

BACKGROUND & OBJECTIVE

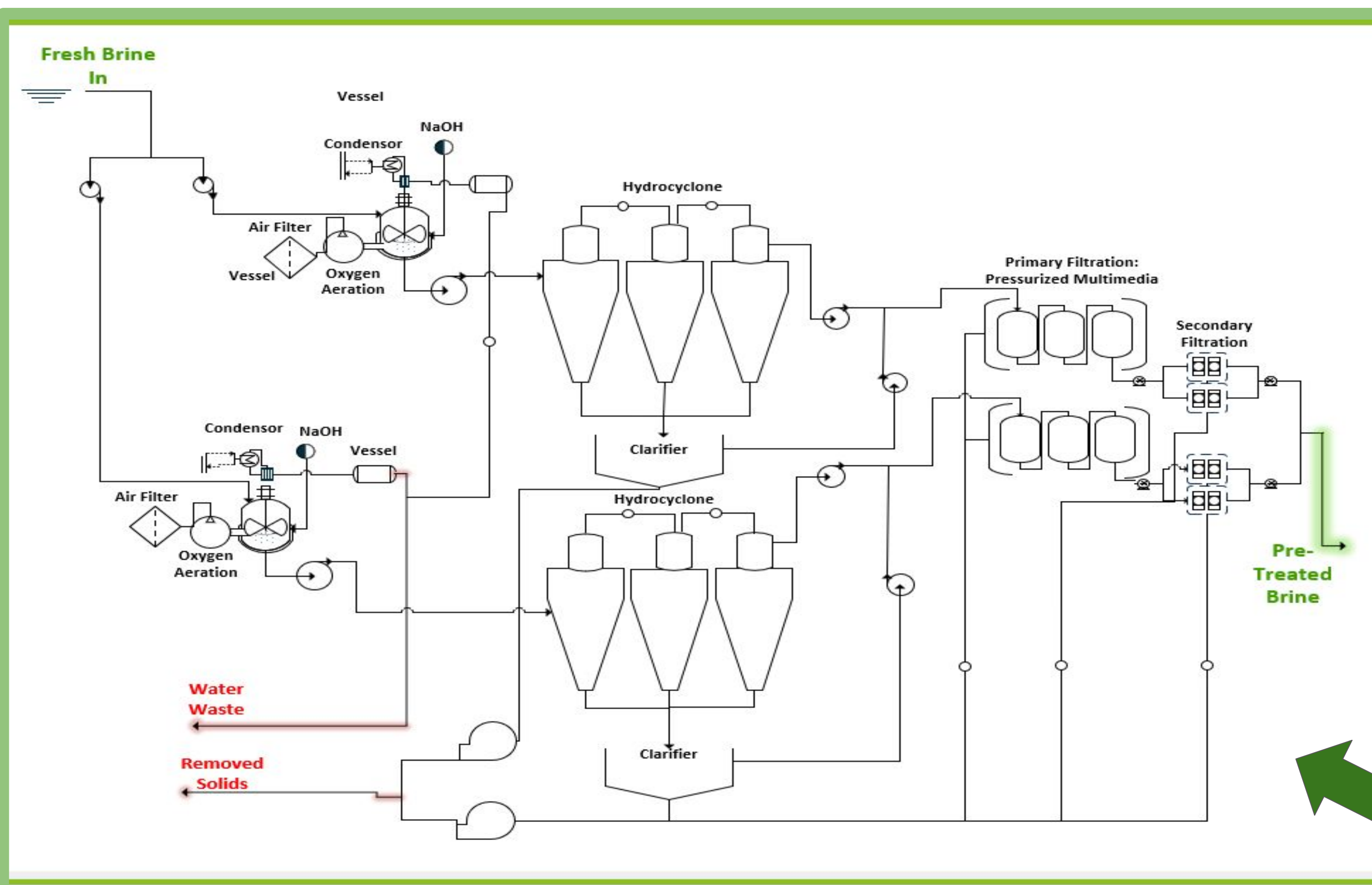
Objective Statement:

Establish an industrial scale lithium recovery process using a mixed-saltwater brine solution sourced from the Salton Sea in California.



