

#### 11 February 2016

# ASX ANNOUNCEMENT

# **PILGANGOORA LITHIUM UPDATE**

# **INDEPENDENT MINING STUDY DEMONSTRATES ROBUST FINANCIAL**

# **RETURNS AND 19 YEAR MINE LIFE**

#### **KEY FINDINGS OF PRE-FEASIBILITY MINING STUDY**

#### **Base Case – 1 Mtpa ore process rate**

- LOM Revenue of A\$1,350 million
- LOM Cashflow of A\$609 million
- NPV of A\$277 million and IRR of 42.5% (8% discount rate)
- o 18.92 Mt of total ore feed
- 2.886 Mt of spodumene concentrate production
- > Option to increase ore feed to 2 Mtpa rate provides significant upside
  - o LOM Cashflow of A\$623 million
  - NPV of A\$392 million and IRR of 60.0% (8% discount rate)
- Increased resource estimate using the breakeven cut-off grade of 0.4% Li<sub>2</sub>O
  - o Upgraded mineral resource estimate of 35.7 million tonnes
  - o 37% increase on previous estimate of 26.1 million tonnes
- <u>Note:</u> A component of the resources underpinning the production target are classified as inferred mineral resources. There is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realised.

Altura Mining Limited (ASX: AJM) ("Altura" or the "Company") is pleased to announce the results of the Mining Preliminary Feasibility Study completed by Western Australian based mining consultants Orelogy Consulting Pty Ltd.

The study has been completed to Prefeasibility Study level with Orelogy currently commissioned to further develop the scope of the current study to Definitive Feasibility level with completion anticipated at the end of March 2016.

#### <u>Overview</u>

Orelogy was commissioned by Altura to undertake a Mining Preliminary Feasibility Study (PFS) on the Pilgangoora Lithium project which is located approximately 90km to the south of Port Hedland in Western Australia. The Pilgangoora Mining Lease Application tenements, covering the resource modelling area, are M45/1230 and M45/1231 and cover an area of 394 hectares. The objective is to develop the Pilgangoora Lithium Project on the basis of a Concentrator Plant producing Spodumene concentrate at 6% Li<sub>2</sub>O from an average feed to a plant of between 1.15 - 1.20% Li<sub>2</sub>O.

The Mining Study assessed strategic options for development of the Project and determined an economic open pit mine operation, production schedule and site layout for the preferred option, as a basis for progressing to a Definitive Feasibility Study (DFS).

#### **Mining Study Outcomes**

Orelogy developed a high level cost model, exclusive of ongoing project study costs, taxation, interest and other accounting functions, to derive the EBIT financials. The results of the options assessment and evaluation of the selected preferred option show that the Pilgangoora project has robust economics and warrants elevation to further levels of study.

The Base Case focussed on production of 150,000tpa of spodumene concentrate via processing of 1Mtpa ore feed. Initial marketing indications to Altura demonstrate that sales of spodumene concentrate in excess of the Base Case could be achievable therefore an increased production case of 2Mtpa ore feed has been evaluated. The results of the revised schedule confirm that the Pilgangoora project can support a higher production rate if market contracts for the spodumene product are secured.

Key outcomes are detailed in Table 1 below.

Description	Base Case	2 Mtpa Case
Life of Mine (LOM)	19 years	10 years
Total Ore Mined	18.922 Mt	18.922 Mt
Average Annual Ore Feed to Plant	1.0 Mtpa	2.0 Mtpa
Annual Spodumene Concentrate Production	150,000 tonnes	289,000 tonnes
Total Spodumene Concentrate Produced	2.886 Million tonnes	2.886 Million tonnes
LOM Strip Ratio (waste:ore)	2.82 : 1	2.82:1
Spodumene Concentrate Market Price	US\$445 per tonne	US\$445 per tonne
Capital cost estimate	A\$97.6 million	A\$146.7 million
Total Net Revenue *	A\$1,350 million	A\$1,350 million
Total Cashflow (EBIT)	A\$609 million	A\$623 million
Total C1 Cash Cost **	A\$707 million	A\$659 million
C1 Cash Cost / tonne ore mined	A\$37.36	A\$34.87
Total Cash Cost FOB / tonne product ***	A\$320.60	A\$298.90
NPV (8% discount rate)	A\$277 million	A\$392 million
IRR	42.5%	60.0%
Project payback period	2.3 years	1.6 years

# Table 1Mining Study Outputs (Base Case and 2Mtpa Option)

- \* \$A : \$US exchange rate of 0.75
- \*\* **C1 Cash Costs** are defined as the costs of mining, milling and concentrating, onsite administration and general expenses, property and production royalties not related to revenues or profits, metal concentrate treatment charges, and freight and marketing costs less the net value of the by-product credits.
- **\*\*\* Total Cash Cost FOB / tonne product** are defined as all cash costs to free on board, including sustaining capital expenditure, but excluding interest, tax and depreciation.

