Standard Lithium Announces Positive Preliminary Economic Assessment and Upgrading of Mineral Resource at Its Southern Arkansas Lithium Brine Project

written by Raj Shah | June 19, 2019



June 19, 2019 (Source) – **Standard Lithium Ltd.** ("Standard Lithium" or the "Company") (TSXV: SLL) (OTCQX: STLHF) (FRA: S5L), is pleased to announce the results of a Preliminary Economic Assessment (PEA) of its 150,000 acre project in the south-central region of Arkansas, USA (the "Property"). The PEA considers the production of battery-quality lithium carbonate through a phased build-out to a total 20,900 tonnes per annum (tpa) from the contemplated joint venture with Lanxess Corp. (see press release dated November 12, 2018) at their three-operating bromine-processing plants. The PEA also includes the reclassification of the existing mineral resource to an Indicated category. The PEA was prepared by Advisian, the consulting arm of WorleyParsons Canada Services Ltd (Worley), a world-leading integrated engineering firm with extensive experience in the design and construction of chemical plants and lithium brine processing projects around the globe.

Key Points:

- Pre-tax US$1.3 Billion NPV at 8% discount rate and IRR of 42%;
  Total CAPEX estimate of US$437 Million including 25% contingency of both direct and indirect capital costs, completed in accordance with American Association of Cost Engineers (AACE) International Class 5 standard for estimates in process industries;
- 25 year mine-life producing 20,900 tpa battery-quality lithium carbonate when all three plants are operational (production ramped up to full capacity over 5 years);
- Non-optimised reagent cost per tonne lithium carbonate of US$3,107
- All-in operating costs, including all direct and indirect costs, sustaining capital, insurance and mine-closure costs of US$4,319 per tonne of lithium carbonate; and
- Lanxess resource upgraded to 3,140,000 tonnes Lithium Carbonate Equivalent (LCE) at the Indicated Category.

Dr. Andy Robinson, President and COO of Standard Lithium commented *"We are delighted that we have been able, through close partnerships and access to large amounts of data, to bring our Lanxess project to the stage of successful completion of the PEA in such a short period of time. We were able to provide to Worley a huge amount of process testing and actual operational data from the current brine-processing plants in southern Arkansas, and as a result, we feel that we have produced a realistic view of the potential there, as well as a picture of the robustness of the project. We are progressing the deployment of the demonstration plant, and are scheduled to have it deployed to the project site in southern Arkansas in Q3 of this year. Real-world process optimisation from the demonstration plant, combined with the advanced nature of this PEA, mean that we are well positioned to release a robust feasibility study in early 2020."*

PEA Highlights:

	Units	Values
Production	tpa	20,900[1]
Plant Operation	years	25[2]
Total Capital Cost (CAPEX)	US$	437,162,000[3]
Operating Cost (OPEX)	US$/yr	90,259,000[4]
Average Selling Price	US$/t	13,550[5]
Annual Revenue	US$	283,195,000
Discount Rate	%	8
Net Present Value (NPV) Pre-Tax	US$	1,304,766,000
Net Present Value (NPV) Post-Tax	US$	989,432,000
Internal Rate of Return (IRR) Pre-Tax	%	41.8
Internal Rate of Return (IRR) Post-Tax	%	36.0

Notes:
All model outputs are expressed on a 100% project ownership basis
[1] Total production, using existing brine supply rates at the completion of Phase 3
[2] Plant operation commences upon completion of Phase 1
[3] Includes 25% contingency of both direct and indirect capital costs
[4] Includes all operating expenditures, including sustaining capital and allowance for mine closure
[5] Selling prices ranging between US$10,840-16,260/tonne were modelled as part of sensitivity analysis

Capital Costs
The project is envisaged to be implemented in three stages, corresponding with build-out at the existing brine processing facilities. At full build-out, with estimated production of

20,900 tpa of lithium carbonate, the direct capital costs are estimated at US$204 Million, with indirect costs of US$146 Million. A contingency of 25% was applied to both direct and indirect costs.

Project Phase	Item	Direct Cost US$	Indirect Cost US$	Contingency US$	CAPEX US$
Phase 1 South Plant	South Lithium Extraction Plant, Train 1 Carbonate Plant and Ancillary Infrastructure	$79,959,000	$56,978,000	$34,234,000	$171,171,000
Phase 2 West Plant	West Lithium Extraction Plant, Train 2 Carbonate Plant and Ancillary Infrastructure	$74,355,000	$54,587,000	$32,236,000	$161,178,000
Phase 3 Central Plant	Central Lithium Extraction Plant, Train 3 Carbonate Plant and Ancillary Infrastructure	$49,812,000	$34,038,000	$20,963,000	$104,813,000
TOTAL		**$204,126,000**	**$145,603,000**	**$87,433,000**	**$437,162,000**

Operating Costs

The operating cost estimate included both direct costs and indirect costs, as well as sustaining capital and allowances for mine closure. The majority of the operating cost is based on reagent usage required to extract the lithium from the tailbrine, as well as conversion to lithium carbonate. Out of

this, the greatest amount is related to acid and base consumption (hydrochloric acid and caustic soda), and was estimated using information from the mini-pilot studies completed to date; it should be noted that optimisation of reagent usage during the mini-pilot studies was not conducted, and hence, it can be reasonably assumed that future reagent consumption can be optimised. As such, the estimates provided are considered to be at the upper end of likely future costs. One of the key assessments that will be made during operation of the demonstration plant will be studying reagent optimisation and acid/base recovery.

