



Thunderstone

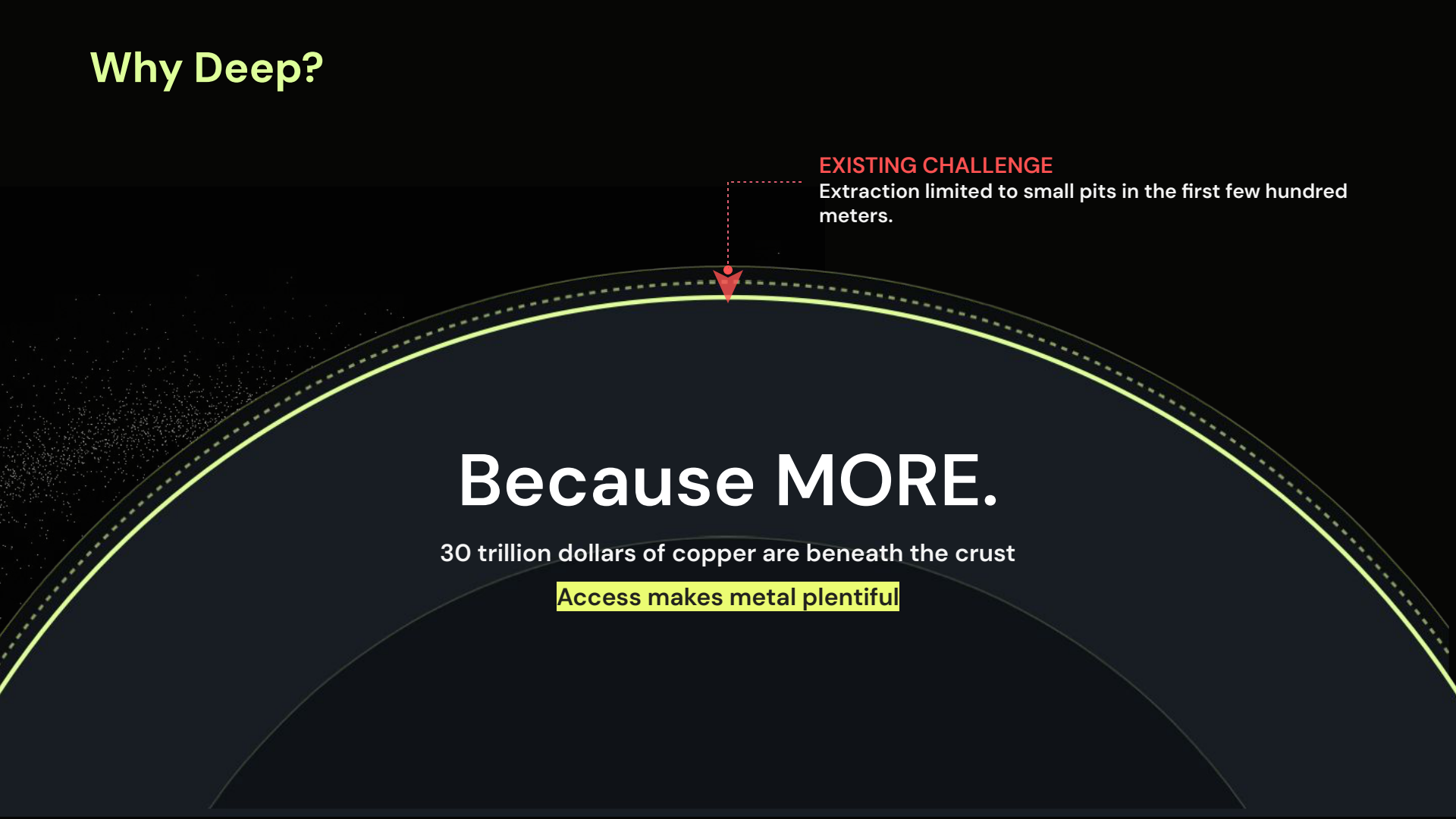
Mine the deep.

thunderstone.rocks

Why Deep?

EXISTING CHALLENGE

Extraction limited to small pits in the first few hundred meters.



Because MORE.

