Reliable Lithium Production

Engineering & Operations Guide

Lithium Harvest

No Operational Burden

Executive Summary

Integrate a lithium extraction asset into your existing infrastructure with zero disruption to your primary mission: moving and disposing of water.

What stays the same

Produced water handling remains the primary objective. The lithium asset is engineered as a "side-stream" integrated via defined interfaces. If the lithium plant goes offline, your water flow does not stop.

How integration works

- **Co-location:** We deploy modular plants at midstream hubs or Saltwater Disposal (SWD) sites where water already aggregates.
- **Bypass-first design:** A dedicated bypass path ensures that produced water handling continues during maintenance, start-up, or process upsets.
- **Black-box process approach:** This playbook focuses on interfaces and operability; internal process configuration remains proprietary and is defined during engineering.

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

Our goal is to minimize retrofit complexity. We tie into your existing system at the points of highest efficiency.

System boundaries

- **Inlet boundary:** Produced-water feed tie-in at the SWD / injection-disposal system - typically at the gun-barrel outlet or produced-water transfer header.
- **Outlet boundary:** Treated-water return tie-in back into the same SWD / injection-disposal system at or near the same gun-barrel / transfer header location, routed onward to disposal injection (SWD) or other operator-directed uses.
- **Bypass boundary:** Defined bypass path to protect continuity of produced-water handling.
- **Sampling boundaries:** Agreed sampling points for feed and return streams (and product as applicable).
- **Drain/waste boundary**
- **Footprint:** Modular deployment minimizes land use. A 20,000 bbl/d facility fits within roughly 1.4 acres, requiring no large civil works or evaporation ponds.

Water management outcomes (option set, not a promise)

Water composition, site requirements, and local regulations define the route for treated water. Options may include:

- **Reinjection/disposal** (base case in many basins)
- **Beneficial reuse** where composition and legislation allow it (site-dependent)

Operability & Continuity

The "over-the-fence" operating model.

We treat our facility as an industrial service provider on your site.

- **Standardized interfaces:** Tie-in points and responsibilities are locked during the FEED (Front-End Engineering Design) stage.
- **Operational coordination:** Lithium Harvest operates under strictly defined KPIs and coordinates daily with your site lead and HSE requirements.
- **Redundancy:** Our modular "train" approach means we can perform maintenance on one unit while others remain at full capacity.

