OLOKUN MINERALS · FORWARD-STRATEGY DOSSIER

What comes back, and what it becomes.

A verified resurrection dossier on Olokun Minerals: why the original lithium-from-produced-water plant stalled, why the market turned after the pause, and the defensible second life - a licensed critical-minerals recovery module for industrial wastewater.

Validation-stage · Reddix & Watkins-Curry · two research waves, every keystone adversarially verified

Every external figure is cited; click any superscript to open the source. 54 references in full at the end.

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How to read the citations: a small teal number after a sentence is a clickable link to the third-party source for that claim; the full numbered list is in 12. The ~October-2025 pause date is the founders' own account, not a public record; unit-economics figures are modeled from public ranges and flagged where estimated.

01

Executive summary

THE DECISION AT A GLANCE

The finding	The Olokun that paused - a startup raising money to build and own a lithium plant on Permian produced water - should not come back. That path is verified dead on the IP, the unit economics, and the competition.
Still alive	The entity is not dissolved: a Delaware C-corp, California-active and tax-good as of March 2026, with filed IP. This is a recapitalize/reposition decision, not 'revive a corpse'.
The IP truth	Olokun owns its system/architecture patent, but NOT the core NREL resin science - and holds a first-right-of-refusal, not an exclusive license. Leverage, not a moat.
The wedge-killer	The 'sell water to dodge the lithium price' fee fails on Permian produced water: the lithium is sub-economic and deep-well injection is cheap and legal.
The blind spot	Every angle modeled Olokun as a plant owner. The winning 2026 structure is bifurcated - the resin is a licensable module; the capex/feedstock/offtake belong to the partner.
The beachhead	Cobalt and rare earths (NOT nickel - it is in surplus) recovered from industrial aqueous effluent, as a licensed recovery module on a per-kg fee.
The recommendation	Don't rebuild the plant. Don't sell the company. License the module - and convert the NREL first-right-of-refusal into a narrow effluent-field exclusive. One pilot unlocks it.

Olokun Minerals set out to recover lithium, cobalt and other metals from brine and industrial wastewater using a water-regenerated resin, selling the recovered minerals and the cleaned water. It raised ~$1.1M, never left lab scale, and quietly went dormant after mid-2025. Two waves of cold research and an adversarial verification pass were run on a single question: should it come back, is the market still there, and what angle was missed? [4,2]

The answer is a pivot, not an autopsy. The original commodity-lithium-plant model is dead three ways - but the technology, the entity and the market are all alive, and the market turned in Olokun's favor in the months after the pause. The second life is not a plant to own; it is a module to license.

Why the reframe wins

- Demand is scarcity-backed: cobalt is in a DRC-quota deficit, rare earths are a supply-chain priority, and there is no US primary magnesium - while lithium supply races in. [20,26]
- The edge is decisive on dilute, multi-cation, discharge-regulated industrial effluent - where removal is legally mandatory and a water-regenerated resin with a clean-water co-product genuinely differentiates. [35]
- The capital is pointed here: DOE funds recovery directly at industrial sites ($275M + $134M), open to all sectors - exactly the co-located-module archetype. [46,47]

The honest recommendation

License the module / small JV as the technology party - not recapitalize-and-rebuild (the path that died), not sell-the-company (the IP is too thin unvalidated to fetch that price). The whole plan turns on two facts a founder must close: converting the NREL first-right-of-refusal into a narrow field-of-use exclusive, and validating the resin on real effluent in one pilot.

02

Method & how to read this

This dossier was built with a two-wave AI research process and an adversarial verification gate. The question was decomposed into research angles, fanned out cold across independent sources, and every load-bearing keystone was handed to an independent skeptic told to refute it. The survivors were synthesized into the cited findings below.

Three tiers of claim

- Sourced fact - a number with a cited, clickable third-party source and a date.
- Triangulated estimate - corroborated across two or more sources; ranges reported rather than false-precision points.
- Labeled judgment (est.) - analytical inference and framing; reasoned estimates on cited inputs, never third-party facts dressed up as such.

