



TB AMATI STRATEGIC METALS FUND

Amati Site Visit Series

OSINO

RESOURCES



By Mark Smith, Fund Manager



Twin Hills & Ondundu Gold Deposits on the Karibib District, Namibia

Amati fund manager Mark Smith visited the exploration assets of Osino Resources (OSI.V) to assess the investment potential. This 3rd in the 'Site Visit Series' will outline the process of assessing the exploration and development prospects. The Amati approach:

1. Desk top screening of the company with a review of the technical data and the independent consultant reports.
2. Meeting senior management to discuss the financial, technical and ESG merits of the project.
 - Site visit to assess the spatial setting of the deposit, in order to contextualize the resource, potential mining scenario and environmental impact.

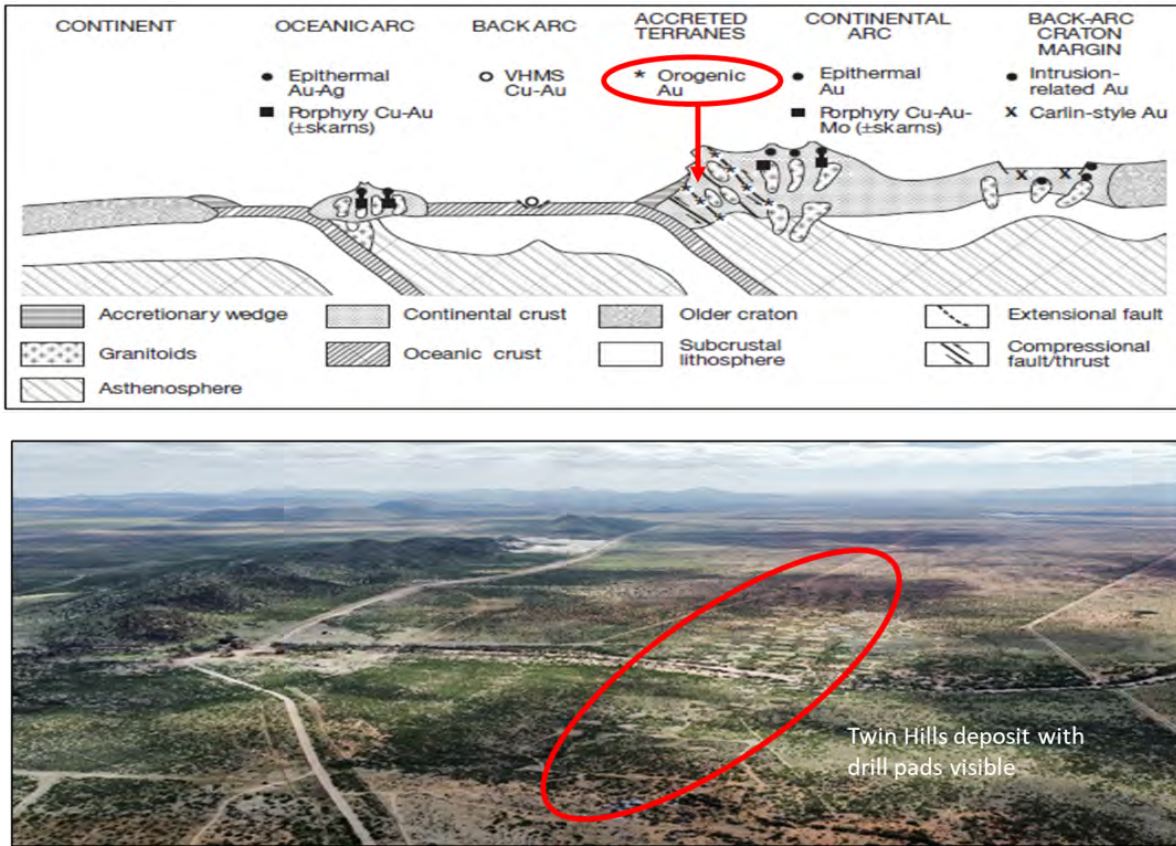
This site visit is a key part of our investment process as it can highlight any fatal flaws not appreciated in the desk top review, but also allows Amati to look for opportunities not recognised by the wider market.

Osino Resources started its operations in Namibia in 2016 and defined a mineral system of intensely folded sediments, deformed by granite intrusions. The generation of prospective areas was based on the identification of large-scale regional structures, favourable lithological contacts between rock units and second or third order structures (jogs, bends) adjacent to major structures. A 70km regional fault structure (Karibib Fault) was identified with airborne geophysics.

