoping study assessment level, hence the decision to start developments is riskier in nature; opex and capex may increase or, worse, unforeseen technical complexities may be encountered. We feel execution risks are significant, with no updated reserves and the development of a long-term mine plan unfinished.

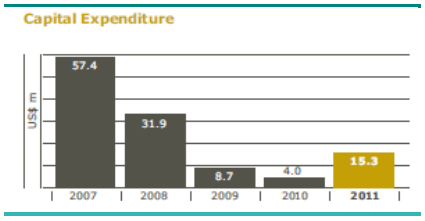
# Company Overview

## Background

In August 2005 Sierra Rutile (formerly Titanium Resources) listed on AIM and by March 2006 the D1 dredge had been commissioned after an operational refurbishment. Operations failed to achieve production targets and, with the unfortunate capsizing of Dredge 2 in 2008, the company struggled to recover in the following two years.

Sierra has moved on from its history of under-investment severely constraining production, a difficult majority shareholder and its 2010 dispute with the Sierra Leone Government. After a 2010 corporate re-structuring and operational improvements being undertaken, Sierra has started to deliver on production. Integral to this was the strategic operations review undertaken in 2011 by technical consultants. Since the consultants' recommendations were made, Sierra has been implementing numerous changes, as reflected in its revived capex programme and the delivery of numerous expansion projects.

### Capex




Source: Sierra Rutile

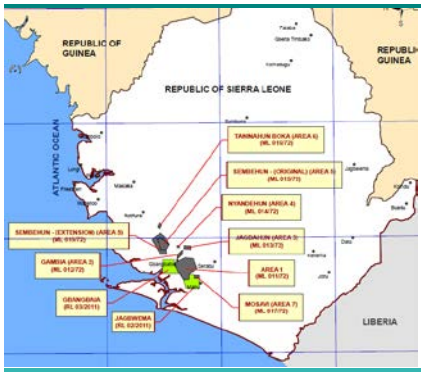
## Financial Position and Capital Structure

At 30 June 2012 Sierra had a strong balance sheet, with US$23m cash and an inventory valued at US$27m. Debt stands at US$30.2m. Pala Investment Holdings Ltd AG failed to complete its takeover offer in late 2011 at a price of 30p/share. Pala currently owns 55% and has three of the seven board seats. Pala has a track record in the natural resources sector, and is a cornerstone shareholder in several resource companies (Alacer Gold, Nevada Copper and Peninsula Energy). Resource service companies also form part of its portfolio, with shareholdings in Gemcom and Dumas.

# South-west Sierra Leone Project

## Project Overview

### Site Location




Source: Sierra Rutile

Sierra owns over 876km$^2$ of tenure, of which less than 13% has been drilled. The mine is located on a low-lying coastal plain 135km south-east of the capital of Freetown. The operation has a long history; mining began in 1967 and the mine operated continuously between 1983 and 1995. In 2005 Sierra Rutile (formerly Titanium Resources) refurbished the operation to commence commercial production a year later.

Today it is in production and currently operates one dredge, processing the ore through an existing floating treatment plant and a land processing plant. Operations have benefited from significant investments in 2011 and 2012, with improvements including spiral upgrades and investment in critical spares to reduce downtime. An ~US$8m annual maintenance budget is forecast going forward, and this should improve reliability.

Sierra has extensive infrastructure in place, including its own 23MW power plant (only 9MW is utilised), a distribution network, an export port, a mining camp, a laboratory and a road network. Significant capacity exists at the concentrate upgrading facilities, which can accommodate the increased production from the mining expansion projects planned. The dry plant, port and power station can handle up to ~200,000tpa, and production has averaged ~85,000tpa in recent years (67,000t Rutile/~17,000t Ilmenite).

## Resource & Reserves

At a 0.80% Rutile cut-off grade, the mineral resource contains +600Mt of ore. There is significant exploration upside as less than 20% of the mining leases have been drilled. While there are extensive resources, no updated reserves exist other than those at D3 — Sierra will update these next year.

| Classification | Tonnes (m) | HM (%) | Rutile (%) | Ilmenite (%) | Zircon (%) | HM (000t) | Rutile (000t) | Ilmenite (000t) | Zircon (000t) |
|---|---|---|---|---|---|---|---|---|---|
| Reserves | 175.4 | N/A | 1.27 | N/A | N/A | N/A | 2,228 | N/A | N/A |
| Measured | 4.4 | 2.30 | 1.13 | 0.42 | 0.18 | 102 | 50 | 19 | 8 |
| Indicated | 436.6 | 6.18 | 1.42 | 0.74 | 0.32 | 26,992 | 6,204 | 3,242 | 1,377 |
| **Measured & Indicated** | **441.0** | **6.14** | **1.48** | **0.74** | **0.31** | **27,095** | **6,254** | **3,260** | **1,385** |
| Inferred | 163.9 | - | 0.96 | - | - | - | 1,575 | - | - |
| **Total** | **604.9** | | | | | **27,095** | **7,829** | **3,260** | **1,385** |

Source: Sierra Rutile

## D1 Lanti Operation & Dry Mine Development

### Mining — D1 Dredge

D1 dredge has been operating since the late 1960s and has a further +30 years LoM

The sole electric bucket line dredging unit operates at 1,000tph (~7.2Mtpa capacity). The dredge scrubs and screens the slurry before piping the material to the wet plant; marginal oversize material is removed at this stage. Sierra has no reserves and hence the optimisation of mine operations is limited, with no detailed mine plan. While the operation has traditionally coped well with clays and fluctuating grades, reduced mining faces have at times limited production in the past. Production has also been reduced in prior years from requirements to move the dredge to new areas. A US$4m in-fill and exploration drilling programme has been undertaken this year and should reduce these risks going forward. Essentially, the creation of a detailed mine plan from the drilling will optimise mining efficiencies and flexibility.