The 2Mtpa Case shows significant increase to the project NPV (increased from A\$277 million to A\$392 million) and IRR (from 42.5% to 60%) offset by a shortened mine life (10 years) and increased capital cost of A\$146.7 million.

The Base Case (1Mtpa ore feed) had the primary objective of a plant throughput of 1.0 Mtpa at a target feed grade between 1.15-1.20% Li<sub>2</sub>O achieved for each period of the schedule up until Year 10. During this period Inferred Mineralisation included in mill feed was not significant, ranging between 0.5-6.2% with the maximum occurring in Year 1.

No pre-stripping period was required to meet the mill feed rates and although some lower grade ore was processed, the target feed grade range was met. Low grade material was stockpiled and only processed at the end of mining operations in Year 17.

The 2Mtpa Case is achieved via plant throughput of 2.0 Mtpa at a target feed grade between 1.15 -1.20% Li<sub>2</sub>O achieved for each period of the schedule up until Year 7. During the first 5 years, the Inferred Mineralisation was kept to below 5% after which the Inferred Mineralisation feed content jumped to approximately 16% for the final two years of mining.

## **Cut-off Grade and Mineral Resources**

During the mining study Orelogy has completed a number of mine scheduling scenarios in order to determine the optimum product output rate whilst maximising resource recovery.

The results have determined that the ultimate pit design inventory for the Pilgangoora project has a 0.4%  $Li_2O$  (breakeven) cut-off grade. The lower grade ore at approximately 0.4%  $Li_2O$  within the mining pit would be stockpiled and processed at the end of the mine life.

The determination of the breakeven cut-off grade of 0.4% Li<sub>2</sub>O has a positive impact on the total amount of mineralised resources that can be reported for the Pilgangoora Lithium Project.

Altura has previously released a JORC compliant Mineral Resource estimate completed by Western Australian based geological consultants Ravensgate Mining Industry Consultants. This Mineral Resource estimate released on 14 September 2015 was based on a cut-off grade of 0.8% Li<sub>2</sub>O (see Table 2 overleaf).

	Measured	0.80	
	Indicated	0.80	
	Inferred	0.80	
	Total Resource	0.80	
$(\bigcirc)$			
	The resultant breakev	_	
615	triggered a need to re able to re-visit the res	•	
UD	0.4% Li <sub>2</sub> O cut-off grad		
$\mathcal{O}$	Table 3 below sets the revised Miner		
7			
		Table	
	Rev	ised Mineral R	
R	JORC Category	Cut-off Li₂O (%	
UL			
	Measured	0.40	
	Indicated	0.40	
$\bigcirc$	Inferred	0.40	
$\leq$	Total Resource	0.40	

**JORC Category** 

## Table 2 – Altura Pilgangoora Lithium Previous Mineral Resource Estimate (September 2015)

Tonnes

(Mt)

\_

19.77

6.29

26.06

Li<sub>2</sub>O

(%)

\_

1.21

1.20

1.20

Contained Li<sub>2</sub>O

(tonnes)

239,000

76,000

315,000

de value of 0.4% Li<sub>2</sub>O as determined by the Mining Study has ious Mineral Resource estimate work. Ravensgate have been and have calculated a revised Mineral Resource based on the

al Resource estimate.

Cut-off Li<sub>2</sub>O (%)

## 3 – Altura Pilgangoora Lithium esource Estimate (0.4% Li<sub>2</sub>O Cut-off Grade)

JORC Category	Cut-off Li <sub>2</sub> O (%)	Tonnes (Mt)	Li₂O (%)	Contained Li <sub>2</sub> O (tonnes)
Measured	0.40	-	-	
Indicated	0.40	26.70	1.05	280,000
Inferred	0.40	9.00	1.02	92,000
Total Resource	0.40	35.70	1.05	372,000

## **Future Direction**

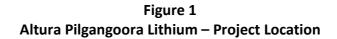
The results from the Mining Study are extremely pleasing and once again confirm the significant potential of the project. The Company will continue to direct substantial resources to the project in line with its objective for fast tracking the development.

