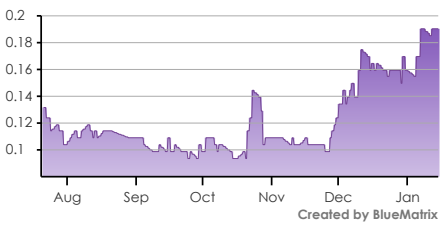
DEEP-SOUTH RESOURCES INC (CVE:DSM)

18 January 2021

Metals & Mining

52-WEEK HIGH	**C$0.19**
52-WEEK LOW	**C$0.03**
PRICE	**C$0.16**
MARKET CAP MLN	C$17.32
NET CASH (MLN)	C$6.60

Share Price



Major Shareholders

Management and Directors - 19%	
Teck Resources - 21%	
Shares in issue	108,762,298
Avg Three-month trading volume	315,713
Primary Index	CVE

Company Information

Address: Suite 888, 700 West Georgia, Vancouver, British Columbia, Canada, V7Y 1G5
Website: www.deepsouthresources.com

Analyst Details

Ryan Long
ryan@proactiveinvestors.com

Highly Profitable Copper Project with Low Market Valuation

Deep-South Resources Inc (CVE:DSM) is a copper focused exploration and development company advancing the Haib Copper Project, located in Southern Namibia (Figure 1). The Haib deposit is one of, if not the oldest copper porphyry deposits in the world.

It's also one of the larger undeveloped copper deposits with a total NI 43-101 compliant mineral resource estimate of 799.1 Mt at a grade of 0.30% copper (Cu).

A large proportion of the current resource estimate comes from drilling down to a shallow depth of just 75 metres (m) below the surface, and the bulk of the resource estimate comes from drilling to a depth of 350 m. The deepest drill hole at the project extends to a depth of c. 850 m below the surface demonstrating that the ore-body remains open at depth and that additional deeper drilling would allow the resource estimate to be expanded beyond its already substantial size.

In addition to the expansion targets at depth, a 12,000 m infill drill programme is expected to expand the 140 Mt high-grade zone, which would also increase the life-of-mine head grade.

Haib also has four near mine satellite targets, the eastern; southern; south-western; and western anomalies, that with further drilling could add additional deposits to the overall project resource estimate.

As well as the near mine satellite targets there are three regional satellite targets, the: southwest alteration feature; the northwest induced polarisation (IP) anomaly; and the east alteration feature that could also represent additional sources of mineralisation, increasing the scale of the project.

Deep-South Resources has recently completed an updated preliminary economic assessment (PEA) for the project based on the current mineral resource estimate. The PEA returned a post-tax $NPV_{7.5}$ (net present value using a 7.5% discount rate) of US$1.3bn and a post-tax internal rate of return (IRR) of 42.1%, with a payback period of 3.4 years using a copper price of US$7,716/t (US$3.5/lbs); the current copper price is US$8,002/t.

These robust economics can potentially be improved with the use of optical ore sorting to reduce processing costs and improve project efficiencies. Alongside this, the company is also assessing the potential of using solar power generation and a sulphur burning plant to further reduce operating costs.

Deep-South Resources is now in the process of advancing the Haib Copper Project towards a feasibility study with plans to complete a 12,000 m infill drill programme to expand the high-grade zones.

The company is also planning further metallurgical test-work, which is expected to improve recoveries and reduce the operational cost while completing the mining engineering design and preparing an environmental impact assessment and base-line study.

John Akwenye, chairman, director

Akwenye is a retired Namibian lawyer with over 30 years of experience. He is director of Areva Resources Namibia and PE Minerals.

Pierre Léveillé, president & chief executive officer, director

Léveillé has more than 28 years of experience in the international financial sector and 20 years of experience in the mining exploration industry. He has realised over US$75mln in transactions and financing for Namibian and African mining exploration projects.

Jean-Luc Roy, chief operating officer, director

Roy has been a major contributor to the development of several important corporations in Africa during the last 30 years working for majors, mid-tiers and junior exploration companies.

Figure 1 - Location of Haib

Source: Deep-South Resources

Despite making significant progress at Haib, compared to other copper project development companies Deep-South Resources is significantly undervalued. On a Profitability Index basis (NPV/Capex) Haib has the highest rating of our peer group of development stage copper projects yet the company trades on the smallest enterprise value to NPV ratio of the peer group, just 0.96%. This compares to an average of 12.32% for its peer group.

Deep-South Resources owns 100% of the Haib Copper Project, located in Southern Namibia (Figure 1). The project currently has a total NI 43-101 compliant mineral resource estimate of 799.1 Mt at a grade of 0.30% Cu (copper) .

The recently completed updated preliminary economic assessment (PEA) for the project returned a post-tax $NPV_{7.5}$ of US$1.3bn and a post-tax IRR of 42.1%, which compares favourably to the economics of other large-scale copper development projects being operated by juniors (Figure 2).

Based on the PEA the mine is expected to produce 847,968 t of copper equivalent over the 24-year life-of-mine, making it a large and long-life copper producer (Figure 3).