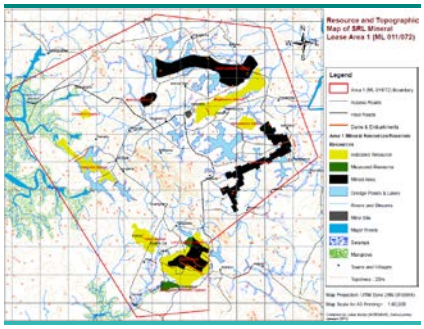
### Mining — Dry Mine Development

Capex of US$20.7m at costs of US$680/t Rutile with a seven-year LoM

The dry mining operation increases mining flexibility and creates value from resources previously inaccessible with a dredge mine. The owner-operated dozer and truck fleet will mine ~3Mtpa of sands; this should contribute 30,000-35,000tpa of Rutile to annual production over the next seven years.

The construction of the dry mining operation has commenced, with operations expected to start in late 2012 — mobile equipment delivery is expected in 3Q12. Operating costs of US$600-680/t Rutile are estimated, with the lower costs based on an owner-operator operation. Approximately US$25m of the ~US$40m capex budget has been spent to date; the budget was increased from US$20m to allow for the mine fleet acquisition.

### Resource (MI&I) Map



Source: Sierra Rutile

### Processing

The wet and dry mined Minerals Sands are processed through wet and dry concentrators respectively to produce a concentrate. The mass of concentrate produced is significantly reduced and can be transferred for refining in the Feed Preparation Plant (FPP) and dry plant. The processing of wet and dry mined ore is discussed in more detail below.

Dry mined Mineral Sands are processed in a moveable concentrator at the mine. A concentrate is produced that contains only 2-3% of the mass mined before being trucked to the FPP and dry plant for further refining. Sierra has commenced stockpiling feed ore for the plant commissioning, due later this year (400,000t have been stockpiled to date).

The wet mined Mineral Sands are processed through the 850tph (+6Mtpa capacity) floating wet concentrator. The wet concentrator produces a sand fraction (1mm to +63µm) that undergoes a three-stage upgrading process (through a series of spirals and cyclones) to produce a concentrate containing +70% Heavy Minerals. In 2012 further spirals and cyclones will be added to the wet plant to increase recoveries. The wet plant concentrate is then transported by front-end loaders to the FPP.

The FPP is a 200,000tpa capacity land-based gravity and flotation processing plant utilising attrition scrubbers, spirals and flotation cells. The plant increases the feed grade from ~70% HM to 96% HM. The FPP product is filtered and dried for further refining in the dry plant. Using high-tension rollers, the dry plant electrostatically separates the Rutile and Ilmenite conductors from the Zircon and quartz non-conductors. Ilmenite and Rutile are further separated with induced roll magnetic separators and electrostatic plate separators to produce finished Rutile containing 95-96% $TiO_2$. The Ilmenite product contains 60% $TiO_2$. Zircon is produced when availability allows treatment of the Zircon-rich concentrate. The Rutile is further refined (by screening) into two product grades: Industrial Grade Rutile (IGR) and Standard Grade Rutile (SGR). IGR is used in the welding sector, while SGR is sold into the pigment and titanium metals sector. New magnets and electrostatic separators will be added to improve recoveries at the dry plant; this should improve production and reduce operating costs.

## D2 Mogwembo Tailings Project

### Mining

Scoped capital costs of US$25m at costs of US$580/t Rutile with a ~10-year LoM

The old tailings contain higher grades of Rutile due to historical operational inefficiencies. Grades have been established from grid sample drilling. The project will treat 22Mt of tailings located close to the mineral separation plant.

The project is scheduled to commence production in mid-2013 with a fixed price, performance guaranteed EPCM contractor due to be signed in 4Q12. The project is targeting full capacity production by 2014. This study has budgeted capital costs of US25m at cash costs of US$580/t Rutile. Sierra is targeting production of 20,000-25,000tpa Rutile. A small-scale 500tph (~3Mtpa) dredge will mine the unconsolidated sand tailings.

### Processing

A moveable wet concentrator will treat the feed from the dredger in the later years of the operation's life (the last four years); the concentrator will be converted to a dry mine concentrator. The concentrate products are then processed through the existing FPP and dry plant; we estimate the FPP and dry plant will require expansion to accommodate this material.

## D3 BFS Recently Completed

BFS indicates capital costs of US$169m at costs of US$394/t Rutile (after by-products) with a ~28 year LoM

A BFS was completed at the time of writing; the capex is US$169m with operating costs of US394 LoM. The study plans are for a +1,000tph dredge (~7Mtpa) that will produce 68,0000tpa of Rutile, 38,000tpa of Ilmenite and 5,200tpa of Zircon concentrate over the LoM. The project has over 175Mt of defined reserves and mines higher-grade deposits in the first ten years, thereby maximising NPV and project cashflows (payback). The dredging equipment and processing flowsheet are essentially a replication of the existing D1 operation, utilising more modern equipment and process controls.

4 October 2012

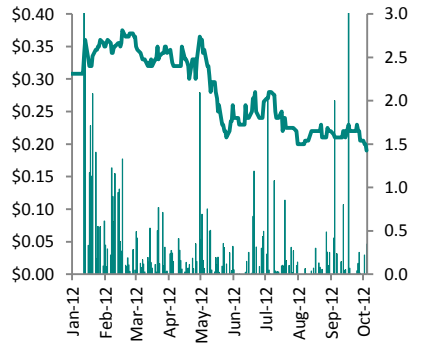
# World Titanium Resources

## Speculative Buy

## Funding is the Major Obstacle

| | |
|---|---|
| **Price (A$)** | **0.19** |
| Target Price (A$) | 0.41 |
| Ticker | WTR-AU |
| Market cap (A$m) | 56.7 |
| Estimated cash (A$m) | 9.9 |
| Estimated debt (A$m) | 0 |
| **Shares in issue** | |
| Basic (m) | 298 |
| Fully diluted (m) | 318 |
| **52-week** | |
| High (A$) | 0.38 |
| Low (A$) | 0.20 |
| 3m-avg daily vol (000) | 281 |
| 3m-avg daily val (A$000) | 91 |
| **Top shareholders (%)** | |
| Boulle Titanium | 20.7 |
| Mineral Deposits Limited | 14.9 |
| National Nominees Ltd | 7.2 |
| HSBC Custody Nominees | 5.5 |
| **Total** | **48.3** |
| **Management** | |
| Bruce Griffin | CEO |
| Wayne Malouf | NED |
| Mahen Sookun | CFO |
| Norman Rod Baker | NED |
| Tristan Davenport | NED |