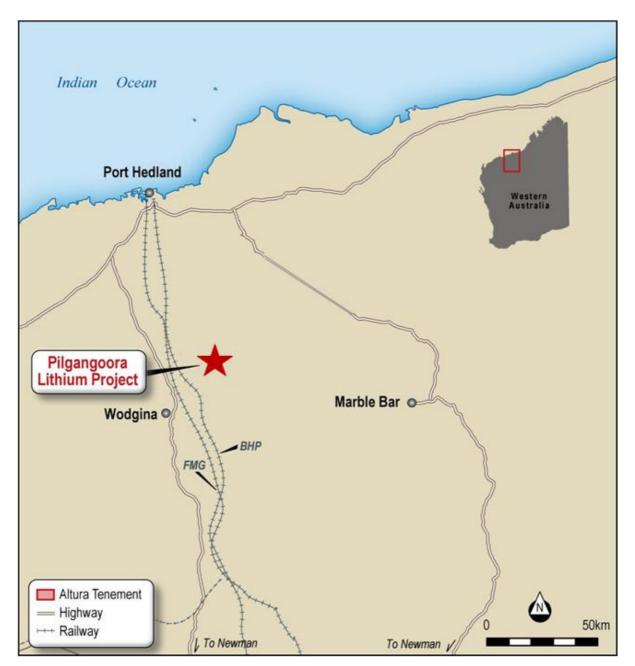
The Company believes the project delivers Altura's key objectives in:

- High demand commodity with compounding growth projections
- Potential for low cash operating costs due to shallow and thick high grade zones
- Manageable capital input utilising proven technology
- Access to excellent infrastructure including roads and ports
- Ideal proximity to significant Asian end user markets
- Well known mining area with stable governing laws

Altura will continue to proceed with the project feasibility as planned and is currently advanced in delivering the Definitive Feasibility Mining Study being compiled by Orelogy. The Company remains focused on delivering the Feasibility Study phase of the project by the end of the current quarter.

Further updates on the feasibility study will be provided in future ASX announcements.





#### Summary Information Required by Listing Rule 5.8.1

#### Geology and Geological Interpretation

Lithium (spodumene) mineralisation is contained within clearly identified pegmatites dykes within the broader Pilgangoora region hosted within amphibolites, covering a strike of about 1600 metres and in a zone about 300 meters wide. The dykes range in thickness from 5-40m.

A regional pattern of zonation away from a nearby granite / greenstone contact has been observed with a simple quartz – microcline – muscovite pegmatite assemblage near the contact and changing to an albite-spodumene +/- muscovite at a distance of some 2kms from the contact. This is the approximate distance of the Pilgangoora pegmatites.

#### Sampling and Sub-sampling

Sample information used in the resource estimation was derived from diamond core and RC drilling. Drill samples were geologically logged and samples taken for lab analysis. During sample preparation, for both the RC and diamond drill samples, the whole sample was crushed to 2mm, rotary divided and a 500g (approximately) sample pulverised to -75microns. A 0.2 gm split was sent directly to a microwave-assisted dissolution.

#### Sample Analysis Method

Samples were dispatched to Ultra Trace Laboratories in Perth for earliest drilling programs and then subsequently to LabWest in Perth. Both laboratories are NATA certified. Analysis was carried out using microwave assisted HF acid digest with an ICP-OES and ICP-MS finish as required. The technique is considered an effective whole rock determination.

#### **Drilling Techniques**

A staged series of drilling programs commencing in August 2010 and extending through to March 2103 has covered the majority of the pegmatite field with 290 drill holes. In total there are 282 RC holes (including four water bore holes) for 24,649m and eight diamond core drill holes for 1,387.9m.

All drilling is aligned to a 40x40m grid covering the pegmatite field. The drill grid is deposit-based with locations and orientations shifting depending on the local dyke orientation. Down hole surveys readings were completed on 53 selected RC holes and their twinned Diamond holes over the extent of the Pilgangoora resource area. The surveys were completed by Down Hole Surveys of Perth, WA using a GyroSmart tool.

#### Estimation Methodology

Grade estimation using ordinary kriging was completed for one reportable element - Li2O% using MineSight<sup>®</sup> software. Drill hole sample data was flagged using domain codes generated from 3D mineralisation domains and geological surfaces.