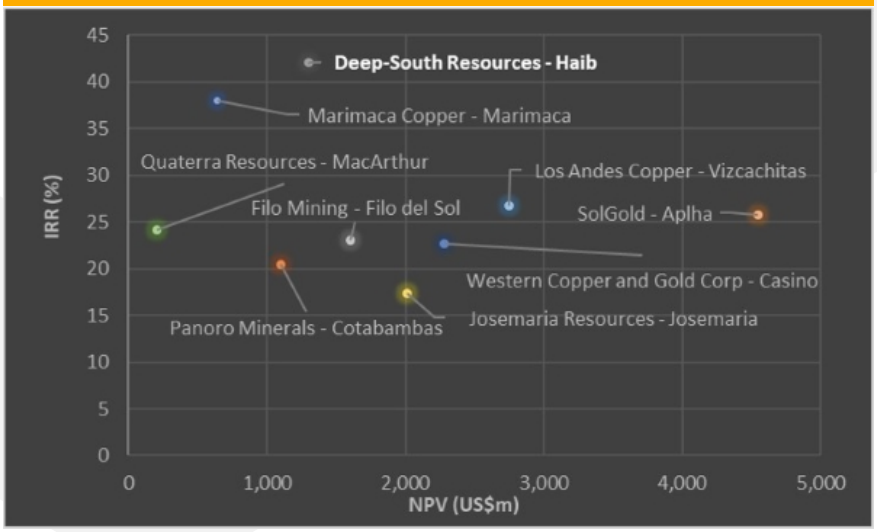
Compared to the peer group Haib is mid-range in terms of operational cost per pound of copper (US$1.36/lb) but at the low-range for pre-production capital intensity on a life of mine production basis (US$402/t) (Figure 4).

On a Profitability Index basis, which is the net present value of the project, divided by the pre-production capital required to build the operation (NPV/Capex), Haib has the highest rating of our peer group of development stage copper projects, at US$3.82 (Figure 5).

As a result, for every dollar spent to build the Haib project, the life-of-mine return it generates is worth US$3.82 at present. This is the highest of the peer group which range from US$0.65 to US$2.25 and average US$1.19.

Despite Haib's impressive rating on a Profitability Index basis, Deep-South Resources trades on the smallest enterprise value to net present value ratio of 0.96% (Figure 5). This compares to a range of 30.95% to 4.20% for the peer group and an average of 12.32%. As a result, the shares of Deep-South Resources looks good value at this level.

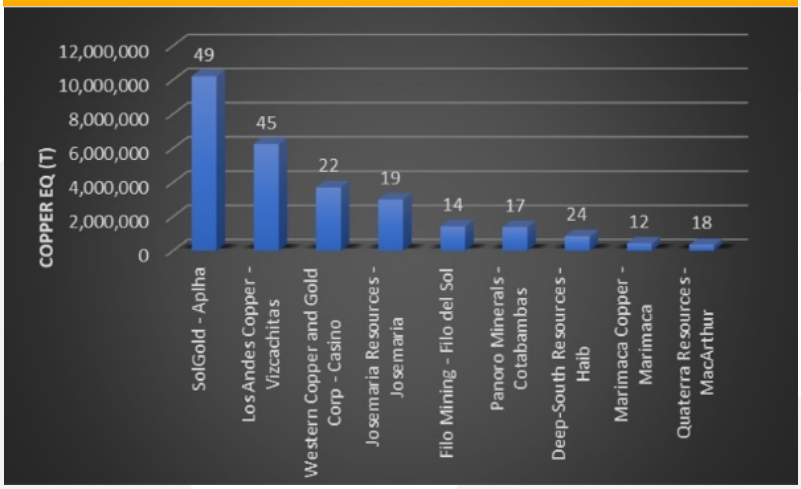
Figure 2 - IRR-NPV of Large Cu Projects



Source: Mining and Metals Research Corporation

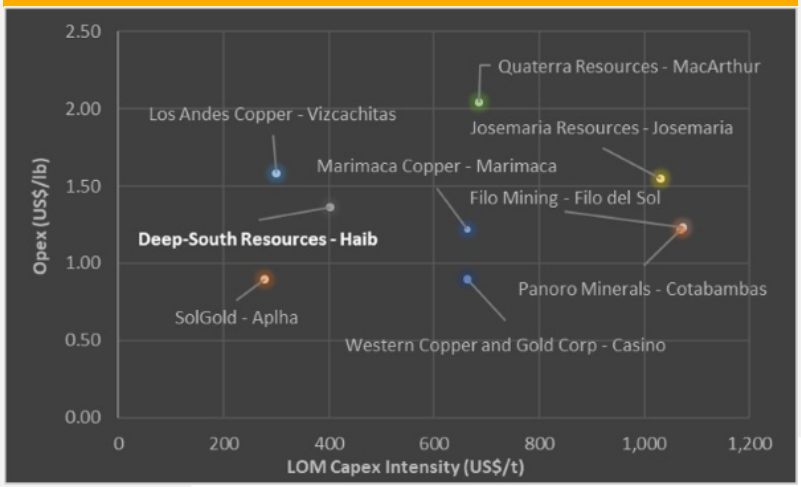
Data assumes a copper price of c. US$3.5/lbs and uses a discount range between 7.5-8%

Figure 3 - Peer Group Production Levels



Source: Mining and Metals Research Corporation

Figure 4 - Opex and Capex Intensity of Peer Group



Source: Mining and Metals Research Corporation

History

The Haib Copper Project was first discovered in the late 1800s or early-1900s by German prospectors, who identified widespread copper staining on fractures in and around the dry river bed of the Volstruis River. Minor amounts of high-grade copper carbonate ore were extracted during this period.