### Share Price Performance (A$)




Source: FactSet

**World Titanium Resources (WTR) is the 100% owner of the Toliara Mineral Sands Project in Madagascar.** WTR recently completed a definitive engineering study (DES) for the Ranobe Mine, which is within the Toliara Sands Project, to examine an 8Mtpa operation over an initial 21-year mine life commencing in late 2014.

| Assets | Commodity | Location | Status |
|---|---|---|---|
| Toliara Project | Mineral Sands | Madagascar | Development |
| Ranobe Deposit* | Mineral Sands | Madagascar | Development |
| Otjinene and Otavi | Copper | Namibia | Exploration |

*The Ranobe Deposit is within the Toliara Project; Source: WTR

**The DES found that Ranobe is a low technical risk operation.** The operation will use two front-end loaders to mine the deposit, which will then feed into conventional processing methodology. Capex is estimated to be US$191m.

**LoM forecast production** at Ranobe is 326,000tpa of Sulphate Ilmenite, 81,000tpa of Chloride Ilmenite and 44,000tpa of a Zircon and Rutile concentrate.

**WTR has defined a resource of 959Mt at an average grade of 6.10% THM across the Toliara Sands Project.** Based on a mine rate of 8Mtpa — as defined in the DES — this would support a mine life in excess of 100 years.

**Presidential and parliamentary elections are planned in Madagascar for May 2013.** Despite a number of political 'events' over the past few years, substantial investment has taken place in the mining industry, most notably the US$5.5bn investment in the Ambatovy Nickel-Laterite Project and Rio Tinto's US$940m investment into the QMM Mineral Sands mine.

### Recommendation — SPECULATIVE BUY; Target Price A$0.41

**We initiate coverage of WTR with a SPECULATIVE BUY rating and a target price of A$0.41.** The reason for our rating only being 'speculative' at this time is due to the substantial funding risk associated with the project. However, if this situation changes in the future we would review our recommendation, with the potential to upgrade it to a full Buy rating. A key catalyst going forward is:

- Project financing

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RFC Ambrian

| | |
|---|---|
| **Ticker** | WTR-AU |
| **Recommendation** | **Spec Buy** |
| **Target Share Price (A$)** | 0.41 |
| **Current Share Price (A$)** | 0.19 |
| **Implied Return (%)** | 116% |
| **P/NAV (x)** | 0.46 |

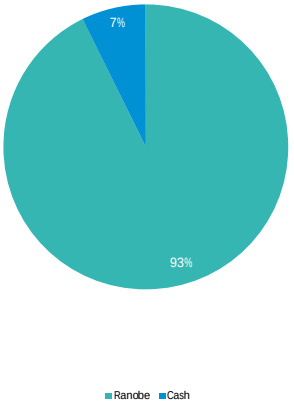
| | |
|---|---|
| **Financial Yr. End** | 30 June |
| **Shares on issue (m)** | 298.4 |
| **Market Cap (A$m)** | 56.7 |
| **EV (A$m)** | 46.8 |
| **Cash (A$m)** | 9.9 |
| **Debt (A$m)** | 0.0 |

## Valuation

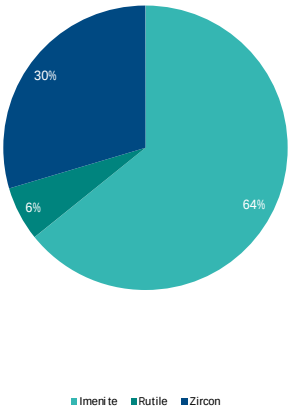
| Asset | Discount rate | NAV "X" Factor | NAV Target (A$m) | Target SP (A$) |
|---|---|---|---|---|
| Ranobe | 10% | 0.5 | 114.7 | 0.38 |
| Cash | | 1.0 | 9.9 | 0.03 |
| **Total NAV** | | | **124.6** | **0.41** |

| Commodity Stats | Ilmenite | Rutile | Zircon |
|---|---|---|---|
| Revenue Generated (LOM) | 64% | 6% | 30% |

**Valuation Split**




**Revenue Split**




## Reserve and Resource Statement

| | Mt | grade (%) | Contained VHM (Mt) | EV / tonne (US$) |
|---|---|---|---|---|
| Total Reserves | 161.0 | 7.6% | 12.2 | 3.69 |
| M&I only | 435.0 | 7.0% | 30.3 | 1.48 |
| Total Resource | 959.0 | 6.2% | 59.2 | 0.76 |

## Production Profile (t)

| Commodity | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Ilmenite | 0 | 0 | 122,747 | 492,966 |
| Rutile | 0 | 0 | 2,787 | 11,194 |
| Zircon | 0 | 0 | 9,640 | 38,715 |
| **Total** | 0 | 0 | 135,174 | 542,875 |

## Revenue (Avg Price) (US$/t)

| | | | | |
|---|---|---|---|---|
| Ilmenite | 0 | 0 | 281 | 240 |
| Rutile | 0 | 0 | 1,650 | 1,526 |
| Zircon | 0 | 0 | 1,671 | 1,525 |

## Cash cost (US$/t of ore)

| | | | | |
|---|---|---|---|---|
| Net Revenue | 0.00 | 0.00 | 14.12 | 24.63 |
| C1 Cash Costs | 0.00 | 0.00 | 6.37 | 6.31 |
| Total Production costs | 0.00 | 0.00 | 17.21 | 16.74 |

