

Lithium Brine Projects: there is a resource, but is there a reserve?

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Jujuy, Argentina – April 7, 2016

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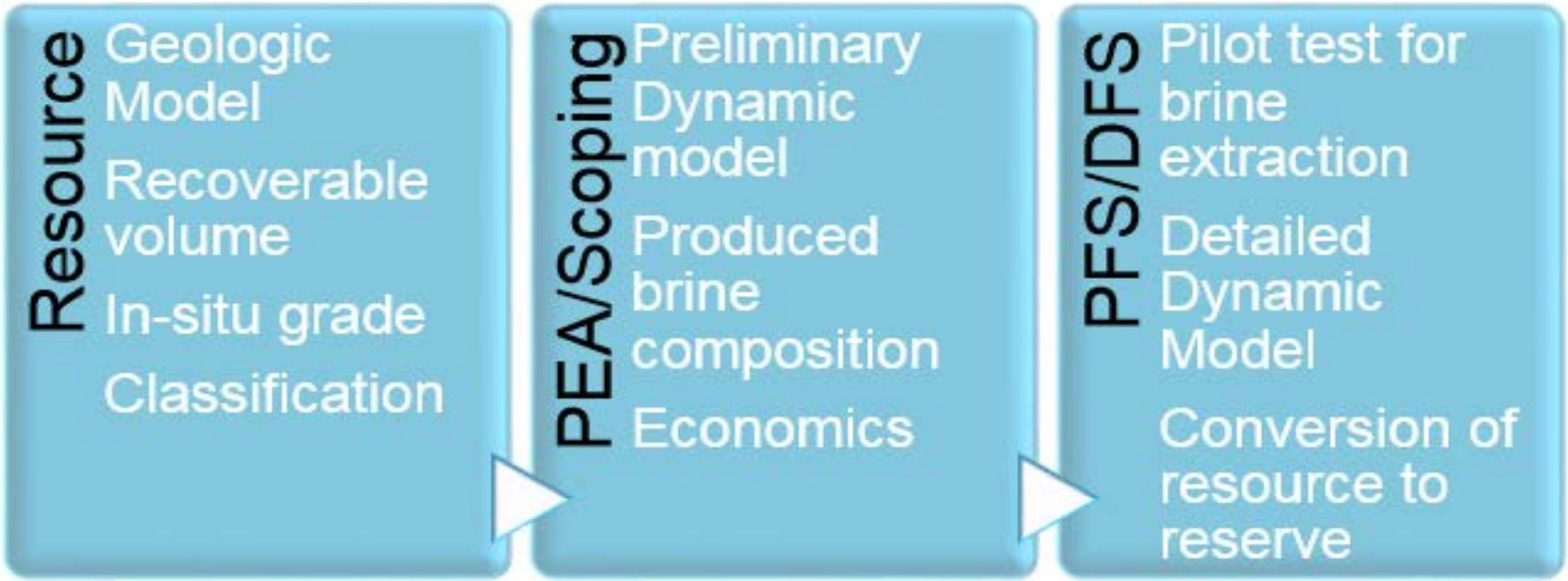
Lithium Brine Projects - Stages