Osino carried out a detailed ground magnetic survey (Figure 2) along the Karibib fault. Line spacing was 50m apart and the anomalous magnetic response (warm colours) was due to presence of pyrrhotite sulphides; the gold anomaly coincides 'geologically' to the regional geological structures.

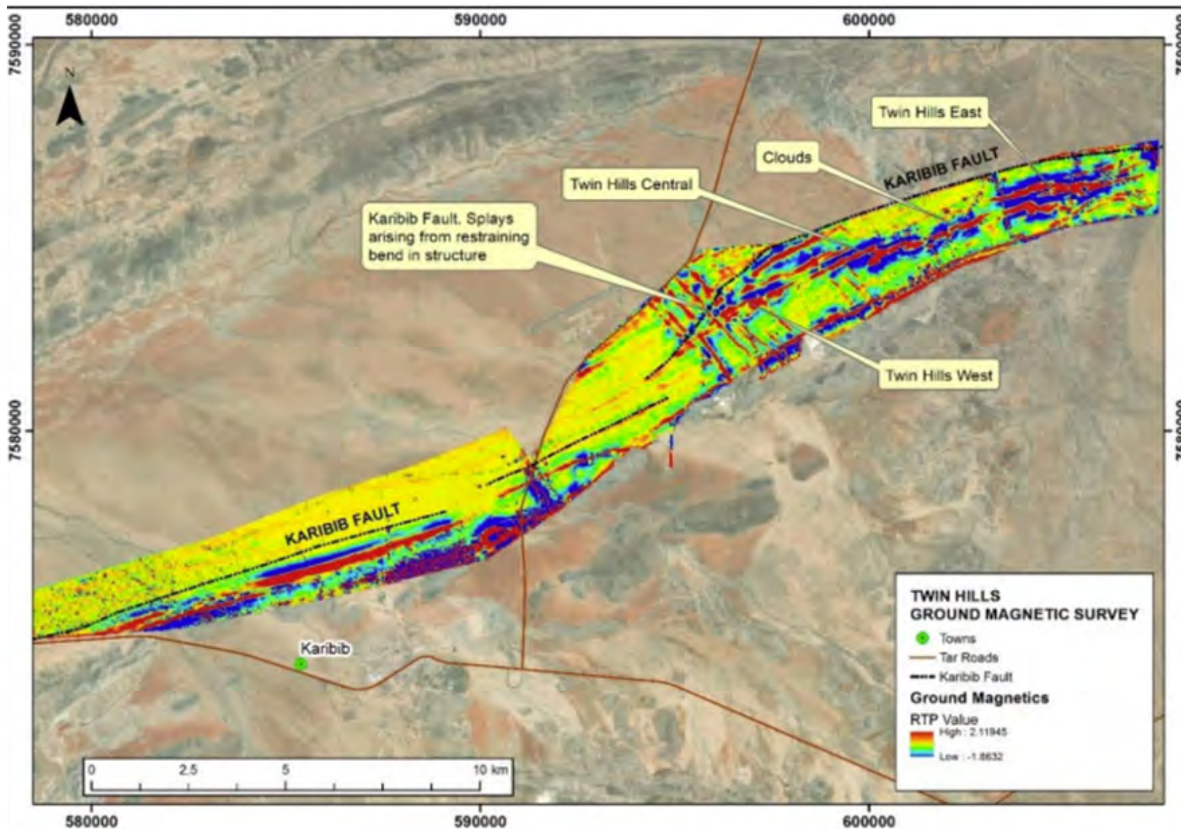
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→ Figure 1: Tectonic setting of the Twin Hills deposit with an aerial photo of the deposit



