

Chatham Rise phosphorites : Seven million years old but now a present day strategic asset for New Zealand

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Phosphorite nodules were first discovered on the Chatham Rise in the 1950s by a New Zealand government survey. During the 1960s to 1980s several private and government sponsored cruises explored the Chatham Rise and surrounding seafloor area.

Since acquiring the licence in 2010, Chatham Rock Phosphate Ltd. (CRP) has conducted six cruises in two programs in the project area. The key task of the cruises was to validate the previous work conducted on the Chatham Rise and collect further geological, geotechnical, geophysical and environmental data. For phosphorite grade estimation purposes the *M.V. Tranquil Image* cruise collected 55 samples using a Van Veen grab. The *R.V. Dorado Discovery* conducted four cruises to the project area and collected 206 box core and grab samples.

In December 2010 CRP invited OceanfLORE, Jan de Nul, van Oord and Boskalis to submit independent studies for the design of a system to recover rock phosphate from the seabed of the Chatham Rise. After a rigorous independent evaluation by CRP, Boskalis was selected by CRP in mid-2011 as its preferred technical partner.

CRP and Boskalis have worked in collaboration to design a mining vessel to meet the specific requirements of the project which assumes the modification of a dredging vessel.

Phosphorite nodules and surrounding material would be retrieved from the seabed using a conventional trailing suction hopper dredger drag-head. This material would be brought to the surface via a riser and processed on board the mining vessel; the phosphorite nodules (>2 mm) being retained and stored on the vessel and the tailings returned to the seabed via a sinker and diffuser. When the vessel's holds are full, the mining vessel would stop mining and proceed to a port where the phosphorite would be unloaded, stored and distributed to the market.

A number of field trials were conducted in the 1960s and 1970s on the applicability of the Chatham Rise phosphorite as a fertilizer. These and more recent pot trials have established that the Chatham Rise phosphorite does not need to be converted to superphosphate as it is an effective fertilizer on many soil types if just ground, pelletized and applied directly.