Two honesty notes carried throughout

First, every keystone in this dossier returned 'partially verified' - not one was cleanly confirmed, and the gate caught a real error (nickel is in surplus, not deficit, so the beachhead leads with cobalt and rare earths). That is not weakness; it is the map of a situation where the bull and bear cases are both half-true.[25]

Second, the '~October 2025' pause date is the founders' own account - it is not documented in any public record, and the entity is in fact still legally alive. Where this report says the company 'died', read 'went dormant'. The decision frame is recapitalize-or-reposition, not resurrect-a-corpse.[6]

03

The company & the pause

Olokun - named for the Yoruba spirit of the deep ocean and the wealth in it - was founded in 2021 by two Spelman College alumnae, Lacey Reddix (CEO) and Dr. Pilanda Watkins-Curry (CTO, PhD chemistry, LSU). Its technology, derived from NREL, used a water-regenerated zwitterionic resin to pull cations out of brine and wastewater without harsh acids, selling the recovered minerals and the cleaned water - a 'mining / filtration as a service' model. [1,3,11]

Why it actually stalled

The founders' account - 'the tech took too long, we were late to market, burn outran revenue, cash ran out' - holds up under verification. A capital-intensive chemistry company that raised only ~$1.1M and, after four-plus years, never reached a financeable pilot, simply exhausted its runway. There was no co-founder split, no single lost contract, no one-off financing collapse. [4,5,2]

FACT	VERIFIED
Founded	2021; Delaware C-corp (reincorporated from California) [5]
Raised	$1.1M pre-seed (Jan 2023, Propeller-led) - and nothing since [4,5]
Stage at pause	Lab / bench - never reached a revenue-generating pilot [2]
Entity status	Alive - CA Active, FTB-good as of March 2026; a compliant dormant shell [6]
Validation	Breakthrough Energy Fellows; Elemental Excelerator; NREL West Gate [7]

Three honest corrections to the brief

- 'Never generated revenue' is more accurate than 'burn exceeded revenue' - the dual-revenue model was never operationalized; the company was effectively pre-revenue throughout.
- The desalination-to-produced-water 'pivot' was a re-prioritization, not a costly redirect - oilfield water was a named target from inception. [2]
- The 'October 2025' pause date is not publicly documented; every public signal points to a company that went dormant after mid-2025, still legally alive. [6]

04

The market turned

The 'prices collapsed' story explains the death - but in the months after the pause, the market turned. Olokun paused near the literal bottom of the cycle, and the demand case is now scarcity, not volume.

METAL	2026 MOVE	READ
Lithium	recovering [18]	Nearly doubled to ~$26k/t in Q1 2026 off the 2024-25 trough.
Cobalt	structural deficit [20]	DRC export ban -> ~96,600 t/yr quotas; metal +160-180% off a nine-year low.
Nickel	deep surplus [25]	~288kt 2026 surplus - the reason to lead with cobalt + REEs, not nickel.
Magnesium	no US supply [26]	Only US primary smelter bankrupt; near-total import dependence.

Demand is bigger, and structurally different

- Grid / battery storage shipped 421 GWh in 2025 (+75%), ~600 GWh projected 2026 - now turbocharged by AI-datacenter power, a driver that barely existed at founding.[22,23]
- EVs are decelerating in the US (~-19-28% in 2026 after the credit expired) - the bull case now rests on storage, not cars.[24]
- Industrial water reuse is a ~$32B market growing ~7.7%/yr on non-cyclical regulation (PFAS, heavy-metal limits, ZLD) - the durable, metal-price-immune half of the model.[27,28]

And the money followed

A large non-dilutive federal stack opened after the pause and points straight at recovering critical minerals from waste: DOE's $275M to pilot recovery at industrial sites, $134M for rare earths from waste, DPA Title III, and a permanent IRA 45X production credit. Olokun paused just before the exact tailwind it needed arrived.[46,47,50]

05

Is the technology real now?

The honest answer cuts both ways. The field as a whole 'took too long' - that was an industry-wide enemy, not an Olokun-specific failure - and the multi-mineral wastewater dual model is still not broadly commercial in 2026. But the lithium leg has crossed into commercial scale, and a rival is already realizing Olokun's exact produced-water model.

