Reliable Lithium Production

Engineering & Operations Guide

Lithium Harvest

No Operational Burden

Executive Summary

Add lithium extraction as an add-on to the geothermal brine loop - operated by Lithium Harvest under DBOO, with defined interfaces and bypass logic so generation and reinjection remain primary.

What stays the same

- **Added:** A co-located lithium extraction asset tied in as a side stream with defined inlet/return, sampling, and bypass boundaries.
- **Unchanged:** Your core geothermal operation: brine production, heat exchange/power/heat generation, and reinjection remain primary and protected.

What "low disruption" means

- **Defined interfaces:** Tie-in points and responsibilities are agreed up front.
- **Bypass capability:** Produced brine handling can continue during maintenance, start-up/shutdown, or process upsets.
- **Ops-first integration:** The lithium asset is engineered around your operating envelope and reinjection constraints.

The DBOO model (design, build, own, operate)

Lithium Harvest	Your Team
Responsible for the design, capital cost, construction, government and landowner approvals, and 24/7 operations of the lithium asset.	Provides site access, the integration point, mineral rights, and HSE alignment. You provide the brine; we provide the lithium organization.

Integration Scope & Interface Boundaries

This section defines what's in scope, where the lithium asset connects, and what the site must provide - without exposing proprietary process details.

Co-location logic (where this fits)

Designed for co-location at geothermal facilities where brine already circulates, and the operating footprint, access, and utilities are in place. The goal is to minimize retrofit complexity by integrating as a defined side-stream.

System boundaries (what we interface with)

- **Inlet boundary:** Brine feed tie-in point to the lithium asset (side stream off the loop).
- **Return boundary:** Treated brine return tie-in (back to the loop and/or reinjection route as defined).
- **Bypass boundary:** Defined bypass path so brine handling can continue during maintenance, start-up/shutdown, or process upsets.
- **Sampling boundaries:** Agreed sampling points for feed and return streams (and product as applicable).
- **Drain/waste boundary:** Defined handling for any reject/waste streams (site-dependent).

Footprint and access (illustrative)

Modular deployment minimizes land use and avoids ponds and large civil works. Footprint depends on throughput, integration scope, and site layout.

Water management outcomes (option set, not a promise)

Return routing is defined by brine chemistry, reinjection requirements, site needs, and local regulation. Options may include:

- Return to reinjection (base case in many projects)
- Beneficial reuse where composition and legislation allow (site-dependent)