Post World War II, small-scale mining and tank leaching was undertaken at the project producing a copper cement that was sold for further refining.

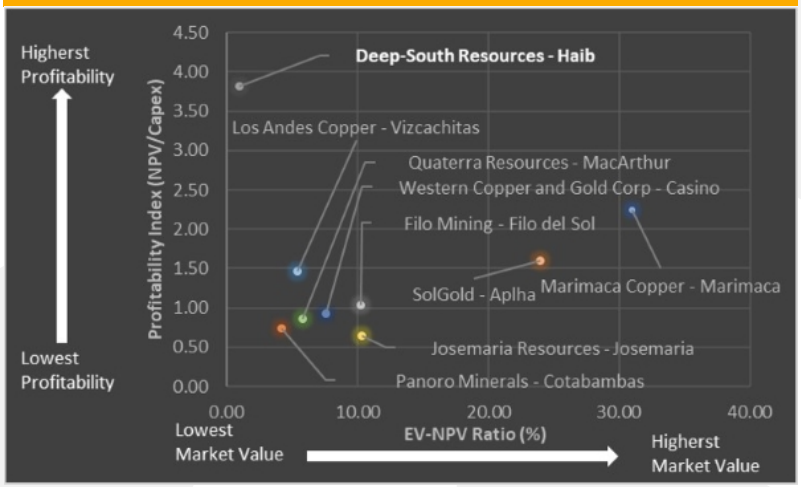
Between 1963 and 1964, Falconbridge of Africa Ltd undertook a detailed exploration programme that focused on the higher-grade zones within the deposit, completing around 1,012 m of drilling, though very little of this data remains other than the assays.

Between 1968 and 1969, King Resources of South Africa Pty Ltd examined both lower and higher-grade sulphide zones, as well as the higher-grade oxide shear zones with an additional drill programme consisting of 21 holes totalling 3,485 m; much of this data is also missing apart from the assay results. The company also conducted some leaching metallurgical studies.

Rio Tinto Zinc (RTZ) conducted the first extensive and systematic investigation of the Haib deposit between 1972 and 1975. The company drilled 120 holes that totalled over 45,903 m, as well as completing various geochemical sampling programmes and geophysical surveys.

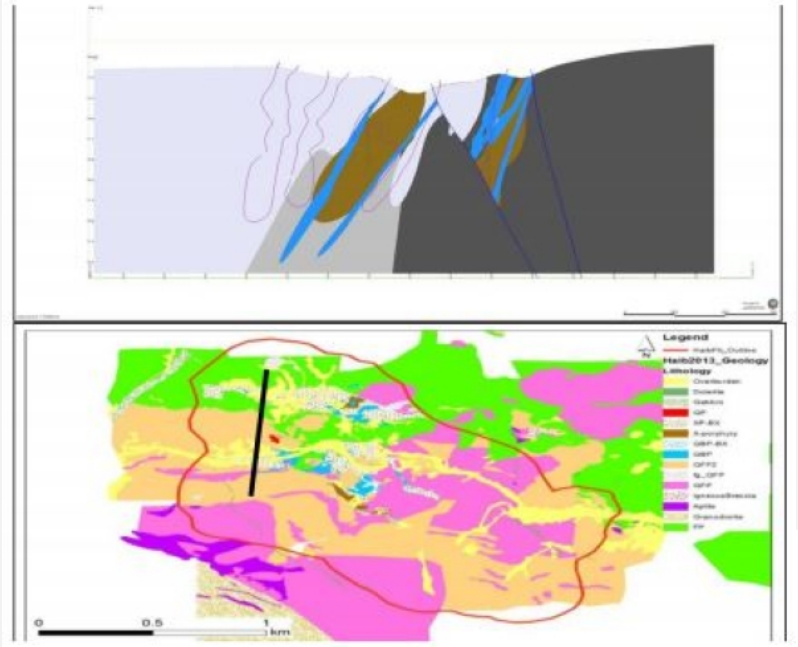
In 1993 Rand Merchant Bank Ltd acquired an option over the Haib Project that culminated in a joint venture with Great Fitzroy Mines NL in 1995. The operating company was called the Namibian Copper Joint Venture, which conducted exploration at the

Figure 5 - Profitability Index and EV-NPV Ratio



Source: Mining and Metals Research Corporation

Figure 6 - North-South Cross-Section Across Western Haib



Source: Deep-South Resourcs

project between 1995 and 1999. Of the drill holes completed 12 were infill holes and five were large-diameter drill holes for geotechnical work.

In 1999 the concession was sold to Rusina Mining Ltd but the transfer of the mineral rights to Rusina was apparently not ratified by the Namibian Government and as a result Rusina didn't advance the project.