A single search ellipsoid was used to estimate each block. Sample data utilised was first composited according to the main Li2O% item to a 1m down-hole length. Grade continuity was measured using geostatistical techniques. Directional variograms were modelled using traditional and normal score transformation semivariograms.

#### Resource Classification

The Resource model uses a classification scheme based upon block estimation parameters including Kriging Variance, Number of composites in search ellipsoid informing the block cell and composite distance to block centroid.

Classification by the Competent Person has also taken into account a range of other modifying factors commencing with the geological understanding of the Pilgangoora pegmatites which is a primary requirement to producing a robust resource estimation model. The Mineral Resource Estimates have been carried for the Pilgangoora deposit in accordance with the JORC Code (2012 Edition).

#### Cut-off Grade

A revision of the previously used 0.8 0% Li2O lower cut-off following advice from Altura Mining Limited that a Prefeasibility Study (PFS) recently carried out by Engineering consultants Orelogy in November 2015 revealed that a lower operation economic cut-off was likely to prevail at Pilgangoora.

Ravensgate's opinion is that the use of a 0.40% Li2O lower cut-off as described from the Mt Cattlin based sensitivity analysis may now be used for reporting the lithium resource at Pilgangoora. The cut-off grade of a 0.40% Li2O for the stated Mineral Resource Estimate is determined from current economic parameters and currently reflects potential anticipated mining practices. This updated resource summary must be viewed with direct reference to the Orelogy Pre-Feasibility Study Mining report

#### Mining and Metallurgical Methods and Parameters and other modifying factors

The Mining PFS conducted by Orelogy combined with the recently completed Metallurgical testwork programme indicates that an open pit mining will be employed to recover ore. As part of the Mining PFS strategic mining schedules were generated using Maptek Evolution<sup>®</sup> on an annual calendar basis aiming to achieve the maximum value schedule from a number of different variations (scenarios).

The financial inputs, costs and processing parameters, used in pit optimisation were applied on the base case scheduling scenarios along with further sensitivity analysis inputs and variations advised by Altura.

#### **Competent Persons Statement**

The information in this report that relates to the Mineral Resource for the Pilgangoora lithium deposit is based on information compiled by Mr Stephen Hyland and Mr Bryan Bourke. Mr Hyland is a Fellow of the Australasian Institute of Mining and Metallurgy and Mr Bourke is a Member of the Australian Institute of Geoscientists. Mr Hyland is a principal consultant at Ravensgate and has sufficient experience that is relevant to the style of mineralisation under consideration and to the activity of mineral resource estimation to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Bourke is the Exploration Manager of Altura Mining Limited and has had sufficient experience that is relevant to the style of mineralisation and to the type of deposit under consideration to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Bourke is the Exploration and to the type of deposit under consideration to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Hyland and Mr Bourke consent to the inclusion in the report of the matters based on this information in the form and context in which it appears.

#### About Altura Mining Limited (ASX: AJM)

"Aggressively building independently sustainable businesses that deliver profitability, liquidity and growth in coal and non-ferrous mining and exploration" - **The Altura Vision** 

Altura is a multi-faceted miner with significant lithium and coal projects in Australia and Indonesia and a diverse minerals exploration portfolio. With experienced leadership and a strong and supportive shareholder base, Altura's success is further underpinned by its solid suite of exploration and development projects. The Company's main focus is the development of its 100% owned Pilgangoora Lithium project in Australia. Altura also has interests in the producing Delta Coal project in Indonesia, and the Tabalong Coal project which is in the final stages of approvals before mining commences.

#### Key Projects and Prospects:

- Lithium: Progressing to Feasibility stage at Pilgangoora WA, one of the world's largest high grade deposits.
- **Coal:** a 33<sup>1</sup>/<sub>3</sub> % interest in the Delta coal mine currently targeting production at the 1.5 million tonnes per annum rate in East Kalimantan, Indonesia.
- **Coal:** Mine construction planned at Tabalong upon receipt of final regulatory approvals.
- **Coal:** Exploration tenements at Catanduanes, Rapu-Rapu and Surigao del Sur located on the eastern seaboard of the Philippines.
- Uranium: Exploration stage of key targets in Hayes Creek region, Mt Shoobridge NT.
- **Base/Precious Metals:** Exploration stage for lead, copper, zinc, gold and silver prospects Shoobridge NT, Pilbara WA, Tanami NT.

For further information, please visit <u>www.alturamining.com</u> or phone: James Brown, Managing Director on + 61 8 9488 5100. Chris Evans, General Manager Operations on +61 (0)419 853 904

# JORC CODE, 2012 EDITION

# Table 1

#### SECTION 1 - SAMPLING TECHNIQUES AND DATA

(Criteria in this section apply to all succeeding sections.)