## Profit & Loss (US$m)

| | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Gross Profit | 0.0 | 0.0 | 27.3 | 132.8 |
| EBITDA | (-4.4) | (-4.4) | 21.8 | 124.5 |
| Net Profit before tax | (-4.0) | (-4.2) | (-15.0) | 52.2 |
| Tax Payable | 0.0 | 0.0 | 0.0 | (-9.3) |
| Profit after tax | **(-4.0)** | **(-4.2)** | **(-15.0)** | **42.9** |

## Balance Sheet (US$m)

| Assets | | | | |
|---|---|---|---|---|
| Cash | 7.7 | 3.5 | 20.8 | 118.3 |
| Total Current Assets | 8.3 | 4.0 | 21.4 | 118.8 |
| PPE & Exp & Dev | 1.9 | 131.5 | 167.2 | 102.0 |
| **Total Assets** | **10.9** | **136.3** | **189.4** | **221.6** |
| Liabilities | | | | |
| Senior Debt | 1.7 | 80.0 | 80.0 | 69.3 |
| **Total Liabilities** | **2.1** | **80.4** | **80.4** | **69.8** |

## Ratios and key financial data

| | | | | |
|---|---|---|---|---|
| EPS (A$) | (-$0.01) | (-$0.01) | (-$0.02) | $0.05 |
| FCFPS (A$) | (-$0.01) | (-$0.44) | (-$0.16) | $0.36 |
| P/E (x) | NM | NM | NM | 4.1 |
| P/FCF (x) | NM | NM | NM | 0.5 |
| EV/EBITDA (x) | NM | NM | 2.2 | 0.4 |
| Rev/Cash Costs (x) | 0.0 | 0.0 | 2.2 | 3.9 |

## Other (US$m)

| | | | | |
|---|---|---|---|---|
| Capex | 1.7 | 129.7 | 69.0 | 2.0 |
| Equity Requirement | 0.0 | 51.3 | 0.0 | 0.0 |
| Shares on issue (m)* | 298.4 | 568.4 | 926.3 | 926.3 |

* Assumed placement price is the current share price

## Directors & Management

Non-Executive Chairman - Wayne Malouf
Chief executive Officer - Bruce Griffin
Chief Financial Officer - Gooroodeo (Mahen) Sookun
Non-Executive Director - Norman Roderick (Rod) Baker
Non-Executive Director - Tristan Davenport
Non-Executive Director - Darren Morcombe
Non-Executive Director - Jeffrey W Williams
Non-Executive Director - Dr Ian Ransome MSc
Non-Executive Director - Dr Richard Valenta

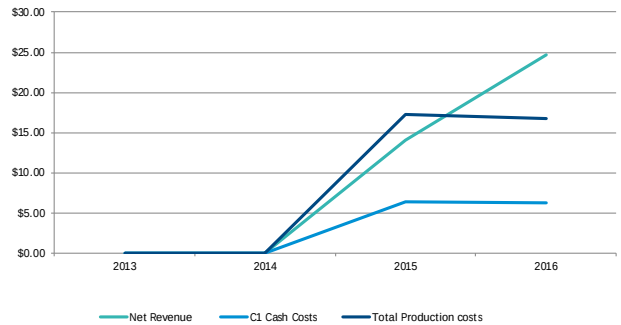
## Major Shareholders

| | % |
|---|---|
| Boulle Titanium | 20.7% |
| Mineral Deposits Limited (ASX:MDL) | 14.9% |
| National Nominees Limited | 7.2% |
| HSBC Custody Nominees (Australia) Ltd | 5.5% |
| **Total** | **48.3%** |

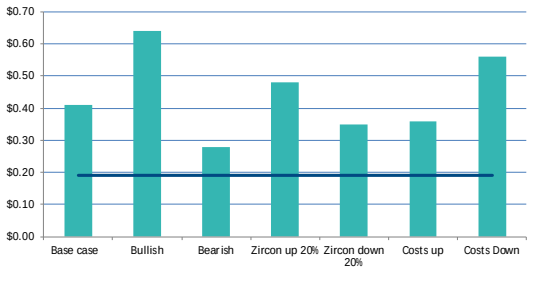
## Scenario Analysis

| Scenario | NAV Target (US$m) | Target Share Price (US$) | variance from base case (%) | variance from current SP(%) |
|---|---|---|---|---|
| Base case | 124.6 | 0.41 | | 116% |
| Bullish | 190.7 | 0.64 | 56% | 237% |
| Bearish | 85.9 | 0.28 | -32% | 47% |
| Zircon up 20% | 143.9 | 0.48 | 17% | 153% |
| Zircon down 20% | 105.3 | 0.35 | -15% | 84% |
| Costs up | 108.6 | 0.36 | -12% | 89% |
| Costs Down | 168.1 | 0.56 | 37% | 195% |

**Revenue/Cash Cost Per Tonne**




**Current Share Price vs. Various Scenarios**




Source: Company data, RFC Ambrian Assumptions

## Recommendation and Valuation

We initiate coverage of WTR with a **SPECULATIVE BUY** rating and a **target price of A$0.41**.

A breakdown of our valuation is given below.

| Asset | NAV (A$m) | NAV (x) | NAV Target (A$m) | Target SP (A$) |
|---|---|---|---|---|
| Ranobe | 229.4 | 0.5 | 114.7 | 0.38 |
| Cash | 9.9 | 1 | 9.9 | 0.03 |
| **Total NAV** | **239.3** | | **124.6** | **0.41** |

Source: RFC Ambrian

Based on the information in the definitive engineering study, discussions with management and our views, we calculate an $NAV_{10\%}$ value of A$229.4m for the Ranobe Project. The key assumptions of our analysis are highlighted below.