Source: Groves et al (2003); Osino Resources; Amati

→ Figure 2: Ground magnetics of the Twin Hills Project



Source: Osino Resources

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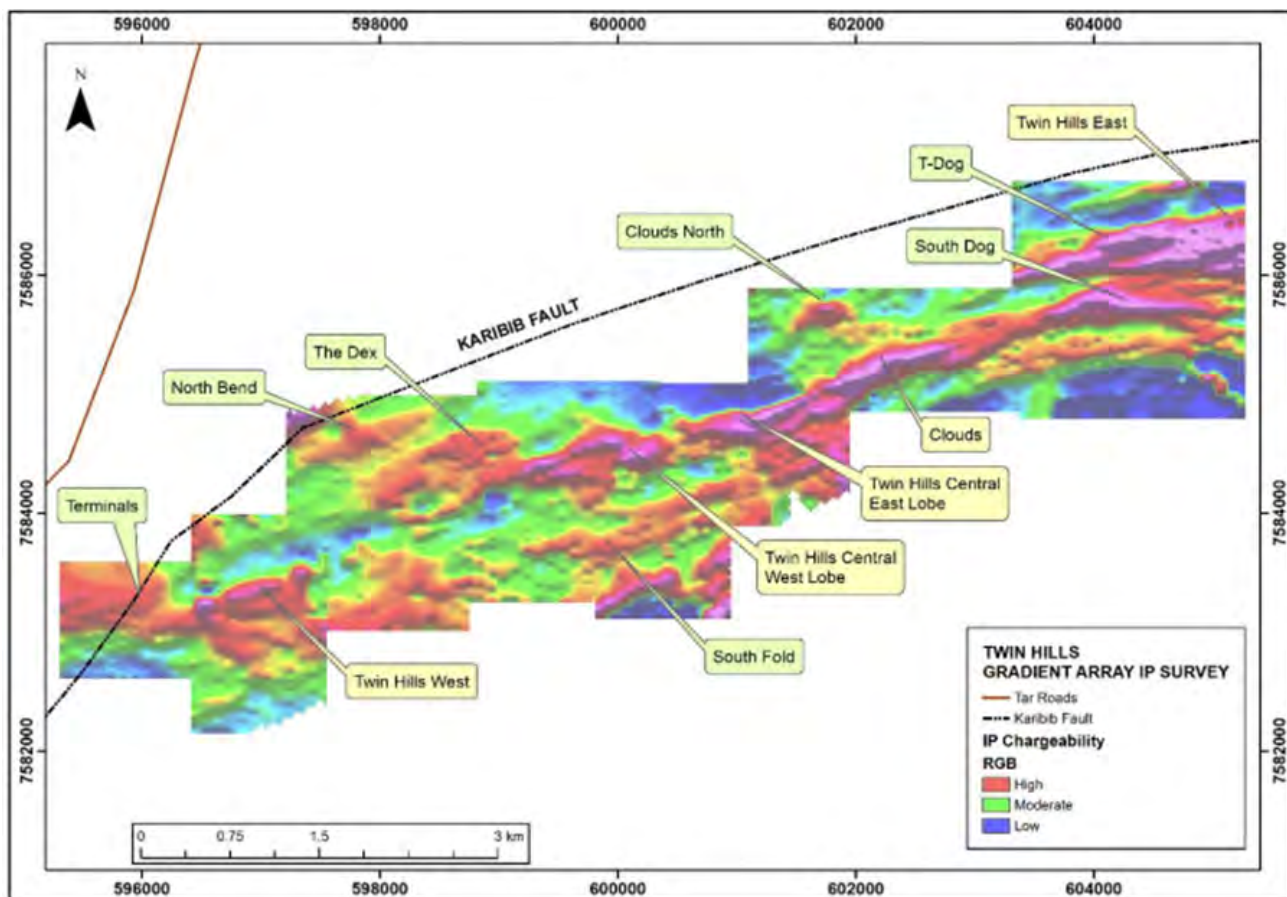
A soil and calcrete sampling programme was undertaken which led to the gold discovery 'Twin Hills Project', and the anomaly correlated to the field mapping and the magnetic anomalies. Local elevations or hills in the Project area are generally associated with marble outcrops and granitic intrusions.

The presence of disseminated sulphides created prominent chargeability IP anomalies (Figure 3) over the identified gold mineralisation and clearly highlighted the important geological structures responsible for the deposits of Bulge, Twin Hills Central, Twin Hills East, Twin Hills West as well as highlighting several new target areas.

The mineralisation consists of disseminated sulphides (arsenopyrite and pyrrhotite) within the wall-rock as well as millimetre scale quartz-sulphide veinlets. The gold bearing intervals are generally found within the rock fold hinges and rock fabric. The mineralisation is generally low grade disseminated gold, dispersed over an area of 13km, typical of orogenic gold deposits. Osino drilled over 220,000m for a resource definition of 3.08 million ounces of gold.

The Mineralogy of these deposits usually lead to large tonnage operations, mining low grade, but often with a simple metallurgy and so high recoveries.