Criteria	Commentary
Sampling techniques	<ul> <li>The Pilgangoora deposit was sampled by RC and diamond drilling.</li> <li>Drilling for samples for assay was undertaken on a regularly spaced grid. All ore intervals and their contacts into barren wall rock were sampled.</li> <li>RC samples were collected at 1m sub-samples for assay were split directly from a rig-mounted riffle splitter into a uniquely numbered calico bag. The remaining material was collected directly off the cyclone into a numbered plastic bag and kept on site for geological logging and chip sampling.</li> <li>Diamond drilling (DD) was HQ2 diameter triple tube, removed from the tube and transferred to 4x1m HQ core trays. Core was matched, marked up and logged. Cut half core from mineralised zones was sent for assay. Assay lengths were determined by the geologist, based on the nature and location of the mineralisation logged in the core.</li> <li>Mineralisation was initially determined visually and confirmed by geological logging and geochemical assays.</li> </ul>
Drilling techniques	<ul> <li>The RC and diamond drilling was undertaken by Altura Mining's PRD2000 multipurpose rig rated at 1120 cfm @350 psi. The RC drilling used a 51/2" (132mm) face sampling hammer, the diamond drilling used HQ (63.5mm internal) coring. RC was sampled from the surface. Diamond holes were pre-collared to 3m and then coring commenced.</li> <li>No core orientation was undertaken.</li> </ul>
Drill sample recovery	<ul> <li>No direct recovery measurements of reverse circulation samples were performed. Sample recovery at the rig is visually estimated for loss per sample interval.</li> <li>Representative drill chips were collected by an Altura geologist and placed in 2m intervals in chip trays.</li> <li>HQ core was recovered in nominal 3m runs and marked by the drillers core block. The core was later marked in metre intervals and recovery measured.</li> <li>RC sample recovery was maximised by stopping drilling at the metre interval and air-flushing the cyclone contents through the splitter to maximise recovery.</li> <li>Diamond drilling was targeted at maximum core recovery. Recovery exceeded 95%.</li> <li>The assay results of duplicate RC and paired DD hole samples do not show sample bias caused by a significant loss of/gain in lithium values caused by loss of fines.</li> </ul>
Logging	<ul> <li>All RC and DD holes were logged by Altura geologists. The RC logging is undertaken on 1m intervals documenting the lithologies, colour, hardness, texture, alteration and mineralisation using the Altura standardised logging codes. The same attributes were recorded for DD core with geological boundaries logged to 10cm accuracy.</li> <li>The logging is considered quantitative in nature.</li> <li>All DD holes were measured for RQD and their structural data (joints, faults/fractures &amp; natural breaks measured &amp; documented).</li> <li>Photographs of RC chip trays or core trays were taken for the full length of all holes.</li> <li>All recovered RC and DD intersections were logged.</li> </ul>
Sub-sampling techniques and sample preparation	<ul> <li>RC samples were normally dry. If water was present, it was expelled from the hole before sample was collected. Samples were riffle split on the rig to provide a 1/8<sup>th</sup> sample.</li> <li>Diamond core was ½ or ¼ cut (for check sampling and metallurgical purposes) with sampling from the same side where possible.</li> </ul>