### Key Modelling Assumptions

| Description | Assumption |
|---|---|
| **Mining and Processing Assumptions** | |
| Total Ore Mined (Mt) | 160.7 |
| Avg Grade Mined - THM (%) | 6.70 |
| Avg Grade Mined - Ilmenite (%) | 6.04 |
| Avg Grade Mined - Rutile (%) | 0.20 |
| Avg Grade Mined – Zircon (%) | 0.46 |
| Sales - Ilmenite –Total (000t) | 8,477 |
| Sales – Rutile - Total (000t) | 193 |
| Sales - Zircon - Total (000t) | 666 |
| **Financial Assumptions (Avg Rev/Cost per tonne of ore)** | **A$/t** |
| Avg Revenue per tonne | 16.93 |
| **Mine Production Expenses** | **7.20** |
| Mining | 2.33 |
| Wet Concentration Plant | 1.29 |
| Mineral separation Plant | 1.59 |
| Product Handling & Transport | 1.28 |
| Mine site Admin & Overheads | 0.70 |
| **Other Operating Expenses** | **2.65** |
| Royalty | 0.34 |
| Corporate Expense | 0.64 |
| Depreciation Expense | 1.54 |
| Interest Expense | 0.13 |
| Pre-production Capex (A$m) | 199.4 |
| **Funding Assumption (A$m)** | |
| Equity | 120 |
| Debt | 80 |
| Ownership | 100% |

Source: RFC Ambrian

Given the size of the capital requirement in comparison to the size of WTR's current market cap, and the uncertainty in the equity markets at the moment, we feel it is prudent at this time to discount our NAV by 0.5x. This lowers our valuation to A124.6m, or A$0.41/share.

## Investment Case

Toliara is a very high-grade deposit

World Titanium Resources (WTR) is the owner of the Toliara Mineral Sands Project in Madagascar. The first thing that stands out about Toliara is that it is a very high-grade deposit that also has a very large contained mineral assemblage. Whilst there are a number of smaller deposits that have a similar grade to Toliara, very few are of the same size. Based on the recently-completed definitive engineering study (DES) forecast production rate of 8Mtpa, the current resource could support a mine life in excess of 100 years — which is a long life of mine by any standards.

It would be relatively easy to expand the production profile in the future

The DES examined an 8Mtpa operation over an initial 21-year mine life, commencing in late 2014. The operation would be mined using front-end loaders and has a zero strip ratio. Conventional processing techniques would be used to process the ore. We also understand that, due to the size and nature of the orebody, it would be relatively easy to expand the production profile in the future, potentially doubling the current forecast production rate.

So, this begs the question, why is WTR's share price currently languishing at half our current target valuation? We believe that this is for the same reason that many other development companies' share prices are currently depressed — project finance risk.

WTR requires some US$191m to develop the Ranobe Project

As has been the case for the past 12 months, equity markets are operating with a 'risk averse' mentality, particularly for projects that require substantial capital development/funding. WTR requires some US$191m to develop the Ranobe Project, which — assuming WTR funded 100% of the project from the equity markets — would require approximately 3.5x its current market cap. It goes without saying that this would be difficult in a buoyant equity market environment, let alone the current one. Even with the potential of debt funding, a multiple of the current market cap from the equity market would still be required — and difficult.

We believe the two most likely options available to WTR to fund the development of the project in the current environment are either to introduce a larger strategic partner to buy into Toliara at the project level (similar to POSCO being introduced to Gunson's Coburn Project) or M&A activity with either another Mineral Sands company or a 'cashed-up' shell that is looking to enter the Mineral Sands space.

It is possible that one of WTR's major shareholders — Boulle Titanium (20.7%) or Mineral Deposits (MDL) (14.9%) — may be open to either of these scenarios. Of the two, we believe that MDL would be the most likely candidate.

On saying this, MDL is currently developing their Grande Côte Project in Senegal, which requires substantial funding (as well as management's time) and developing another project at this time may be a bridge too far. However, we would not rule out this possibility given the quality of the Toliara Project. Likewise, a cashed-up shell or a company looking to enter the Mineral Sands space would struggle to find a project of this quality at its current valuation.

# Company Overview

## Background

### Project Location


Source: WTR

World Titanium Resources is an ASX-listed Mineral Sands development and exploration company that trades under the ticker WTR. As at 30 June 2012 WTR had A$9.9m in cash and no debt.

WTR's flagship is the 100%-owned Toliara Sands Project in south-west Madagascar, approximately 40km north of the regional port of Toliara and some 640km south-west of Antananarivo, the capital of Madagascar.

The Toliara Sands Project is situated in the driest region of Madagascar, with annual rainfall of 500-800mm reported at the deposit. The island is heavily exposed to tropical cyclones that bring torrential rains and destructive floods, such as those in 2000 and 2004, which left thousands homeless.

Within the greater exploration licence across the Toliara Sands Project, WTR has obtained two mining licences (Ranobe is within these areas) that contain 313Mt at an average grade of 7.6% THM. Each of the mining licences has a term of 40 years and may be renewed for one or more additional 20-year term.

To date WTR has defined a total resource across the Toliara Sands Project of 959Mt at an average grade of 6.10% HM, as shown in the table below. Based on the mine rate of 8Mtpa as defined in the DES, this would support a mine life of over 100 years.

### Total Resource

| | Tonnes | Heavy Minerals | | Slimes | Mineral Assemblage (% in HM) | | |
|---|---|---|---|---|---|---|---|
| Category | (Mt) | HM (%) | HM (Mt) | (%) | Ilmenite | Rutile | Zircon |
| Measured | 209 | 7.6 | 15.9 | 4.0 | 72.2 | 2.4 | 5.6 |
| Indicated | 226 | 6.1 | 13.8 | 4.0 | 71.8 | 2.2 | 5.6 |
| Inferred | 524 | 5.5 | 28.8 | 4.4 | 72.3 | 2.3 | 5.6 |
| **Total** | **959** | **6.1** | **58.5** | **4.2** | **72.2** | **2.3** | **5.6** |

Source: WTR

## Ranobe Project

WTR recently completed a DES for the Ranobe Mine, which is within the Toliara Sands Project, to examine an 8Mtpa operation over an initial 21-year mine life, commencing in late 2014. The key financial findings of the study are highlighted in the table below.