→ **Figure 3: Gradient array IP over Twin Hills**



Source: Osino Resources

With the geological setting understood, Amati went on site to get a spatial appreciation of the deposit. Osino released a positive pre-feasibility study (PFS) in September 2022, which scoped out a mining scenario with an associated economic analysis. The PFS outlined a 2.15 million gold reserve, providing:

- 13yr mine life processing 5.0mtpa (million tonnes per annum) per year of 1.04g/t gold, producing 169Koz gold per year at US\$939/oz all-in cost.
- The capital cost to build the mine is estimated at US\$375m.
- The operation will have 5.0mtpa throughput capacity and comprise of conventional crushing, milling gravity, pre-oxidation and Carbon-in-leach circuit, resulting in a gold recovery rate of 92% over the life of the mine.
- The project economics is an after-tax Net Present Value (at a 5% discount and an assumed gold price of US\$1700/oz) of US\$503m, with a 2.3 year payback and internal rate of return of 26%

We took the development plans on site (Figure 4) to gain a 'feeling' for the plant layout. These plans show the location of the truck and shovel open pit operations, plant site, tailings storage, and waste dumps.

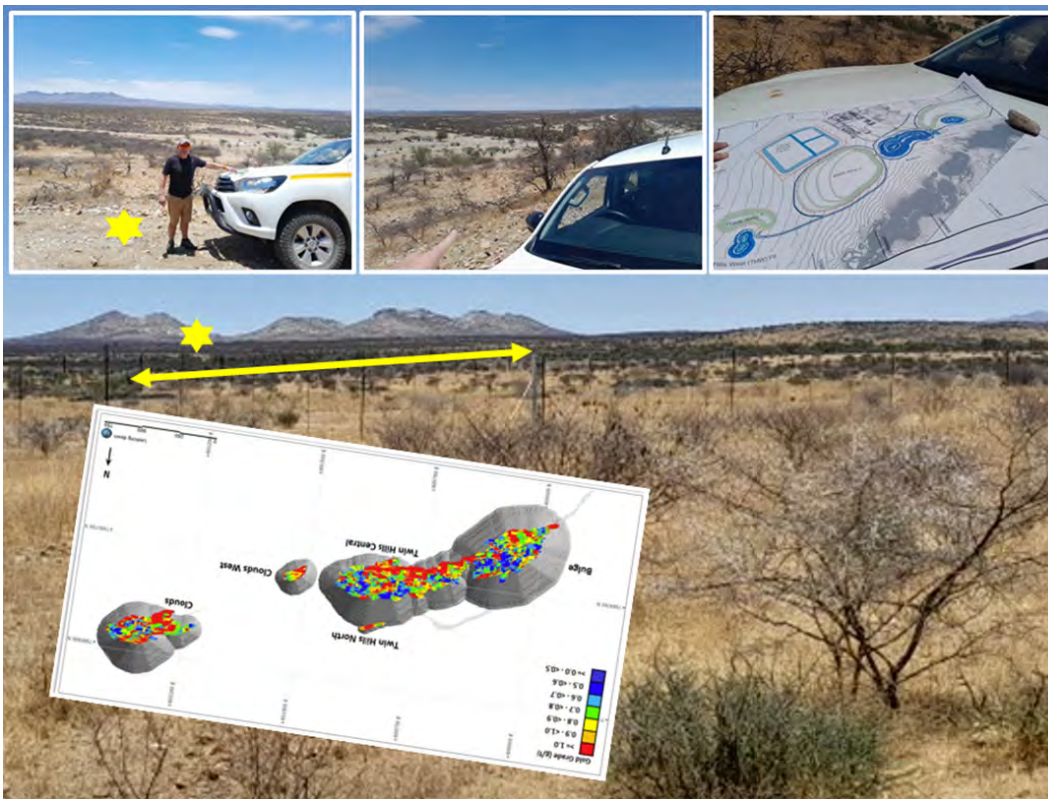
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Given the dry climate in Namibia, water is a scarce resource, so it was important to know that Osino plan to use dry stack tailings with a closed water recirculation.

We drove 150km from Windhoek (capital city) along sealed roads and mainly well maintained gravel roads. This gave us an appreciation of the project's proximity to Namibia's road, rail, grid power, water and surface infrastructure.