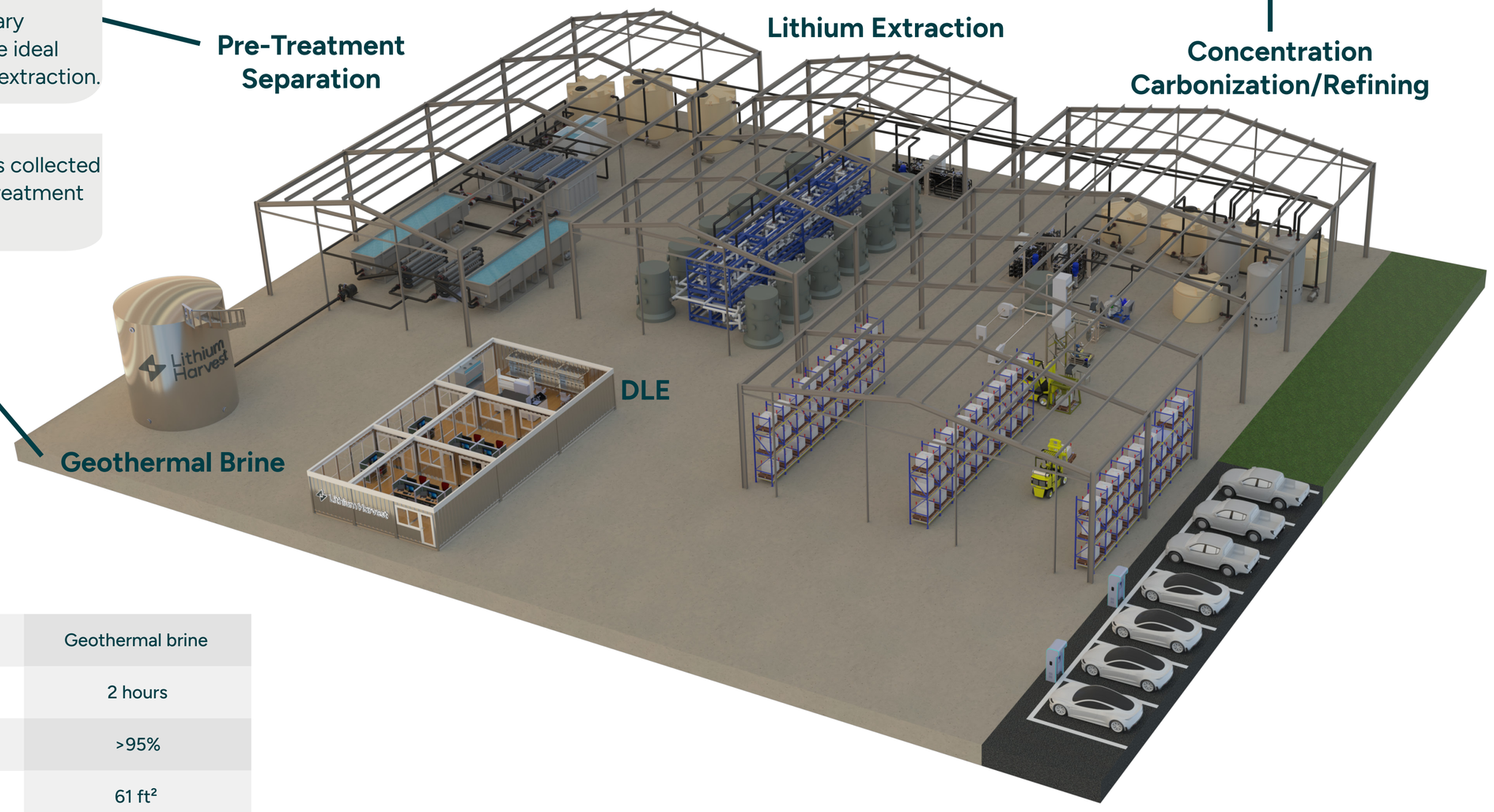
Process Overview - From Waste to Value

3. Lithium extraction: Lithium is efficiently extracted by DLE without using any chemicals.

4. Lithium refining: Lithium is refined into battery-grade lithium carbonate.

2. Advanced water treatment: We remove solids, hydrocarbons, and other contaminants using our proprietary filtration technology, creating the ideal conditions for high-yield lithium extraction.

1. Collection: Geothermal brine is collected and directed to our co-located treatment facility.



Lithium feedstock	Geothermal brine
Lithium carbonate production time	2 hours
Lithium yield	>95%
Average footprint per mt of LCE	61 ft²
Environmental impact	Minimal
Freshwater consumption per mt of LCE	22,729 gallons
Water recycled	>90%
CO_2 footprint per ton of LCE	Neutral

Utilities we use:

- Electricity
- Water
- Heat

Continuity & Operability

Geothermal operations remain primary. The lithium asset is integrated with defined interface boundaries, enabling operation and maintenance under DBOO without causing unnecessary disruption to brine circulation and reinjection.

Bypass is built in
The system includes a defined bypass path so brine handling can continue during:

- Maintenance activities
- Start-up/shutdown events
- Process upsets or excursions outside the operating envelope

What this means in practice (high level)

- **Defined interfaces:** Tie-in points, sampling points, and responsibilities are agreed up front.
- **Operational coordination:** Lithium Harvest operates the lithium asset under DBOO, coordinated with plant operations and HSE requirements.
- **Upsets are managed inside the lithium asset:** Procedures are designed to protect loop stability and reinjection requirements, with escalation through agreed channels.

Ops-friendly outcome

- The lithium asset behaves like an operated add-on with clear boundaries - not a new workload inside your control room.

Engineered for Variable Geothermal Brine

Geothermal brine isn't a lab feed. It varies by reservoir, plant operating conditions, scaling behavior, and season. That's why lithium recovery can't be treated as a plug-in box. It has to be engineered as an integrated system with a defined operating envelope.

