

# Orocobre Announces the Maiden Resource for the Salinas Grandes Lithium-Potash Project

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## Highlights

- A shallow inferred resource has been estimated containing 239,200 tonnes lithium carbonate equivalent and 1.03 million tonnes of potash (KCl) to an average depth of 13.3m.
- Brine chemistry is attractive, with a low Mg/Li ratio, high K/Li ratio and low sulphate and calcium levels.
- Test work undertaken since late 2010 suggests high recoveries of both potassium and lithium could be expected using a simple, low operating cost, process route. Laboratory scale testing has produced potassium +95% KCl.
- Installation of test production wells is planned for long term pumping tests. If the results are positive the company will undertake further drilling and a preliminary economic assessment (PEA) to evaluate the project further

BRISBANE, AUSTRALIA -- ([Marketwire](#) - March 6, 2012) - [Orocobre Limited](#) (TSX: ORL) (ASX: ORE) (the Company or Orocobre) reports completion of the maiden resource estimate and results of initial pumping tests for the 85% owned Salinas Grandes Lithium-Potash project ("Salinas Grandes") in Salta Province, North West Argentina.

Murray Brooker, independent hydrogeologist, has estimated an inferred resource of 56.5 million cubic metres of brine at 795 mg/L lithium and 9,550 mg/L potassium which is equivalent to 239,200 tonnes of lithium carbonate and 1.03 million tonnes of potash (potassium chloride) based on 5.32 tonnes of lithium carbonate being equivalent to 1 tonne of lithium and 1.91 tonnes of potash being equivalent to one tonne of potassium.

Details are given in the table below.

Resource Category	Area km2	Brine body parameters Average thickness m	Average resource concentrations Mean specific Brine volume Lithium Potassium Boron Lithium	Tonnes contained
Inferred resource	116.2	13.3	Potassium 4.1% Boron	56.5

The estimate extends to an average depth of 13.3 meters, and applies the company's property boundaries and a 1,000 mg/l Li cut-off from the extensive surface pit sampling data to establish peripheral resource boundaries. No internal cut-off boundaries have been used because it is inappropriate to apply them in a fluid resource where extraction will cause mixing. The weighted average specific yield used is 4.1%.

The shallow brine body has attractive grades and, as previously reported, excellent chemistry, with a low magnesium to lithium ratio of 2.5, a high potassium to lithium ratio of 12.5 and a low sulphate to lithium ratio of 5.8 in the central area of drilling, rising to 10.6 for the area covered by all the company properties over the salar. Test work since late 2010 suggests high recoveries of both potassium and lithium could be expected using a simple, low operating cost, process route. Laboratory scale testing has produced potassium (82-89% KCl), prior to washing to obtain +95% KCl.

The low sulphate levels of the Salinas Grandes brine indicate that potash recovery would be high and as a

co-product of lithium carbonate production with potentially eight tonnes of potash produced for each tonne of lithium carbonate produced.

## **Introduction**

The Salinas Grandes Project is located 70 km directly south east of the Company's flagship Salar de Olaroz lithium-potassium project (Figure 1) and is predominantly within the Province of Salta, Argentina.

[http://www.orocobre.com/Maps/Salinas\\_Olaroz\\_Fig1\\_05March12.jpg](http://www.orocobre.com/Maps/Salinas_Olaroz_Fig1_05March12.jpg)

Over the past 15-18 months, field investigations including 47 auger holes, 12 diamond drill holes, pumping tests and processing investigations have been undertaken. This work provides the basis of the resource estimate, by independent consulting hydrogeologist, Murray Brooker, and other preliminary conclusions presented in this announcement.

## **Geology, Data and Interpretation**

Orocobre drilled a total of 12 diamond drill holes in the Salinas Grandes salar to an average depth of 71.4 meters, with certain holes as deep as 180 meters. Diamond core samples were sent to the British Geological Survey ("BGS"), with a total of 117 samples analysed for total porosity (Pt) and specific yield (Sy). The Sy analyses provided mean values for sands (0.16), silt mixes (0.04) and clays (0.02) subsequently applied in the resource modelling.

Interpretation of diamond drilling data established six lithological units to the base of drilling. Halite (salt) reaches a maximum thickness of 0.5 m in the southern central part of the salar. Beneath the surficial halite, Unit B consists of sand, silt and clay, with an increasing proportion of sand on the northern margin of the salar. Unit C is a black to green organic rich clay and silt. Unit F at the base of drilling includes medium to coarse sand and conglomerate units. Units D through F may be part of clastic sedimentation from the alluvial fan to the north of the salar. Units B and the upper levels of Unit C host the shallow brine resource.

