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## Shefa Yamim

18<sup>th</sup> March 2019

### Gemstone mining project in the Holy Land with high margins on rare gemstones expected by adopting a Mine to Market strategy

Shefa Yamim (A.T.M.) Limited listed on the LSE in December 2017. After 19 years of exploration in greenfield terrain in Israel, the company has found commercial quantities of some exquisite and rare coloured gemstones which are destined to fetch fancy prices. So far, more than US\$35 million has been invested in exploration. Drilling and bulk sampling has allowed the delineation of a 4.5km long deposit in Kishon Mid-Ranch Zone, with gravel layers of varying thickness up to 4.5m, where all the gemstones have been found. Significant exploration upside exists within the Mid-Reach, Proximal Reach and the longer term Distal-Reach.

#### ■ Early cash flow expected with the start of commercial mining in 2020

Trial mining is scheduled to begin later on this year, with commercial mining of the Kishon Mid-Ranch Zone 1 in 2020. The granting of a mining licence will allow the company to sell the gemstones found in bulk sampling and other exploration work, which provides the prospect of early cash flow.

#### ■ Capturing high margins with a Gemfields-style Mine to Market strategy

World renowned jeweller Yossi Harari is creating an exclusive collection using these gems. Shefa Yamim is pursuing a similar strategy to that successfully pursued by Gemfields, which was acquired for £200m+ in 2016.

#### ■ Gemstone market growing fast with prices outperforming diamonds

Over the last five years, the coloured gemstone market has grown by 145% to US\$6 billion and outperformed the price of diamonds by 37% since 2005.

#### ■ Risked conservative NPV suggests upside of more than 600%

Our conservative valuation shows the potential. We initiate coverage of Shefa Yamim with a target price of 376p and **Conviction buy** stance.

Table: Financial overview

Year to end Dec	2017A	2018A	2019E	2020E
Revenue (NIS'000)	-	-	-	54,300
PTP (NIS'000)	(16,258)	6,009	(7,605)	26,000
EPS (NIS)	(1.703)	0.422	(0.446)	1.220

Source: Company accounts & Align Research

*This investment may not be suitable for your personal circumstances. If you are in any doubt as to its suitability you should seek professional advice. This note does not constitute advice and your capital is at risk. This is a marketing communication and cannot be considered independent research.*

## CONVICTION BUY

– Price target 376p



#### Key data

EPIC	SEFA
Share price	52.5p
52 week high/low	112p/52.5p
Listing	LSE
Shares in issue	14.236m
Market Cap	£7.5m
Sector	Mining

#### 12 month share price chart



#### Analyst details

Dr Michael Green  
[michael.green@alignresearch.co.uk](mailto:michael.green@alignresearch.co.uk)

**IMPORTANT:** Shefa Yamim (SEFA) is a research client of Align Research. Align Research holds an interest in the shares of SEFA. For full risk warning & disclaimer information please refer to the last page of this document.

## Business overview

### Shefa Yamim Operations

Shefa Yamim (A.T.M.) Limited (Shefa Yamim) is a multi-commodity (gemstones and industrial minerals) exploration mining company with operations in Northern Israel. At present, the company's two flagship projects hold two Prospecting Permits and one Exploration Permit covering an area of 614 km<sup>2</sup>. Shefa Yamim's main exploration targets are primary volcanic sources on Mount Carmel plus secondary sources which are represented by sediment deposits filling the valley throughout the Kishon River catchment.

- **Mount Carmel** – Inside Shefa Yamim's exploration permit, the company has discovered four primary volcanic sources (Rakefet Magmatic Complex - RMC, Muhraka, Har Alon and Beit Oren) where weathering and erosion has resulted in gemstones being present in secondary alluvial deposits, such as the Kishon Mid Reach Placer.
- **Kishon River** – The Kishon Mid Reach placer is seen to be the company's most advanced exploration project. The current exploration programme is focused towards commencing trial mining at the same time as moving to define a SAMREC compliant Mineral Resource. The target is 4.5 kilometres long and 150 metres wide with gravel layers of varying thickness between 0.5m to 4.5m, where the gemstones have been found.

### Target Mineral Assemblage

A Competent Persons Report (August 2017) on the company's Precious Stone Project by South African-based Creo Ltd (Geological & GIS Consulting) dated October 2017 pointed out that Shefa Yamim's Target Mineral Assemblage (TMA) consisted of two significant mineral suites.

Firstly, a DMCH suite comprising of Diamond (D), Natural Moissanite (M) Corundum gem varieties (C) of Sapphire, Carmel Sapphire™, Ruby and Hibonite (H). Secondly, there is also a Heavy Industrial Mineral (HIM) suite which consists of Zircon, Corundum, Rutile, Ilmenite and Garnet.

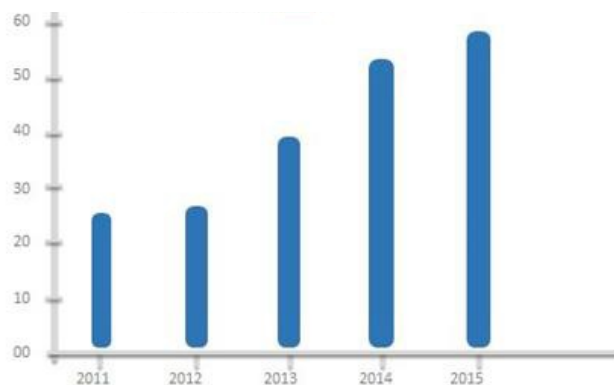


*Unique assemblage of gemstones found by Shefa Yamin in Northern Israel. Source: Company*

In January 2019 the company was able to announce that Carmeltazite, which had been discovered by Shefa Yamim and found in its gemstone the Carmel Sapphire™ had been recognised as a new and rare mineral by the International Mineralogical Association (IMA) Commission on New Minerals, Nomenclature and Classification. With the prices of gems predominantly determined by their rarity, the Carmel Sapphire™ represents a unique discovery and one that the board believes will substantially increase the value of the company's Gem Box of precious stones.

## Gemstones

Gemstones are mineral crystals which when cut and polished are used to make jewellery. The price per carat of the huge array of gemstone types varies enormously from less than a dollar to more than US\$10,000 per carat. In coloured gemstones, it is rarity and colour that are probably the biggest determinants of value. Other factors include variety, clarity, cut & polish, size, shape, treatments, origins, fashion and supply chain. The gemstone market has witnessed impressive growth over the past five years rising from US\$2.4bn to US\$6bn.



*Global trade (US\$ million) – export value sapphires, rubies and emeralds. Source: UN Trade Data.*

Since 2005, it is believed that the prices of coloured gemstones have outperformed diamonds by c.37% (that is by comparing diamond prices with the Gemval Aggregates index (GVA) which is determined from the value of 26 standard specimens of gemstone and represents the overall pricing trend in the jewellery market). Demand is being driven by China and India, which is expected to continue as fashion seems to be favouring coloured precious stones over the more traditional diamonds.



*Coloured gemstone prices have outperformed. Source: Gemval.*

The supply story of the coloured gemstone market is vastly different from that of diamonds. The diamond market is practically run by just a handful of big players which control the large diamond mines. In contrast, the coloured gemstone market remains much more fragmented. This does mean that it is harder to market coloured gemstones en-mass as a complete sector. However, in recent years, coloured gemstone miner Gemfields has been invested heavily in marketing gemstones, which seems to have begun to successfully promote coloured gemstones across the board, benefitting the entire sector.



## Israel

The State of Israel lies on the eastern side of the Mediterranean and only became an independent country in 1948. Previously the country had been one of a number of British protectorates in the Middle East. Israel is a relatively small country which is about the same size as Wales and has a population of 8.4 million. The country has a lengthy coastal plain giving way to highlands in the north and central regions with the Negev desert to the south.



*Map of the northern half of Israel. Source: justmaps.org*

Israel's main economic interests lie within the industrial manufacturing and hi-tech sectors. The Israeli diamond industry is seen to be one of the world's leading centres for diamond cutting and polishing, accounts for c. 23% of the country's exports. Shefa Yamim's marketing costs are likely to be low due to the project's location close to such a big trading centre for diamonds and precious stones.

Israel is not that well-endowed with mineral resources. However, the Dead Sea is one of the richest sources of potash (fertiliser), magnesium bromide and other salts in the world. In southern Israel, the Timna Valley is seen as an area rich in copper ore where mining dates back to biblical times. Despite this, Shefa Yamim probably represents the only advanced stage exploration company in the country.

The country boasts impressive established infrastructure and has good corporate governance and democratic structures in place. The government is supportive of the natural resources sector and mining laws in the country are based on English law dating back to the 1920s, which means that there is clear title of ownership of mineral resources.

## Background

Shefa Yamim (A.T.M.) Limited was established in 1999 to explore for precious stones and gems in the biblical territory of the tribe of Zevulun (6<sup>th</sup> son of Jacob & Leah) in the Holy Land which lies in northern Israel. The Bible contains a number of references to the abundance of natural resources in the Holy Land of Israel. In the Book of Deuteronomy, Moses talks about the “...treasures hidden in the sand....” in Zevulun, which lies between the Sea of Galilee and the Mediterranean. On today’s maps, this area is shown as the Zevulun Valley, which is found at the foot of Mt. Carmel and close to the seaport of Haifa. Sages believe that these treasures mentioned in the Bible are precious stones and gems.

In an interview with the Mayor of Haifa in 1988, one of the foremost Jewish leaders of recent generations, the Chassidic master, the Lubavitcher Rebbe – Rabbi Menachem Schneerson, said the following: “.... In Haifa, there is a sea. One shouldn’t become intimidated by something that is deep. The uniqueness of Haifa is that it has a sea, and it has a valley – and in that valley are precious stones and gems....”.