- The nearest substation is 20km away, which could reduce power infrastructure capital.
- Water supply studies underway to secure process water from local aquifers on a sustainable yield basis, supplemented by additional sources (national grid, recycling and proposed aquifer recharge scheme)
- Part of the district road will have to be diverted and permitting is underway.
- The mining area is covered by two farms and so surface rights have to be purchased.
- Mining licence can then only be granted once the surface rights are obtained.

→ **Figure 4: Fund Manager Mark Smith at Twin Hills assessing the site layout - deposit & mine site**



Source: Amati

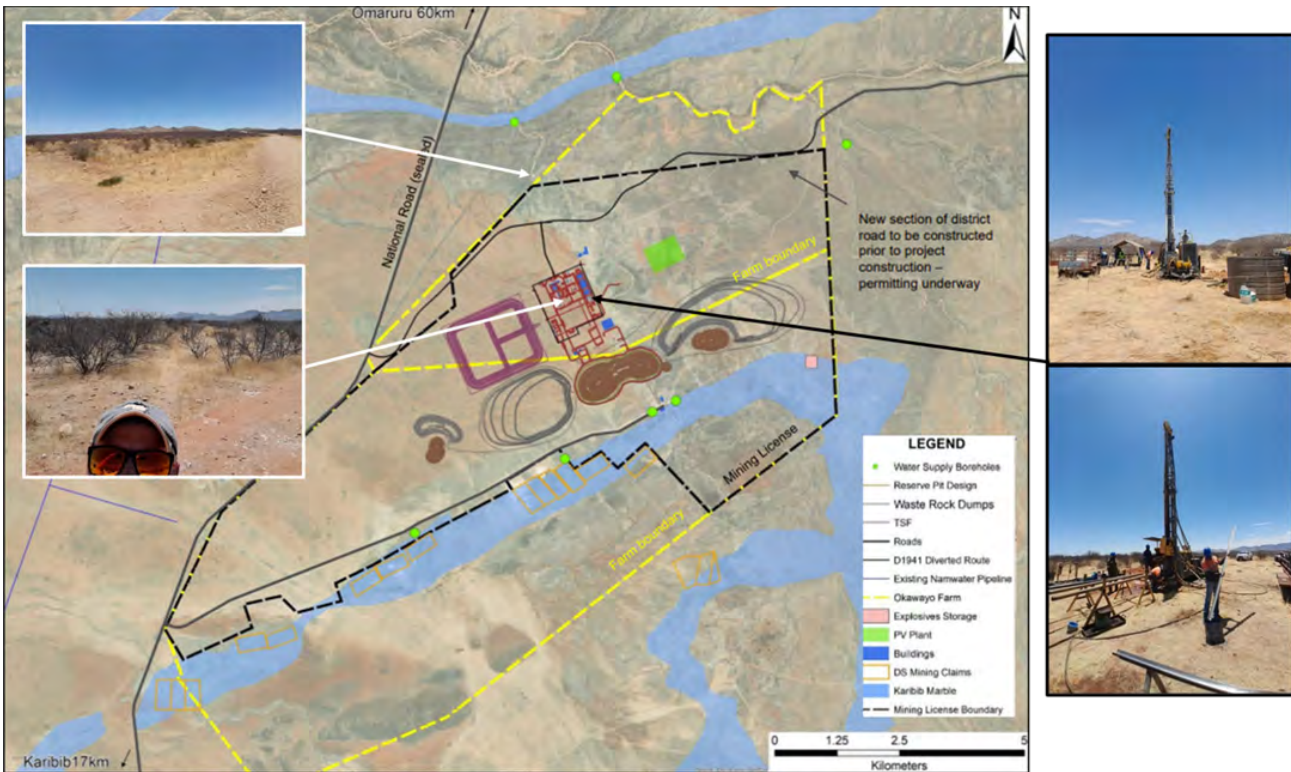
By standing on top of the orebody and plant site (Figure 5) we observed a relatively flat topography surrounding the gold deposits. The potential waste rock dumps can be located in the footwall and hanging wall of both pits, providing a flexible waste rock dumping strategy through the course of the mine life. A potential plant site location is situated to the north of the Twin Hills Central open pit in an area of flat ground covered by Kalahari sands (see Fund Manager inset, Figure 5) . The open area designated for the plant site is situated optimally for the transportation of majority of the ore tonnes to be mined from the Twin Hills Central open pit.

We observed Osino drilling vertical geotechnical holes to assess the ground competency for the plant site footings (Figure 5). Although the plant site is very isolated, the flat area lends itself to easier construction. The buildings required on the Project site will generally be prefabricated buildings transported to site either as fully assembled units or as panels and assembled on site onto concrete block or strip footings.