30 trillion dollars of copper are beneath the crust

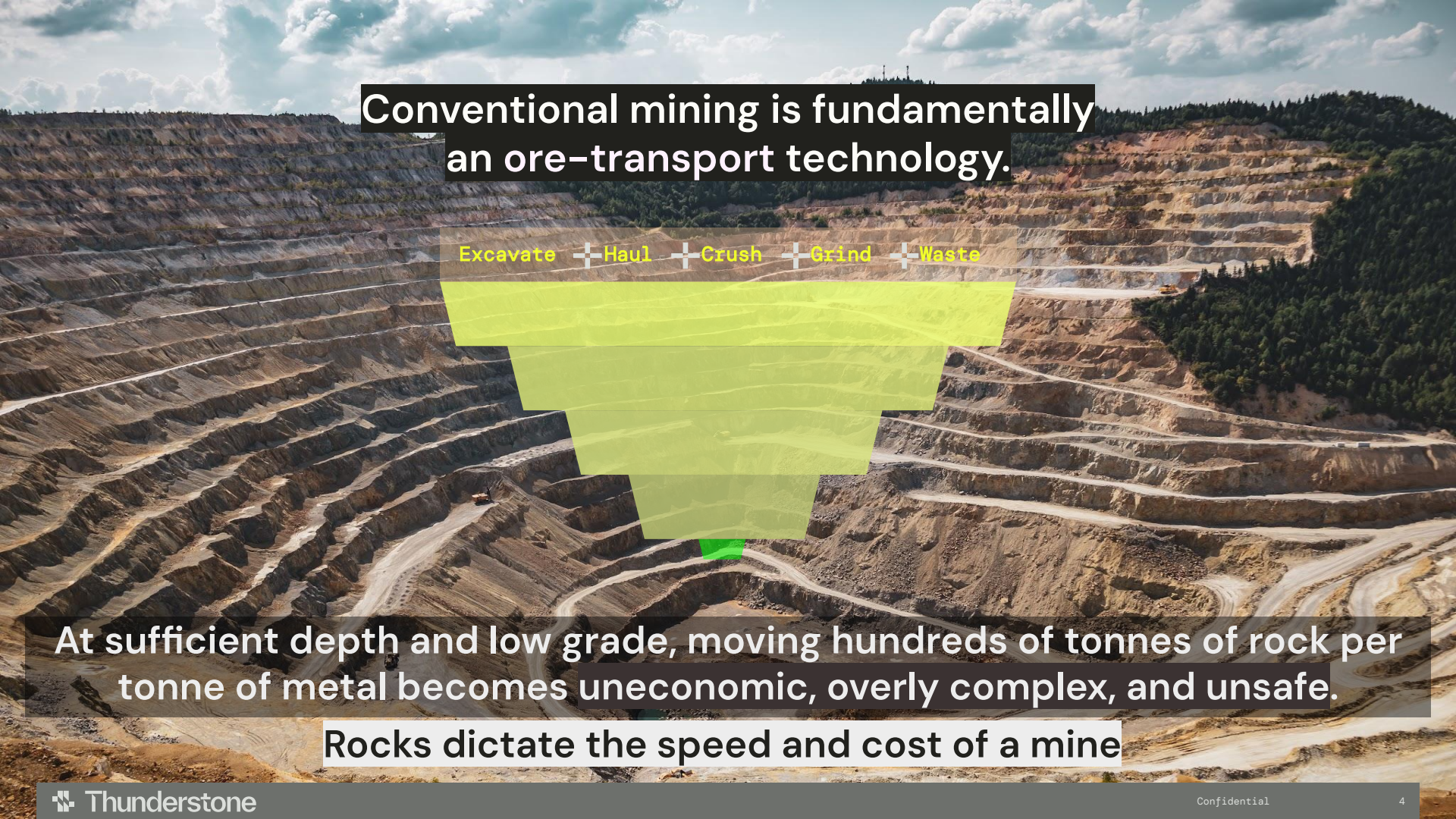
Access makes metal plentiful

The world has a multi trillion
dollar problem:

AI moves in **years**.
Metal mines move in **decades**

Deep mining makes metal possible.
Plumbing is needed to make it fast.





Conventional mining is fundamentally
an ore-transport technology.

Excavate + Haul + Crush + Grind + Waste

At sufficient depth and low grade, moving hundreds of tonnes of rock per
tonne of metal becomes uneconomic, overly complex, and unsafe.

Rocks dictate the speed and cost of a mine

Today = moving more rock for *less* metal

The stone age is over. Let's move **metal**, not rock.