Brine Resource Estimation

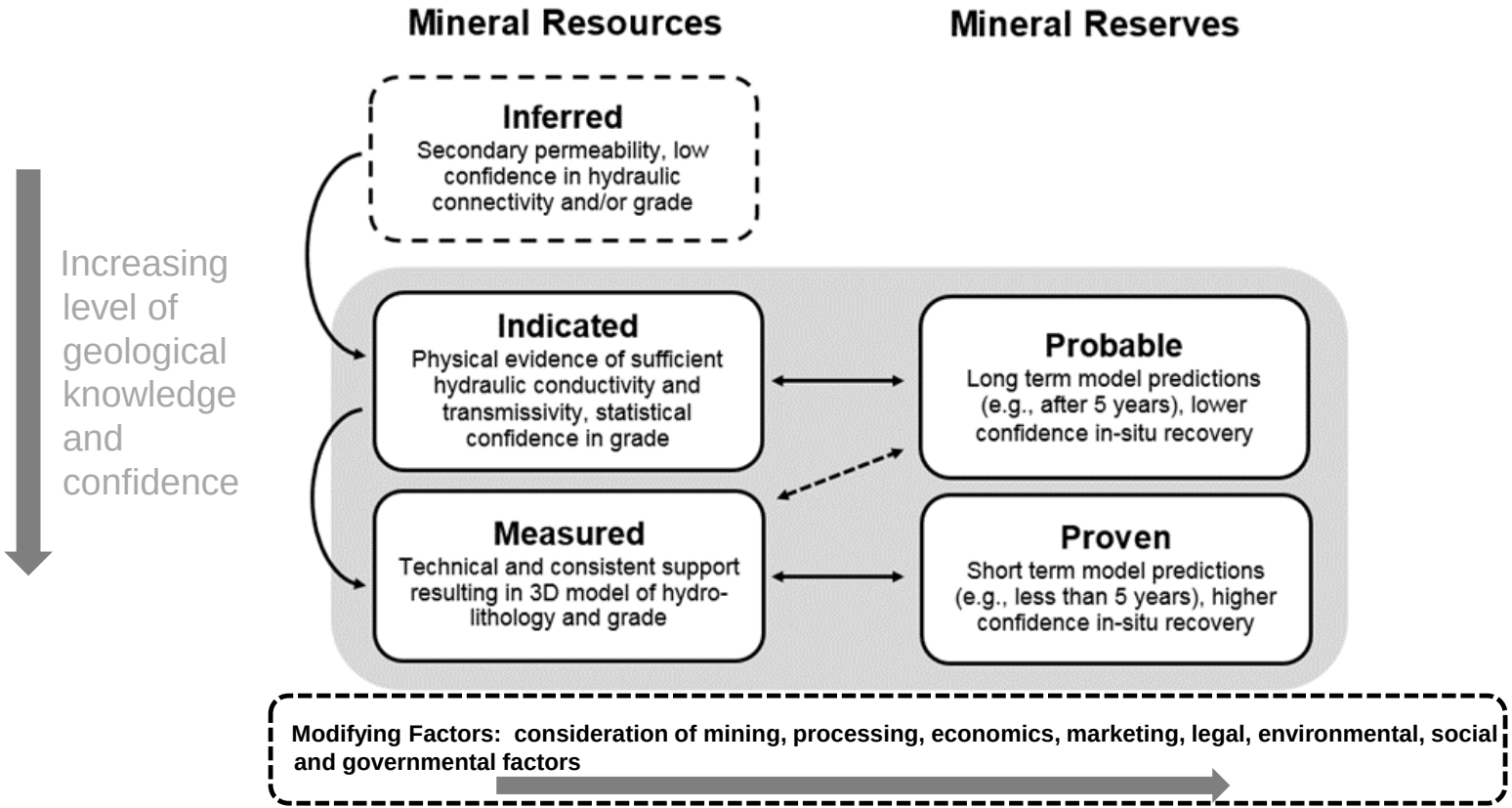
What is the challenge?

- Dynamic Resource - Brine moves…
- Resource Volume - Aquifer volume and specific yield
- Permeability governs rate of extraction
- Once the pump is on; the system is ON!
- Weather plays major role
- Sampling storage
- Spent brine disposal

CIM Definition of Mineral Reserve (May 20, 2014)