	Criteria	Commentary
	D	<ul> <li>Sample Preparation: For both the RC and DD the whole sample was crushed to 2mm, rotary divided and a 500g (approximately) sample pulverised to -75microns. A 0.2 gm split was sent directly to a microwave-assisted dissolution. HF acid MADs are performed in sealed vessels at temperatures up to 200°C and pressures up to 20 Bar. Digests are controlled with respect to microwave power, vessel temperature and vessel pressure to achieve reproducible digestion conditions across a wide range of sample materials.</li> <li>One pegmatite duplicate from each drill hole was analysed. The range between the two sets of data was 10-15%. LabWest inserts check samples in each assay batch (see below).</li> <li>The drill sample sizes are considered appropriate to represent the spodumene mineralisation, based on the size of the spodumene crystals (up to 50cm) and the thickness and overall consistency of mineralisation within the pegmatite hosts.</li> </ul>
	Quality of assay data and laboratory tests	<ul> <li>Initially, the samples were dispatched to Ultra Trace Laboratories in Perth. All subsequent submissions were sent to LabWest in Perth. Both laboratories are NATA certified.</li> <li>Li, Al<sub>2</sub>O<sub>3</sub>%, CaO%, Fe<sub>2</sub>O<sub>3</sub>%, K<sub>2</sub>O%, MgO%, MnO%, Na<sub>2</sub>O%, P<sub>2</sub>O<sub>5</sub>%, SO<sub>3</sub>% and TiO<sub>2</sub>% were assayed using microwave assisted HF acid digest with an ICP-OES finish, while U, Th, Nb, Rb, Ta and Cs were similarly digested with an ICP-MS finish. The technique is considered an effective whole rock determination.</li> <li>No geophysical tools, spectrometers or hand-held XRF instruments were used in determining any of the data included in this resource.</li> <li>Insertion of one of three certified reference standards by Altura/ LabWest at a rate of one in every 25 samples with a minimum of one standard per drill hole. Field duplicates were inserted at a rate of one per drill hole. Internal lab splits (post-crushing) and repeats (from pulps) are inserted at the rate of one per 25 samples. LabWest randomly inserted in-house standards to check their internal QC sampling.</li> <li>Random, blind re-submission of pulps following analysis to an external lab (Ultra Trace).</li> <li>The QC samples (field duplicates and lab splits and lab internal standards have indicated the assaying shows acceptable levels of accuracy and precision.</li> </ul>
	Verification of sampling and assaying	<ul> <li>Ravensgate personnel viewed photos of the chip trays and the diamond core and confirmed the ore intervals from assay data. The core and RC chips also viewed on site at Pilgangoora.</li> <li>Some significant intersections from the RC program were twinned by the eight hole diamond drilling program.</li> <li>Drill hole geological and geotechnical logging was undertaken on-site by Altura geologists. Assay data was provided by the laboratories as certified data files. All survey, assay and geology data was entered into Excel spreadsheets and/or exported to Datashed then Geobank (Micromine). Data validation and cross-checking is conducted through the Micromine automated verification function.</li> <li>Lithium assay data were initially recorded as Li. It is general industry practice to present lithium results as Li<sub>2</sub>O so where this has been done a conversion factor of 2.153 has been applied.</li> </ul>
)) 	Location of data points	<ul> <li>All drill hole collars were surveyed by Heyhoe Surveys, Geraldton, WA using a Trimble R6 RTK GPS system with an accuracy of +/- 0.02m in the horizontal and +/- 0.03m in the vertical relative to control station Pilg1. Pilg1 was established by R6 RTK GPS using SSM KM3 Marble Bar38 (horizontal) and SSM R610 (vertical).</li> <li>Down hole surveys were completed on selected RC holes and their twinned DD holes over the extent of the Pilgangoora resource area. The surveys were completed by Downhole Surveys of Perth, WA using a GyroSmart tool.</li> <li>Grid co-ordinates are Map Grid of Australia (MGA) and GDA94 Zone 50. AHD elevations use the Ausgeoid98 Geodic model.</li> <li>The nature of the topography is such that the current number of survey points and their accuracy is considered adequate for the topographic control required for</li> </ul>

Criteria	Commentary
	this resource calculation.
Data spacing and distribution	<ul> <li>RC holes were drilled on a nominally spaced 40m x 40m grid pattern covering the strike extent of the Pilgangoora pegmatite zone.</li> <li>The grid pattern is considered an adequate spacing for establishing geological and grade continuity both along strike and down dip. From outcrop mapping and costean exposures, the pegmatite dykes exhibit consistency over distances exceeding 40m and data acquired from drill holes at this spacing is considered adequate for the definition of the Inferred and Indicated categories of the JORC code.</li> <li>No sample compositing has been applied within the resource area.</li> </ul>
Orientation of data in relation to geological structure	<ul> <li>The strike of the pegmatite dykes is between 015 and 030 degrees and the mineralised dykes generally dip at 25 - 35 degrees to the east. Most of the RC holes were drilled at 60 degree dips on azimuths between 270 degrees and 300 degrees. This enabled accurate measurement of the true width of the mineralisation.</li> <li>All ore zones occur inside the pegmatites and are relatively homogeneous. No structural control on the distribution of mineralisation within the pegmatites has been identified. The drill orientation does not introduce a sampling bias.</li> </ul>
Sample security	<ul> <li>The chain of custody for sampling procedures and sample analysis is managed by Altura Mining geologists and field technicians.</li> <li>Sample material was geologically logged and sample bags removed at the time of drilling or at the end of the drill line.</li> <li>Samples were stored onsite temporarily while the batch was made up and totals checked before being transported by Altura personnel to Port Hedland.</li> <li>The samples were delivered by Toll-Ipec to Ultra Trace in Cannington or LabWest in Malaga which checked bags and totals for the batch before commencing sample preparation.</li> <li>The remainder of RC samples were left onsite. Remaining DD core and RC chip samples are stored in secure facilities on site.</li> <li>Assay pulps are retained in permanent storage by Altura.</li> </ul>
Audits or reviews	• A review of sampling techniques and a thorough data review have been undertaken by Ravensgate for this resource estimate. Current methods comply with industry standards. The insertion of blank samples by Altura in each of their submitted batches was recommended.