Conventional



400+

- + Demand is **increasing**.
- + Grades are **declining**.
- + Costs are **rising**.
- + Timing is **right**

Thunderstone

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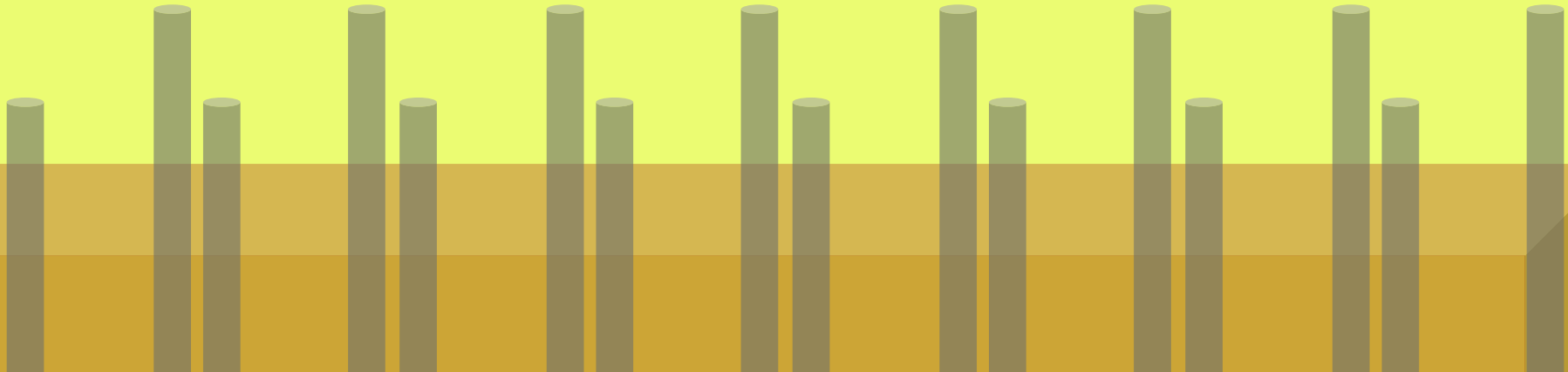
Today: Kilograms of rock moved to produce 1kg of Copper

Build wells. Not mines.

Wells take days. Mines take decades.

Thunderstone makes well field mining possible. We leave the rocks where they are: **In the ground, “in-situ”.**

In-situ: extraction = scale fast, low cost, reduced risk



Ridiculously small capex makes scaling easy

● **2-5Billion**
Cost of a new copper mine

● **230Million**
Cost of the cheapest in-situ copper mine: Florence

● **<1Million**
Cost of our first well pattern

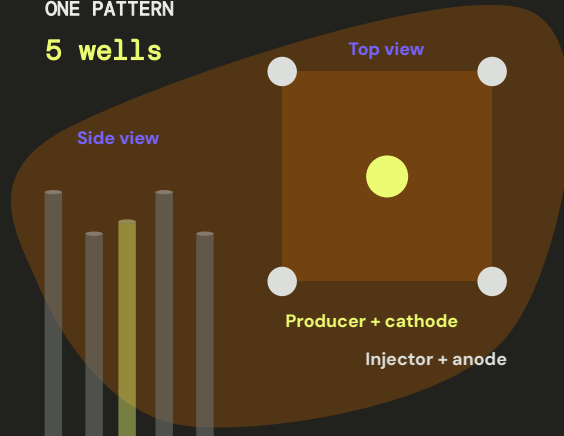
A new paradigm:

Existing: build a mine to the size of the deposit

Thunderstone: mine at the size of your well quadrant

ONE PATTERN

5 wells



Cheaper makes everything faster

1. Can scale more deployments
2. Trials / learnings are quick
3. Our product improves

Our total cost is less than a single mine line item

Traditional blockers are solved

SAVING CRITICAL TIME AND MONEY

TOP MINE RISKS:

Forever liabilities

Tailings introduce forever cost + environmental damage

A failed mine project

Failed tailing dams cost 100's of lives; lose public + political mine support

Huge cost penalties

Environmental penalties from waste Companies fined >10 Billion regularly

WASTE / TAILINGS

Thunderstone prevents mine waste.

No tailings = avoid \$billions of liabilities.

OPTIONALITY IS GOOD

>1400 copper sites already exist. Our costs are so low, we can hedge bets across multiple sites + avoid risky sites.