Deep-South Resources consolidated the mineral rights over the entire Haib deposit in 2004 and has subsequently advanced the project to the preliminary economic assessment stage (PEA).

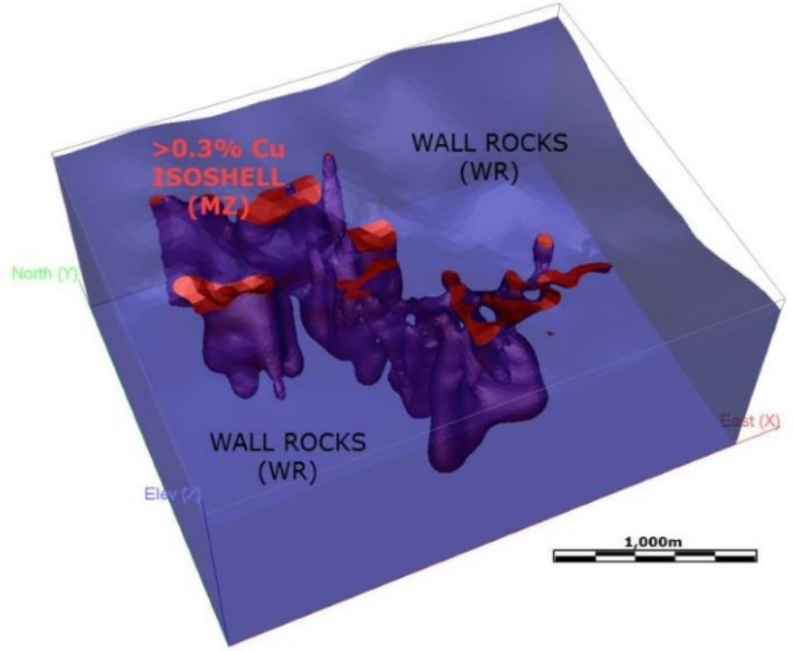
Geology

The Haib Copper Project is a rare example of a Precambrian porphyry copper deposit. The project area contains sub-aerial volcanic rocks and reworked volcaniclastic sediments that were intruded by a quartz-feldspar bearing porphyry and a feldspar bearing porphyry. These porphyries host the copper mineralisation at the project.

The quartz-feldspar bearing porphyry is interpreted as a quartz-diorite body that intruded the feldspar porphyry (andesite) some 1,868 ± 7 Ma ago. The quartz-feldspar bearing porphyry is largely coincident with a steeply dipping shear zone that has an east-west strike and is related to the higher-grade intersections within the deposit. The deposit has been displaced by a post mineralisation deformation event that has displaced a portion of the ore-body to the south (Figure 6).

Within the deposit there are three areas of higher-grade copper mineralisation (c. 0.4% Cu) surrounded by lower-grade mineralisation (Figure 7). The sulphide minerals of economic interest are chalcopyrite with minor molybdenite. Bornite, digenite, chalcocite and covellite are also occasionally present. Oxide copper, malachite, azurite, chrysocolla, minor cuprite and chalcocite, rarely extends to depths in excess of 30 m on fracture zones.

Figure 7 - 3D Model of Haib



Source: Deep-South Resources

The host rock sequence has undergone low-grade regional metamorphism to greenschist facies and the majority of the area contains typical porphyry copper type alteration with a potassic alteration zone that coincides with the main mineralised area, surrounded by phyllic and propylitic alteration haloes. Silicification, sericitisation, chloritisation and epidotisation are widespread throughout the area.

Resources

The Haib Copper Project has an NI 43-101 compliant total mineral resource estimate of 799.1 Mt at a grade of 0.30% Cu, with 2.4mt of contained copper (Figure 8).

The bulk of this resource estimate (57%) is in the indicated category, and comes from the ore-body that is at a depth no greater than 75 m below the surface (Figure 9), while the inferred category part of the resource is estimated to the deepest drill hole intersection at 330 m below the surface.

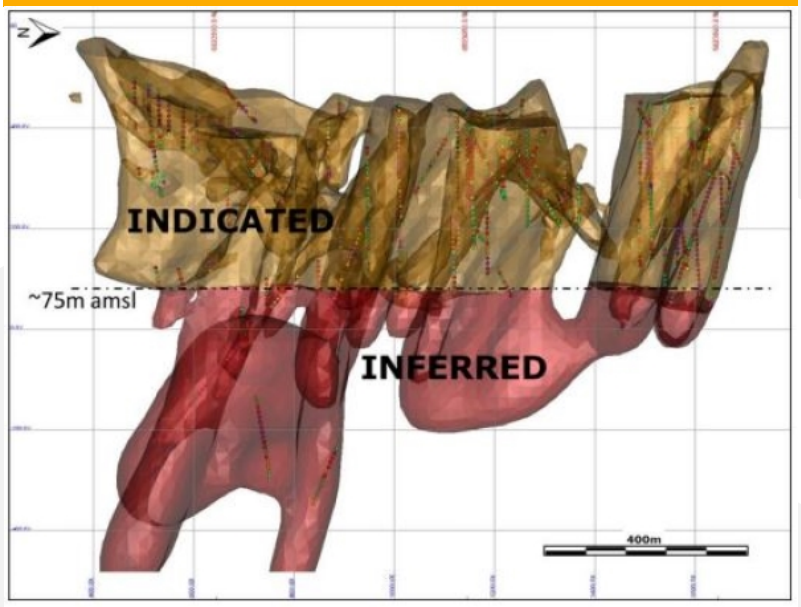
It is important to note that the ore-body remains open at depth and deeper drilling would likely further increase the size of the deposit.

