

# Argentina Lithium & Energy – Probing the Depths

One of the paradoxes of recent times has been the “talking down” of brine lake Lithium deposits (salares) as being in some way “too difficult” or too “long term”. Having said that though two of the most high flying stories of recent times, Orocobre and Lithium Americas are both salar-based and there has been a staking boom in the Argentine part of the Lithium Triangle that makes California in the 1850s pale into insignificance. Explorers, quite literally, cannot get enough of Argentine lithium territory.

The caution relating to salares exploitation is powered by the mishaps that befell Orocobre and Rincon. However, in both these cases the lessons learnt will mean that others will have the benefit of their difficult experiences. The argument that there is a longer lead time for salar development (due to the need to kickstart the evaporation process) does not hold much water (pardon the bad pun) due to the much longer (and more expensive) drilling and resource estimation phase at a hardrock deposit and the much higher development costs at underground mines.

## **The Background Music**

After nearly a decade and a half of irregular iconoclastic governments in Argentina ruled most recently by the dynasts of the Kirchner family and before that the Duhalde regime the country has returned to a certain orthodoxy with the election of Mauricio Macri as President in the last quarter of 2016. While not reinserting Argentina directly into the good books of mining investors it has certainly made thinking about the possibilities not being grounds for insanity. Amongst the measures taken so far that have enhanced the perspective for miners are:

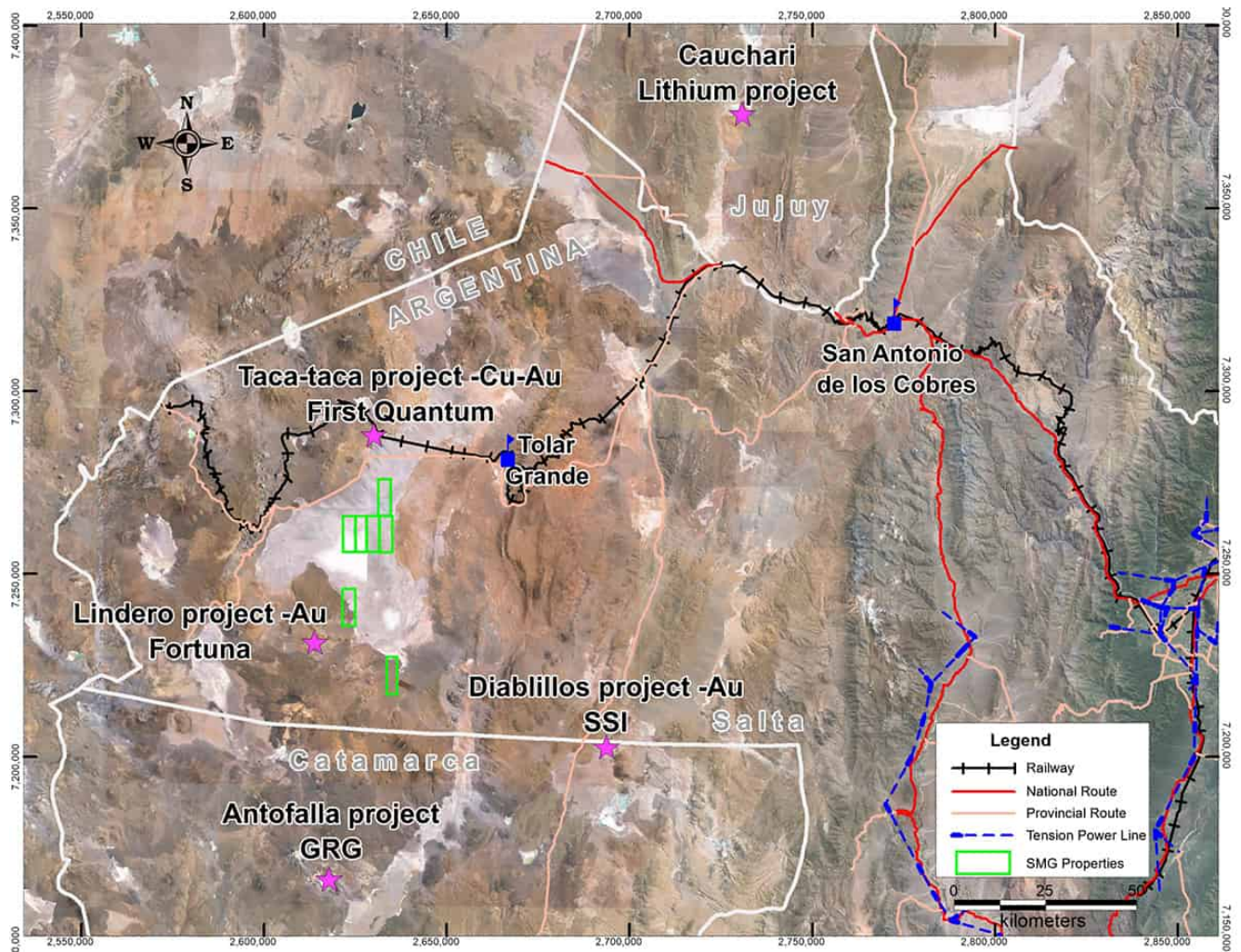
- Lifted currency controls – devalued Peso may result in lower costs for project development
- Eliminated export taxes on concentrates and gold/silver doré
- Some import restrictions lifted – may allow better sourcing of equipment

These changes have removed the major bugbears of foreign miners operating in the country. This reopening has coincided with the Lithium boom. There is a good case to be made that the relative lack of salares moving to production was due to the double negatives of the low lithium price between 2011 and 2016 and the death throes of the Kirchner regime making Argentina an unattractive place to advance projects.

