

Why the Next Rare Earth Winner May Be (Is) a Process, Not a Deposit

written by Jack Lifton | August 16, 2026

Introducing Lifton's Third Law of Rare Earth Economics

For decades, investors have been conditioned to believe that success in the rare earth industry begins with discovering another deposit. I believe they have been looking in the wrong place. The next great winner in the rare earth industry may not be the company that discovers another ore body. It may be the company that discovers a better way to process the ore bodies—and the recycled materials—we already have one.

Throughout my career, I have argued that geology creates opportunities, but chemistry and engineering create wealth. A mineral deposit is simply a natural occurrence until someone develops an economical method to convert the elements it contains into marketable commercial products. That observation leads me to what I believe is another fundamental principle governing our industry.

Lifton's Third Law of Rare Earth Economics

The economic value of a rare earth resource is determined less by the size or grade of its deposit than by the efficiency with which its contained rare earths can be converted into qualified products.

This may seem counterintuitive to those who continue to judge

rare earth companies primarily by the size of their resources or the grades they report. History tells a different story. The rare earth industry has never suffered from a shortage of deposits. It has suffered from a shortage of economical processing technologies. Every meaningful advance in extractive chemistry, solvent extraction, metallurgy, alloy production, magnet manufacturing or recycling increases the value of resources that are already known to exist.

That is why a recent announcement from privately held [L3 Process Development LLC](#) (L3) deserves far more attention than it is likely to receive.

L3 has reported the successful application of an extractant that it has exclusively licensed from the **U.S. Department of Energy (DOE)**. To understand why this matters, it is first necessary to understand what happens during rare earth processing.

Whether the feedstock is monazite, bastnäsite, ionic adsorption clay, xenotime or recycled permanent magnets, the first chemical attack is intentionally indiscriminate. Strong mineral acids dissolve almost everything they encounter. The resulting solution contains not only the rare earths, but also iron and numerous other dissolved elements that must eventually be removed before the rare earths themselves can be purified and separated. That cleanup stage has always been one of the hidden costs of the industry.

L3's process does not attempt to solve the extraordinarily difficult problem of separating the individual rare earth elements from one another. Conventional rare earth solvent extraction, at which L3 is a world class vendor, remains the preferred technology for that task. Instead, L3 addresses an earlier—and in many ways more fundamental—problem.

The company's process selectively extracts the rare earths as a

group while rejecting much of the dissolved iron and many of the unwanted elements present after acid leaching. According to the company, the differential extraction coefficient between light rare earths and iron is well over 100:1. The separation factor for heavy rare earths is an order of magnitude greater. The technology also demonstrates selectivity against aluminum of 5,000:1, phosphorus of 300:1 and thorium of 80:1.

If those levels of selectivity prove repeatable under commercial operating conditions, the implications could extend throughout the rare earth industry.

Iron has always been one of the major burdens carried through downstream rare earth processing. Every kilogram of dissolved iron consumes extractants, reagents and neutralizing chemicals. It occupies plant capacity, generates residues that require disposal, increases operating costs and expands the process's environmental footprint.

The problem becomes even more important in recycling. Most high performance permanent magnets are based upon neodymium iron boron alloys. Anyone attempting to recover the valuable rare earths must first contend with the fact that they are intimately associated with very large quantities of iron. Recovering the rare earths has traditionally required carrying that dissolved iron through multiple processing stages before it could finally be discarded. That approach is expensive. It consumes chemicals. It generates large volumes of neutralized residues. It increases water consumption. It raises both capital and operating costs.

If, however, the rare earths can be selectively transferred into an organic phase while leaving most of the iron behind, the economics change immediately. Downstream solvent extraction circuits become simpler. Reagent consumption declines. Neutralization requirements are reduced. Waste generation falls.

Plant throughput increases. The environmental footprint becomes smaller. Most importantly, the cost of recovering rare earths declines.

This is precisely the type of innovation that creates value. Notice that none of these improvements requires the discovery of another rare earth deposit. None requires finding higher grade ore. None requires government subsidies. They arise from improving the efficiency of converting known resources into useful materials. That is exactly what Lifton's Third Law predicts.

Every improvement in chemistry increases the value of every ton of ore already discovered and every ton of permanent magnets awaiting recycling. It can transform previously marginal resources into potentially economic ones. It allows existing plants to become more productive. It lowers barriers to recycling. It reduces environmental impacts while improving profitability.

Those are the characteristics of truly productive innovation. For many years, investors have tended to reward companies for announcing larger resources. Perhaps they should pay closer attention to companies announcing better processes.

Geology determines where the rare earths are. Chemistry determines whether they can be recovered economically. Engineering determines whether that recovery can be accomplished reliably at commercial scale. Manufacturing determines whether those rare earths become products that customers are willing to qualify and purchase. Only then is value created.

The rare earth industry's future will not be determined solely by who owns the largest deposits. It will be determined by who develops the best chemistry, the most efficient engineering, the lowest cost processing and the highest quality manufacturing

capability.

L3 Process Development's reported process improvement is significant because it addresses one of the industry's most persistent and costly processing problems. Its ultimate commercial importance will, of course, depend upon successful pilot scale and industrial scale validation, but the reported results suggest exactly the type of technological advance the rare earth industry has needed for decades.

The **2026 Feasibility Study for NioCorp Developments Ltd. (NASDAQ: NB)** already incorporates this technology into its proposed flowsheet for the recovery of rare earth elements and scandium.

Investors should remember that history rarely rewards those who merely find more rock. It rewards those who discover better ways to transform that rock into products the world needs. The next great rare earth winner may not be another deposit. It may be another process.