- Lithium-from-brine is now commercial, but brutal on capital: Eramet's Centenario adsorption-DLE plant delivered first carbonate in Dec 2024 at ~$870M and ~90% recovery, after 5 years of piloting.[13]
- Olokun's exact model has a closer twin: Gradiant/alkaLi's Montrose PA plant recovers lithium from oilfield produced water at 97% recovery and 99.5% purity with a 5,000 t/yr offtake, commercial early 2026 - better-capitalized and years ahead.[14]
- The field's own analysts called DLE merely 'on the cusp of commercialization' as recently as 2024; magnesium-from-brine is pre-commercial and cobalt-from-effluent remains lab/pilot.[15,17]

The read: the technology is real and finally maturing - but as a capital-intensive field whose winners are $100M-$870M-funded incumbents. That is exactly the condition that kills an under-capitalized standalone, and it has not eased for a multi-mineral wastewater plant in 2026. It argues for licensing the tech into someone else's plant, not racing to build one.

06

The reckoning - what verification killed

Two waves converged; the adversarial pass then killed the original company three ways and exposed a blind spot the whole analysis shared. This is the most important section in the dossier.

Death 1 - you own the system, not the science

Olokun holds a real, pending patent in its own name (US20250223667A1) - but it claims the plant architecture, not the chemistry. The foundational zwitterionic-resin science is NREL's, owned separately (US20230226462A1; Watkins-Curry is not a named inventor). A funded rival could license NREL's resin directly and engineer around the system patent. [9,10]

Death 2 - the compliance fee fails on Permian water

The 'sell water to dodge the lithium price' wedge needs an expensive, mandatory disposal cost to monetize. In the open Permian there is none: the lithium is sub-economic (1-30 mg/L vs a ~100 mg/L floor) and deep-well injection is cheap and legal (~$0.60-1.50/bbl). No costly mandate, no recurring fee. [29,30,31]

Death 3 - every produced-water seat is taken

The winning structure - owner takes a royalty, a tech party builds - is now the proven template (Select Water + LibertyStream). But the seats went to field-validated parties already shipping carbonate, and in oilfield brine Olokun's multi-ion edge is useless (it is lithium and magnesium only). [37,39,42]

The blind spot - the wrong unit of analysis

Every angle modeled Olokun as a company that must build and own a plant; under that frame the answer is uniformly bleak. But the dominant 2026 structure is bifurcated: the water owner sources and pre-treats the stream and takes a royalty; a separate technology party drops in the extraction step. In that structure Olokun's resin is a licensable unit operation - and the capex, the feedstock, and the offtake all belong to the partner, not to Olokun. The two things that killed the company stop being Olokun's problems. [37,48]

07

The IP - what Olokun actually owns

This is the linchpin of any license, sale or JV - and the public record is now clear.

A two-layer stack

Olokun owns, in its own name, a pending patent family (US20250223667A1 / WO2025147659A1; inventors Watkins-Curry, Reddix, Ibrahim) covering a system/architecture: multiplexed pre-treatment plus an array of zwitterionic simulated-moving-bed separators, each tuned to a different mineral. It is real, transferable IP - but it is the plant layer.[9]

The foundational resin science - the zwitterionic chromatography itself - is owned separately by NREL's operator (US20230226462A1, plus a newer filing). Watkins-Curry is not a named inventor on NREL's patents. Olokun's edge sits on top of NREL's science.[10,11]

First right of refusal, not exclusivity

Per the founders, Olokun holds no exclusive license to NREL's resin - but it does hold a first right of refusal through the West Gate relationship. That is a timing option, not a lock: if NREL moves to license the base IP, Olokun gets first crack at matching.[12]

The strategic implication is the heart of the recommendation. Because the cobalt / rare-earth-from-effluent field is one NREL itself is not commercializing, the smart move is not to fight for crowded lithium rights - it is to exercise the first-right-of-refusal to convert it into a narrow, field-of-use exclusive license for industrial-effluent critical minerals: cheaper, more attainable, and the exact lane the edge wins in.

08

The unit economics & the wedge-killer

The compliance-fee-immune-to-metal-price wedge is real - but it is feedstock- and geography-gated, and it fails for the open Permian produced water Olokun historically targeted.