### **The Prime Asset**

It is probably evident to those who know the Grosso group that it should be so well-positioned here. Argentina Lithium & Energy Corp. (TSXV: LIT | OTCQX: PNXLF) has the option to earn a 100% interest in the Arizaro Lithium Brine Project. The terms of the option agreement include \$6mn in staged payments and \$4.2mn in expenditures over a four-year period. Additionally, the company must issue 2.5mn common shares with certain resale restrictions.

The territory optioned covers 20,500 hectares in the central core of the Arizaro Salar, the largest in Argentina and third largest in the “Lithium Triangle”. The whole salar covers an area of 1600 km<sup>2</sup> within a watershed of 6000 km<sup>2</sup> and is located in the Andean province of Salta.



However, like many other salares in Argentina it has a portion of the pie rather than the whole pie. Other players with parts of the Salar de Arizaro are Lithium X, Eramet, Sentient and REMSA (an entity of Salta's government).

Volcanic and associated hydrothermal activity is believed to be the main source of lithium and other solutes to the basin. This is verified by the deposits of travertine and occurrences of ulexite that have been found, as well as the presence of lithium bearing clay (hectorite), and lithium mica (lepidolite), in the surrounding areas of the basin. The generation of salt deposits has occurred in stages over time; early-deposited halite and gypsum layers that have been deformed by Andean tectonic activity are found on the eastern side of the salar. The rugged, lunar landscape nature of the salar's surface can be seen below.



Very little historic exploration work has been done on the Arizaro Salar, however the central area is interpreted to have the geologic conditions and thickness to be the most prospective for quality brine resources. Historical sampling on the western margins of the Salar de Arizaro show elevated lithium values near surface contained within a classic halite dominant salar, much like nearby Rincon, Salar del Hombre Muerto and Atacama projects, all of which host advanced or producing lithium brine operations. This salar has a prevalence of halite to the west and gypsum to the east. These evaporites are covered by surficial deposits along the eastern margin of the salar.

The Arizaro salar benefits from good infrastructure in the Puna region, and is set to benefit from further development of adjacent large-scale mining projects, including First Quantum's Taca-Taca copper project and Fortuna Silver's Lindero gold project. Salar de Arizaro is traversed by a

highway and railroad that connect the area to the Chile port of Anotfagasta some 450kms west and east to Pocitos on the main Argentine rail network, where natural gas and an industrial park are found.

The development of brine projects on some other salars in the region has been hindered by a lack of fresh water for processing. At Arizaro, there is a known water recharge area, and the Company has made securing a water source a key component of the exploration program in order to prepare for a feasible mining project.

## **Exploration**

In association with work on the Taca Taca project, holes of approximately 100 metres depth were drilled into the salar and detected interbedded volcanic material, reflecting the volcanic activity that accompanied the evaporite sedimentation. The presence of geological structures such as faults and flow channels solutions were also detected. However, as might be expected these holes were not directed towards establishing the Lithium content of the salar.

Until recently little work had been done and the historical references are mainly to a report from the USGS in 1987 which reported date sampling of brines from the subsurface (to a mere two metres depth) that returned lithium values, up to 160 mg/L, confirming the presence of lithium in the basin but really only (literally) scratching the surface.

Argentina Lithium's exploration campaign thus far includes both near-surface geochemical sampling and a Vertical Electric Sounding (VES) geophysical survey to delineate conductive zones at depth that may host lithium-bearing brines. Data from this first stage of the program has been used to define targets for a drill program that is planned for early in the second quarter of 2017.

The goal now is exploration for deep layers of lithium-rich

brine which are not directly linked to the surface fluids at the Arizaro salar. This initial exploration program at Arizaro was, therefore, designed to acquire initial hydrogeological understanding of this largely un-tested salar and to identify conductive zones at depth that may host lithium-bearing brines. VES is effective to depths of approximately 400-500 metres below which alternative surveys such as Controlled Source Audio-frequency Magneto-tellurics are required.

Near-surface fluid samples collected from the trenches returned low lithium (<10 mg/l) and potash (<1,500 mg/l) levels. However, in the company's opinion, the very large size of the salar and its geomorphology support the potential for discovery of deep brine layers with potential to host higher concentrations of lithium, as well as potash.

The consultants that undertook the VES tests have concluded from the results that, as well as the geologic and geomorphologic setting, climatic conditions, and hydrogeological environment at Arizaro, when compared to other well-studied salars, including Hombre Muerto, Rincón, Antofalla, Llullaillaco, and Rio Grande, indicate that there is a high probability to find brines at depth with high densities of 1,210 to 1,225 g/l and conductivities higher than 200 microS/cm. The VES results identified clear targets for an initial drill campaign. Now three or four holes of up to 400 metres in depth are planned to test these targets.

## **Conclusion**

It's early days for the companies in the Generation X of the Lithium wave. Those from the preceding generation that started out late last decade have moved towards production, now it's the turn of those spawned by the 2016 Lithium price surge or those from the previous generation who were thwarted when prices took a tumble (and political circumstances deteriorated) resulting in wholesale shelving of development plans.

With a price tailwind, a dramatically improved political situation and the deep insertion of Joe Grosso in the Argentine political and economic scene, the scene is set for Argentina Lithium & Energy to make advances if the exploration data starts to stack up in a favorable way.