The company was established by a team of devout Torah observant Jews who were followers of the Rebbe and brought with them proven industry experience in precious gemstones and diamonds. This team was inspired by the prophecies in the Bible and Rebbe’s prophetic statements. In 2003, Shefa Yamim secured exclusive exploration and prospecting rights covering 60,000 hectares. Subsequently, in 2005 an initial drilling programme began.

In 2012, Shefa Yamim commenced trading on the Tel Aviv Stock Exchange. October 2013 saw the drilling campaign on Zone 2 in the Kishon Valley, followed in May-June 2014 by the drilling campaign on Zone 1. Based on these drilling results, a series of cross-sections were drawn up to allow the interpretation of the morphology of the Kishon River valley floor as well as allowing for the identification of the likely paleo-channels. In July 2016, there was further drilling in Zone 1 with larger holes to provide bulk samples. The findings of these resulted in an increase in the resources volumes and mineralised gravels.

The Competent Persons Report (CPR) was published in October 2017, which pointed out that the drilling, pitting and bulk sampling work in the Mid Reach of the Kishon valley was sufficient to delineate good placer deposits in this area. The CPR paved the way for Shefa Yamim to list on the London Stock Exchange in December 2017 when the company raised £4.15 million through conversion of existing loans and a placing and subscription at 100p per share. At this price, Shefa Yamim had an initial market capitalisation of £15.3 million.

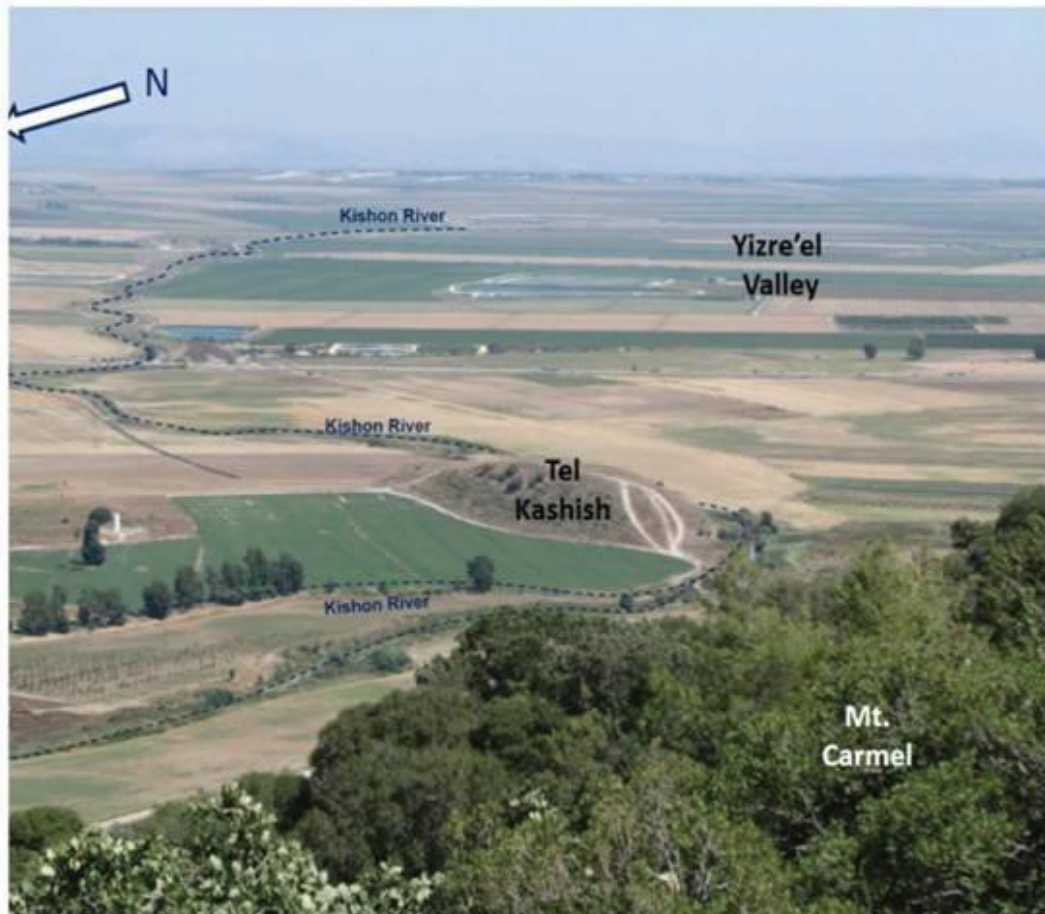
The funds raised on admission to the LSE were earmarked for the advance exploration of the company’s priority Kishon Mid Reach project, including the completion of a pre-feasibility study. Since the IPO, Shefa Yamim has completed the upgrading of equipment at the operational site in Akko, as well as further bulk sampling at Kishon Mid-Reach Zone 1 (the most advanced deposit) and also the start of bulk sampling in Zone 2. This work has led to the discovery of high-grade spinel along with ilmenite and garnet to be added to the company’s Gem-Box.

In August 2018, Shefa Yamim was granted its first Prospecting Licence, over its alluvial exploration target, the Kishon Mid-Reach Zone 1 Project, taking it towards a 'Certificate of discovery' and its first mining licence. To provide further funds for these developments, in October 2018 the company successfully raised £250,000 at 80p per share.



## Operations

The company has a 100% interest in the Precious Stones Project. The focus of interest is on natural moissanite, sapphire, ruby and diamonds in the Kishon River catchment area at Haifa in Israel, which lies some 85 kilometres north of Tel Aviv. The company has exploration and prospecting permits covering 60,000 hectares which are centred on Mount Carmel and the Kishon river catchment area. In August 2018, Shefa Yamim was granted its first Prospecting Licence over alluvial exploration target the Kishon Mid-Reach Zone 1 Project.



*View looking SE from Mt. Carmel onto the Kishon River floodplain. Source: CPR October 2017*

The company began exploration in 1999 when this area represented virgin country for diamonds, precious stones and gold as ahead of that time no discoveries had been reported or documented. Over the intervening years, the company has invested more than US\$35 million undertaking in-depth exploration programmes over a significant area in northern Israel. A total of 212 holes have been drilled in the project area.

Location	Drill holes	Comments
Kishon Mid Reach Zone 1	137	
Kishon Mid Reach Zone 2	49	
Distal area	25	6 historical drilling till to a maximum depth of 300m
Proximal area	1	
<b>Total</b>	<b>212</b>	

*Drilling in the project area. Source: Company*

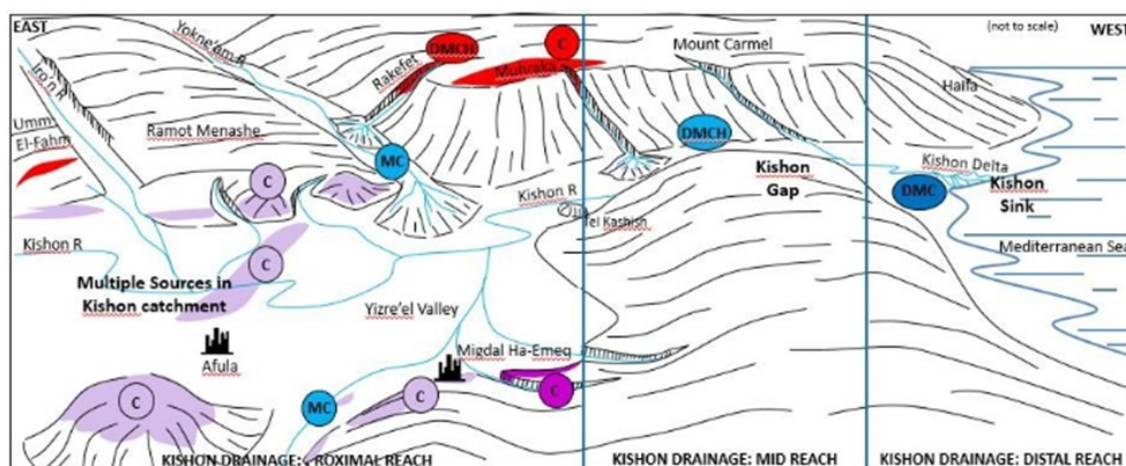
Shefa Yamim has moved onto bulk sampling to begin to determine the true scale of the resources of a unique mineral suite. It is as a result of the company's extensive exploration of the past 19 years that northern Israel is beginning to become known for high-quality rubies and sapphires, along with large natural moissanite crystals, together with diamonds.

## Geology

The Shefa Yamim precious stone deposits at Mt. Carmel and in the immediate vicinity are located on the Arabian Plate. This represents the flank of a rift-zone, which in geological terms is deemed to have been recently active. The precious stones have been found to occur in primary deposits which lie within the Cretaceous volcanic host rocks in Mt. Carmel, along with other volcanic host rocks which border the Yizre'el Valley.

Precious stones also occur in secondary deposits where the gemstones are derived from the weathering and erosion of primary volcanic sources. These secondary deposits are essentially alluvial sediments filling the Kishon River valley where it flanks Mt. Carmel on the north eastern side. Israel is seen to be a young country geologically speaking, but that does seem to be a far too simplistic interpretation as the discovery of diamonds points to much older rocks.