### Key Financial Findings

| Key Parameter | Finding |
|---|---|
| $NPV_{10\%}$ (US$m) | 257 |
| IRR (%) | 27 |
| Capital Payback (years) | 3 |

Source: WTR

The study determined the optimal mining method for Ranobe was to use front-end loaders (FEL). The study found FEL mining provided a high degree of flexibility, reduced the risks imposed by mining in close proximity to the limestone basement along the eastern side of the deposit, and is able to sequence selectively and mine the higher-grade parts of the deposit to maximise the project cashflow.

The ore zone ranges between 2–30m in depth and will be mined by two FEL. Ore mined will be fed to mining units and pumped to the primary concentrator plant (PCP). Ranobe ore has low slimes content (less than 5%), which should assist the concentration of the ore feed. The concentrator has four stages of spirals and a hydrosizer to produce a Heavy Mineral Concentrate (HMC). The final HMC, which will have a grade of 92% HM, will be stockpiled before being fed into the Mineral Separation Plant (MSP). The MSP will use conventional Mineral Sands separation equipment to produce final products, consisting of primary Ilmenite, secondary Ilmenite and a valuable non-magnetic concentrate containing Rutile and Zircon.

The Ilmenite circuit is a combination of magnetic separators and high-tension rolls to produce 326,000tpa of saleable Sulphate Ilmenite and 81,000tpa of saleable Chloride Ilmenite.

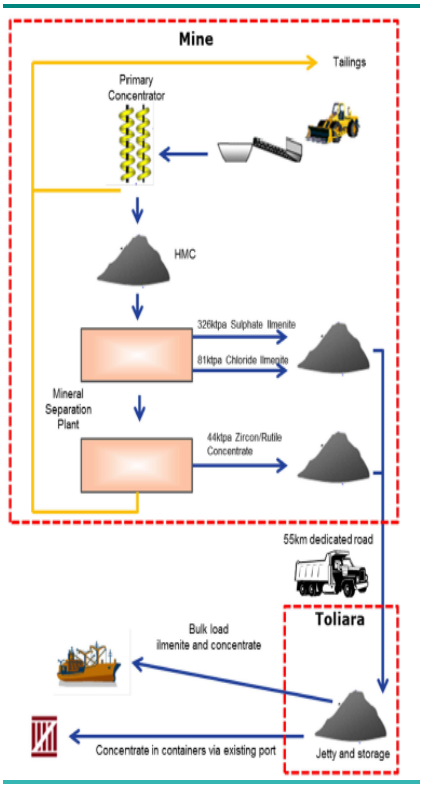
The non-magnetic circuit will utilise gravity separation (spirals) and magnetic separation to produce 44,000tpa of saleable Zircon- and Rutile-rich concentrate.

All products will be transported, via a planned dedicated 55km long-haul road, to a bulk loading facility, located north of the existing town and port of Toliara.

The Ilmenite products will be bulk loaded through a dedicated bulk-export jetty, which will be established as part of this development. The Zircon/Rutile concentrate will either be bulk loaded via the same facility or loaded into containers for export from the existing port of Toliara. The proposed dedicated jetty is sufficiently deep for larger vessels up to Handymax and Supramax size.

The haul road plus dedicated jetty export option provides inherently expandable infrastructure and maximises the potential to scale up the operation incrementally to exploit the resource fully. Once the starter pit has become well established these expansion options will be progressed.

### Flowsheet of Operation




Source: WTR

## Madagascar

Madagascar is an old French colonial country that gained its independence in 1960. Since independence Madagascar has seen a turbulent political environment, most recently in 2009 when Andry Rajoelina took control of the country with the support of the army. Whilst Andry Rajoelina has not been voted as the country's president, he is currently in charge of the country.

Presidential and parliamentary elections are planned in Madagascar for May 2013, after previously having been scheduled separately for (and postponed in) September 2011, May 2012 and November 2012.

Considerable investment has occurred within the mining industry over the past five years, most notably the US$5.5bn investment in the Ambatovy Nickel-Laterite project about 80km east of the capital Antananarivo. Rio Tinto also invested US$940m into the QMM Mineral Sands mine in south-eastern Madagascar. There are a number of other early-stage explorers looking for gold, copper, nickel and Mineral Sands.

## Ones to Watch

The following section outlines three companies that we feel are worth a mention as part of a review of the Mineral Sands sector. We have not completed a level of due diligence on these companies that gives us confidence to come up with a recommendation, but believe they are *Ones to Watch* in the sector. Of these three companies, we feel that Sheffield Resources is the top pick on the back of excellent drilling intersections.

### Ones to Watch

| Company | Ticker | Status | Country of Assets | Share price | Mkt Cap (US$m) | Net Cash (US$m) | EV (US$m) | Resource (Mt) | EV/ Res (US$/t) | Reserve (Mt) | EV/Res (US$/t) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Diatreme Resources | DRX-AU | Exp | Australia | A$0.02 | 8.46 | 1.1 | 8 | 4.67 | 1.61 | 2.43 | 3.11 |
| Image Resources | IMA-AU | Exp | Australia | A$0.31 | 33 | 0.9 | 32 | 10.05 | 3.21 | - | |
| Sheffield Resources | SFX-AU | Exp | Australia | A$0.60 | 57 | 9.3 | 48 | 55.31 | 0.89 | - | - |