Resource Assessment

The resource present in the Smackover Formation below the Lanxess property was reclassified based on completion of additional brine sampling/geochemistry and advances in the lithium recovery process development work. Using a cut-off criteria of 100 mg/L, the Lanxess lithium brine resource estimate is classified as 'Indicated' according to the CIM definition standards. The total Indicated Lanxess lithium brine resource is estimated at 590,000 tonnes of elemental lithium, or 3,140,000 tonnes LCE; see below for more detail.

South Arkansas Lithium Brine Project Indicated Resource Statement

Parameter	South Unit	Central Unit	West Unit	**Total**
Aquifer Volume (km^3)	5.83	8.29	16.31	30.43
Brine Volume (km^3)	0.689	0.995	1.84	3.52

Average Li concentration Milligrams per litre (mg/L)	168 mg/L			
Average Porosity	11.8 %	12.0 %	11.2 %	11.6 %
Total Li resource (as metal) metric tonnes (see notes [4] & [5] below)	116,000	167,000	308,000	590,000
Total LCE resource (metric tonnes) (see notes [4] & [5] below)	615,000	889,000	1,639,000	**3,140,000**

Notes:

[1] Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

[2] Numbers may not add up due to rounding.

[3] The resource estimate was completed and reported using a cut-off of 100 mg/L lithium.

[4] The resource estimate was developed and classified in accordance with guidelines established by the Canadian Institute of Mining and Metallurgy. The associated Technical Report was completed in accordance with the Canadian Securities Administration's National Instrument 43-101 and all associated documents and amendments. As per these guidelines, the resource was estimated in terms of metallic (or elemental) lithium. The Qualified Person for the Mineral Resource estimate is Roy Eccles, P. Geol.

[5] In order to describe the resource in terms of 'industry standard' lithium carbonate equivalent, a conversion factor of 5.323 was used to convert elemental lithium to LCE.

Lithium Pricing and Production

A detailed future pricing study for lithium chemicals was not completed for this PEA. The average price used for future sales of battery-quality lithium carbonate was developed by calculating the three-year rolling average from USGS-compiled sales figures. This future average sales price of US$13,550/tonne is consistent with those used for publicly-released economic assessments of other lithium brine projects in the previous 12 months. Future selling prices ranging between US$10,840 to US$16,260/tonne were modelled as part of a sensitivity analysis exercise.

The total production of 20,900 tpa lithium carbonate is based on recovery of lithium from the tail-brine stream already being produced at the three operational brine processing facilities in southern Arkansas. It does not take into account possible future increases in pumping volumes at the plants; possible optimisation by using selected brine supply wells to increase lithium concentrations in the tail-brine stream; nor possible expansion to include brine streams from other brine leases that the Company has access to in the region (e.g. the Company's Tetra lithium-brine property).

Processing

The PEA is based on a flowsheet that contemplates use of the lithium extraction technology that has been tested by the Company through independent bench-scale and mini-pilot stage testing, and will be tested further in the Company's Demonstration plant, scheduled for delivery to the South Plant location in Q3 of 2019. The conversion of the resulting lithium chloride solution to a final battery quality lithium carbonate product is based on existing technology as used commercially at several facilities.

Quality Assurance

The PEA was completed by Worley, with Stanislaw Kotowski P.Eng. as the lead author. Roy Eccles P. Geol. of APEX Geoscience Ltd. was the QP responsible for the reclassified mineral resource estimate. Stanislaw Kotowski P.Eng., is a qualified person as defined by NI 43-101, and has supervised and approved the preparation of the scientific and technical information that forms the basis for this news release. Mr. Kotowski is independent of the Company. A National Instrument 43-101 report is required to be filed, in conjunction with the disclosure of the PEA in this news release, within 45 days.

About Standard Lithium Ltd.

Standard Lithium (TSXV: SLL) is a specialty chemical company focused on unlocking the value of existing large-scale US based lithium-brine resources. The Company believes new lithium production can be brought on stream rapidly by minimizing project risks at selection stage (resource, political, geographic, regulatory and permitting), and by leveraging advances in lithium extraction technologies and processes. The Company's flagship project is located in southern Arkansas, where it is engaged in the testing and proving of the commercial viability of lithium extraction from over 150,000 acres of permitted brine operations utilizing the Company's proprietary selective extraction technology. The Company is also pursuing the resource development of over 30,000 acres of separate brine leases located in southwestern Arkansas and approximately 45,000 acres of mineral leases located in the Mojave Desert in San Bernardino County, California.

Standard Lithium is listed on the TSX Venture Exchange under the trading symbol "SLL"; quoted on the OTC – Nasdaq Intl Designation under the symbol "STLHF"; and on the Frankfurt Stock Exchange under the symbol "S5L". Please visit the Company's website at www.standardlithium.com.

On behalf of the Board,

Standard Lithium Ltd.
Robert Mintak, CEO & Director

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