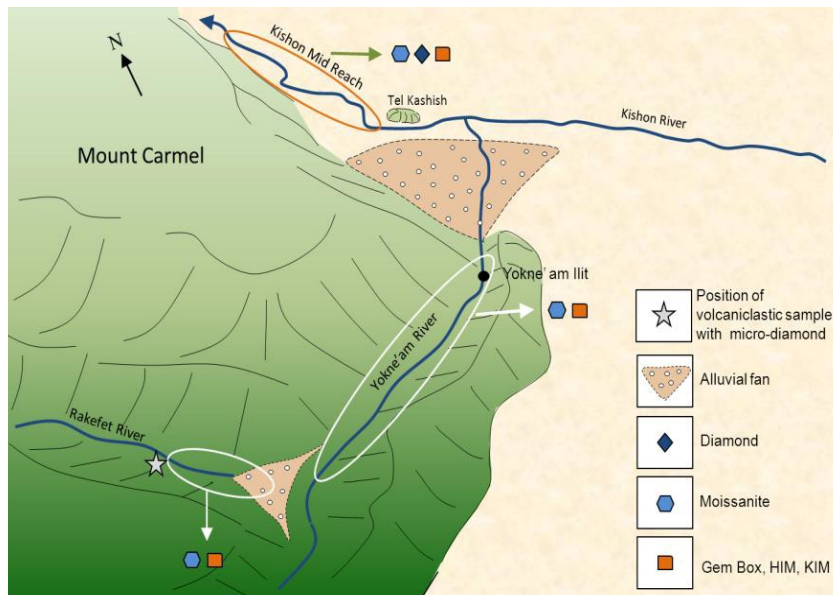
Mt. Carmel has complex stratigraphy and structure. Although the rocks building Mt. Carmel are largely of Cretaceous age, magmatic (volcanic) bodies occur at certain levels. Petrographic studies have revealed that the Mt. Carmel rocks share a number of similarities with kimberlitic rocks. The company has identified four primary volcanic sources inside its exploration permit which are: Rakefet Kimberlitic Magmatic Complex (RMC), Muhraka, Har Alon and Beit Oren.



*Source to Sink geological model of Shefa Yamim, Northern Israel. Source: Company*

Gemstones from primary sources have been discovered in some volcanic bodies within the Kishon catchment such as: Diamond (D), Sapphire (C), Carmel Sapphire™, Ruby (C), Moissanite (M) and Hibernite (H). It is thought that the gemstones have been transported by the Kishon River from source to a sink in the Mediterranean Sea. These placer deposits in the sink are deeply buried, making them difficult to access.

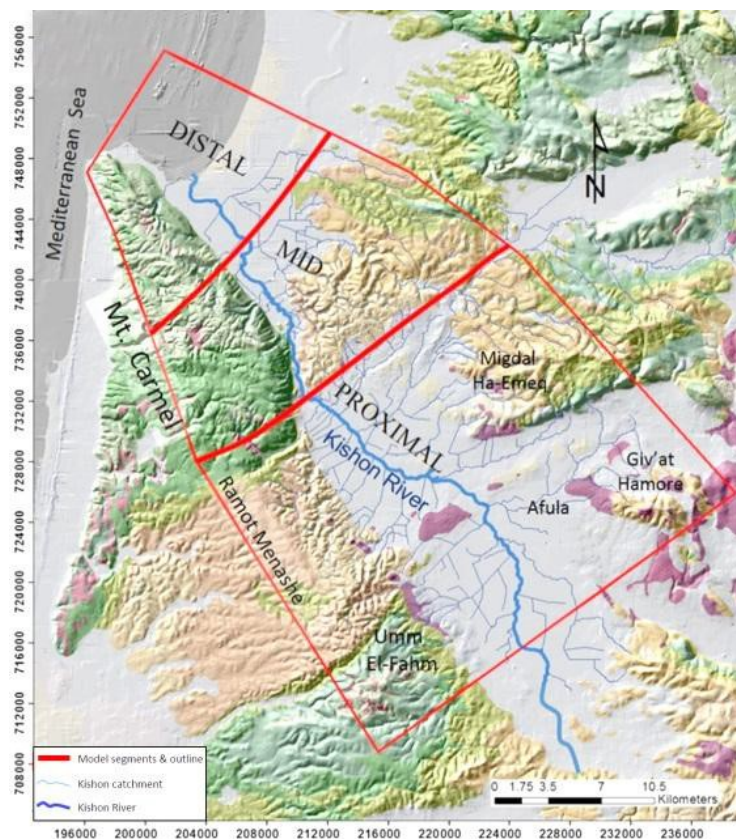




*Mineral distribution in alluvial deposits within the RMC \area. Source: Company*

### **Mount Carmel and the Kishon River**

To date, the bulk of the exploration work has been carried out on the RMC area, which is located on the southern part of Mt. Carmel. Detailed exploration work undertaken by the company includes geological mapping as well as rock and soil sampling. This work has resulted in the identification of an impressive array of gem and industrial minerals together with kimberlitic indicator minerals, which are mantle-derived minerals brought to the surface by kimberlites. Note: in RMC we have all the Gem Suite including one micro diamond found by De Beers in a sample of approx. 252kg (see De Beers Report dated June 4, 2004).



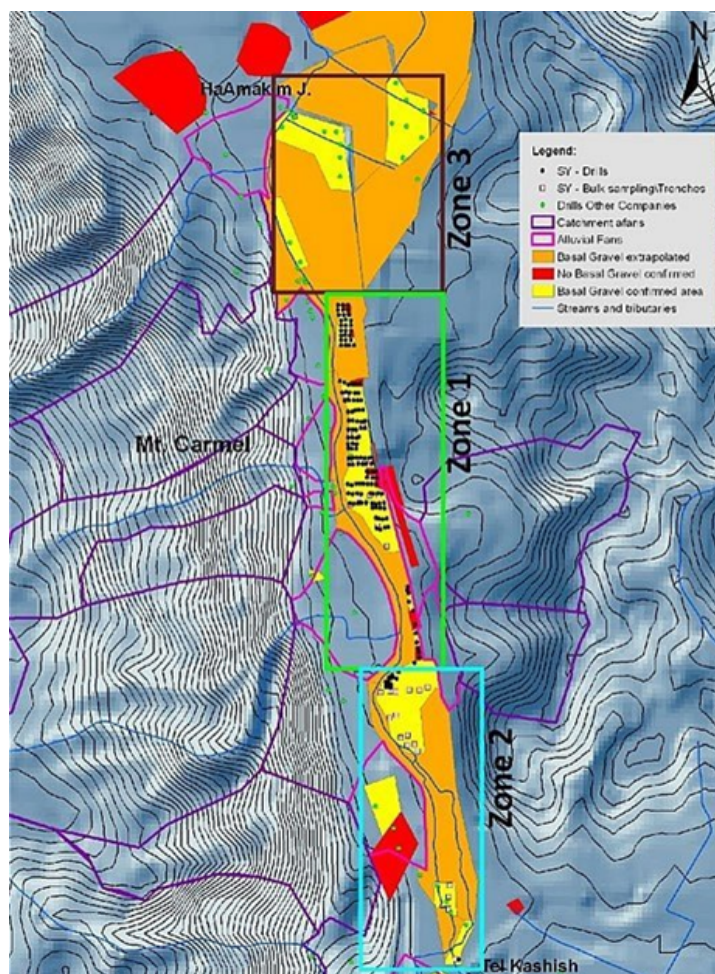
*Exploration and prospecting permits covering 60,000 hectares centred on Mount Carmel and the Kishon river catchment. Source: Company.*

Out of the four primary sources that have so far been identified, the RMC does seem to contain the full target mineral assemblage. However, at the current time, there is insufficient data to determine whether this primary source could be exploited economically and so remains undrilled. Exploration of the volcanic bodies is planned to continue in tandem with the exploration and evaluation of the Kishon Mid Reach.

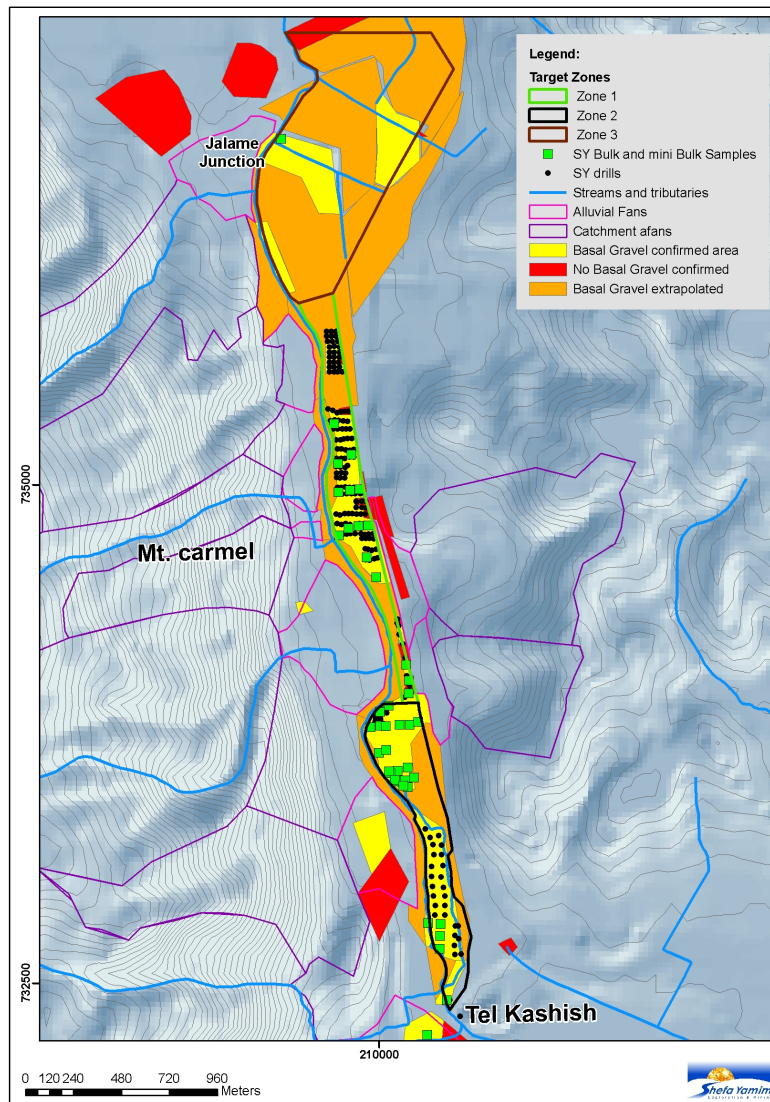
Thorough and painstaking exploration work has revealed that the most accessible natural trap for the gemstones is the Mid-Reach area of the Kishon Valley. Here the river has been confined through the Kishon Gap to form a transient source of gemstones within placer (gravels). The company has split the exploration targets into three broad segments which are: Proximal-Reach (Primary sources), Mid-Reach (Secondary sources – accessible) and Distal-Reach (Secondary sources). In the Mid-Reach area, the alluvials are shallow, very accessible, and so it is very easy to work there.

