

Underwater Mining Equipment

SMD has an unrivalled history in the provision of bespoke remotely controlled underwater excavation and intervention equipment. Since 1971 SMD has supplied ploughs, trenchers and ROV's to the offshore telecommunications, oil & gas and renewables sectors. This extensive experience, coupled with improvements in technology have now enabled the provision of large remotely controlled underwater mining equipment for both deep-sea and inland water applications. Average stripping ratios on land are increasing and average ore grades are decreasing. At the same time populations and mineral demand per capita are increasing. This has led to increased interest in alternative mineral sources. By 2015, one third of world oil production was from offshore sources. The same trend is emerging for harder minerals. Offshore resources are plentiful with high ore grades. In many cases these resources are unburied. The international seabed authority has put draft legislation in place for mining in international waters. In parallel, some governments have already put in place mining and environmental legislation for their exclusive economic areas. For particular types of mineral deposits, the new technology can also be used inland below the water table with many advantages over conventional mining from both a technical and environmental perspective.



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Find out more about SMD...

Nautilus Minerals' Solwara 1 Deposit



- 7.5% Copper
- 6g/t Gold
- 25g/t Silver
- Calm sheltered location with low sea-state
- Independent Environmental and Social Benchmarking Analysis undertaken
- Lower carbon footprint than conventional mining
- Mining licence in place
- Production Support Vessel under construction
- Part government ownership
- Ore take-off agreement in place



These three remotely-controlled mining machines, the largest of which is 300t are designed to mine seafloor massive sulphides in the Bismarck Sea off Papua New Guinea. The mineral deposit has an average depth of 1600m below mean sea level. They have been built for Nautilus Minerals – a pioneer in deep-sea mineral exploration and exploitation.



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Find out more about
Nautilus Minerals....

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A Viable Alternative Mine Operating System

For soft to medium strength semi-vertical inland ore deposits below the water table, a new technique is now available. A submerged remotely operated mining machine is used to crush and pump the ore as a slurry to the surface where it is dewatered. The water is returned to the pit maintaining the pit water level. The dewatered ore is delivered at typically minus 50mm, bypassing primary crushing circuits. Applications include abandoned open pit mines, extensions of existing mines and new deposits where mining has not taken place previously due to hydrological or other environmental constraints on conventional mining.



Advantages of the Technique

- No drawdown of aquifer(s) affecting neighbours
- No blasting noise, ground vibration, dust or fume nuisance
- No discharge of mine water
- Safer as no personnel in the mine
- Improved slope stability and reduction in stripping ratio
- No toe-seepage, weathering or erosion of side-walls
- No blast over-break or blast vibration
- Water pressure balanced across pit wall
- No dewatering costs and/or barrier construction/maintenance
- Cheaper capital cost than an u/g mine and quicker set up
- Access to barrier pillars, buffer zones etc.
- Infrastructure and mill life extended
- Chance to finalise rehabilitation problems that have been left behind

The prototype is under construction and will be tested in flooded mines across Europe from the second half of 2017. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642477. In addition to SMD, partners in this project include...



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Find out more about VAMOS...

Find out more about SMD...

Supplying Solutions to the Emerging Market

- Feasibility or feed studies
- Independent assessments
- Mining machine concept designs
- Mining machine final design and construction
- Launch and recovery systems
- Power & control systems
- Commissioning
- Training
- Mission simulation and planning



Seafloor massive sulphides

...for underwater mineral exploration, sampling and extraction, inland or offshore.



SMD... partnering with UMS to provide end-to-end underwater mining solutions

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Find out more about UMS...

Find out more about SMD...