=> Must be capable of producing 20,000 metric tons per year of solid lithium (LiOH or Li₂CO₃).

Pre-DLE: Brine Conditioning

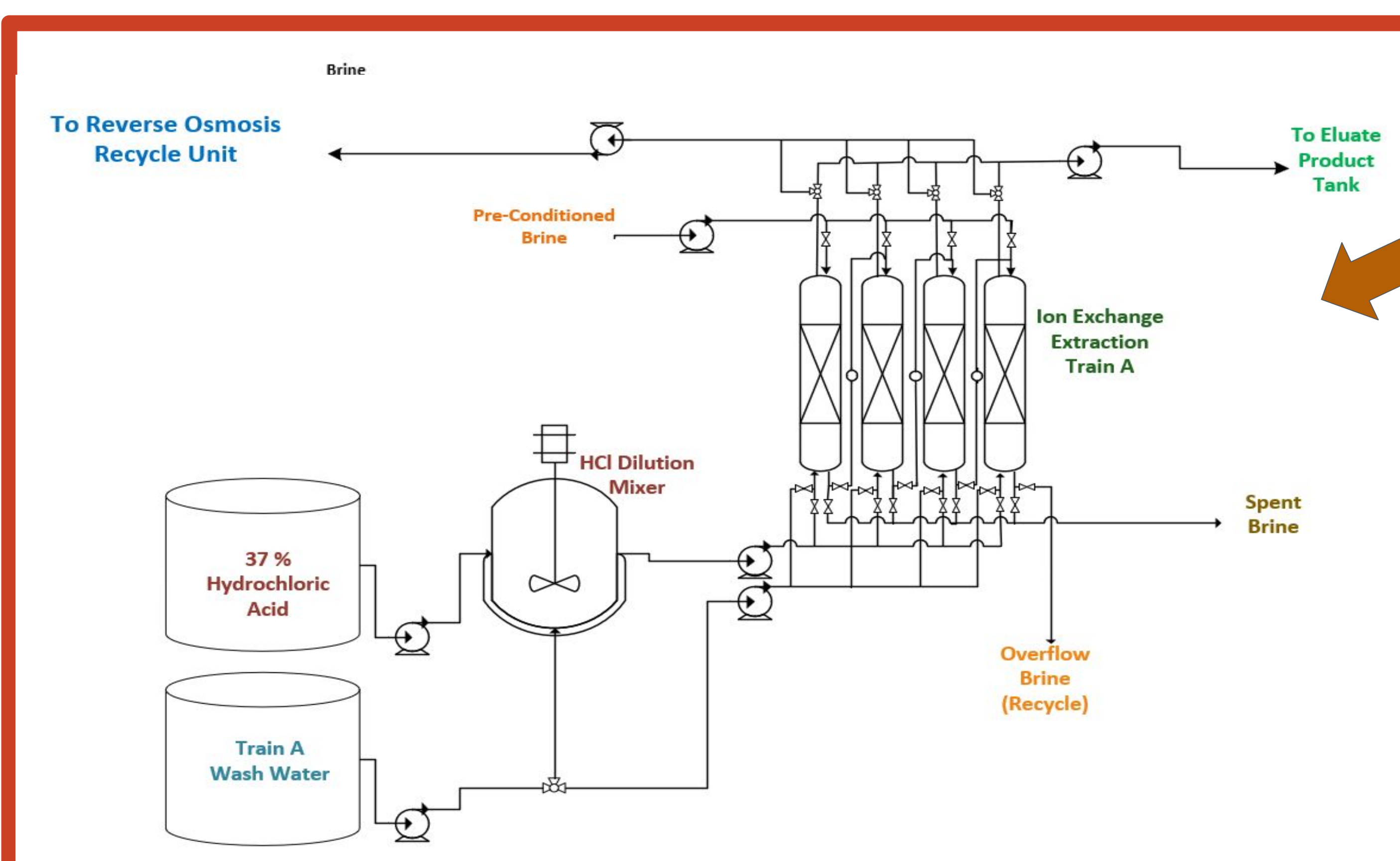


Flocculation: Precipitation of multivalent ions from brine.

Filtration: Removal of unwanted solids and contaminants.

Adjustment: Temperature/pH change.