### Kishon Mid-Reach

Although coloured gemstones have been found throughout the exploration and prospecting areas, Shefa Yamim's initial focus has been on Kishon Mid Reach deposit where placer formations are easily accessible as they lie at a depth of less than 10 metres. The company has divided the Kishon Mid-Reach placer into three zones (1, 2 & 3), which are all at differing stages of development.







*Map of the three zones in Kishon Mid Reach. Source: Company & Align Research*

Zones 1 and 2 have been the focus of the company's exploration and evaluation activities which have involved drilling and bulk sampling programme. Zone 3 still remains to be delineated.

All the work that has been undertaken is leading towards the twin goals of establishing trial mining/commercial mining and the definition of a SAMREC-compliant mineral resource. The target is 4.5 kilometres long, around 150 metres wide and consists of gravel layers of varying thickness between 0.5m and 4.5m, with all the gemstones found in the gravels. Zones 1 and 2 cover around 3.5km of this 4.5km long placer.

## Zone 1

Out of a total of 212 boreholes drilled by the company, 137 boreholes were specifically drilled in Zone 1, plus there were a number of bulk samples excavated ahead of the IPO in December 2017.

Sample /(Zone)	Tonn -age	Carmel Sapphire		Sapphire		Ruby		Moissanite		Hibonite		Total Grade cpht
		cts	cpht	cts	cpht	cts	cpht	cts	cpht	cts	cpht	
SY-982(2)	400	29.77	7.44	54.99	13.75	1.97	0.49	5.94	1.49	-	-	23.17
SY-1124(1)	400	991.43	247.86	24.27	6.07	0.89	0.22	3.54	0.89	-	-	255.03
SY-1125(1)	600	730.17	121.7	40.45	6.74	0.86	0.14	1.32	0.22	5.34	4.39	133.18
SY-1174(1)	533	374.31	70.23	41.13	7.72	0.48	0.09	0.84	0.16	-	-	78.19
SY-1175(1)	539	165.39	30.68	4.78	0.89	2.15	0.4	0.30	0.06	5.85	1.09	33.11
SY-1176(1)	508	28.28	4.71	0.33	0.06	0.01	-	0.17	0.03	0.05	0.01	5.67
SY-1210(1)	551	24.81	4.5	6.02	1.09	0.09	0.02	0.05	0.01	0.05	0.01	5.63
SY-1211(1)	518	37.87	7.31	26.54	5.12	0.04	0.01	0.09	0.02	-	-	12.46
SY-1213(1)	347	21.01	6.05	23.98	6.91	0.02	0.004	0.07	0.02	-	-	12.98
SY-1214(1)	530	42.34	7.99	14.85	2.80	0.59	0.11	4.89	0.98	4.89	0.92	11.85

*Bulk sampling showing carats (cts) and grade (cpht – carats per 100t) highlight from Zone 1.  
Source: Company -IPO prospectus December 2017*

Since the IPO, work has commenced on the Technical Economic Evaluation Report (TEE). In all by now a total of 14 bulk sample campaigns have been successfully completed that have recovered 6,384 tonnes with 9,778.15 carats recovered for an estimated total content grade of 153.16 cpht (carats per 100t). The Board has decided to move straight into trial mining which will provide additional data towards defining a resource where work is expected to continue in parallel. In August 2018, the company was granted Prospecting Licence 869C9 covering 252 Dunams at Zone 1, which marks an important step on the path to ultimately gaining a mining licence.

Mineral suite		Total Zone 1	
		carats	cpht
Gem Suite	Sapphire	287.34	4.50
	Carmel Sapphire™	2,512.84	39.36
	Ruby	5.30	0.08
	Natural Moissanite™	6.65	0.10
	Hibonite	20.89	0.33
	Spinel	3,952.91	61.91
	Garnet	2,176.77	34.09
	Ilmenite	769.86	12.06
HIM	Zircon	37.29	0.58
	Rutile	8.31	0.13
	<b>Total</b>	<b>9,778.15</b>	<b>153.16</b>
	Total sample size (t)	6,384.42	

*TMA suite bulks sample results from Zone 1 (announced 03 July 2018). Source: Company*

With Zone 1, well delineated, future bulk sampling and drilling campaigns moved onto Zone 2 and Zone 3 to determine the full resource potential of the Kishon Mid Reach placer.



## Technical Economic Evaluation

Shefa Yamim appointed the South Africa based project management and engineering company Paradigm Project Management (PPM) to provide the company with working and capital costs of bringing the Kishon Mid-Reach alluvial deposit into production. PPM has extensive experience in undertaking such diligence work along with managing and executing projects within the mining sector. PPM is headed by CEO Jeremy Clarke who was a past CEO of Gemfields plc as well as formerly being a Consulting Metallurgist for De Beers.

The report was completed during January 2019 and serves as the first step in starting to build the economic profile of the project as the company progresses towards commercial production. The TEE has outlined an overall generalised mining plan covering the Life of Mine (LoM), production schedule, selection of plant and equipment together with operating costs and capital costs. However, the scope of the TEE did not cover an estimated selling price of gemstones found during mining.

There were three principle findings of the TEE. Firstly, the mine can potentially process a total of 1.5Mt of gravel over an 11-year LoM. Secondly, overburden requiring removal would total 1.8Mt. Thirdly, the operating cost over the LoM was estimated at US\$26/t of processed gravel. Undoubtedly, this independent report demonstrated that costs reassuringly lie at the lower end of the cost curve for precious stone producers, as most such mines have operating costs above US\$30/t.

Capital expenditure was estimated at US\$11.30 million, based on using new equipment. However, this figure could be reduced to US\$7.5 million by using contract mining, but in this case the operating cost budget over LoM was estimated to increase to US\$27/t processed.

In this report, PPM also investigated a number of opportunities to significantly reduce both capex and opex which included using second hand equipment, contract mining, upgrading the existing plant and expanding the mineral resource. The consultants also investigated increasing the level of production to gain greater economies of scale which were shown to potentially allow opex to fall to US\$10-15/t, if the production rate was doubled to 100t/hr.

To date the company has invested significantly in processing plant and machinery, which is expected to help Shefa Yamim reduce opex significantly. The company has well-developed plans to make further upgrades to the new processing equipment already purchased from the proceeds of the IPO. Also, the board believes that the additional investment of US\$1 million would be required to allow the production rate to increase to 100t/hr.

Importantly, the TEE paves the way for the move towards trial mining in the Kishon Mid Reach Zone 1 by quantifying the funding that will be required. The publication of the TEE was announced in early February 2019, just a couple of weeks after investors learnt that the company was making good progress with both the planning and regulatory procedures to advance this area in accordance with the Prospecting Licence.

## Zone 2

This zone has seen 23 boreholes and 26 bulk and mini bulk samples with in excess of 2,900t of bulk sampling carried out.

In January 2019, the full results of the 2018 bulk sampling campaign of Kishon Mid-Reach Zone 2 were announced. These results showed a total of 3,935.60 carats of gemstones were recovered from five bulks samples (BS-1223, BS-1224, BS-1225, BS-1229 and the previously announced BS-1230) and a total of 2,908.8 tonnes of basal gravel. There were a number of highlights from this work. Firstly, the largest gemstones recovered were a 3.90 ct sapphire, a 5.26 ct Carmel Sapphire™, a 6.68 ct spinel and a 3.61 ct garnet. Secondly, samples were dominated by gemstones, with spinel accounting for 55% of the TMA followed by garnet (20%), ilmenite (16%), sapphire 4.5% and Carmel Sapphire™ (3%).

In addition, there is a significant increase in the overall grade following the updated TMA which now includes spinel in the Kishon Mid-Reach placer gemstone assemblage. So, the revised Gem Box suite consists of nine gemstones. The board plans to excavate three more bulk samples in Zone 2 in the area where 26 drilling surveys were completed in June 2018. The remaining bulk sampling work in Zone 2 is planned to be completed after May 2019 because of agriculture. This will mark the end of the exploration phase in Zone 2, as the company prepares for the move towards trial mining.

Mineral suite		Total Zone 2	
		carats	cpht
GEM Suite	Sapphire	176.36	6.06
	Carmel Sapphire™	119.02	4.09
	Ruby	0.20	0.01
	Natural Moissanite™	0.25	0.01
	Hibonite	5.70	0.20
	Spinel	2174.91	74.77
	Garnet	797.91	27.43
	Ilmenite	622.64	21.44
HIM	Zircon	35.38	1.22
	Rutile	2.19	0.08
	<b>Total</b>	<b>3,935.60</b>	<b>135.30</b>
	Total sample size (t)	2,908.8	

*TMA suite bulk sample results from Zone 2 (announced 31 January 2019). Source: Company*

When these results were announced, Avi Taub, CEO of Shefa Yamim commented that: *"The results from the bulk sampling of Zone 2, together with the excellent grade achieved in Zone 1, further highlight the potential of the Kishon Mid-Reach deposits and have led to a significant increase in the level of confidence in the project. We look forward to building on these encouraging results and completing our exploration programme in Zone 2 with our next bulk sampling campaign scheduled for the second quarter of 2019..."*

## Zone 3

The mapping, drilling and pitting results to date, which have been further modelled in 3D, point to potential extensions of the Kishon Mid Reach placer in both upstream and downstream directions.