Where it fails

Permian produced water carries only 1-30 mg/L lithium (vs a ~100 mg/L economic floor), so the recoverable metal is roughly an order of magnitude sub-economic. And disposal is legal and cheap - deep-well saltwater injection runs ~$0.60-1.50/bbl - so there is no large mandatory cost to monetize as a recurring fee. Both legs of the dual model fail on the same feedstock. [29,30,31]

Where it holds

- NPDES-limited industrial effluent (semiconductor CMP, mining, FGD, geothermal) - removal is legally mandatory (Cu 2.07, Ni 2.38 mg/L under 40 CFR 433), so the fee is for compliance and the recovered metal is a bonus. The best fit. [35]
- Inland / ZLD desalination reject brine - disposal is genuinely expensive (15-33% of opex) - but the metal is near-zero, so a pure water play. [34]
- Permian zones inside Seismic Response Areas, where the Railroad Commission has suspended SWD (23 wells Jan 2024; all deep permits after the M5.4 quake May 2025) - a real but narrow, regulation-contingent niche. [32,33]

Bottom line: do not model this as a metals business. Model it as a recurring discharge-compliance service that harvests scarce metal as upside - gated to where injection is banned, restricted, or absent.

09

Competition & the partner map

The bifurcated JV is structurally correct and the template is proven - but it is not attainable as-is in produced water, and only conditionally attainable on the recommended effluent beachhead.

The seats are taken

The premium produced-water seats already went to field-validated tech parties: Select Water + LibertyStream (and Mariana), Double Eagle + Element3, and Aris (now in-house under Western Midstream). The one genuinely open major, WaterBridge, will pick from its 10-12 active pilots - which Olokun is not in.[37,39,40,41]

The attainable partner is elsewhere

Olokun's multi-ion edge is irrelevant in oilfield brine, which is lithium and magnesium only. The attainable partner is a non-produced-water effluent generator whose stream actually contains cobalt or rare earths - a mining/hydromet operator, a fab, or a utility - a smaller, fragmented owner base with no established licensing market yet, meaning Olokun would have to originate the deal.[42]

And the incumbents are real: DuPont, Lanxess and Purolite already sell selective and chelating ion-exchange resins for AMD and tailings metal recovery. Olokun's water-only regeneration is a genuine but unvalidated edge - it must be proven, not assumed. The realistic unlock is a DOE/DPA non-dilutive award plus one field-scale pilot to convert a paused, 4-person team into a credible counterparty.[45]

10

The opening - the beachhead

All four research lenses converge on the same corner of the map - and it is the opposite of where Olokun was pointed. Lithium-from-brine is the most crowded, best-funded link in the chain; the whitespace is the non-lithium metals from industrial effluent.

The beachhead

A water-regenerated, multi-ion-selective resin module recovering cobalt and rare earths (magnesium / manganese secondary; not nickel) from US industrial aqueous effluent - mining leach raffinate and tailings / acid-mine-drainage first, semiconductor-CMP and power-plant FGD as fast-followers - delivered as the technology party in someone else's plant, on a per-kilogram processing fee while the effluent generator owns the feedstock, the capex and the offtake.[25,35,46]

Why this beachhead and not the old model

- Demand: cobalt is in a quota-driven deficit and there is no US primary magnesium - versus lithium, where supply is racing in.[20,26]
- Defensibility: the streams are dilute, multi-cation and discharge-regulated - exactly where a water-regenerated multi-ion resin with a clean-water co-product is decisive rather than lapped.[35]
- Capital efficiency: as the tech party in a bifurcated deal, Olokun carries IP and a recurring fee, not the plant - the position a ~$1.1M-raised balance sheet can support, especially with non-dilutive DOE/DPA cost-share.[46,50]
- Model proof: Nth Cycle runs exactly this refining-as-a-service shape (modular unit, per-kg fee, customer keeps the metal) and just signed a $1.1B, ten-year offtake.[48,49]

11

The path - recommendation, plan & kill-switches

Three paths, ranked

- DO THIS - License the module / small JV as the technology party. Capital-light, recurring fee, partner carries the build, riding the price recovery and the federal money.
- FALLBACK - Sell the IP into the consolidation. A clean exit if neither founder returns - but unvalidated, the IP will not fetch a buy-the-company price yet.
- DON'T - Recapitalize and rebuild the plant. This is the path that died; nothing structural has changed enough for a 4-person, sub-pilot team to out-build funded incumbents.