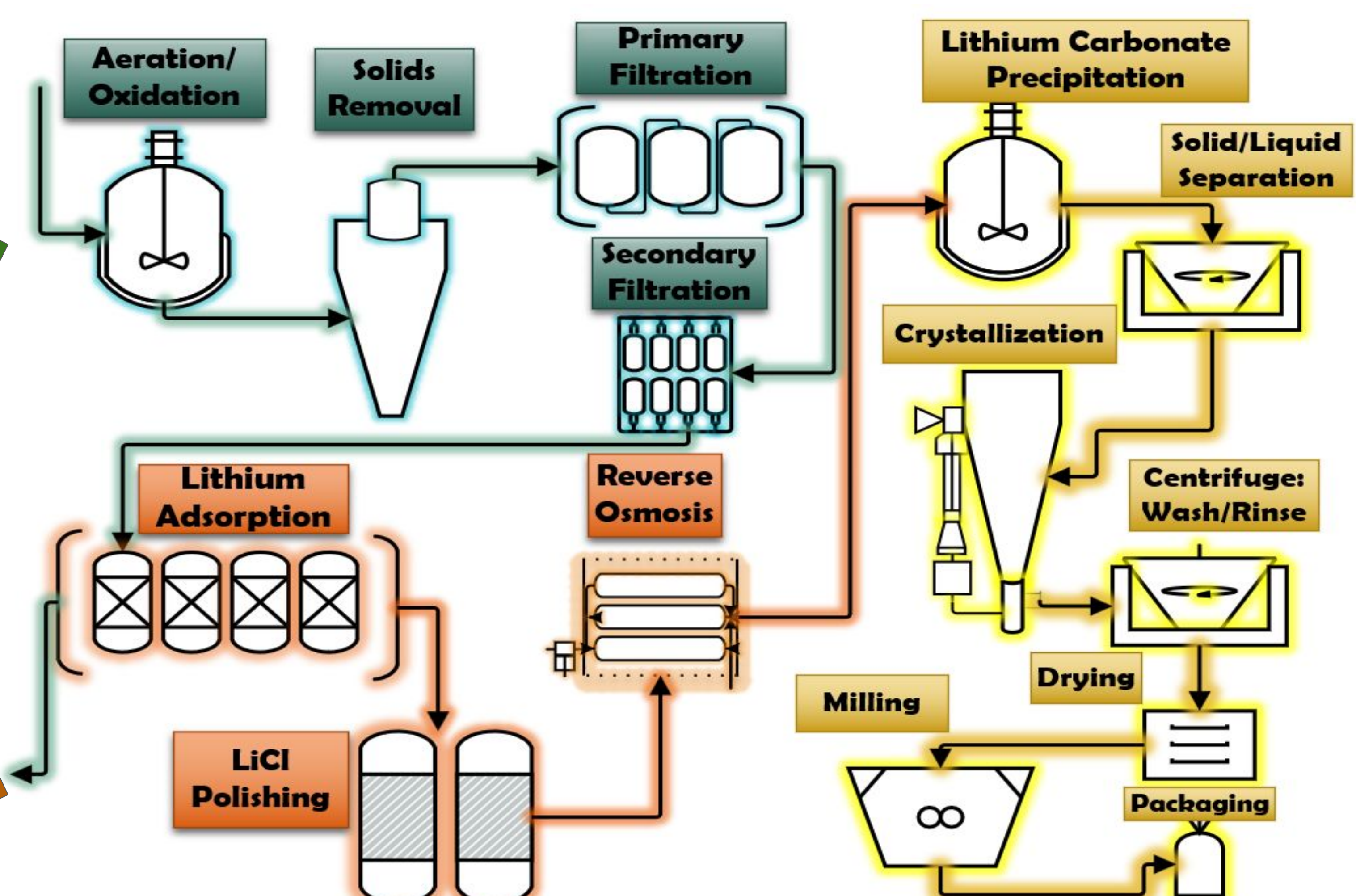
DLE: Lithium Adsorption



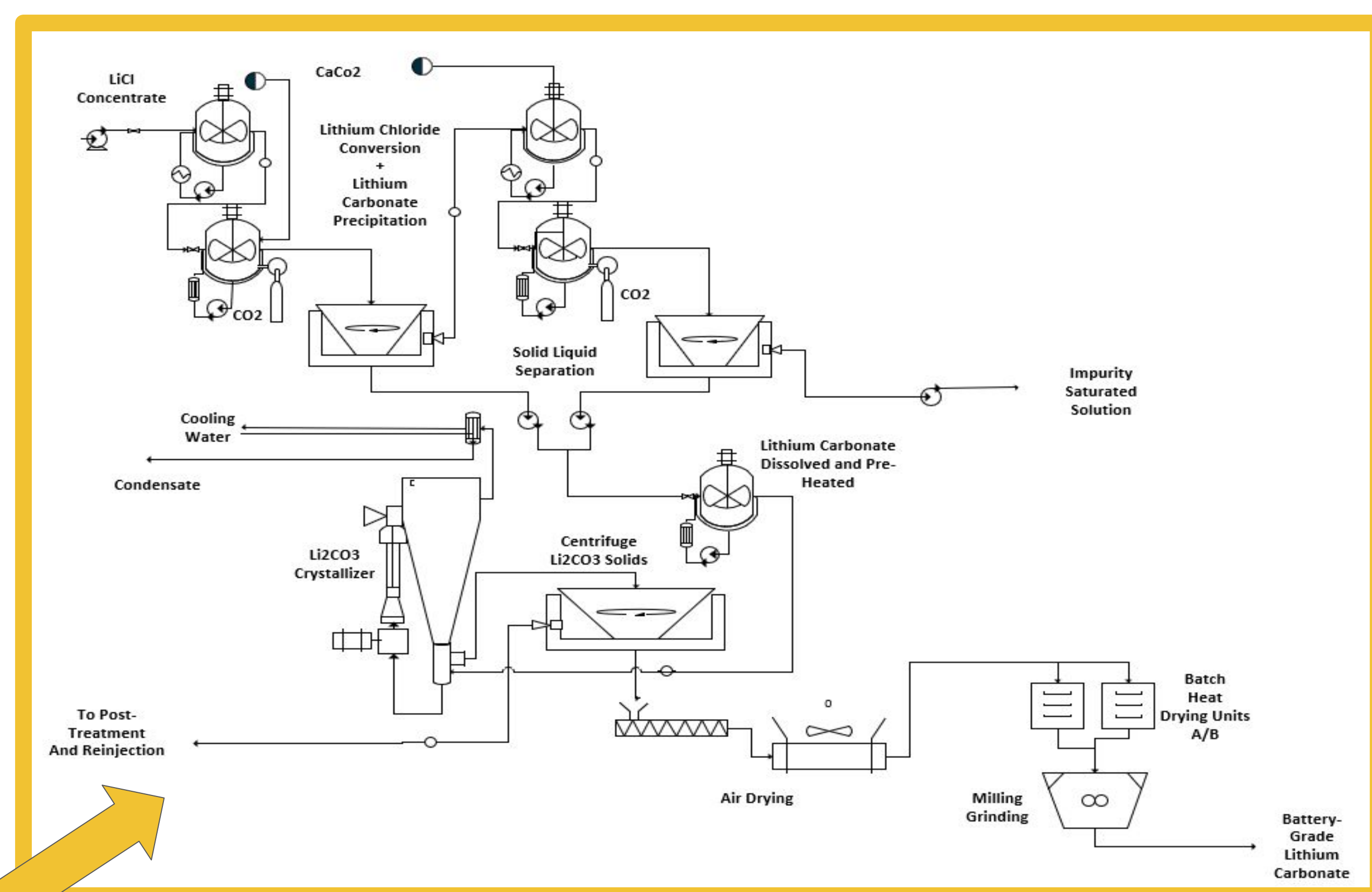
Lithium Adsorption: Highly lithium selective ion sieves for main separation process.

LiCl Polishing: Mixed bed ion exchange system to remove most of the remaining monovalent and divalent ions.

Reverse Osmosis: 3-stage reverse osmosis to concentrate lithium chloride solution.