## Mineral Tonnage Estimates

In November 2018, the company was able to report a significant increase in mineralised tonnage for Kishon Mid Reach. These results were derived from data that had been collated from exploration results which served to highlight much larger total volumes of mineralised placer gravels for the three target exploration zones. The mineralised quantities were seen to increase from approximately 1.1Mt, which had been reported at the IPO stage, to 5 Mt.

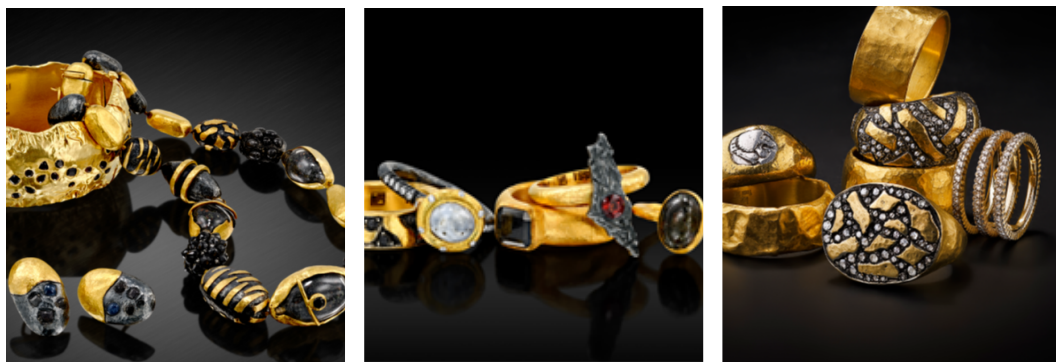
Zone	Area (m <sup>2</sup> )	Overburden Tonnes (t)	Placer (basal) Gravel Tonnes (t)
Zone 1	250,000	1,930,000	1,120,000
Zone 2	269,000	1,698,000	873,000
Zone 3	788,000	6,621,000	2,979,000
<b>Total Mid-Reach</b>	<b>1,308,000</b>	<b>10,250,000</b>	<b>4,980,000</b>

*Updated areas and tonnage estimates for exploration targets Zones 1, 2 and 3. Source: Company announcement 29 November 2018.*

The increased volume of mineralised tonnage serves to potentially triple the quantity of Shefa Yamim's Gem-Box of precious stones that the company expects to produce by mining Zone 1.

## Additional potential

Alongside precious minerals exploration and the surveying of primary sources in the volcanic body on Mount Carmel and secondary alluvial sources of the primary source's weathering products that could host precious minerals, the team is also duplicating this exploration effort at primary sources in the volcanic bodies in the Menashe Hills and Lower Galilee region and their weathered products. All these sites have potential for mining gemstones.



*Some pieces of jewellery from the "Heaven on Earth" collection which was the latest collection from Yossi Harari comprising of comprising of 31 unique, handcrafted, individual pieces of jewellery using Shefa Yamim's rare and unique suite of gemstones found in the Kishon Mid-Reach area. Source: Company*



## Processing

The company has an operational centre which is located in the industrial zone at the nearby town of Akko. This centre covers an area of more than 6,000m<sup>2</sup> which comprises of a treatment facility, a laboratory which meets international standards and storage.



*Scrubber plant at the processing facilities at Akko which washes and liberates sand-sized sentiments from clay aggregates. Source: CPR August 2017.*

The processing facility was able to process bulk samples at a rate of 20-30 tonnes per day at the time of the IPO in December 2017. In H1 2018, the company completed substantial improvements to the operational site in Akko to reduce costs and make the processing of materials more efficient. The equipment consists of a water system, scrubber unit, conveyors, two classifiers and two jig plants. The announcement concerning the TEE suggested that processing capacity is now around 50t/hr.



*Two classification and jig plants at the processing facilities at Akko. Source: CPR August 2017.*

Following the washing, sieving and concentrating treatment process, the gemstones and heavy mineral concentrates are sorted in the company's laboratory by trained staff.



*Processing facility and laboratories at Akko where in the mineral final recovery laboratory, sorting is carried out manually. Source: CPR August 2017*

## Strategy for growth

Shefa Yamim represent a highly compelling resources play as the company looks set to begin mining an exciting mineral suite of gemstones, some rare and some which are truly unique. In addition, these highly appealing extraordinary gemstones are sourced purely from the Holy Land, which gives them an additional cache which is expected to add further value. There is a large global market for anything from the Holy Land and so these precious stones should attract a lot of interest from evangelists internationally.

Unique is a rather over-used word, but this mineral suite, comprising of garnet, natural moissanite, diamond, spinel, ruby, Carmel Sapphire™, sapphire, ilmenite and hibonite, is undoubtedly unique. Already, the team has discovered the biggest ever natural moissanite gemstone at 4.1mm, not only the biggest size but also of an impressive quality. In addition, the Carmel Sapphire™ does not occur anywhere else in the world.

The company is just starting to see the fruits of its labour after spending 19 years and US\$35 million on highly successful exploration. Trial mining is expected to begin in H2 2019 and can be successfully initiated with just US\$200,000 of further investment. The recently published TEE sets out the plant and equipment necessary and provides detailed analysis of the capital and operating costs for commercial mining. Plus, the route map to commercial mining being established in 2020 is in line with the current schedule. With the TEE published, the management are now in a position to take the mining decision which has the potential to allow substantial value to be added over the coming years.

The company seems to be on track to gain a mining licence for the Mid Reach Project to meet its projected timeline. Receipt of a mining licence would not only allow the company to start trial mining and the commercial operation, but also sell stones it has recovered to date through bulk sampling and other exploration work which are not currently saleable under the terms of the exploration permit. All this means that there is the prospect of early cash flow generation.

Currently, the team is involved with the planning and regulatory procedures to advance the area into trial mining at Zone 1. Progress looks to have been pretty good to date. As in August 2018, Shefa Yamim was granted its first Prospecting Licence for the Kishon Mid-Reach Zone 1 Project, taking it closer towards a 'certification of discovery' and its first mining licence.

A mining licence will be only granted once the company has been able to demonstrate the presence of a sizeable gemstone deposit (which they have) and a discovery certificate has been granted. With a discovery certificate in their possession, a mining licence can be granted provided the company can demonstrate that it has the necessary capital and the technical expertise to mine the deposit. The discovery certificate has a 12-month life span in which to apply for a mining licence which would give Shefa Yamim a 25-year lease.

Since the IPO in December 2017, further analysis has allowed the gravel reserves to climb from 1.1Mt to 5Mt. Our belief is that this company could very well offer blue sky potential for investors and there is much more gravel. Sensibly, management does not want to overwhelm investors when even the current upside has yet to at all be reflected in the current share price in our view. But it needs to be pointed out that there are a few other mine locations in the area which could well be unveiled as early as in H2 2019.

The board has developed a Mine to Market strategy whereby the company controls the complete process from exploration through development, mining, design and the sale of its gemstones. This will allow Shefa Yamim to capture the entire margin and fully benefit from the fancy prices that many of these gemstones could fetch when sold. Already there are

well-developed plans to market these gemstones with a licensed brand name of Shefa Yamim, which serves to firmly underline the biblical provenance of these coloured gemstones. This is a similar strategy to that which was successfully pursued by Gemfields, which was acquired for £212 million in 2016 by Pallinghurst.

Management has considerable experience in the marketing of precious stones and the team relishes the potential for online sales by distributing directly to consumers globally. The team is masterminding the creation of a fully integrated operation which is likely to include cutting and polishing. The project is located just an hour's drive from one of the largest trading centres for diamonds and gemstones in the world, which is expected to help keep marketing costs low. By adopting all these initiatives, the company is expected to increase the value of gemstones and be able to generate dramatically higher margins.

The company is partnering with Yossi Harari to create an exclusive jewellery collection using Shefa Yamim's gemstones. Yossi Harari is a world-renowned jewellery designer to celebrities and stars which will initially be creating a unique 18-piece of fine jewellery using gemstones found in Shefa Yamim's Kishon Mid-Reach Zone 1 deposit. This deal was announced in September 2018 when it was pointed out that Yossi Harari's jewellery has been worn by some of the world's biggest celebrities including Jane Fonda, Salma Hayek, Oprah Winfrey, Jessica Alba and Jennifer Hudson amongst others. His jewellery features in over 40 stores worldwide, including prestigious retailers such as Bergdorf Goodman, Neiman Marcus and Harvey Nichols London. The first such collection from Yossi Harari was unveiled in late-February 2019 with prices ranging between US\$1,000 to \$US85,000. This is not an exclusive agreement and so Shefa Yamim is free to negotiate similar deals with other international jewellery companies which have been quick to spot the potential of these gemstones.

The gemstones market seems to be going from strength to strength as the demand for coloured gemstones has grown by 145% to US\$6 billion, just in the last five years. This looks to be on the back of women starting to buy more colour gemstones in China and elsewhere in Asia. Increasingly it would seem that people want something different from diamonds. Notably, both Bulgari and Tiffany have been creating unique pieces by incorporating colour gemstones like amethyst and emeralds in with gold and diamonds.

Shefa Yamim has already demonstrated proven findings of a selection of gemstones including diamond (rare), spinel, Carmel Sapphire™, ruby, Natural Mossanite™, hibonite, garnet, ilmenite, and the HIM Suite: zircon and rutile. Many of these gemstones are highly valued and some cannot be found anywhere else in the world. Mining is now set to begin in Zone 1 which is high accessible, where the rich gravels are not that deep and there is not that much overburden, which all points reassuringly to low-cost production.

Given an appealing combination of its gemstone assemblage, low-cost route to production and Mine to Market strategy aided by partnerships with leading international jewellery companies, we believe that Shefa Yamim offers the scope to generate high margins. Subject to successful financing, over the next 24 months, investors can look forward to the rapid development of the Kishon Mid Reach Zone 1 with trial mining in H2 2019 followed by commercial production commencing in 2020. Given all this activity, an impressive flow of news looks to be likely, which we believe could serve to captivate the imagination of investors and begin to demonstrate the sort of value that is being added at Shefa Yamim as the company moves from exploration through development and into commercial production.