The 18-month plan

(0-3 mo) Close the two facts: pin the NREL license terms and convert the first-right-of-refusal toward a narrow field-of-use exclusive; confirm founder commitment; pick the first cobalt/REE effluent stream from a real assay. (3-9 mo) Win the non-dilutive anchor - apply into the DOE Mines-&-Metals / REE-from-waste programs and DPA Title III as the tech party on a partner's stream. (6-15 mo) Run one field pilot on real, fouling, dilute effluent - the single result that converts a paused team into a fundable counterparty. (12-18 mo) Sign the license / JV, structured to push feedstock, capex and offtake onto the owner.[46,47,50]

Six kill-switches

- NREL exclusivity proves un-obtainable even via the first-right-of-refusal - a rival licenses the base resin and engineers around the system patent.
- The resin does not survive real industrial effluent at pilot scale - or incumbent chelating resins already do it cheaper.[45]
- Cobalt/REE in accessible US streams is too dilute to recover economically - the metal stops being a bonus.
- No DOE/DPA award is winnable without a pilot, and no owner will fund the first pilot - the chicken-and-egg never breaks.
- The inventors will not re-engage - the system patent's value is tied to named-inventor know-how.
- Discharge rules loosen in the target geography - removing the mandatory cost the recurring fee depends on.

Net: the 'don't rebuild the lithium plant' call is high-confidence. The reframe is a real, fundable, differentiated opportunity - gated on a license conversion and one pilot. Close those two, and Olokun has a second life that plays to exactly what made it special.

12

References

The 54 sources that directly support claims in this dossier are listed below, grouped by theme. Every entry is clickable - the superscript numbers throughout link here and out to the original. Company facts come from primary filings (SEC, USPTO, state registries); market and technology figures are vendor- or analyst-reported and dated; the pause date is the founders' account.

The company & the pause

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C&EN (ACS) - https://cen.acs.org/articles/103/web/2025/05/2025-Talented-12-Pilanda-Watkins-Curry.html

3 Interview with Lacey Reddix, CEO of Olokun Minerals — chromatography/resin column, no added chemicals, lab-scale, 'mining / filtration as a service'
Survival Tech Club - https://www.survivaltech.club/newsletter/lacey-olokun-minerals

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7 Olokun Minerals — Breakthrough Energy Innovator Fellows project (2023 cohort)
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The technology & its origin

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Is the tech real now

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34 Energy, water, land and cost implications of ZLD/MLD desalination — inland brine disposal is 15-33%+ of opex; the mandatory cost the compliance wedge monetizes
Nature Water - https://www.nature.com/articles/s44221-024-00327-1

35 Remediation of cobalt from semiconductor wastewater (fluidized-bed granulation) — up to 98.8% Co removal; metals above NPDES limits make treatment legally mandatory
ScienceDirect - https://www.sciencedirect.com/science/article/abs/pii/S2213343721009131

36 Lithium in Smackover Formation brines (Fact Sheet 2024-3052) — ~1-477 mg/L; the high-grade oilfield brine already locked up by Standard Lithium / ExxonMobil
USGS - https://pubs.usgs.gov/publication/fs20243052/full

Competition & the partner map

37 Select Water + LibertyStream definitive agreement (Feb 2026) — the bifurcation template: owner pre-treats water + takes a royalty; tech party funds/builds/operates; first 1,000 t/yr unit commissions Dec 2026
Select Water Solutions - https://investors.selectwater.com/news-events/press-releases/detail/139/

38 LibertyStream commences lithium carbonate production at Select Water's facility + secures first US purchase order (Apr 2026)
BusinessWire - https://www.businesswire.com/news/home/20260409963278/en/

39 Element3 launches commercial lithium carbonate in the Permian at Double Eagle Energy (Feb 2026) — first new US lithium mining in >50 years; 3,000 t/yr
GlobeNewswire - https://www.globenewswire.com/news-release/2026/02/06/3234049/0/en/

40 Western Midstream to acquire Aris Water Solutions (~$1.5B, closed ~Oct 2025) — a major produced-water owner pursuing mineral recovery in-house
PR Newswire - https://www.prnewswire.com/news-releases/western-midstream-to-acquire-aris-water-solutions-302523585.html