A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

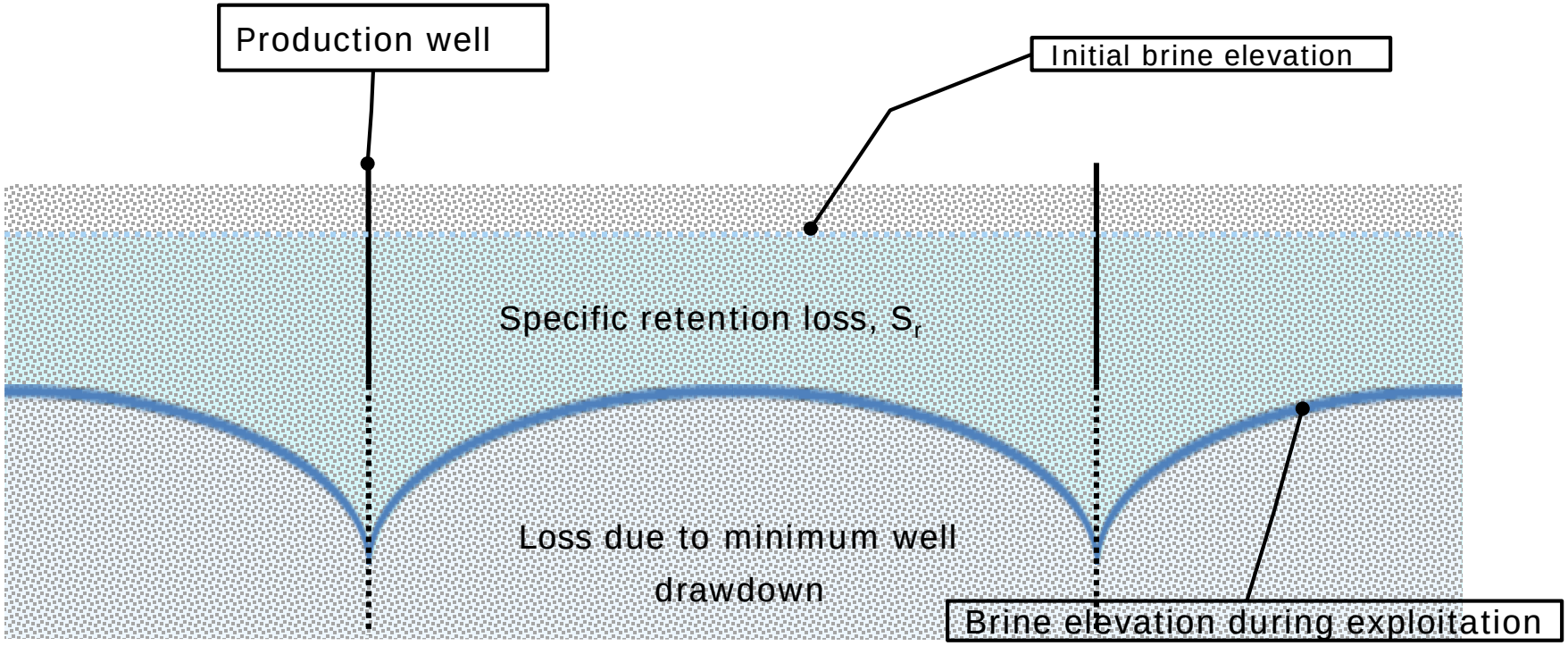
Resources and Reserves



Extractability

- Brine aquifer characteristics
  - Characteristic porosity
  - Specific yield
  - Transmissivity
  - Heterogeneity of stratigraphy
  - Grade distribution

Extractable reserve



Reserve base subject to an in-situ recovery factor

Extractable Reserve

- In-situ recover factor derived from QP judgement and calibrated dynamic model
- Immature vs. mature salars
- High P_t and low S_y hydrostratigraphic layer(s) may not be appropriate to include as potentially extractable resource

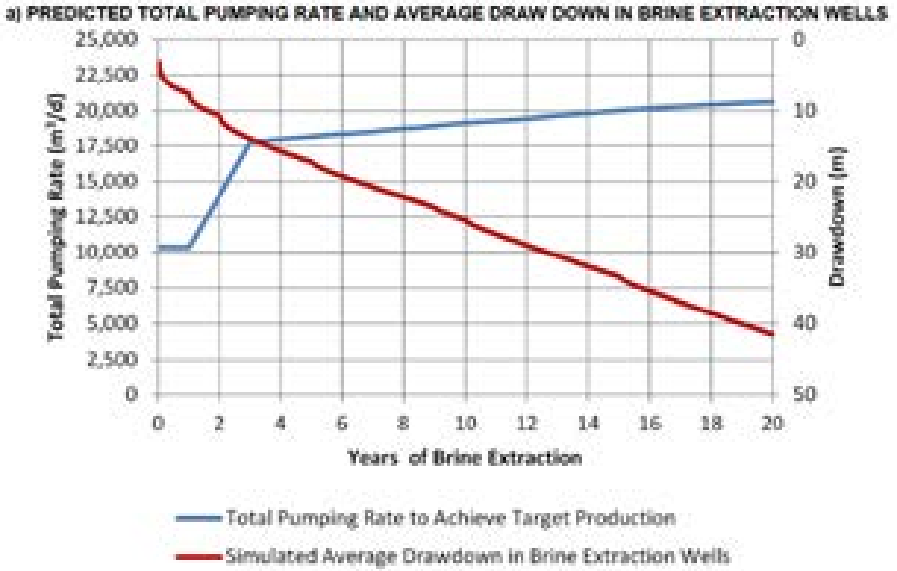
Numerical Groundwater Model for Brine Projects