## Financials & current trading

Shefa Yamim has a 19-year exploration history in greenfield terrain in Israel for gemstones. Recent results mainly show the cost of administration, exploration & financing.

12 months ending 30 December NIS '000s	2015	2016	2017	2018
Revenue	-	-	-	-
Pre-tax profit (loss)	(310)	(549)	(16,258)	6,009
Net profit/(loss)	(310)	(549)	(16,258)	6,009

*Shefa Yamim's four-year trading history. Source: Company accounts*

### 2018 results

Financial results for the twelve months ended 31<sup>st</sup> December 2018 showed an operating loss of NIS 3.410 million resulting from general and administrative expenses. Financial expenses were NIS 0.218 million compared with the NIS 15,954 million recorded in the previous year which resulted from the conversion of convertible loan notes into equity ahead of the IPO. Financial income stood at NIS 9.637 million (against NIS 0.237 million in 2017) due to the adjustment of the value of a financial liability at fair value. Net financial income came out at NIS 9.419 million which resulted in a profit for the year and comprehensive profit attributed to the company's shareholders of NIS 6.009 million. This represented a profit per share of NIS 0.422.

### Recent developments

In September 2018, the board was able to announce the signing of a Letter of Intent with the world-renowned jewellery designer Yossi Harari, to initially create a unique 18-piece collection of fine jewellery using gemstones found at the Kishon Mid Reach Zone 1 deposit.

October 2018 saw the company raise £250,000 in a placing at 80p per share. Subscribers to this placing were issued with one warrant per new share at an exercise price of 100p with an 18-month life. At the same time, it was announced that the TEE report was progressing along with work being provided by world renowned jewellery designer Yossi Harari, which was designed to build the economic profile to an advanced stage as the company progresses towards trial mining.

In November 2018, investors were brought up to date with the results from combining the data of all the recent exploration activity which showed that the total volume of mineralised placer gravels for the three target exploration Zones (1-3) had risen from 1.1 Mt to 5 Mt. The estimate in this report showed a significant increase in mineralised tonnage for Kishon Mid Reach. At the time, Avi Taub, CEO of Shefa Yamim pointed out that as the company progresses towards trial mining in Zone 1 in 2019, the larger volume of mineralised tonnages potentially triples the quantity of its Gem Box of precious stones and the company will produce from mining in Zone 1, which increases the potential of the project.

February 2019 saw the announcement of the independent Technical Economic Report which firmly placed the first mine in Kishon Mid Reach Zone 1 at the lower end of the cost curve. Before the end of February 2019, Yossi Harari completed his latest collection comprising of 31 unique, handcrafted, individual pieces of jewellery using Shefa Yamim's rare and unique suite of gemstones found in the Kishon Mid-Reach area.

## **Risks**

### **Geological risks**

There are a series of risk factors concerning the amount of understanding of the geology of the project areas, the mineralisation being targeted and the distribution and concentration of coloured gemstones that have been identified in exploration work.

### **Political risk**

There are political risks involved in companies operating in Israel.

### **Luxury goods market risk**

Coloured gemstones represent part of the luxury goods market which is affected by adverse economic conditions. The coloured gemstone industry is also affected by changes in customer preferences, perceptions and spending habits. The company's fortunes will be dependent on a number of factors which may affect the worldwide desirability of coloured gemstones. Historically, general economic downturns and uncertainty over future economic prospects has served to affect the sales of luxury goods like jewellery.

### **Exchange rate risks**

The company's accounts are in New Israeli Shekels (NSI) with economic studies and gemstones being priced in US dollars. Fluctuations in the value of the NSI and the US dollar against the pound may have an effect on the valuation that Shefa Yamim is awarded by the UK stock market.

### **Future funds**

The market for raising funds for small cap resources companies steadily worsened over the course of 2018. Some recent fund raising in the resources sector have seen share prices being undermined by incoming investors demanding substantial discounts to provide the necessary capital.

## **Management**

### **Abraham (Avi) Taub – CEO**

Avi is the co-founder of Shefa Yamim and has over 45 years' experience in all aspects of the gemstone sector from cutting, polishing and marketing. He is a scholar of Gemology and Mineralogy, as well as being second generation to the founders of the Israeli diamond industry. Avi is a serial entrepreneur who has founded and managed a number of Israeli companies.

### **Vered Toledo – COO**

Vered has led Shefa Yamim's exploration and operations team for more than 19 years. She is responsible for field, plant and laboratory activities and staff management. Vered has extensive in-field experience with a focus on gemstones and especially the rare, potential natural moissanite (SiC) and Carmel Sapphire™ discoveries.

### **David Ben David – CFO**

David has been a Certified CPA for 15 years after gaining a BA in Economics and Accounting, at Bar Ilan University. He is highly experienced in auditing & analysing financial reports for various public companies in Israel. In addition, David has an in-depth knowledge of the Capital Market and analysing financial data. He is also experienced in internal auditing and risks assessment and management.

## **Board of Directors**

### **Abraham (Avi) Taub – CEO**

See above

### **Vered Toledo – COO**

See above

### **Michael Rosenberg – Chairman**

Michael is a corporate finance expert with over 40 years' experience working on boards globally. He has extensive experience of being Chairman and Non-Executive Director of UK listed companies. Michael is also a mentor to The Prince's Trust.

### **James AH Campbell - Non-Executive Director**

James is a qualified geologist who has worked for more than 20 years with De Beers' Global Mining and Exploration Group, before becoming the Managing Director of African Diamonds plc in 2006. Since then he has served on a number of UK and Canadian boards including West African Diamonds plc, Stellar Diamonds plc and Rockwell Diamonds Inc. James is currently Managing Director of Botswana Diamonds plc.



**Nathalie Schwarz – Independent Non-Executive Director**

Nathalie is a qualified lawyer who began her career at leading global law firm Clifford Chance focusing on cross-border mergers and acquisitions, corporate restructurings, IPOs and private equity. She has extensive board experience, both as an Executive Director and Non-Executive Director, of UK listed companies including Channel 4 Television Corporation, Capital Radio PLC and Amiad Water Systems PLC. Nathalie is currently a Non-Executive Director on the Board of UK publicly listed company Wilmington Group PLC. She specialises in growing businesses, strategy, operational management, developing new commercial and technological opportunities and mergers and acquisitions.

**Gershon Fraenkel – Independent Non-Executive Director**

Gershon is a British Citizen and founder of WST Charity Ltd, in North West London which focuses on alleviating poverty within the local Jewish Community. He has successfully launched many international businesses in the last 25 years, which includes SEACO Group of Companies and Linkedell Ltd. As a result, he acts as an intermediary and adviser of international transactions to companies in Israel and the UK. Gershon is fluent in English, Hebrew and Yiddish.

**David Nachson – Independent Non-Executive Director**

David is a graduate in Rabbinical Ordination and has extensive ties within the Jewish community worldwide, as well as established government relations in Israel. He has been on the board of Shefa Yamim (A.T.M.) Ltd and Shefa Yamim Ltd since 1999, when the company was founded. David is a Board member of the Jewish community institution in Kiev, Ukraine, Chairman of the Chabad Jewish Mobil Mitzva Centre, Chabad Youth Movement Tzivos Hashem and Chabad Educational Institutions.

**Hanoch Ehrlich – Independent Non-Executive Director**

Hanoch is a qualified lawyer and has held an Israel Bar Association license since May 1994. He specialised in contract law, company law and all aspects of commercial law. Hanoch has worked on several international M&A transactions, including advising companies in Central and Eastern Europe. He is experienced in litigation, having represented various entities such as the Israel Military Industries Ltd, the Shikun U'binui Group (the largest construction conglomerate in Israel), the Ofer Brothers Group, the Yitzhak Tshuva Group, Bank HaPoalim, the Israel Discount Bank, the Industrial Development Bank, the Israel Shipping Bank, Amdocs (Israel) and the Israel Citrus Marketing Board.

## **International Consulting Team**

### **Professor William Griffin**

William is a respected academic and Professor of Geology at Macquarie University. He is the Program Director for Technology Development and Industry Interaction in the ARC National Key Centre for Geochemical Evolution and Metallurgy of Continents (GEMOC).

### **Dr John Ward**

John has a PhD in Geology and has won the Oliver Davies and Henno Martin Medals for his contributions to academic and economic geology. He is a leading alluvial diamond exploration geologist with over 35 years' field experience which includes extensive time working in Africa where he was previously employed by De Beers and Gem Diamonds.

### **Professor Mike de Wit**

Mike is a highly respected chief geologist focusing on diamonds and geophysicist. His experience includes positions with two of the largest resources companies in the world, Anglo American in South Africa and De Beers, where he worked for 29 years. Mike is a diamond focused geologist and Professor at the University of Pretoria.

### **Dr Renato Spaggiari – Exploration Manager at Allotropes**

Renato was previously the Vice President at C&K Mining, Cameroon. He has a strong background in geomorphology and sedimentology and his PhD research dealt with favourable conditions for diamond deposits along Africa's west coast.

## Forecasts

We initiate coverage of Shefa Yamim with forecasts for the years ending 31<sup>st</sup> December 2019 and 2020. In the year ending 31<sup>st</sup> December 2019, trial mining is expected to begin in the Kishon Mid-Reach area in the second half, although any revenue from the sale of discovered gemstones is not expected to be received until the following year. Operating costs for the trial mining are expected to total NIS 4.000 million with general and administration expenses estimated to be NIS 3.500 million. This is forecast to result in a pre-tax loss of NIS 7.605 million. The resultant loss per share is estimated to fall to NSI 0.446 per share.