Post-DLE: Conversion and Purification

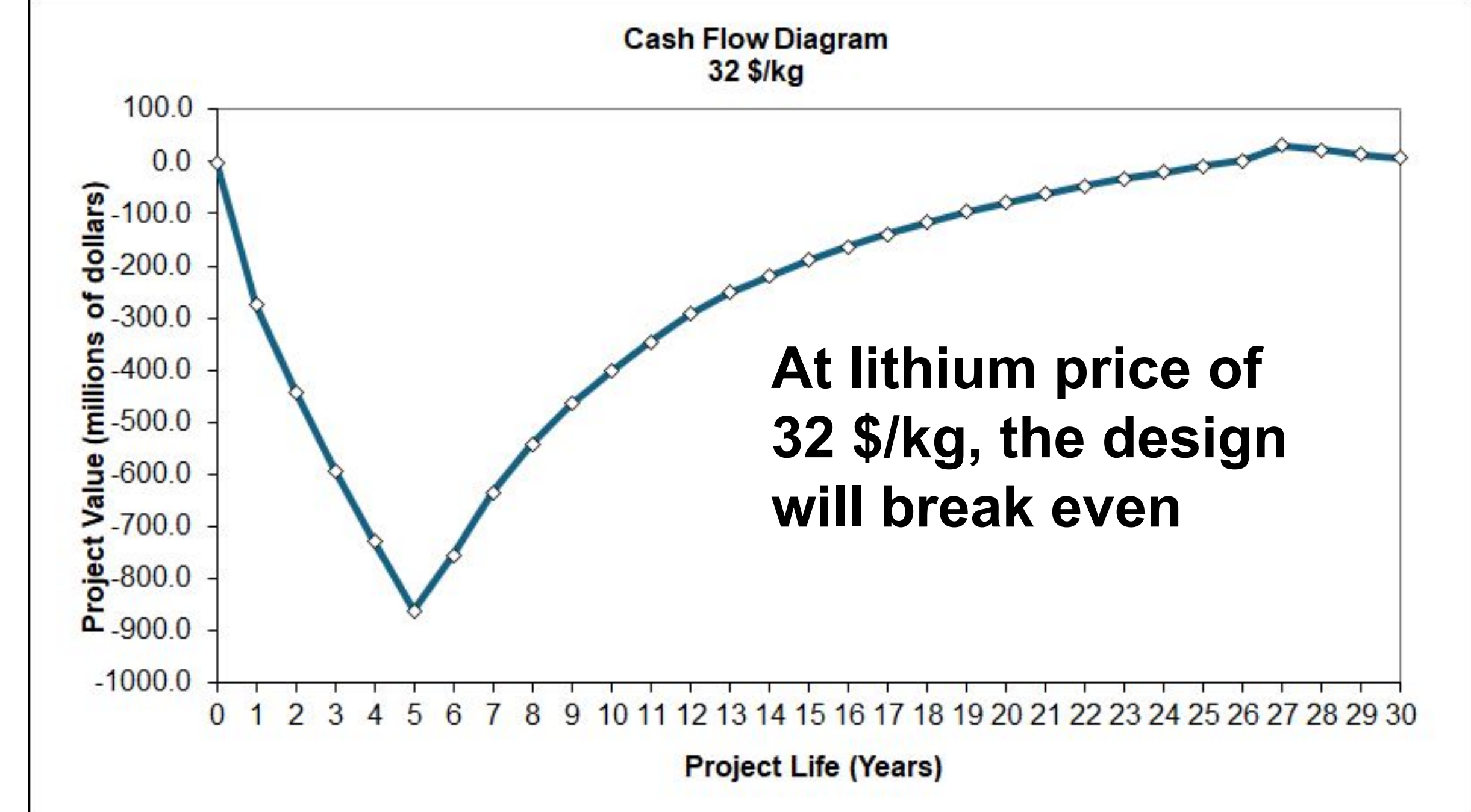
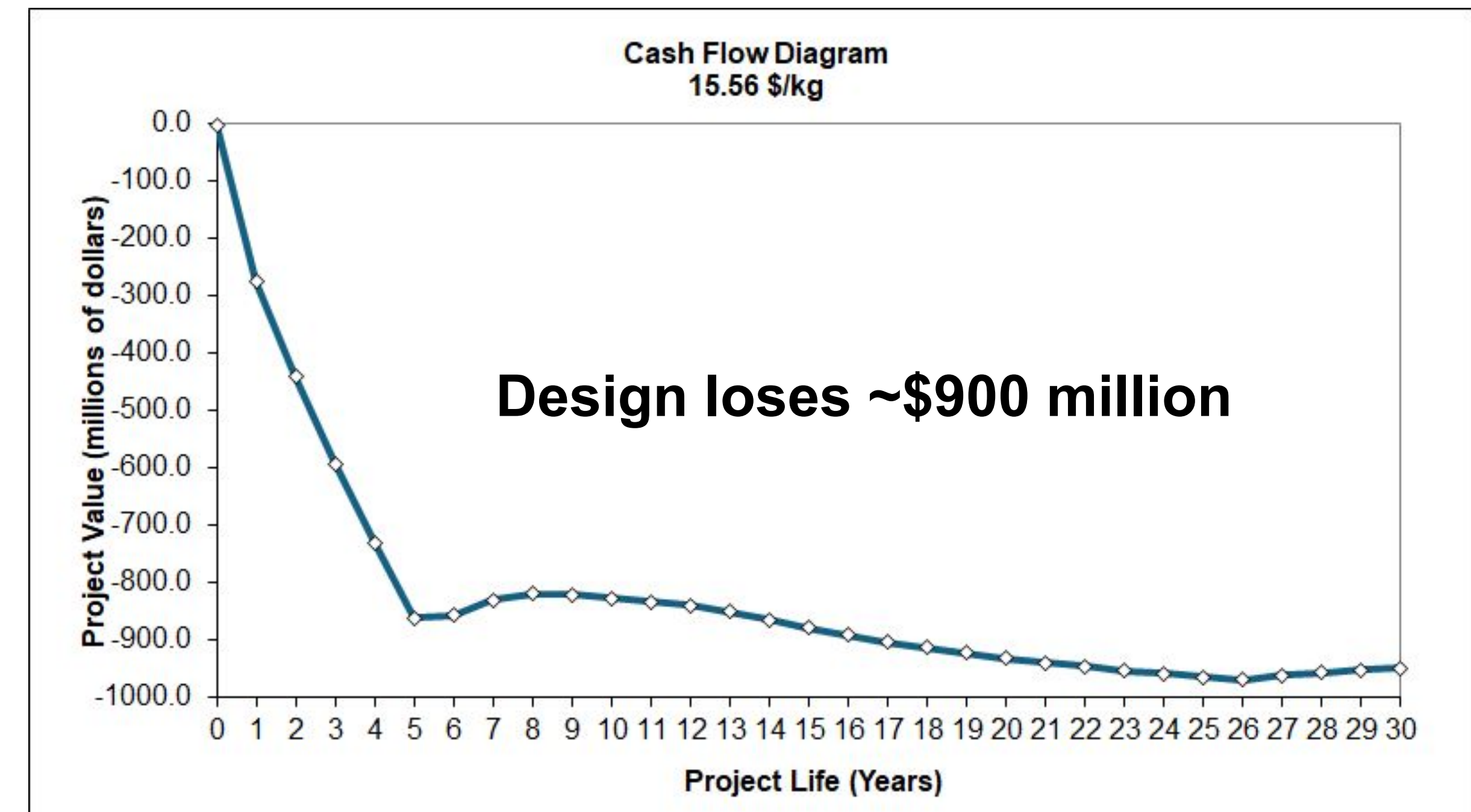


Precipitation: Convert concentrated LiCl to Li₂CO₃.

Crystallization: Redissolve and heat Li₂CO₃.

Milling: Grind Li₂CO₃ to <4 μm particle size.

Economic Analysis Results



CONCLUSIONS

- The lithium market has been experiencing a drastic decline over the past year.
- Process not profitable at current lithium value (~\$15/kg).
- Not profitable at current prices due to extremely large scale of the process, resulting in long construction time and initial investment requirement.
- Market would have to return to a stable state (~\$32/kg) to achieve break even within the target lifetime of the process. If prices rise to past levels (>45 \$/kg), the plant would generate large profits.
- The team recommends investors who can take high risks to invest in the lithium extraction project.