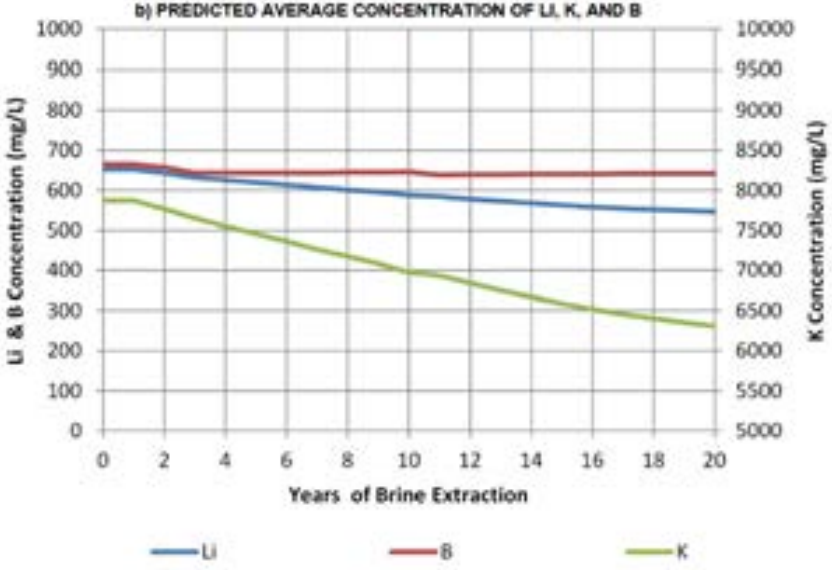
Numerical model is used for brine projects as “dynamic” resource model to support mineral reserve estimates.

Model predicts:

- Extracted brine volume over time
- Brine chemistry in time

Numerical GW Model Applications





Production schedule definition

- Defines extracted brine volume and grade to meet production expectations
- Defines number of production wells, individual pumping rates, and well locations during exploitation
- Defines CapEx and OpEx during life of mine

Production schedule should

- Account for process losses associated with LCE and/or KCl production
- Incorporate concurrent fresh water extraction from the salar
- Include process residuals (e.g., spent brine) that remain or are re-introduced to the salar

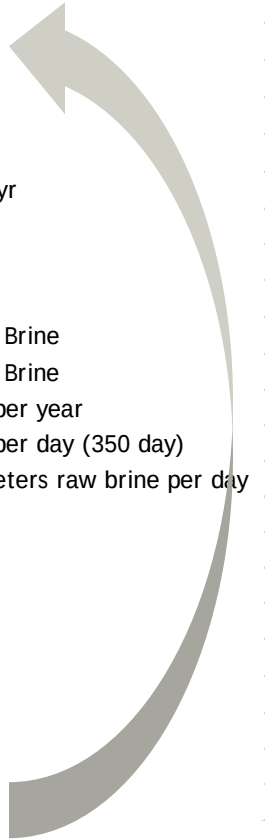
Cut-Off Grade

The lowest grade of mineralized material considered economic; used in the calculation of the ore reserves in a given deposit.

- Variables:
  - In-Situ Losses
  - Ex-Situ Losses
  - Product Pricing
  - OPEX

Cut-Off Grade - Example

Target Sales Price	$	8,000	$/t LCE
Process Cost	$	2,200	$/t LCE
Fixed tail		100	mg/L
Prod Volume		40,000	t LCE / yr
LCE - Li conv		5.28	
Prod Volume		7,575,758	kg Li/yr
Average Li Conc		500	mg Li/L Brine
Average Li Conc		0.0005	kg Li /L Brine
Brine to achieve target		15,151,515,152	L brine per year
		43,290,043	L brine per day (350 day)
Max Plant Throughput		43,290	cubic meters raw brine per day
Annual Prod Cost	$	88,000,000	
Prod cost/L brine		0.005808	
Breakeven Grade Li		**238**	mg/L
Recovery		58%	
Produced LCE		11,000	t/yr
Opex	$	8,000	$/t LCE



Conclusions

Your mineral reserve estimate should…

- Account for in-situ recovery factors for raw brine extraction from the Salar
- Include ex-situ recovery factors which must be offset by additional raw brine extraction
- Be limited to measured and indicated mineral resource classifications
- Address spent brine handling and/or process water supply which may impact predicted mine life
- Remain economic