41 US produced water: the emerging value chain — WaterBridge (largest pure-play Delaware owner, ~4.5M bbl/d) running 10-12 treatment-tech pilots; the one unpartnered major seat
Davis Graham - https://davisgraham.com/news-events/u-s-produced-water-the-emerging-value-chain-reshaping-energy-water-and-critical-

42 Critical mineral source potential from oil-and-gas produced waters — lithium and magnesium have the highest recovery potential; cobalt/nickel present but uneconomic in oilfield brine
ScienceDirect - https://www.sciencedirect.com/science/article/abs/pii/S0048969724027190

43 Lilac–Traxys binding 10-year offtake for Great Salt Lake lithium (Jan 2026) — the best-funded pure DLE play ($315M+ raised)
Lilac Solutions - https://lilacsolutions.com/news/lilac-and-traxys-announce-binding-10-year-offtake-agreement-for-great-salt-lake-lith

44 Brine's second act — independent economics: mineral revenue ~16x water revenue; sellable mineral volume only 10-30% of theoretical (undercuts a water-led dual model)
Smart Water Magazine - https://smartwatermagazine.com/news/smart-water-magazine/brines-second-act-mineral-extraction-revenue-stream

45 Lewatit ion-exchange resins for mining & metallurgy — the established incumbents (DuPont, Lanxess, Purolite) already sell selective/chelating IX for AMD & tailings metal recovery
Lanxess - https://lanxess.com/en/products-and-brands/brands/lewatit/industries/mining-and-metallurgy

The opening

46 Mines & Metals Capacity Expansion — up to $275M to pilot recovery technologies DIRECTLY AT INDUSTRIAL SITES for byproducts/wastes, open to all US sectors (the co-located-module program)
US DOE - https://www.energy.gov/cmei/mining/funding-notice-mines-metals-capacity-expansion-piloting-product-critical-minerals

47 $134M to strengthen the rare-earth supply chain — REE recovery from waste streams (awards: Phoenix Tailings, Colorado School of Mines/red mud)
US DOE - https://www.energy.gov/articles/energy-department-announces-134-million-funding-strengthen-rare-earth-element-supply

48 Nth Cycle brings critical-metals refining-as-a-service — modular 'Oyster', per-kg processing fee, customer owns the product (the business-model analog)
MIT News - https://news.mit.edu/2025/nth-cycle-brings-critical-metals-refining-0627

49 Nth Cycle's $1.1B / 10-year Trafigura offtake (Mar 2026) — proves the licensable/processing-fee critical-metals model attracts $B-scale commitments
Electrek - https://electrek.co/2026/03/16/us-battery-recycler-nth-cycle-1-1b-ev-metals-deal/

50 Critical-minerals & rare-earth federal/state funding guide 2026 — DOE OCED FOAs, $200B Energy Dominance Financing, DPA Title III (~$8B), permanent IRA 45X (10% of production cost)
Funding Landscape - https://fundinglandscape.com/answers/critical-minerals-rare-earth-funding-2026

The capital reality

51 The Future of Climate Tech (Apr 2026) — VC share of climate funding ~20% (2021) -> <8% (2025); seed/Series A fell for the first time in a decade; Series A revenue bar ~2x 2021
Silicon Valley Bank - https://www.svb.com/trends-insights/reports/future-of-climate-tech/

52 Beyond the Valley of Death: securing America's critical-minerals future — why first-of-a-kind minerals tech fails to attract private capital without federal risk-sharing
Third Way - https://www.thirdway.org/memo/beyond-the-valley-of-death-securing-americas-critical-minerals-future-through-innovati

53 Direct Lithium Extraction 2026-2036 — at 2025 prices no DLE project was profitable; viability hinges on the price recovery now materializing
IDTechEx - https://www.idtechex.com/en/research-report/direct-lithium-extraction/1140

54 Climate-tech companies are pivoting to critical minerals (May 2026) — Boston Metal, Brimstone reframe toward critical minerals to survive; the policy-narrative tailwind
MIT Technology Review - https://www.technologyreview.com/2026/05/21/1137622/climate-tech-pivot-critical-minerals/