## SECTION 2 - REPORTING OF EXPLORATION RESULTS

(Criteria listed in the preceding section also apply to this section.)

Criteria	Commentary
Mineral tenement and land tenure status	<ul> <li>The deposit lies within E45/2287 and P45/2758 held 100% by Altura Exploration P/L and E45/2363 held by Atlas Operations Pty Limited. The Altura tenements are covered by MLA45/1230 and the Atlas tenement by MLA45/1231. All the M's were applied for on 01-11-2012.</li> <li>All tenements covering the deposit are in good standing and there is no known impediment to obtaining a licence to operate.</li> </ul>
Exploration done by other parties	<ul> <li>There has been no exploration for lithium completed on this ground by other parties.</li> </ul>
Geology	<ul> <li>Altura's Pilgangoora lithium project occurs at the southern end of a zone of pegmatite intrusives within the synformal Pilgangoora greenstone belt. The pegmatites are hosted within amphibolites which have a mafic/ultramafic volcanic origin.</li> <li>From the drilling completed to date, lithium (spodumene) mineralisation is identified within clearly observable pegmatites dykes hosted within amphibolites present in the broader Pilgangoora region. The dykes extend over a strike of about 1600 metres and within a zone about 300 meters wide.</li> <li>The majority of the pegmatites are dykes striking 020°-025° with dips of 25°-35° to the southeast. The dykes range in thickness from 5-20m and at least one dyke in the area identified as C1 is observed to be much thicker at approximately 30-40m thick. The local geology is shown in Figure 4 of the main report.</li> <li>The reason for this structural and or geological control is not fully understood however the distance from the granite contact is such that mineralisation in the pegmatite is confined to lithium and rubidium with relatively low values for tin and tantalum or other associated minerals. A regional pattern of zonation away from a nearby granite / greenstone contact has been observed with a simple quartz - microcline - muscovite pegmatite assemblage near the contact and changing to an albite-spodumene +/- muscovite at a distance of some 2kms from the contact. This is the approximate distance of the Pilgangoora pegmatites.</li> </ul>
Drill hole Information	• Significant results were reported in the stipulated format (excepting RL's) in an ASX announcement on 22.06.2015. Detailed results of deposit-restricted programs were reported to the ASX on 02.03.2011, 15.03.2011, 09.05.2011, 16.06.2011, 05.07.2011, 03.08.2011 and 08.05.2012. Mineralisation widths reported were > 3m.
Data aggregation methods	<ul> <li>There have been no weighting or averaging techniques used in determining this resource estimate. There has been no cutting of high grade intercepts as the nature of spodumene distribution in pegmatite lenses and the evidence of continuity from drill assay results is sufficient to accept higher grade values are consistent between the intercepts. Limited outlier composites have had some area of influence restriction applied according to localised geostatistics.</li> <li>No metal equivalent values are reported.</li> </ul>
Relationship between mineralisation widths and intercept lengths	<ul> <li>The drill holes were almost all drilled at right angles to the strike of the pegmatite dykes. In the Northern, Central and Southern deposit grids, the grid base line was oriented due north. At the eastern half of the East deposit and the southern part of the Central deposit, the drill grid lines were oriented at 120°-300°. In the early exploration phase of the northern part of the Central deposit, 27 holes were drilled due north to determine the dimensions of the mineralised pegmatite swells in this area.</li> <li>All drill holes were angled at 60°. The mineralised dykes regularly dip around 30° and range between 25° and 35° thus, reported thicknesses are about 10-15% greater than true thickness.</li> <li>Calculated true widths were not reported.</li> </ul>