Figure 8 - Resource Estimate

Category	Tonnes (Mt)	Copper Grade (%)	Contained Copper (t)
Measured	0.0	0.00	0.0
Indicated	456.9	0.31	1,416,390
Inferred	342.2	0.29	992,380
Total	799.1	0.30	2,408,770

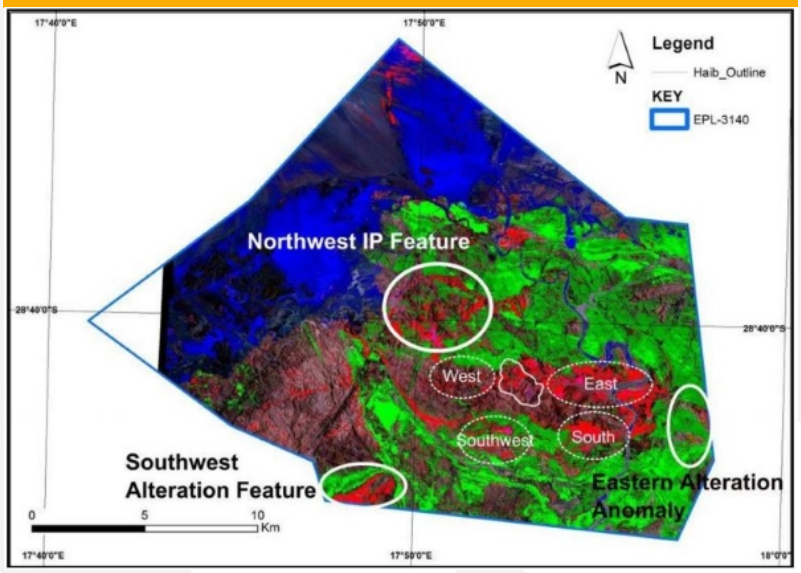
Source: Deep-South Resources

Figure 9 - Indicated and Inferred Resource at Haib



Source: Deep-South Resources

Figure 10 - Regional Targets



Source: Deep-South Resources

Exploration upside

Deep-South Resources believes that the higher-grade zones of copper mineralisation have not been adequately tested by the historical vertical drill holes, which failed to fully define the steeply dipping and plunging high-grade copper bearing fracture zones. The company is planning a programme of inclined drill holes that will be better orientated to define the extent and tenor of high-grade copper zones. The deposit also remains partially open to the west near the surface and to the south at depth.

As well as, the potential to expand the higher-grade zones within the Haib deposit, there are also four regional targets located near to the main deposit, referred to as the eastern, southern, south-western and western anomalies (Figure 10). These targets have been defined based on coincident stream and soil sampling anomalies and induced polarisation (IP) anomalies. Several diamond drill holes have been completed in the east, south and west targets.

In addition to these near-resource targets there are three further targets on the property, the southwest alteration feature, the northwest IP anomaly and the east alteration feature (Figure 10) that require additional exploration work to assess the areas potential.

Accessory minerals of economic interest such as gold, silver and molybdenum that could add some additional upside to the economics as assaying for these metals was not routinely conducted on drill samples. Testing of composite samples prepared for metallurgical testing, gives an approximate indication of the potential grades - 0.02 grams per tonne (g/t) gold; 0.9 g/t silver; and 25 g/t molybdenum.

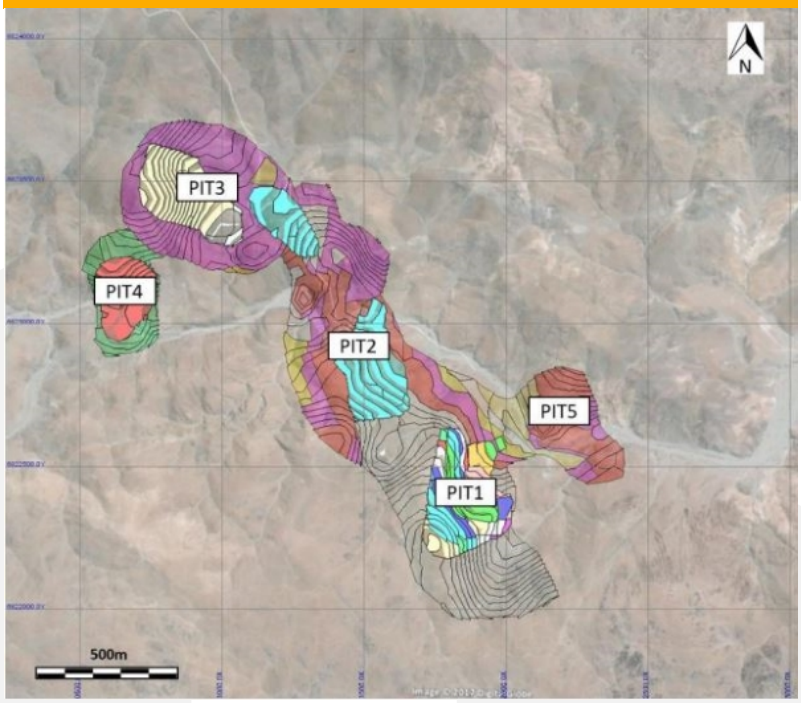
Preliminary Economic Assessment (PEA)