The isolation means less community engagement is required, but no less important. Osino have set up a Twin Hills Trust to manage the corporate social investment (CSI) and are working alongside credible Namibian NGOs (non-governmental organisations). There is a structured community engagement, with ESG data collection. We obtained a copy of the ESG report, published in November 2022. The Trust has to date disbursed more than N\$2m to support a range of strategic social projects in housing, early childhood development, and economic development support for Namibia's most marginalised communities.

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→ **Figure 5: Site Layout and key infrastructure assessment by Fund Manager, Mark Smith**



Source: Amati

After driving to site, we returned 60km to Omaruru to inspect the drill core processing facility. When a core arrives at the facility, it is photographed in core trays with a digital camera mounted on a tripod. The core is then marked, cut, sampled, photographed again (marked-up half-core), logged, and then samples are selected from each tray for density determination. The core is stored undercover in the facility (Figure 6).

→ **Figure 6: Omaruru core processing facility**



Source: Amati

It is always important to assess the company’s quality assurance and quality control procedures (QAQC). This has a direct bearing on the accuracy of the analytical assay (gold grade) data. Osino implemented an industry standard QAQC programme. The programme involves the insertion and performance monitoring of blind certified reference materials, duplicates, and blank samples randomly inserted into the original sample sequences. QAQC samples make up about 15% of all samples tested.

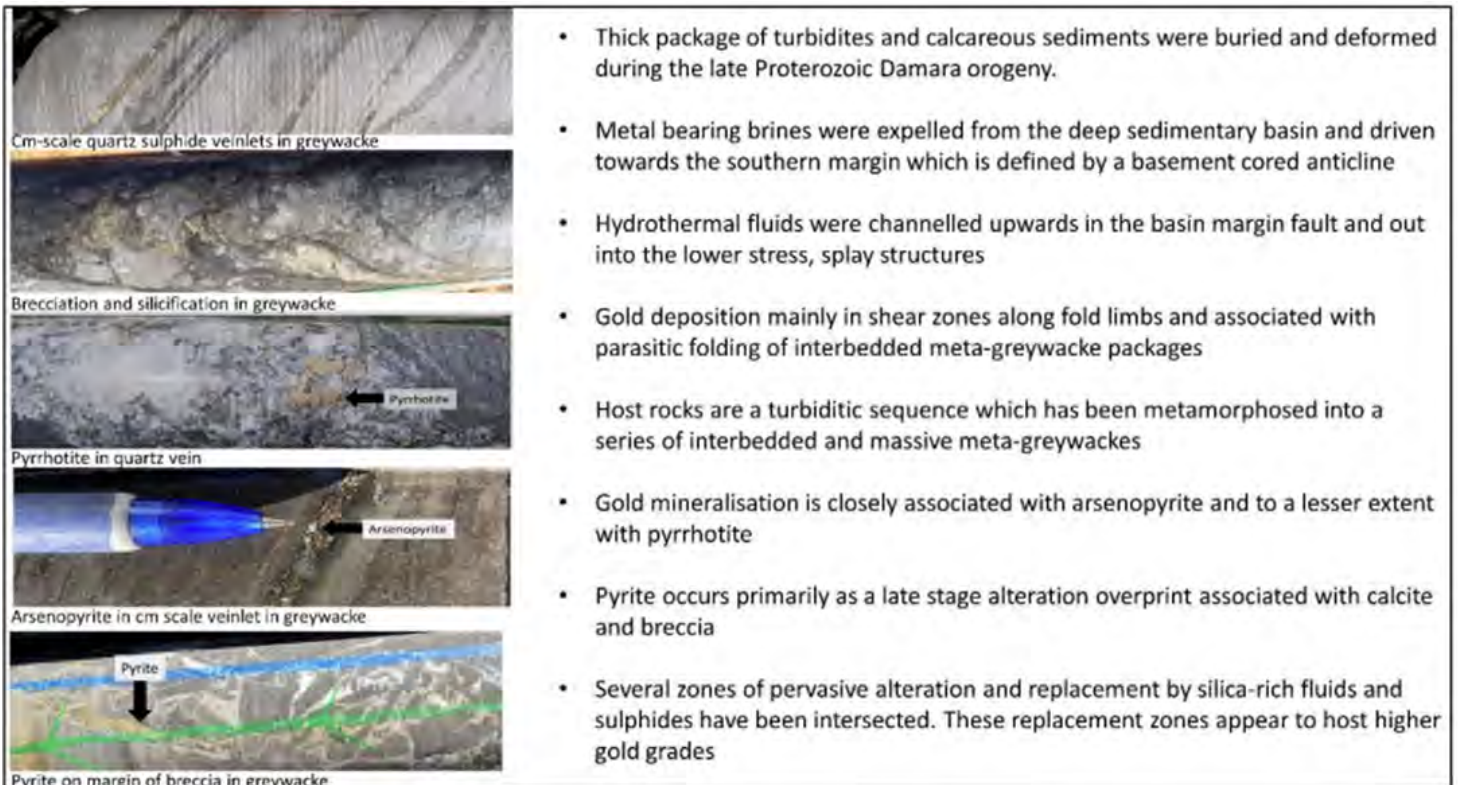
We then analysed the core to observe the nature of mineralisation. Although there is high grade variation among the core samples, the deposit is effectively a low grade, fine gold, bulk tonnage deposit. Here we combine geology, mining and finance to appreciate the implications of this style of mineralisation.

