KOINON

Thin Margins, Public Risk in NORI-D

The economics behind TMC USA's application to NOAA to mine the deep seabed

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Summary of four Koinon notes prepared for the Natural Resources Defense Council, in connection with its comment on NOAA docket NOAA-NOS-2026-1751 For further information contact johnny.west@koinon.consulting

TMC USA asks NOAA for a twenty-year permit to collect polymetallic nodules from the Pacific seabed and process them at a new plant in Brownsville, Texas. NOAA must first find that commercial recovery is feasible and that the applicant has the financial resources to carry it out. The application states how many nodules there are but gives no revenue, cost or margin, and its budgets are redacted.

Koinon has rebuilt the economics from TMC's own filings with the US Securities and Exchange Commission. The nodules exist in quantity. The question is whether collecting and processing them pays, and who bears the cost if it does not.

1. Each tonne earns little more than it costs

At the metal prices of the past fifteen years, and with realistic sales of the manganese by-product, a wet tonne of nodules is worth a median of about US$277. Collecting and processing it costs about US$227. That leaves some US$50 a tonne operating surplus before billions of dollars of capital expenditure are recovered.

To cover its running costs, the project must process about 15 kg of nodules per square metre. The licence area estimate averages 17.4 kg, so small variations in the seabed decide whether there is any operation surplus. TMC's own threshold of 4 kg counts revenue as if the nodules were dry, assumes a collector that has not been designed, and optimistic prices.

2. The capital cannot be repaid from operations

The whole project needs about US$25 billion of capital. That figure counts all four collection systems, a smelter and refineries at Brownsville, Texas, and the cost overruns which are habitual in first-of-a-kind megaprojects. The operating surplus could repay a median of about US$5 billion of it. In Koinon's model, the project covers both its running costs and its capital in fewer than 2 cases in 100.

3. The shortfall would fall on public money

TMC says it plans to fund the Texas plant 30% from equity and 70% from debt and government incentives. On Koinon's estimate of the plant's cost, the 70% comes to about US$9 billion, and no lender or agency is committed to provide it. The operating surplus falls short of servicing that debt in seven cases out of ten. Lenders could expect to lose nearly half of what they advance, so public loans on these terms would effectively work as grants.

4. Twenty years asked, about seven demonstrated

TMC reports 363 million wet tonnes of nodules in NORI-D, the area it has studied most. Only 51 million tonnes count as reserve, meaning shown to be economic under the SEC standard TMC itself cites, and TMC's own study has them mined out by year seven. The application nevertheless schedules 202.5 million tonnes over twenty years. The balance comes from nodules not yet shown to be economic and from ground never sampled. Further, both the reserves, and the indicated resource estimate it is based on, were arrived at using permissible but outlier techniques and assumptions.

5. US mineral security does not close the gap

The US government's own assessments place mineral-supply risk in processing and refining, not in ore. Measured by the economic loss the government (USGS) estimates it would avoid, the project's mineral security benefit is worth at most US$0.7–1.2 billion today, and US$0.4–0.7 billion counting only what US buyers can use in the forms offered. Public exposure would be US$6–9 billion. A refinery buying its feed under contract would deliver most of the mineral security benefit for about a third of the capital, without the seabed risk.

What NOAA could ask for

Under most headings of the regulation, the application supplies information a level below what a production decision ordinarily requires. NOAA could ask the applicant for:

- A full budget, with each tranche of funding, its source and whether it is committed.
- Revenue, operating cost and margin per tonne for the plan as filed, and the workings behind the 4 kg threshold.
- The capital cost of the Brownsville plant, stage by stage.
- Independent review of the collector, the cost estimates and the reserve.
- Annual restatement of the reserve, with collected tonnage reconciled against the estimate.

About this summary

Koinon Consulting, Berlin, has advised more than fifteen governments on mining contracts and fiscal terms. It has no tie to any seabed minerals contractor and no stake in any seabed minerals project. This summary was written for the Natural Resources Defense Council. Koinon's earlier deep-sea mining work was done with the Oceano Azul Foundation, Oceans North, the Deep Sea Conservation Coalition and IUCN, all of which publicly support a moratorium. The figures are Koinon's computations from TMC's own documents. Model results are medians of 10,000 iterations from Koinon's final model run. Sources and methods are in the four underlying notes: on the reserve, unit economics, mineral security and the information criteria. Revised 16 October 2026: figures updated to Koinon's final model run; this supersedes the version of 14 October.