Assuming a copper price of US$7,716/t (US$3.5/lbs) - the current copper price is 7,918/t - the preliminary economic assessment (PEA) for the Haib Copper Project defined a post-tax $NPV_{7.5}$ of US$1.3bn and a post-tax IRR of 32.9% with a pay back period of 3.4 years.

The operation would have a throughput of 20 mt per year over a long mine life of 24 years, producing 77.9 mlbs (35 ktpy) of copper cathode and 112.6 mlbs (51 ktpy) of copper sulphates, which equates to over 2.19 bn lbs of copper equivalent. The project would generate an average yearly revenue of US$398mln.

The project has a pre-production capital cost of US $341mln and the cash cost is estimated to be US $1.34/lbs Cu. The PEA assumes a recovery rate of 80% and a strip ratio of 1.41:1.

Figure 11 - Open Pits Proposed for Haib



Source: Deep-South Resources

Figure 12 - Proposed Mine Layout

Source: Deep-South Resources

Mining

Mining at the project is expected to be undertaken by traditional open pit methods, including: drill and blast, load and haul methods. The mining plan for the operation is focused on five areas (Figure 11):

- Pit 1 – southeast pit includes the adit area.
- Pit 2 – central pit.
- Pit 3 – northwest pit.
- Pit 4 – south of Pit 3 and a possible westward extension of the Pit 2 higher-grade mineralisation.
- Pit 5 – northeast of Pit 1.

Processing

The low grade and hardness of ore means that conventional crush-grind-float processing methods for producing a copper concentrate at Haib are not feasible. Heap leaching provides an attractive alternative despite the dominant copper bearing minerals being sulphides and not oxides, which are traditionally processed by leaching. Initial metallurgical studies indicate that bacterial assisted leaching could result in recoveries of up to 95.2%, though additional testing is required.

Deep-South Resources has been conservative in the recovery assumptions used in the PEA, which returned robust economics, using 80% as the base model despite obtaining consistent recovery results between 80% and 82% in the metallurgical studies completed to date. The company is aiming to reach a constant recovery of 85% from this year's test work.

The updated preliminary economic assessment (PEA) for the Haib Project, defined a 20 million tonnes per annum (mtpa) operation as the optimum size for the plant. The flow sheet for the processing plant is expected to consist of a primary crusher that is a gyratory crusher followed by a secondary cone crusher. This stage is followed by a long distance conveyor (4.5-5 km) to transport crushed ore from the mine site to the subsequent grinding circuit consisting of high-pressure grinding rolls (HPGR) (Figure 12).

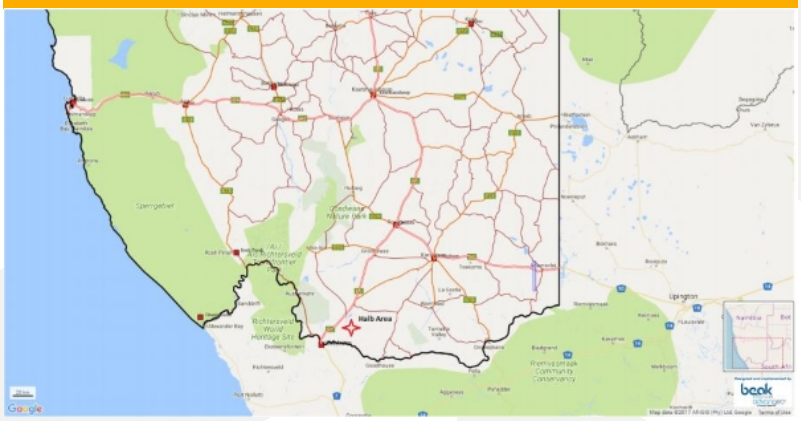
The feed is then passed to an agglomeration drum to roll the ore and stabilise the clay content in the ore to achieve satisfactory percolation rates when irrigating the heap. The feed will be transported to the leach pads using grasshopper conveyors.

The high-chalcopyrite content of the ores makes it difficult to leach the ore from Haib using conventional acid sulphate media, as a result, Deep-South Resources plans to use high-temperature bio-leaching, which uses microbial cultures that catalyse the oxidation reaction of the sulphides.

Bio-leaching is a relatively low-capex and low-opex processing technique compared to conventional milling and tank leaching. It's relatively quick to instal and setup and requires low-levels of training for those who oversee the operations but it should be considered a higher-risk processing option as only 50% of heap leaches across all metals can be classed as successful.