In the year ending 31<sup>st</sup> December 2020, commercial mining is planned to begin in the Kishon Mid-Reach area with full production of 50t/hr (136,000tpa) anticipated to be achieved by the end of the year. We have estimated that commercial mining in this period will see the mining of a total of 34,000t of gravel producing just over 52,000 carats of rough gemstones. It is estimated that almost 21,000 carats of cut and polished gemstones (which includes gemstones that were also found during the exploration programme and those from trial mining in 2019 and 2020) will be set in jewellery and sold. Revenue from sales of gemstones to the jewellery venture and the company's share of the revenue generated by the jewellery venture has been estimated to total NIS 54.300 million. This resulted in a gross profit of NIS 43.400 million, after deducting the cost of sales. The increase in general and administration expenses reflects the necessary expansion of the business as it moves into commercial mining. Allowing for operating, general & administration and financing expenses results in a pre-tax profit of NIS 26.000 million. No tax charge is assumed due to past accumulated losses. This level of profit for the year would give rise to earnings per share of NIS 1.22, which equates to 25.6p per share at current FX rates.

Year End 31 December (NIS'000s)	FY2017a	FY 2018a	FY 2019e	FY 2020e
Revenue	-	-	-	54,300
Cost of sales	-	-	-	10,600
Gross profit	-	-	-	43,400
Operating expenses	-	-	(4,000)	(10,000)
General and administration expenses	(541)	(3,410)	(3,500)	(7,400)
Capital gain	-	-	-	-
<b>Operating profit/(loss)</b>	(541)	(3,410)	(7,500)	26,000
Finance expenses	(15,964)	(218)	(250)	(250)
Finance income	237	9,637	145	250
Finance income (expenses) net	(15,717)	9,419	(105)	-
<b>Pre-tax profit/(loss)</b>	(16,268)	6,009	(7,605)	26,000
<b>Taxation</b>	-	-	-	-
<b>Profit/(loss) for the year and comprehensive profit/(loss) attributed to the Company shareholders</b>	(16,268)	6,009	(7,605)	26,000
Basic and diluted earnings per share (in NIS) attributed to the Company shareholders	(1.703)	0.422	(0.446)	1.220
Weighted average number of shares	9,648,938	14,172,167	17,055,753	21,303,920
Total shares plus options and warrants	20,494,387	22,011,306	22,011,306	22,011,306

Source: Company/Align Research



## Valuation

After 19 years of exploration activity and US\$35 million of expenditure, Shefa Yamim lies at the threshold of the developmental stage. Already the company has outlined the enormous potential for highly valuable coloured gemstones stones that exists in a country that has little history of mining.

We have sought to value the company at the current stage of its development based on our analysis of the future mining project in this area, which is solely based on the mining of Kishon Mid Reach Zone 1. This has been based on a financial model that we have developed following the analysis of the exploration results and the coloured gemstone market together with a deep reliance on the results of the recently released independent TEE by consultants PPM and discussions with the management. The proposed alluvial mining project that is outlined by the TEE envisages a surface mining operation and the processing a 1.5Mt of Run-of-mine (ROM) gravel over an 11-year LoM from Kishon Mid Reach Zone 1. Below we set out some of the main assumptions used in the financial model.

**Timing** – We assume that commercial production will commence in 2020, with the ramp up to full production being achieved by the end of that calendar year. However, the granting of the mining licence will allow gemstones that were recovered during the bulk sampling and other exploration work to be sold which provides the possibility for sustained cash flow from early 2020.

**Production capacity** – A mining rate of 50t per hour. This means that in working two eight hour shifts per day a total of 136,000tpa of gravels could be mined plus 164,000tpa of overburden stripped away.

**Resource** – The resource used in our financial model was based on that used in the TEE which used a figure of 1.5Mt of gravel over the LoM which seems based on the increased mineral tonnage estimates that were unveiled in November 2018 plus some subsequent analysis. The TMA suite and grade used in the analysis was based on the bulk sampling results from Zone 1. Alluvial diamond projects normally need 500 carats of diamonds to determine the grade for an inferred resource, but the company has already recovered close on 10,000 carats.

Mineral suite		Total Zone 1	
		carats	cpht
GEM BOX	Sapphire	287.34	4.50
	Carmel Sapphire™	2,512.84	39.36
	Ruby	5.30	0.08
	Natural Moissanite™	6.65	0.10
	Hibonite	20.89	0.33
	Spinel	3,952.91	61.91
	Garnet	2,176.77	34.09
	Ilmenite	769.86	12.06
HIM	Zircon	37.29	0.58
	Rutile	8.31	0.13
	<b>Total</b>	<b>9,778.15</b>	<b>153.16</b>
	Total sample size (t)	6,384.42	

*TMA suite bulk sample results from Zone 1. Source: Company*

**Life of Mine** – Based on 1.5Mt of gravel and a production rate of 50t/hr (136,000tpa), the project would have an eleven-year life, as set out in the TEE.

**Capital expenditure** - Consultants PPM have suggested a capital expenditure of US\$11.30 million based on using new equipment, which we have used in our model to remain conservative. Although, we realise that this is unlikely to be the management's chosen route and the choice of second-hand equipment is probably more in line with current thinking. In addition, Shefa Yamim has already invested significantly in processing plant and machinery which should serve to reduce the overall spend on capital equipment.

**Operating costs** - In the TEE, PPM determined an operating cost of US\$26/t of processed material which has been used in our analysis. The consultants also investigated increasing the level of production to 100t/hr which could allow opex to fall to US\$10-15/t. The company has well-developed plans to make further upgrades to the new processing equipment already purchased from the proceeds of the IPO and the board believes that a further investment of US\$1 million would allow the production capacity of the mill to be increased to 100t/hr.

**Coloured gemstone prices** – In determining a price for the various gemstones found to date at the project, we analysed the market prices of coloured gemstones and made a number of assumptions, which are shown in the table overleaf for the most valuable gemstones found. The prices of coloured gemstones used in our analysis is conservative as it has to be pointed out that the gemstones which are likely to be mined here are not only unique but also have the additional cachet of coming from the Holy Land. Such provenance could significantly increase value of such gemstones to the many millions of religious people worldwide. Plus, given the uniqueness of the locality, there is also the branding of Natural Moissanite™ and Carmel Sapphire™, which are gemstones that are not found anywhere else on the planet.

Carmel Sapphire™ ranges in colour from orange to brown to blue to almost black. The ultimate colour is dependent on the titanium (Ti) content as well as the abundance of trapped inclusions of melt (from which it grew) which provides the attractive sparkly appearance. These melt inclusions contain a large array of unusual minerals. Our research has pointed towards an estimate a price of US\$2,000 to 10,000+ for high quality unheated rich blue sapphires and have used an average of US\$7,000 per carat, due to these gemstones' provenance. For the black Carmel Sapphire™, a value per carat of US\$5,000 per carat has been selected as being appropriate. So, for the Carmel Sapphire™, we have chosen to use an average value of US\$6,000 per carat.

Mosissanite that is available in the market is all synthetic as it has been manufactured. No Natural Moissanite™ has been found to exist anywhere else on earth to date. There is limited quantity of Natural Moissanite™ as geologists at Shefa Yamim's project have discovered very little. So, we have chosen to value Natural Moissanite™ at a premium to diamond prices due to its extreme rarity. Nearly colourless diamond can be valued at over US\$10,000 per carat and rare gems like bixbite, mugravite, pianite, alexandrite and grandidierite are all thought to be worth more than diamonds. It seems likely that Natural Moissanite™ might join that exclusive group

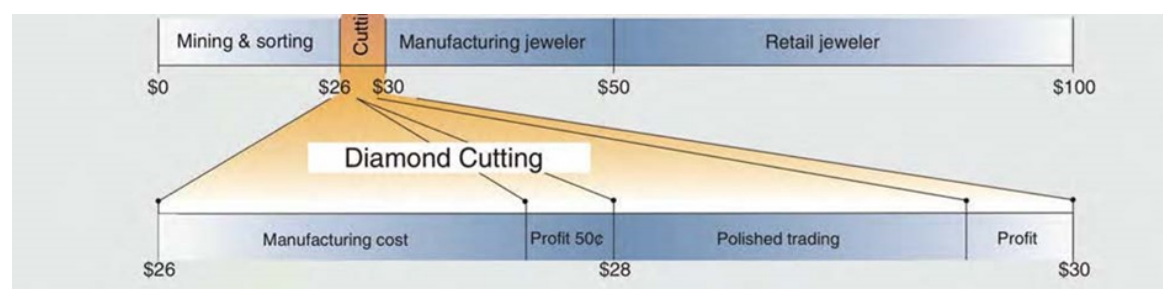
The company plans to include clinopyroxenes (CPX) into the jewellery as it is a nice apple green colour making a nice contrast with the other gemstones. CPX is a kimberlite indicator mineral which the team has discovered in the area. Its value per carat is expected to be US\$2-5 and as there is no grade determined for these gemstones, we have left it out of the analysis.