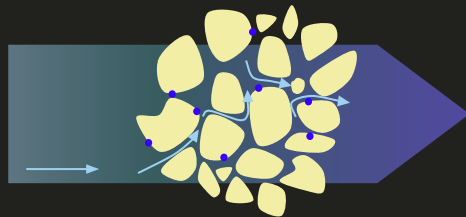
Uranium proves in-situ works. But we need copper.

Copper's \$264B growing market is facing looming 10Mt shortage. In-situ scales, only if we solve the rock problem

Uranium

54%

IN-SITU SHARE OF WORLD
PRODUCTION

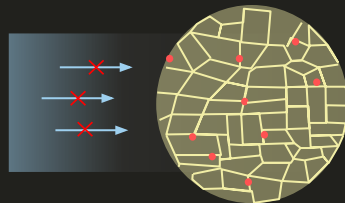


Uranium sandstone ore is **permeable to fluids**.
Fluids can leach metals deep in the ore

Copper

0.06%

IN-SITU SHARE OF WORLD
PRODUCTION



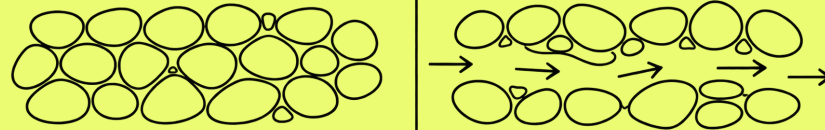
Copper ore is typically tight and **not permeable**.
No method to leach and recover copper

Example Case:

Florence is the only producing in-situ copper mine due to ideal geology. A handful others have been attempted or are being permitted (see appendix). One in particular, Gunnison, was stalled due to low flow rates.

We make in-situ geology plentiful

Thunderstone transforms imperfect geology into the ideal in-situ mine



1. **High** voltage creates the fluid channels
2. **Low** voltage pulls dissolved metals into them

Core mechanisms proven. Hard-rock copper is the scale-up.

Create pathways → steer fluid → move dissolved metal → recover product. We've demonstrated in real ore



HIGH VOLTAGE - CREATES PATHWAYS

PROVEN

- 400 kV - peak voltage - in house measured
- 100x - peak fluid flow enhancement



METAL TRANSPORT - RECOVER S PRODUCT

PROVEN

- 0.2 g - recovered Ni hydroxide precipitate
- 0.28 g/L - implied Ni in PLS, from ICP composition



LOW VOLTAGE - STEERS FLOW

PROVEN

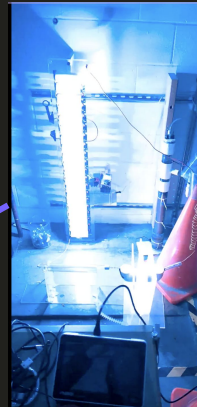
- 0-25 L/m²/h - sustained, from ~zero at 450 V.
- 8-12 L/m²/h - is industry heap-leach irrigation.



FLOW CHANNELS - PRODUCED IN COPPER ORE

OBSERVED

- 20 cm core - HV stimulated, then flowed
- unassisted
- Continuous - unassisted flow, visually estimated at >300 mL/h



Our laterite ore work taught what we need to pursue

We built the platform on nickel, measured our own economics, and changed ore. It took months, not years.

The platform works

High voltage rig

Built in-house – we've improved our system from 200–400kV and reduced downtime to <once a month

Electrokinetic rig

Built in-house, instrumented to per-cycle voltage and current from 0–1000V. Fully automated flow measurement system.

Metal product isolated

We've demonstrated capacity to isolate metal concentrate in house: Iron and aluminium rejected below detection

Everything downstream of this is the same hardware.

Laterite disqualified itself

Nickel dissolves over weeks

Not hours – chemistry sets the pace, not flow. Our mass transport solution doesn't benefit.

The solution stays dilute

Each litre carries too little metal to pay for moving it

So we measured it and stopped

The answer cost us one column programme.

Transport was never the constraint. Payload per litre was.

Copper is the ore this was built for

Chalcopyrite porphyry

A litre is worth the energy to move it

Permeability is the binding constraint

Exactly what high voltage solves.

Published EK work reaches 57–90%

On intact sulfidic ore, at centimetre scale.

The technology was never the question. The ore was.

A team that kills its own thesis on data is the one you want holding the next one.