Diamond drilling established that lithium, potassium and boron concentrations in brine are elevated (generally exceeding 600 mg/l Li) in the upper 6-20 meters of the Salinas Grandes salar. However, diamond drilling showed that concentrations decrease with depth, with only isolated Li-bearing intervals (concentrations generally

The Salinas Grandes resource estimate is based on geological controls from the 12 diamond drill holes and 47 solid stem auger holes, with geochemistry from the brine samples bailed from the auger holes. 44 of the 47 auger holes lie within the resource area. These holes were drilled to a depth of 12 meters,, except for two 16 meter and one 20 meter holes. Brine composite samples were taken every 4 meters during the auger drilling. Results for each auger hole were previously presented in the company press release dated November 15, 2011.

The auger holes were drilled on a north-south oriented grid, with an average drill hole spacing of 1.7 km, in the central part of the salar. Auger drilling was restricted to the Province of Salta, where all drilling approvals were previously obtained. Geological samples were logged and results compiled on geological sections, which show a significant increase in sand on the northern margins of the salar where sand has been sourced from the northern alluvial fan. Locations of the auger holes are shown in Figure 2 below.

It should be noted the composite values from auger drilling are influenced by the lithium concentrations in each lithological unit and the permeability of individual lithological units, with higher permeability units influencing brine sample compositions more than lower permeability units.

The shallow brine body is hosted in a sequence of silt, clay and sand units, with an increase in sand content in the north of the salar. Halite is limited to a maximum thickness of 0.5 meters from surface in the center-south of the salar. The elevated brine distribution encountered during auger sampling correlates well with the distribution of elevated lithium values from original pit sampling.

## **Resource Estimation**

The areal extent of the resource was controlled by the location of pit samples, with lithium values of 1,000 mg/l or greater within the salar salt pan where auger drilling was undertaken. Brine sample results and lithological information collected during the auger drilling was used to calculate a resource for the shallow brine zone. The mean Sy values from the BGS analyses were used to calculate a weighted Sy value for

each auger hole, based on the lithologies and thicknesses recorded. The weighted Sy data was used to calculate an equivalent brine thickness and an equivalent brine volume at the location of each auger hole, based on the interpreted thickness of the shallow brine zone.

The mass of lithium (Li), potassium (K) and boron (B) for the square metre centred on each auger hole was calculated by multiplying the equivalent brine thickness (converted to a volume in litres) by the concentration in g/l of each element of interest in the auger hole. This mass data from the auger holes was then kriged across Orocobre's Salinas Grandes tenements to produce concentration maps of kg/m<sup>2</sup> for Li, K and B. The sum of the individual grid cells provides the total resource mass as presented in the table on page 2 of this press release.

### **Data Collection and QA/QC**

Obtaining high quality samples in the field and ensuring that subsequent analysis of the samples was carried out to a high standard was considered of great importance considering the technical challenges of sampling fluids (brines) and semi-consolidated sediments.

Further information and mapping of the location of the auger drilling at Salinas Grandes is available on [http://media3.marketwire.com/docs/ORL\\_drillingmap.jpg](http://media3.marketwire.com/docs/ORL_drillingmap.jpg)

The initial diamond drilling program at Salinas Grandes salar was conducted with lexan tubes in the place of the triple tube splits, to maximize core recovery and geological understanding. Notwithstanding the best efforts of geologists and contractors, core recoveries averaged 67%. Down-hole geophysical logging was undertaken on some diamond drill holes to provide additional geological information. Fluorescein dye was used in the drilling fluid, to indicate whether brine samples taken with a bailer during the drilling were contaminated with drilling fluid. Core samples from diamond drill holes were used for measurements of total porosity (total contained fluid) and specific yield (recoverable fluid), with measurements made at the British Geological Survey laboratories using recognized techniques. As a further check on brine samples obtained by bailing during diamond drilling brine was also extracted from core samples and analysed.

Chemical analyses were undertaken by Alex Stewart Assayers (Argentina) S.A. ("ASA") in Mendoza, Argentina. This laboratory has extensive experience analysing brines from salar projects. They are ISO 9001:2000 accredited and operate their own internal standards consistent with ISO 17025. Standards and duplicate samples were used extensively, with laboratory- prepared and field standard samples submitted to the laboratory comprising 17% of the samples submitted and duplicates a further 7% of the total samples.

With minor exceptions, analytical values of the standards fell within +/-10% of the standard values for samples in the diamond drilling, auger and pump testing programs. Duplicate samples showed a high level of sample repeatability (precision), with all but 5 sample pairs falling well within +/-10% limits. Ion balances confirm the general quality of the ASA analyses. Additionally, six duplicate samples were analysed at the University of Antofagasta to compare with the ASA sample values. These sample pairs show average reproducible percentage differences of 6% for lithium and potassium, with respective maximum values of 13 and 9 % from individual samples. Overall the analyses are considered to be of acceptable quality for the inferred resource estimate, based on the results of the QA/QC samples.

### **Pump Testing**

Pump testing of auger drill holes determined hydraulic conductivities (K values) in the shallow resource zone averaged 3 m/day, with the exception of one hole which had a substantially higher K value (~ 50 m/day) and may reflect a more permeable channel within the salar. The pump tests were carried out with low flow rates (generally

To better understand the behaviour of pumping from the shallow brine unit 4 pump tests on purpose constructed large diameter test production bores at different locations across the salar are planned for the next phase. These will evaluate brine extraction and the stability of brine grade over a long period of time, up to a year, to better understand the potential for commercial production.