Gemstone	Cut & Polished Indicated price per carat' (US\$)	Examples found and sources
Sapphire	422 – 2,785	Blue sapphire 0.62ct 5.2mm Round 0.8ct 5.2mm US\$337.42 = US\$422/ct Oval 3.3ct 9.3 x 6.9mm US\$6,680 = US\$2,024/ct Oval 5.3ct 11.2 X 9.9mm US\$15,876 = US\$2,785/ct Source: Gem Select
Carmel Sapphire™	2,000 – 10,000+ Relate to the blue and black Carmel Sapphire™	In a piece on Blue Sapphire Prices, AJS Gems talk about the four Cs (colour, cut, clarity and weight) apply to sapphire every much as they do for diamonds. They estimate a price of US\$2,000 to 10,000+ for unheated rich blue sapphires. Source: AJS Gems
Ruby	319 - 685	Red Ruby Oval 0.5ct 6.1 x 4.1mm US\$159.62 = US\$319/ct Round 0.8ct 5.66mm US\$478.50 = US\$598/ct Oval 1.4ct 7 x 6mm US\$959 = US\$685/ct Source: Gem Select
Natural Moissanite™	6,634 – 20,790 Not cut, rough only crystals till 4mm the biggest worldwide	Unique and based the price by reference to investigating the prices of high-quality diamonds. Round Brilliant 1.00 carat D colour, IF clarity US\$20,790 = US\$20,790/ct Round brilliant 0.50 carat D colour, IF clarity US\$3,317 = US\$6,634/ct Source: Info Diamonds Nearly colourless diamond can be valued at over US\$10,000 per carat and rare gems like bixbite, mugravite, pianite, alexandrite and grandidierite are all thought to be worth more than diamonds. Source: GN Pawn Big, California
Hibonite	109 – 1,000	Faceted 0.92ct \$100.00 = US\$109/ct Faceted 6.53ct US\$6,500 = US\$1,000/ct Source: Cleopatra Gemshop Faceted 0.69ct Myanmar 5.80 x 4.48 x 3.12mm £550 = US\$123/ct Source: Gemgazer
Spinel	49-89	Cushion violet 1.5ct 6.5 x 5.8mm US\$73 = US\$49/ct Cushion Red 1.1ct 6.5 x 5.6mm US\$63 = US\$57/ct Oval violet 1ct 7.5x 5.7mm US\$88.90 = US\$89/ct Source: Gem Select
Garnet	40 - 51	Oval red Rhodolite 2.8ct 9.4 X 7.4mm US\$111.20 = US\$40/ct Round pink Malaya 3.1ct 8.6mm US\$124.80 = US\$40/ct Round green Grossularite 1ct 5.6mm US\$51.50 = US\$51/ct Source: Gem Select
Ilmenite	105-106	Triangle black 0.32ct 6.5 x 3.3mm £25.84 = US\$105/ct Rectangle black 0.31ct 3.9 x 3.3mm £25.39 = US\$106/ct Gemcraft (Manchester Minerals)

<sup>1</sup> based on the assumption of one gemstone carat being 200mg (or 5 carats in a gram)

*The basis of the determination of the prices of coloured gemstones used in our analysis. Source: Align Research and various sources outlined in the table.*

**Mine to Market strategy** – The company has a Mine to Market strategy which will see the coloured gemstones that are mined being cut and polished and being made into jewellery, thereby capturing a far larger margin than achievable by just selling gemstones. The proportional uplift in value available in the industry and assumed to be gained in our analysis is illustrated by the diagram which is shown overleaf.



*Relative value of a diamond from mine to jewel. Source: The Ohio State University*

Currently there is an agreement being negotiated with world renowned jewellery designer Yossi Harari, which has served to build the economic profile to an advanced stage as the company progresses towards trial mining. This is not an exclusive agreement and the company has received several proposals from international companies that manufacture jewellery as well as jewellery manufacturing companies around the world. We have assumed that the company will have a number of 50:50 joint ventures with jewellery designers whereby the company benefits from sharing the gross profit margin on manufacture of jewellery containing Shefa Yamim's gemstones.

**Revenue** – We have established two sources of revenue. Firstly, there is the revenue from selling the cut and polished gemstones to a jewellery manufacturing joint venture. Secondly, there is a share in the revenue of jewellery sales by joint venture partners.

Gemstone	Grade cpht	Assumed price used in analysis US\$/ct	Total US\$
Sapphire	4.50	1,000	4,500
Carmel Sapphire™	39.36	6,000	236,160
Ruby	0.08	500	40
Natural Moissanite™	0.10	10,000	4,334
Hibonite	0.33	200	66
Spinel	61.91	70	4,334
Garnet	34.09	45	1,534
Ilmenite	12.06	105	1,266
Zircon	0.58	-	-
Rutile	0.13	-	-
<b>Total per 100 tonnes</b>	<b>153.16</b>		<b>248,900</b>
<b>Revenue per tonne processed</b>			<b>2,489</b>

*Calculation of revenue per tonne on processed gravels. Source: Align Research*

**Cutting & polishing** – The company plans that the rough stones will be cut and polished in Israel but with the management estimated cost of US\$10 per carat, the gemstones might well in the end be cut and polished in India. Concerning the thorny issue of wastage that comes from cutting the gemstones, a good rule of thumb is that roughly about half of a natural diamond's size is lost in the cutting. However, if clarity, inclusions and colour are the main concerns then a total of 60% or more might be cut, ground or polished away from the original stone. If the house is prioritizing carat size, then substantially less will be ground and polished off. In order to remain conservative, we have used a wastage figure of 60%.

Size cut and polished carats	Original rough diamond carats	Wastage
0.97	3.24	70%
1.10	3.32	65%
1.60	4.25	62%

*Wastage in the diamond industry. Source: [www.pricescop.com](http://www.pricescop.com)*

Such is the rarity of Natural Moissanite™ that the company has decided to use this gemstone uncut in the jewellery.



**Royalties and taxes** - There is a 5% royalty on colour gemstones in the country and Israeli-incorporated companies were subject to a corporate rate of tax of 23% in 2018. These rates are assumed for the life of the mine. It is assumed that previous investment and losses will be allowable against taxable profits moving ahead which would mean that the company would not pay tax during the early years of the project.

Our financial model based on the above mentioned assumptions was used to determine a Net Present Value for this project at discount rates of 10% and 12% In order to be conservative, we selected to use the NPV(12) figure of US\$333.67 million (£250.88 million).

Discount rate	10%	12%
NPV US\$ million	377.10	333.67
NPV £ million	283.53	250.88

*Net Present Value for the Precious Stones. Source: Align Research*

The TEE has provided the outline of the mining project's likely scale and detailed costs of the capital expenditure and operating costs. It is not hard to come to quite a high number given the innate high level of profitability from the mining of these alluvial gravels at the estimate value per tonne. Currently, there has been little analysis on the revenue stream which will be expected to come with feasibility studies.

In light of this, we have chosen to further de-risk the valuation to derive a figure which we believe is highly conservative and indeed credible in today's market. There is a useful rule of thumb that outline a 20-25% of NAV at the Scoping Study stage, 30-35% at the PFS and 45-55% at the DFS. Obviously, using a 12% discount rate already de-risks the valuation but the project has been further de-risked to the tune of 70%, by taking just 30% of this NPV(12) valuation, or £75.26 million, through to our SOTP calculation.

#### Sum-of-the-parts valuation

	Valuation £ million
Precious Stones Project (risked)	75.26
Cash	0.04
Debt	(0.26)
Total	75.04
Per share (14,236,426)	527.10p
<b>On a fully diluted basis</b>	
<b>Cash from warrants being exercised</b>	<b>7.77</b>
<b>Total</b>	<b>82.81</b>
<b>On a fully diluted basis (22,011,306)</b>	<b>376.19p</b>

*Source: Align Research*

**Our total valuation is £75.04 million, which equates to 527.1p per share based on the current number of shares in issue (14,236,426).** Looking on a fully diluted basis, there are currently 6,889,956 warrants outstanding, which if exercised would bring in a total of £7.77 million (US\$10.3 million) and take the total valuation to £82.81 million which equates to **376.19p per share.**

## Conclusion

Over the coming months, the likely granting of the mining licence and further studies by consultants are expected to pave the way for initial trial mining which is scheduled to begin in H2 2019, to be followed by commercial mining which is planned to commence in 2020. The board is currently developing plans to increase production from 50t/hr to 100t/hr and working an increased number of hours per day would see the Zone 1 resource used in our analysis mined in 4 years rather than 11 years. Such a move would significantly increase the NPV of the project. Our target price is solely based on Zone 1 and the fast-accumulating data from Zone 2 should soon highlight the growing scale of this project and potential far longer mine life and once more serve to increase the project's NPV.

The news flow from these moves looks likely to really see the spotlight firmly focused on Shefa Yamim. The company joined the London market rather quietly more than a year ago and having now brought its impressive gemstone project to the brink of mining, the board is seeking to attract attention to the company so that the compelling potential begins to be reflected in the share price.

We look forward to being given the opportunity to revise our valuation as a number of the uncertainties become better understood over the next 18-24 months and as the directors rapidly advance the project into production. Over this period, there will be a host of value adding milestones to be achieved which include mineral resource definition, the results of feasibility studies, the mining decision, the commencement of commercial mining and the ramp up to name-plate capacity. **We initiate our coverage of Shefa Yamim with a Conviction Buy stance and a target price of 376p.**

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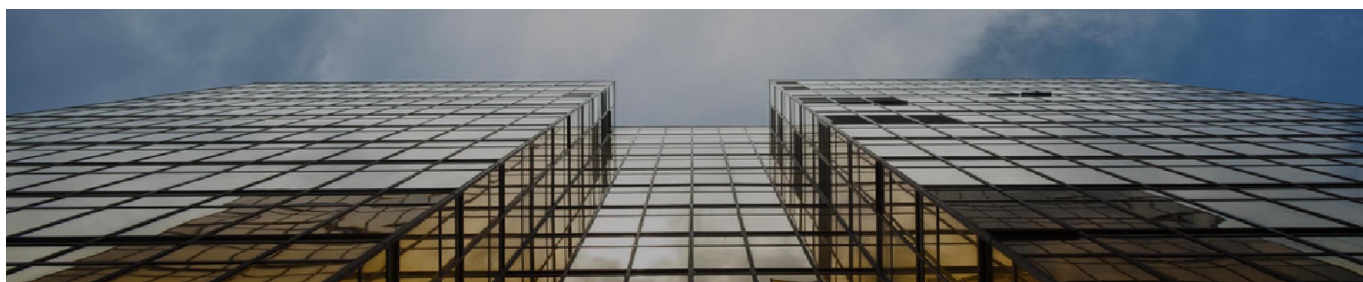
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Align Research Limited  
7 Moorhead Lane  
Shipley  
UK  
BD18 4JH

Tel: 0203 609 0910  
E: [info@alignresearch.co.uk](mailto:info@alignresearch.co.uk)