

CO₂ Mineralization for *in situ* Storage and *ex situ* Enhanced Metals Recovery



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Tom is a registered petroleum engineer who has over 39 years of experience in multiple facets of upstream Oil and Gas Industry Operations, He has been a member of SPE since 1978 and is active in several professional organizations and industry associations. Three years ago, he helped found US Strategic Minerals Exploration with a small group of seasoned oil and gas industry veterans. Throughout his career, his passion for challenging the status quo with inventiveness and problem solving has been a key element in his quest to excel.

Technology or focus area

- Chemical and Electrochemical processes for ex-situ CO₂ storage as precipitated alkaline earth carbonates. Our CCUS processing approach uses LiquidOre™ brines sourced from subsurface geothermal reservoirs and waste brine collection systems that have high concentrations of critical mineral ions present as Chlorides (ie: CaCl₂, MgCl₂, Lithium and Strontium.)

Ideas, Interests, Concepts to be Explored

- Demonstration scale precipitation of CM and other rare minerals using feedstock comprised of human-caused carbon molecules sourced from the industrial process itself, not using DAC for CO₂ sourcing.
- Future scale-up to Sec 45Q minimum CO₂ levels or higher using feedstock and reagents that are waste products either being re-injected (oil and gas processing or geothermal) or from mine waste pits (alkalinity source from sodium bicarbonate processing).
- CM and other specialty minerals produced via CCUS processes can be stored and stockpiled for future use at logistically advantageous locations, so in effect creating a strategic CM reserve much like the SPR.

LiquidOre™ Brines are Abundant

- Most oil and gas fields and mining sites, where CO₂ and waste-water are present in large volumes, are quite prospective for commercial scale CCUS projects given the low cost of feedstocks and existing water gathering and disposal infrastructure.
- Deep Brine and Enhanced Geothermal Systems Reservoirs contain High Concentrations of key dissolved minerals needed for CCUS processes being tested and implemented worldwide – Sec 45Q Tax Credits apply in U.S. *“Create a truly Net-Zero Base Load Electric Power Source by using CCUS technology!”*
- Use Deep Drilling for Brines vs. Open Pit and Evap. Ponds for processes targeting specialty minerals such as PCC, Lithium Carbonate, Magnesium Hydroxide and REE’s. *Don’t close in those idle wellbores until you’ve evaluated the mineral loading contained in the brines.*
- New Domestic Source for many Critical Minerals including rare earth elements for use by the US government space programs and defense system development. *“Rubidium, Cesium, Strontium, and Lithium”*