Source: Intierra, FactSet

# Ones to Watch

4 October 2012

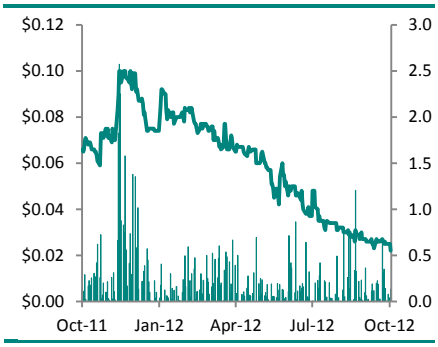
# Diatreme Resources

## One to Watch

## Challenges Ahead

| | |
|---|---|
| **Price (A$)** | **0.02** |
| Target Price (A$) | N/A |
| Ticker | DRX |
| Market cap (A$m) | 8.46 |
| Estimated cash (A$m) | 1.1 |
| Estimated Debt (A$m) | 0 |
| **Shares in issue** | |
| Basic (m) | 384 |
| Fully diluted (m) | 472 |
| **52-week** | |
| High (A$) | 0.10 |
| Low (A$) | 0.02 |
| 3m-avg daily vol (000) | 166 |
| 3m-avg daily val (A$000) | 6 |
| **Top shareholders (%)** | |
| Andrew Tsang | 10.0 |
| Lai You | 9.5 |
| Doral Ltd | 6.1 |
| Mr Zhangxi Zeng | 3.9 |
| Xiang Rong | 3.7 |
| **Total** | **33.2** |
| **Management** | |
| Anthony John Fawdon | E Chair - CEO |
| David Hugh Hall | ED |
| George Henry White | NE |
| Andrew Tsang | NE |

### Share Price Performance (A$)




Source: FactSet

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**Diatreme Resources Limited (DRX) is an ASX-listed explorer** with a portfolio of Mineral Sands, copper, gold and base metal properties within Australia.

| Asset | Location | Ownership |
|---|---|---|
| Cyclone Zircon Project | Western Australia | 100% |
| Clermont Copper Project | Queensland | 100% |

Source: Diatreme Resources

**Diatreme's Mineral Sands exploration focus centres on the Eucla Basin**, in both Western and South Australia. The company also holds exploration ground for Mineral Sands in the Arckaringa Basin (SA), Casterton (VIC), Shark Bay (WA) and Cape Bedford (QLD).

**The company's flagship Cyclone Zircon Project has a total reserve of 97Mt at 2.5% HM**, including 0.79% Zircon. The project also has a total resource of 136Mt at 2.3% HM, including 0.70% Zircon.

**A Cyclone Zircon Project PFS was completed last March.** The PFS results have demonstrated a very strong and robust operating margin for Zircon, which constitutes more than 80% of the revenue of Cyclone. A DFS has commenced and is expected to be completed in 4Q13.

**Diatreme Resources expects that in the first three years of mining & production** (forecast to begin in 2015) it will be producing 70,000tpa of Zircon, with an overall average of 65,000tpa of Zircon over a ten-year mine life.

**In the last quarter aircore drilling was undertaken at the Eucla Basin**, surrounding the Cyclone Deposit, with the aim of locating further resources. Total drilling for the quarter involved 309 holes for 10,579m.

**In early July DRX completed a placement to raise A$1.1m.** As of mid-July A$312,000 had been received in the first allotment.

### Investment Case

**The Cyclone resource is relatively low-grade and small.** The project's position in the Eucla Basin is extremely isolated; the transport of any potential product to market would be quite a challenge. We suspect that the resource is an Aeolian dune that is likely to have slightly less predictable grade, which could also cause problems for potential mining. An MOU on a possible joint development with neighbouring Image Resources' Cyclone Extended (86.3Mt at 1.09% HM) resource may go some way to increasing the economics of the project (although it will still be a small, low-grade resource).

**Metallurgical recoveries of Zircon in particular are favourable at 95%**, and test-work indicates an 85% Zircon product can be produced. However, the end product looks to be fairly high in uranium at 369ppm. Access to process water could also be a challenge in the Eucla Basin.

4 October 2012

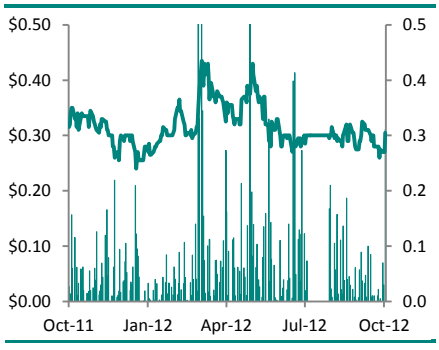
# Image Resources

## One to Watch

## In the Picture

| | |
|---|---|
| **Price (A$)** | **0.31** |
| Target Price (A$) | N/A |
| Ticker | IMA |
| Market cap (A$m) | 33 |
| Estimated cash (A$m) | 0.9 |
| Estimated Debt (A$m) | O |
| **Shares in issue** | |
| Basic (m) | 107 |
| Fully diluted (m) | 118 |
| **52-week** | |
| High (A$) | 0.44 |
| Low (A$) | 0.24 |
| 3m-avg daily vol (000) | 33 |
| 3m-avg daily val (A$000) | 15 |
| **Top shareholders (%)** | |
| Denis Ribton | 7.1 |
| Pontian Orico Plantations | 6.1 |
| Cairnglen Investments | 5.3 |
| Wit Team Enterprises Ltd | 3.7 |
| Thomson Bsc | 2.0 |
| **Total** | **24.3** |
| **Management** | |
| Peter Thomas | Chairman |
| Peter Davies | MD |
| George Salkalidis | ED |
| Peter Thomas | NEC |

### Share Price Performance (A$)




Source: FactSet

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**Image Resources Limited (IMA) is an ASX-listed explorer progressing towards Heavy Mineral Sands production**, with projects in the North Perth and the Eucla basins of Western Australia.

| Asset | Including | Ownership |
|---|---|---|
| Cooljarloo | Calypso, Telesto, Titan | 70% |
| Cooljarloo North | - | 70% |
| North Perth Basin | Atlas, Gingin, Booanarring, Bidaminna, Red Gully | 100% |

Source: Image Resources

**Image Resources is expecting first production from Booanarring in 2014.** A scoping study reported a measured resource of over 1.5km strike length of 3.1Mt at 7.2% HM containing 221,000t HM. A feasibility study has commenced and is due for completion by mid-2013.