Provided that adequate pumping rates can be sustained over time with stable and economic lithium and potassium grades, the company anticipates undertaking further drilling and a preliminary economic assessment for the project.

### **Supporting technical report**

The resource estimate summarized in this announcement has been prepared by independent hydrogeologist

Murray Brooker, addressing the standards set out in the Canadian Securities Administrators' National Instrument 43-101. A technical report complying with National Instrument 43-101 and providing a detailed explanation of data collection, QA/QC and the resource estimate will be filed on Sedar within 45 days of the release of this announcement.

### **Management Commentary**

Orocobre's Managing Director, Richard Seville, stated: "We are encouraged by the completion of the initial resource estimate of 239,200 tonnes LCE (lithium carbonate equivalent) and preliminary pumping tests for the project. This allows us to move forward with a good basic understanding of the project's attributes and how Salinas Grandes can best contribute to the overall value of the company."

"The next stage is to undertake long term pumping tests in 4 locations within the shallow resource. Provided that adequate pumping rates can be sustained over time, with stable and economic lithium and potassium grades, the company anticipates undertaking further drilling and a preliminary economic assessment for the project."

"The shallow brine body has attractive grades and excellent chemistry, with a low magnesium to lithium ratio, a high potassium to lithium ratio and low sulphate levels. Orocobre has been conducting evaporative concentration of this brine for over a year, and these chemical characteristics allow use of simple processing techniques with high recoveries and low operating costs."

"The low sulphate levels of the Salinas brine mean that potash recovery would be very high as a co-product of lithium carbonate production, with potentially eight tonnes of potash for every tonne of lithium carbonate production."

"The proximity of Salinas Grandes to our flagship Olaroz Project has the potential for operating synergies, including the option to process concentrated Salinas Grandes lithium brine at an expanded lithium carbonate plant at Olaroz after completing potash recovery", Mr Seville said.

### **About Orocobre Limited**

[Orocobre Limited](#) is listed on the Australian Securities Exchange and Toronto Stock Exchange (ASX:ORE) (TSX:ORL) and is the leading lithium-potash developer in the lithium and potassium rich Puna region of Argentina. For further information, please visit [www.orocobre.com](http://www.orocobre.com).

### **Competent Person's and Qualified Person's Statement**

The technical information in this announcement has been prepared by Murray Brooker. Murray Brooker is a geologist and hydrogeologist and is a Member of the Australian Institute of Geoscientists. Murray has sufficient relevant experience to qualify as a competent person as defined in the 2004 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. He is also a "Qualified Person" as defined by Canadian Securities Administrators' National Instrument 43-101. Murray Brooker consents to the inclusion in this announcement of this information in the form and context in which it appears.

Additional information relating to the Company's Salinas Grandes project is available in the existing technical report entitled "Technical Report - Salinas Grandes Project, Argentina" dated April 30, 2010, which was prepared by John Houston.

### **Caution Regarding Forward-Looking Information**

This report contains "forward-looking information" within the meaning of applicable securities legislation. Forward-looking information contained in this report may include, but is not limited to, the estimation and realization of resources at the Salinas Grandes project, the viability, recoverability and processing of such resources, potential operating synergies between the Salinas Grandes project and the Olaroz project, and other matters related to the development of the Salinas Grandes project.

Such forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause actual results to be materially different from those expressed or implied by such forward-looking information, including but not limited to the risk that further funding may be required, but unavailable, for the ongoing development of the Company's projects; changes in government regulations, policies or legislation;

fluctuations or decreases in commodity prices; the possibility that required permits may not be obtained; uncertainty in the estimation or economic viability of mineral resources; general risks associated with the feasibility and development of the Salinas Grandes project; unexpected capital or operating cost increases; the risk that a definitive joint venture agreement with Toyota Tsusho Corporation in respect of the Company's Olaroz project may not be completed; uncertainty of meeting anticipated program milestones; as well as those factors disclosed in the Company's Annual Information Form for the year ended June 30, 2011 filed at [www.sedar.com](http://www.sedar.com).

The Company believes that the assumptions and expectations reflected in such forward-looking information are reasonable. Assumptions have been made regarding, among other things: the Company's ability to carry on its exploration and development activities, the timely receipt of required approvals, the prices of lithium and potash, the ability of the Company to operate in a safe, efficient and effective manner and the ability of the Company to obtain financing as and when required and on reasonable terms. Readers are cautioned that the foregoing list is not exhaustive of all factors and assumptions which may have been used.

There can be no assurance that forward-looking information will prove to be accurate, as actual results and future events could differ materially from those anticipated in such information. Accordingly, readers should not place undue reliance on forward-looking information. The Company does not undertake to update any forward-looking information, except in accordance with applicable securities laws.

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