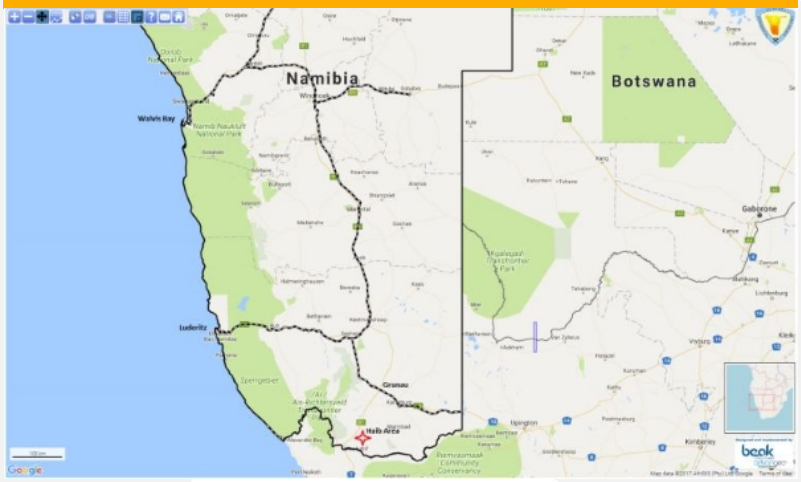
The copper sulphate solution from the leaching process will be converted to copper metal via electrowinning and copper sulfate pentahydrate via an evaporative crystalliser.

Figure 13 - Road Proximity to Haib



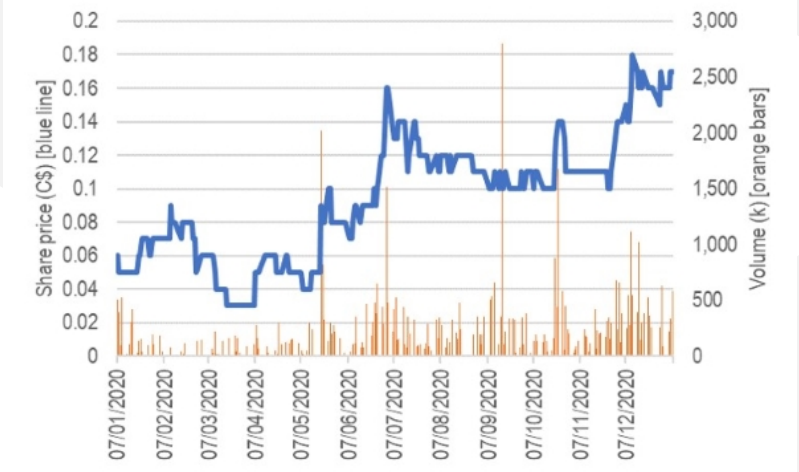
Source: Deep-South Resources

Figure 14 - Rail Proximity to Haib



Source: Deep-South Resources

Figure 15 - Volume and Share Price Chart



Source: Yahoo Finance

Infrastructure

The Haib Copper Project is located 12-15 km east of the main tarred highway that connects Namibia to South Africa (Figure 13). The nearest railway station is at Grunau c. 120 km north on the main highway (Figure 14). The railway could potentially be used by Deep South Resources to transport product to two potential ports - Luderitz, or Walvis Bay - via Windhoek.

The main north-south national power grid lines are around 85 km to the east of the Haib Copper Project and an 85 km link and upgrade of the line capacity would be required. Given the semi-arid climate of Namibia, a solar energy farm may be an option for reducing the unit cost of power and improve the project's environmental and social credentials.

Water for the project will be sourced from the Orange River, located about 15 km to the south of Haib, by a pipeline as there are very limited volumes of groundwater available in the basement rocks and no productive aquifers on site.

2021-2022 Work Programme

Deep-South Resources has an aggressive development work programme planned over the next 12-24 months that includes:

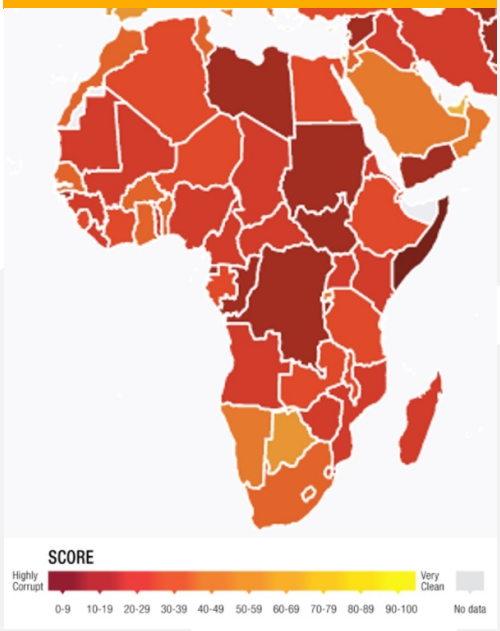
- Q121: commencement of 5,000 m of drilling in the high-grade area; bio assisted heap leaching test work; high-pressure grinding rollers (HPGR) test work
- Q221: commencement of additional 5,000 m of drilling in the high-grade area
- Q321: commencement of engineering design for the feasibility study; production of an updated 43-101 resources estimate; work on the environmental impact assessment (EIA) and social impact assessment (ESA) begins;
- Q421: high-grade ore metallurgical studies
- 2022: completion of all test work, engineering design, EIA and ESA; commencement of a 10,000 m drill programme.