We need seven sites, not market share

Copper mines 23.2 Mt a year, worth \$278B. We only have to convert a handful of sites that already exist to make \$\$\$

\$30T

of copper in porphyry deposits

USGS resource assessment

1,436

significant deposits, >100 kt each

MinEx - the resource universe

709

operating mines

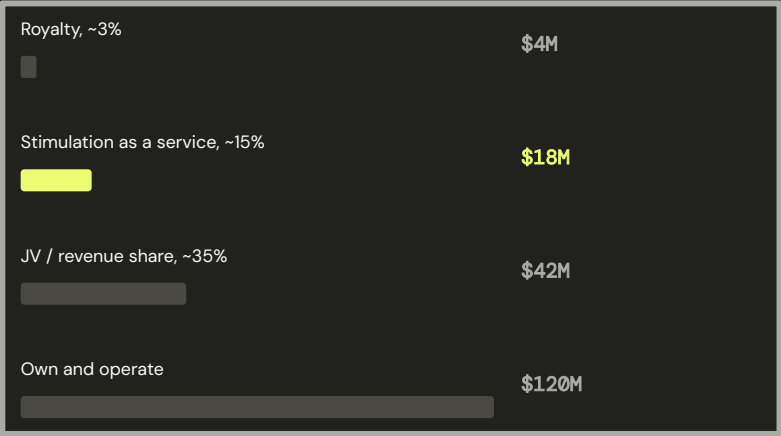
GlobalData - drilled, owned, connected

7

sites, 0.30% of world production

7 sites comes out to 1% of operating mines

ONE MINE SITE - based on business model



HOW ONE SITE IS CALCULATED

*Estimate: 250 five-spot patterns at 10 m spacing over a 100 m mineralised interval = 27,000 t of rock each. At 0.5% Cu and 60% recovery over a two-year leach, that is ~40 t Cu per pattern per year and ~10,000 t per site. MODELLED, NOT MEASURED - spacing, recovery and leach rate are what this round tests. \$30T assumes ~2,500 Mt of porphyry copper at \$12,000/t.

1.4 million USD

Proved the core mechanisms work



What we've proved — and what this round answers

PROVEN TODAY

PRESEED

NOT YET PROVEN

EXTENSION

- ✓ HV + low-voltage platforms built & operated
- ✓ Large permeability / flow enhancement demonstrated up to 1m
- ✓ Electrokinetic transport demonstrated in ore
- ✓ Hard-rock: ~20 cm chalcopyrite stimulated → unassisted flow

COMPONENT PROOF

Working electrical platform → hard-rock evidence

1 Reproducible fracture propagation under confining stress

2 Fluid-channel propagation >1 m

3 Economical ion transport between channels in chalcopyrite

4 Integrated recovery at field-relevant geometry

THIS ROUND Answer all 4 questions that decide pilot readiness.

We have a purpose-built lab and team already operating

Andrew:
Pulsed power

Former Pacific Fusion,
TAE, Zap

Eric: CEO

ETH Chemist PhD.

Serial entrepreneur,
Deep Science Ventures

Ash: Mech tech

Former Embark, Uber,
Lyft

Patrick: R and D

MIT, Berkeley PhD +
LBNL chemist

Lyle Trytten, P.Eng.

Mining & Metallurgy Advisor

30+ yrs mine development & metallurgy | ex-Sherritt | Giga
Metals advisor | projects across 5 continents



Our raise gets us to pilot

We derisk in-lab critical performance requirements to get us in the ground

\$2.0M

PILOT-READY

- Coupled stimulation + transport + recovery
- Field-relevant pressure / geometry
- Mass balance + pilot architecture

VALUE INFLECTION

Pilot-ready system

1. **Fracture reach**
> well spacing
2. **Switch life**
> stimulation cost
3. **Transport efficiency**
> electrical cost

Viable pilot partners



RioTinto

BHP

Fourteen months from close to pilot-ready

M3

Fluid-channel
propagation over 1m

M4

Copper transport
in chalcopyrite

M7

Fracture
propagation under
confining stress

M11

Integrated
recovery at field
geometry

M14

Pilot-ready
package

COMMERCIAL TRACK - RUNS IN PARALLEL

M0

Partner outreach begins at close

M8

Mine MOU / term sheet

M14

Signed pilot partner

Appendix

Get in touch with us at:

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