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As this project is a conventional truck and shovel operation, the mined benches will likely be 10m high. To feed a 5.0M tonne mill, selective mining will likely not be possible in the pit and ore sorting will not be practical at such mill feed rates. The economics of this deposit will likely be dictated by the company's ability to mine efficiently, manage operating costs and maintain leverage to the gold price.

The company defined a reserve of 2.15 million ounces at 1.04g/t using a cut off grade of 0.3g/t and US\$1700/oz gold price.

→ **Figure 7: Mineralisation styles at Twin Hills**



Source: Osino Resources

Regional exploration potential

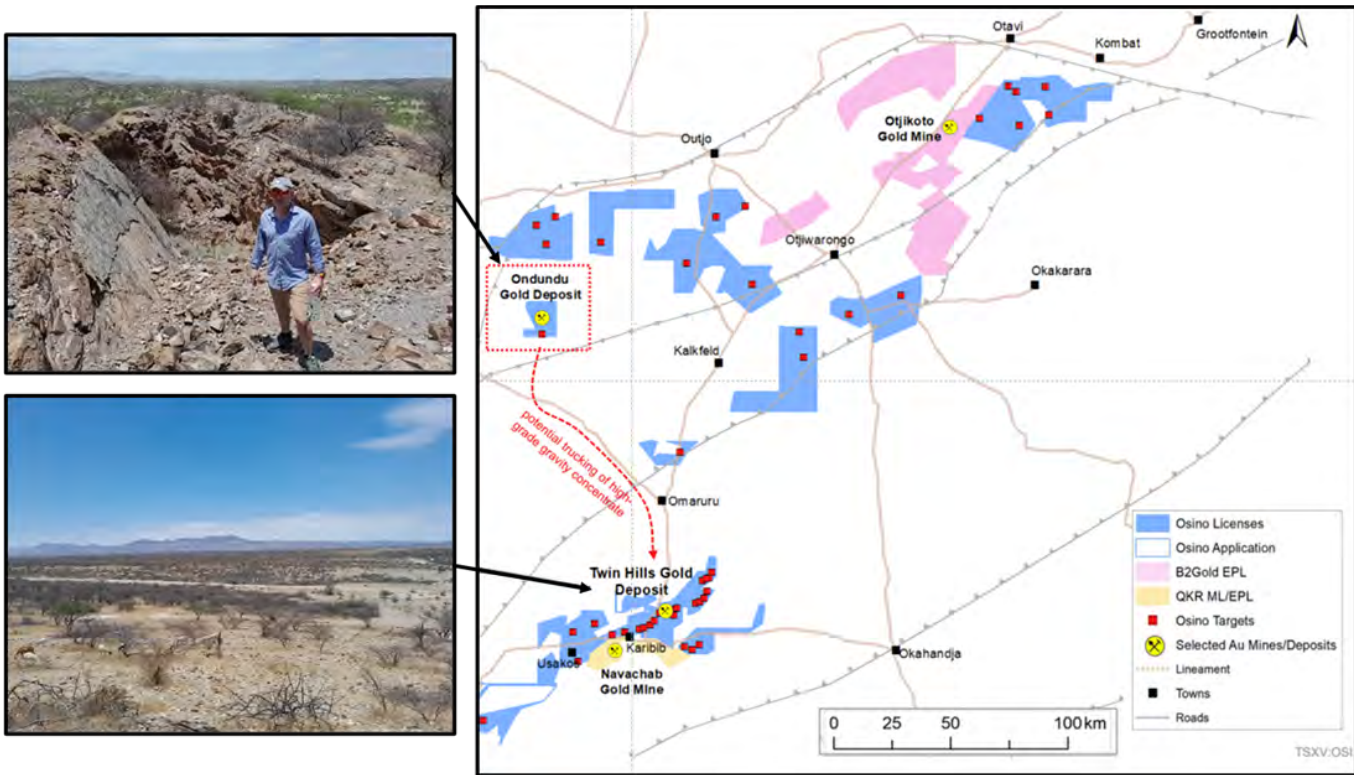
We visited the Ondundu gold prospect, recently acquired from B2Gold (BTO.TO) for US\$15.2m. This project is located 130km NW of Twin Hills, and currently hosts 0.9 million ounces of gold at 1.13g/t. The gold is focussed along a north-south shear zone within the Ondundu anticline-syncline pair (fold). The economic concept is to selectively mine the quartz vein packages and pre concentrate the gold material via gravity separation. This gravity concentrate can then be trucked to Twin Hills to be processed.