**The current Atlas resource is 10.7Mt at 7.8% HM.** Atlas South drilling has extended the main Atlas deposit strike length by 700m. The company expects a new JORC resource statement on the northern section in the near future.

**Image Resources is discussing with other Mineral Sands companies in Western Australia** possible areas of synergy and co-operation. IMA is also considering a build-own-operate arrangement for the initial wet concentrator at Booanarring.

**Image Resources raised A$1.89m earlier this year for general working capital** by issuing shares at A¢30 to a combination of sophisticated and professional investors.

**In May 2012 Peter Davies was appointed as Managing Director of the company.** Peter Davies has strong operational experience in the Mineral Sands and $TiO_2$ industries, and he also has a proven track record as a successful manager.

### Investment Case

**The resource base is small in the Perth Basin.** It is also spread over a number of separate deposits, which is not ideal for the economics of a standalone operation. However, the grade of Heavy Minerals is encouraging at 7.8%, and the Zircon grade is also favourable. Metallurgical test-work is acceptable.

**However, there is no escaping the fact that the tonnage of the resource is extremely low.** The company is well located near other sizeable projects in the area, and there may be some synergies with larger producers wishing to buy product or take over Image's higher-grade resource to blend with their own lower-grade material. In reality though, the small size of the resource and the fact that it is located under cover (that would need removing prior to mining) makes the project less appealing in our view.

**We believe the potential for Image lies in the 12.5km of potential mineralised strike** that requires drill testing and could grow the resource base in the Perth Basin.

4 October 2012

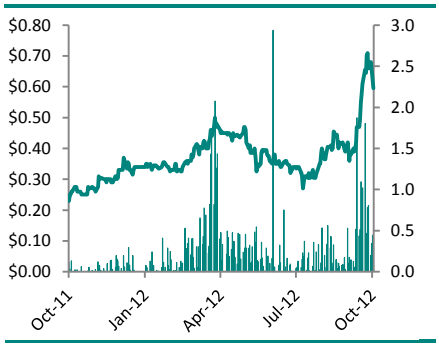
# Sheffield Resources

## One to Watch

## Sheffield Shows its Steel

| | |
|---|---|
| **Price (A$)** | **0.60** |
| Target Price (A$) | N/A |
| Ticker | SFX |
| Market cap (A$m) | 57 |
| Estimated cash (A$m) | 9.3 |
| Estimated Debt (A$m) | 0 |
| **Shares in issue** | |
| Basic (m) | 95 |
| Fully diluted (m) | 126 |
| **52-week** | |
| High (A$) | 0.71 |
| Low (A$) | 0.23 |
| 3m-avg daily vol (000) | 291 |
| 3m-avg daily val (A$000) | 152 |
| **Top shareholders (%)** | |
| Will Burbury | 5.4 |
| David Archer | 5.4 |
| Bruce McQuitty | 5.4 |
| Cappig Finance | 2.1 |
| Passio Pty | 1.3 |
| **Total** | **19.6** |
| **Management** | |
| Will Burbury | E Chair |
| Bruce McQuitty | MD |
| David Archer | Tech D |
| David Boyd | Expl M |

### Share Price Performance (A$)




Source: FactSet

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**Sheffield Resources (SFX) is an ASX-listed Mineral Sands explorer with a primary focus on Western Australia.** The Dampier Zircon Project recently provided positive results.

| Asset | Status | Ownership |
|---|---|---|
| Dampier Zircon Project | Exploration – *Flagship project* | 100% |
| Eneabba Project | Exploration – *Near-term production* | 100% |
| McCalls Project | Exploration – *Longer-term production* | 100% |

Source: Sheffield Resources

**The company has over 6,000km$^2$ of highly prospective tenure**, all situated within the state of Western Australia.

**The Dampier Zircon project, which used to be Rio Tinto's, contains a large, high-grade Zircon-rich HM deposit.** Dampier contains two significant HM prospects: a large, shallow eastern zone, named Thunderbird, and a smaller, deeper western zone, named Argo.

**In July an 8,000m aircore drilling programme commenced at Thunderbird.** It is currently ongoing. Assay results are extremely encouraging, and include: 32.1m at 10.1% HM from 9m, 40.5m at 7.8% HM from 3m and 41.5m at 7.3% HM from 9m.

**The Eneabba Project comprises multiple HMS deposits** and has a total mineral resource of 226Mt at 2.3% HM for 5.29Mt contained HM, including 564,000t of Zircon and 369,000t of Rutile. A scoping study was completed in March 2012 and demonstrated financial viability.

**Latest assay results from surface at Eneabba were encouraging.** They included: 6m at 11.8%, 6m at 8.34%, 7.5m at 7.43% and 7.5m at 7.03%.

**The McCalls Project hosts a large, low-grade inferred mineral resource** of 4.43Bt at 1.2% HM for 53Mt contained HM, including 43Mt Chloride Ilmenite and 3.5Mt of Zircon.

### Investment Case

**Recent drilling results from the Dampier Zircon Project have been extremely impressive.** The project looks to have minimal overburden (up to 3m) and is just 60km from the port of Derby. Drilling indicates a high-value mineral assemblage that averages high-grade 8% Zircon, 2% Rutile, 7% Leucoxene and 34% Ilmenite. We expect a resource estimate to be completed and a scoping study commenced this year.

**The Eneabba Project comprises a medium-sized, reasonable grade resource** that is currently undergoing a pre-feasibility study. This project has the potential to provide relatively near-term production cashflow. The project is also blessed with high-grade Zircon (10%) and Rutile (8%), with 7% Leucoxene and 62% Ilmenite. In our opinion, whilst the resource is large, the grade looks a little low and this is a much lower priority than Eneabba or Dampier.

**With further high grades and good widths expected from drilling**, we view this company as very exciting and One to Watch.

RFC Ambrian

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