Share Price Performance

Deep-South Resources' share price has performed strongly over the past 12-months, steadily increasing from C$0.06 per share to its current level of C$0.17 per share (Figure 15).

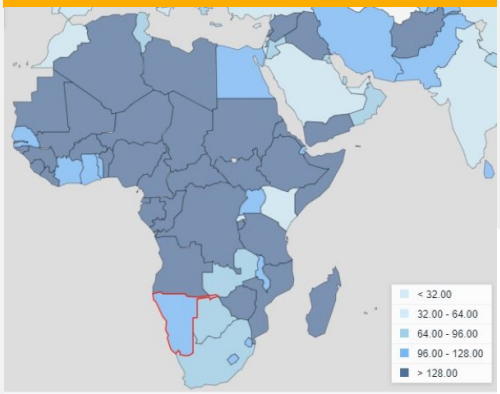
Important milestones that have had a significant impact on the share price include: the publication of the PEA in early-May 2020; the filing of the PEA on SEDAR (a repository of company announcements) in late-May 2020; and the planned drill programme announced in late-November 2020.

Figure 16 - Corruption Perception



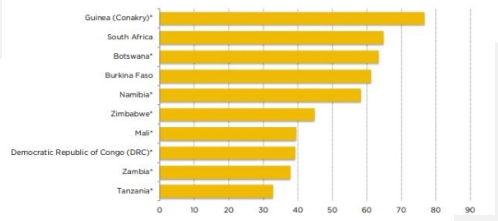
Source: Transparency International

Figure 17 - Ease of Doing Business



Source: The World Bank

Figure 18 - InvestmentAttractiveness



Source: Fraser Institute

Namibia

In Namibia, the president is the head of state and the head of the government. The current president is Hage Gottfried Geingob of the ruling South West Africa People's Organisation (SWAPO); he has held the position since 2015 and before this served as Prime Minister between 1990-2002 and 2012-2015. Hage Geingob won the most recent general election, 2019, with 56.3% of the vote.

Mining is a hugely important part of the Namibian economy accounting for 19% of gross domestic product (GDP) in the third quarter of 2020. The corporate tax rate for mining companies is 37.5% and the royalty rate for base metal mining is 3%.

All mining-related activities in Namibia are regulated by the Minerals Act 33 of 1992 and the Environmental Management Act of 2007. The mining industry is administered by the Ministry of Mines and Energy and managed by the Minister of Mines and Energy and the Mining Commissioner.

There are several types of mining and exploration licence that can be applied for in Namibia. The first is a reconnaissance licence which gives the title holder the right to explore for any mineral using geophysical or aerial surveys. It is valid for six months and can be extended once for another six months.

Prospecting licences can be issued on a non-exclusive and exclusive basis and allow the holder to conduct normal exploration activities. Non-exclusive prospecting licences are valid for one year and are not renewable. Exclusive Prospecting licences are valid for three years and can be renewed twice for a period of two years per renewal. Additional renewals can be granted by the minister at his/her digression.

Mining licences are valid for 25 years and can be renewed for additional periods of 15 years.

Namibia has a transparency international corruption perception score of 52/100 (Figure 16), making it one of the highest-ranked countries in Africa, behind Seychelles (66/100), Botswana (61/100), Cabo Verde (58/100) and Rwanda (53/100).

The Transparency International Index ranks 180 countries and territories by their perceived levels of public sector corruption according to experts and businesspeople. It uses a scale of 0 to 100, where 0 is highly corrupt and 100 is free of corruption. More than two-thirds of countries globally score below 50/100, and the average score is 43/100.

The average score for the Sub-Sharan Africa is 32/100. On a global rank, Namibia is 56th out of 180 countries, demonstrating that Namibia is an uncorrupt country to do business in, relative to other countries globally.

This data is supported by the World Bank: Ease of Doing Business Index, which ranks Namibia 104 out of 190 countries globally. Compared to other African countries it ranks 9th out of the 48 ranked countries in the region (Figure 17).

Namibia is ranked 55/76 (Figure 18) in the Fraser Institute Annual Survey of Mining Companies, 2019, which rates 76 jurisdictions around the world based on their geological attractiveness for minerals and metals and the extent to which government policies encourage or deter exploration and investment. In this survey, Namibia is the 5th highest ranked African country.

On the Fraser Institute's Policy Perception Index, which assesses the relative attractiveness of a country's mining policies, Namibia is the highest-ranked jurisdiction in Africa, ranking 14th out of 76 countries, a very high-score.

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London
+44 207 989 0813
The Business Centre
6 Wool House
74 Back Church Lane
London E1 1AF

New York
+1 347 449 0879
767 Third Avenue
Floor 17
New York
NY 10017

Vancouver
+1 604-688-8158
Suite 965
1055 West Georgia Street
Vancouver, B.C. Canada
V6E 3P3

Sydney
+61 (0) 2 9280 0700
Suite 102
55 Mountain Street
Ultimo, NSW 2007