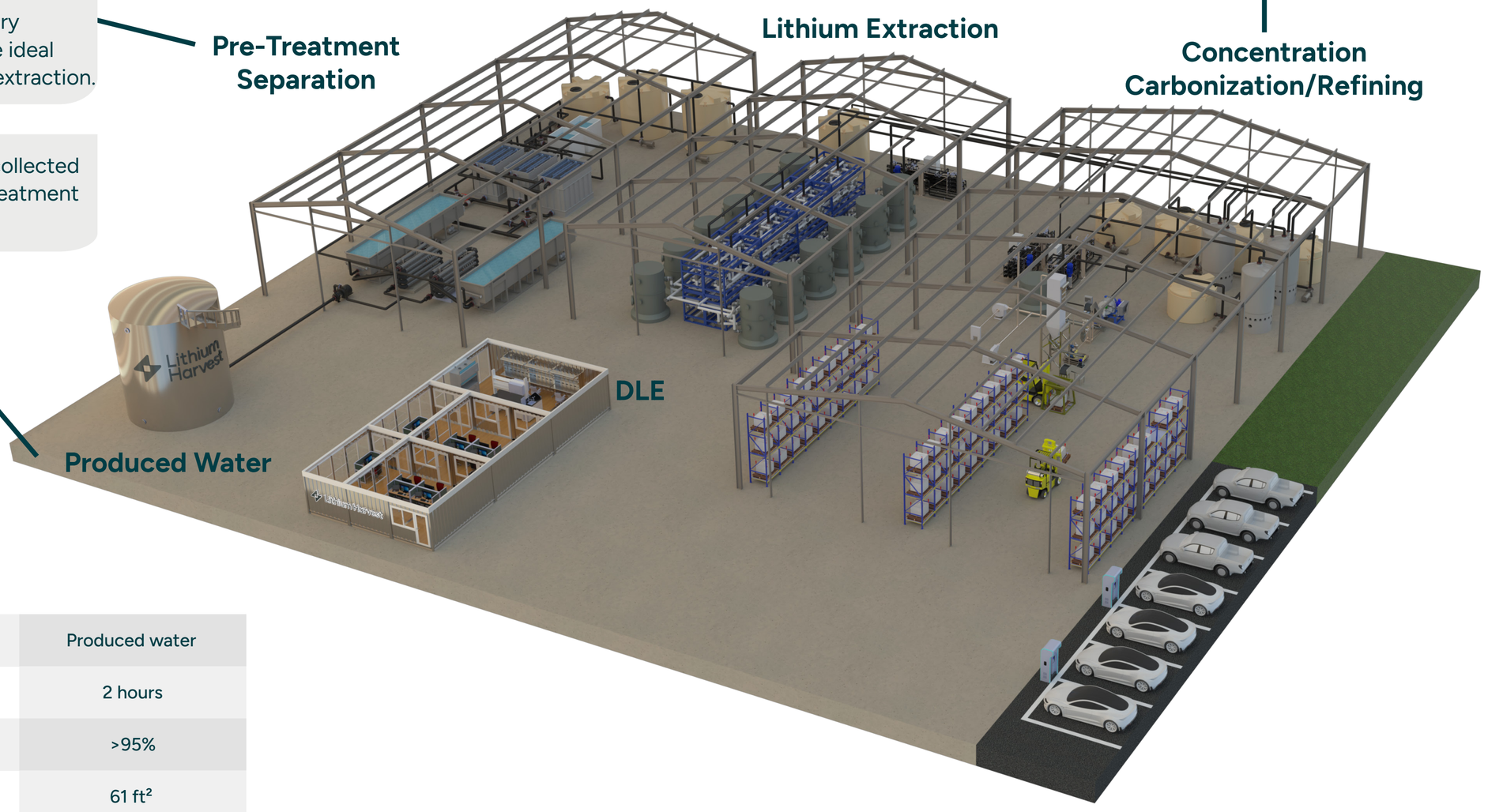
Process Overview - From Waste to Value

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: Produced water is collected and directed to our co-located treatment facility.



Lithium feedstock	Produced water
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
- Gas (Optional)

Engineered for Variable Produced Water

Produced water isn't a lab feed. It varies by basin, well, season, and operating conditions. That's why lithium extraction from produced water can't be treated as a plug-in box. It has to be engineered as an integrated system.

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 (solids, hydrocarbons, scaling risk, chemistry swings) - not a single "representative" sample.

Water engineering first

- Our platform combines lithium recovery with industrial water treatment and separation expertise to handle produced-water conditions.
- Proprietary process design and controls are used to integrate the system into existing produced-water infrastructure with 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 produced-water variability (operating envelope + controls philosophy).
- Modular deployment for staged scale-up and site fit - supported by a clear validation path when needed.
- Built from commercially proven unit operations and integration discipline.
- DBOO means Lithium Harvest runs the lithium asset - not your team.

Optional De-Risking

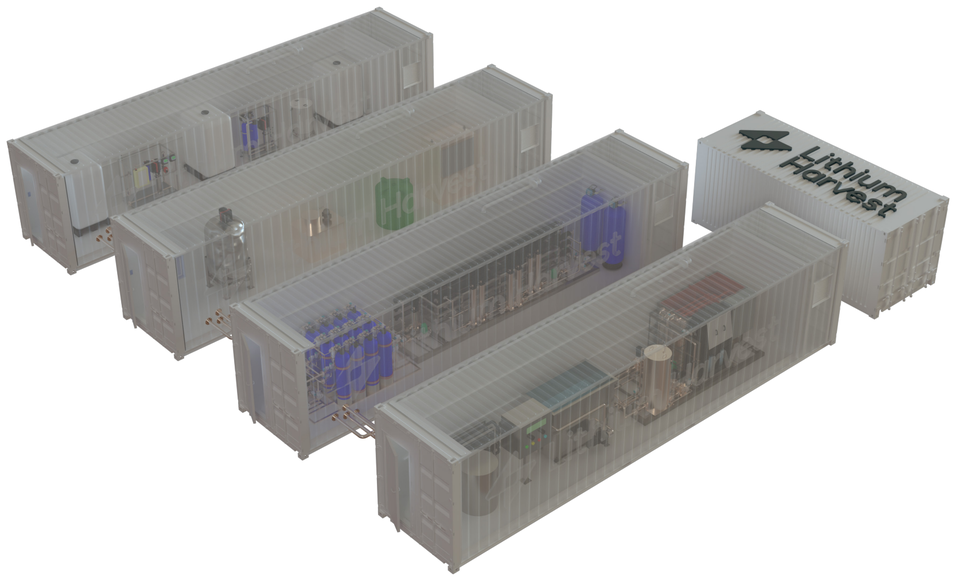
Validate on site. Model in the Digital Twin. Fewer surprises at start-up.

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 actual produced water 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, ion composition, key impurities, and any available variability history.
- **Flow data:** Typical volumes, ranges, and continuity (seasonal/operational swings).
- **Site context:** Preferred co-location point (midstream facility or disposal well), footprint constraints, and available utilities.
- **Current water handling:** Base-case disposal/reinjection route and any known constraints or bottlenecks.

Let’s Assess Integration Feasibility

Add a co-located lithium extraction asset with defined interfaces and a bypass path - operated under DBOO so your team stays focused on core water handling.

Headuarters
USA
2800 Post Oak Blvd., Suite 1910
TX 77056 Houston
+1 (346) 446-5728
sales@lithiumharvest.com

Technology Center
Denmark
Tankedraget 7
DK-9000 Aalborg
+45 3164 6400
sales@lithiumharvest.com

Let’s Assess Integration Feasibility

Scan QR
to learn more

Lithium Harvest