DLE isn't a box - it's a system

- Performance depends on how pretreatment, lithium recovery, controls, and site interfaces work together.
- The operating envelope is built around real variability - not a single "representative" sample.

Water engineering first

- Our platform combines lithium recovery with industrial water treatment and separation expertise to handle geothermal brine conditions.
- Proprietary process design and controls are used to integrate the system into the plant through defined interface boundaries.

Why we chose adsorption-based DLE (as part of the system)

- Selected for operability in variable brines: Best-in-class adsorption capabilities, water-based desorption, manageable system complexity, and modular deployment fit.
- The adsorption step is engineered within a broader pretreatment + concentration + conversion steps - it's one component, not the whole solution.

Proven engineering approach

- Built on 20+ years of industrial water treatment and separation experience
- Designed around brine variability (operating envelope + controls philosophy)
- Modular deployment for site fit and staged scale-up
- Built from commercially proven unit operations and integration discipline
- DBOO means Lithium Harvest runs the lithium asset - not your team

Optional De-Risking

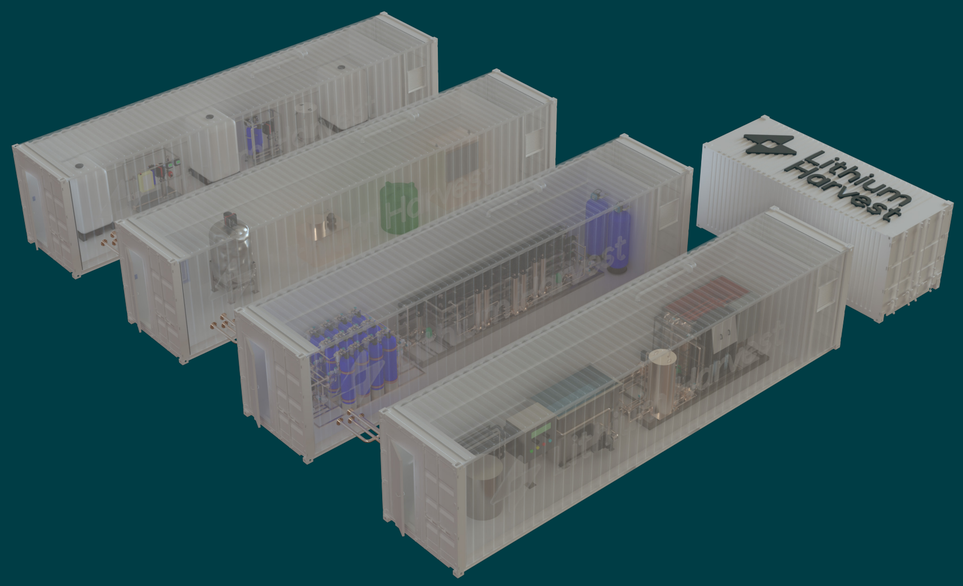
Validate on site. Model in the Digital Twin. Fewer surprises at start-up.

To ensure a seamless start-up, we provide a validation path that moves beyond lab-scale.

The Mobile Site-Validation Unit (SVU)
We bring the SVU to your site to run your geothermal brine on a scaled-down commercial train. This generates decision-grade data on recovery rates and reagent consumption under real-world variability.

The Digital Twin
Data from the SVU feeds into our Digital Twin to define the exact operating envelope. This allows us to simulate process upsets and chemistry swings before the full-scale plant is even built.

(Used when needed, based on data quality, variability, and project scale.)



What We Need to Assess Feasibility

- **Water composition data:** Full water analysis confirming lithium concentration, ionic composition, key impurities, and any available variability history.
- **Flow profile:** Typical flow, operating range, and stability over time.
- **Temperature and pressure:** Expected operating ranges (inlet temperature).
- **Reinjection context:** Reinjection constraints/specs and any known operating bottlenecks (high level).
- **Site context:** Preferred side stream tie-in point, footprint constraints, and available utilities.

Let’s Assess Integration Feasibility

Add a co-located lithium extraction asset with defined side stream interfaces and bypass capability - operated under DBOO so your team stays focused on generation and reinjection.

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Let’s Assess Integration Feasibility

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