Given the low grade of the deposit and its remote location, this asset in the hands of Osino can only reasonably be co-developed along with a plant at Twin Hills.



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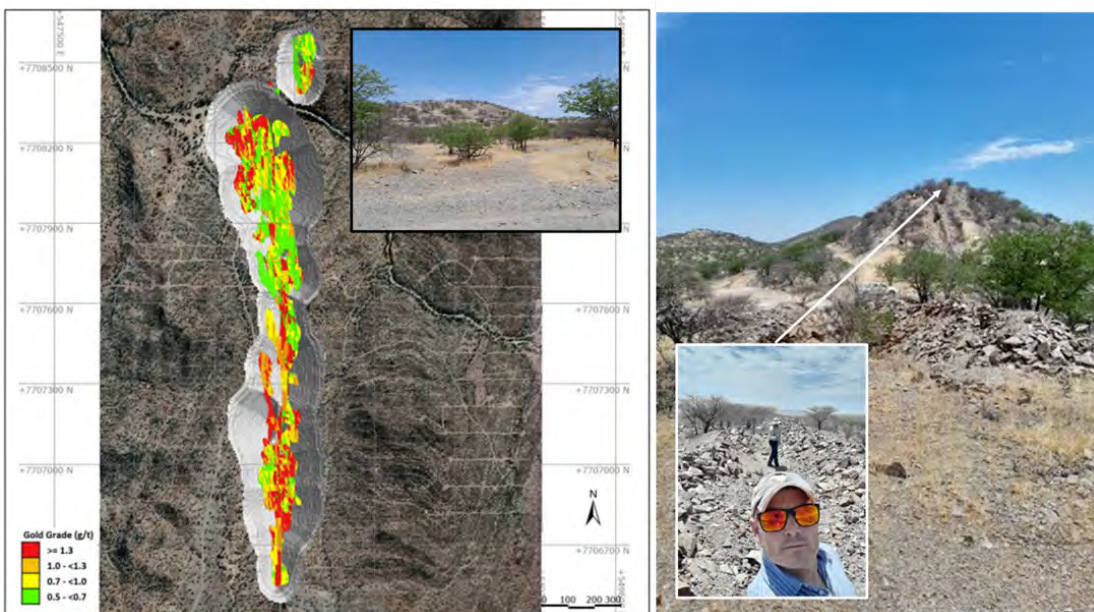
→ Figure 8 – Map of Regional growth potential and Twin Hills location



Source: Osino Resources

The Ondundu Project area has a long history of mining and exploration since its discovery in 1917. Between 1922 and 1964 approximately 20,000 ounces of gold were recovered by small scale miners.

→ Figure 9 – Pit shell plan (at US\$1800/oz Au) with Fund Manager, Mark Smith at outcrop



Source: Osino Resources, Amati

The fund managers of TB Amati Strategic Metals Fund (AMSF) have dual expertise from the mining industry and finance. I hope that this 3rd in the series of the Site Visit Report Card highlights how we can apply our skills to discover and assess new investment opportunities for the fund.

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Literature

In case you missed our last site visit piece, please [click here](#) to read Amati Site Visit Series 2: i-80 Gold Corp



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