Criteria	Commentary
Diagrams	<ul> <li>A copy of the deposit outline and drill hole locations is shown in Figure 4 of the main report.</li> <li>Selected cross section plans of the deposit are shown in Figure 5 of the main report.</li> </ul>
Balanced reporting	<ul> <li>Significant results were reported in the ASX announcement of 22.06.2015. Detailed results of deposit-restricted programs were reported on 02.03.2011, 15.03.2011, 09.05.2011, 16.06.2011, 05.07.2011, 03.08.2011 and 08.05.2012. Internal high-grade zones are identified in the tables.</li> <li>Significant results were reported for intercepts of over 8m grading &gt; 1% Li<sub>2</sub>O. The original cut-off grade for reporting detailed results was 0.3% Li<sub>2</sub>O.</li> <li>Drill hole location plans and representative sections accompanied the assay results.</li> </ul>
Other substantive exploration data	<ul> <li>Preliminary metallurgical studies show that a concentrate grading over 6% Li<sub>2</sub>O can be produced.</li> <li>283 density measurements have been completed on diamond drill core.</li> <li>RQD measurements and preliminary hardness tests.</li> <li>Assays to date have not indicated any potential deleterious or contaminating substances.</li> </ul>
Further work	<ul> <li>On 22.06.2015 Altura announced the commencement of a full feasibility study of which this resource estimate is the first component.</li> <li>The aim is to identify discrete high grade areas (1.7-1.9% Li<sub>2</sub>O) in the deposit that can be mined at low cost.</li> <li>Given the scope of the planned operation, work in the immediate future will concentrate inside the established resource boundaries. It is recommended that the feasibility study include a small-scale close-spaced drilling program on near-surface high grade ore to confirm estimated bench volumes and the short range variability of lithium content in the mineralisation.</li> <li>Further drilling will be undertaken in these areas where there is a requirement for further geological or geotechnical information identified during the resource estimate.</li> <li>An airborne photogrammetry survey will be undertaken.</li> <li>Additional metallurgical sample acquisition and testwork will be required for assessment of the most efficient processing route.</li> </ul>

#### SECTION 3 - ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	<ul> <li>All of the data used has been from recent (post 2009) exploration drilling conducted by Altura. The database consists of new data which has been manually and electronically input from the original paper copies of drill logs, survey sheets and electronic assay sheets and digitised from hand drafted cross sections and geological plans interpreted by the Altura geology team.</li> <li>Ravensgate reviewed a recently supplied Microsoft Access database of the drilling information for the Pilgangoora deposit area which was extracted from Altura's in-house data-set. The database contains 290 drill collar records for the recent Altura drilling data within the overall Pilgangoora Project Area. The databases supplied and used were dated 24 July 2015 and 10 August 2015. It is understood this is the most recent version of the database available.</li> <li>The total of 290 drill holes includes 278 RC drill holes, 8 diamond holes and 4 water bore holes which were available for review at Pilgangoora.</li> <li>Altura undertook a program of drill hole collar survey and validation. All recent drill holes were picked up using DGPS with an established base station control stations in the vicinity of the Pilgangoora deposit. Holes were made by picking up pre-existing drill hole collars where possible. All collar information was rationalised by Altura and thus served to increase confidence in the site survey data.</li> </ul>
Site visits	• A site visit has been carried out by Ravensgate on July 29th 2015. Ravensgate has reviewed in reasonable detail, geological outcrop, rock chip sample locations, costean locations, and drill pad locations and hole collars. Also reviewed were RC chips, diamond core as well as drilling and sampling equipment. Ravensgate is of the opinion that project development and management have been given appropriate attention. Ravensgate has reviewed the previous resource estimation work and the drilling data on which this is based. Additional understanding of the project was gained by the site visit which is important prior to mining and future disturbance near surface mineralised exposures at Pilgangoora.
Geological interpretation	<ul> <li>The confidence in the geological interpretation is good. The Pilgangoora deposit is a typical shear/faulted initiate pegmatite dyke swarm with numerous relatively narrow shallow dipping spodumene bearing pegmatite dykes clearly evident and outcropping at surface. The Pilgangoora pegmatite field lies within amphibolite units of mafic to ultramafic volcanic origin contained in the Pilgangoora greenstone belt. The main pegmatite dykes are broadly oriented north-northeast to south-southwest with a strike of 020-025 degrees with shallow to moderate easterly dips of 25-35 degrees and up to 50 degrees locally.</li> <li>The 2010 to 2012 RC and diamond drilling programs were used to confirm and validate the main pegmatite dyke lengths and thicknesses confirming the continuity of spodumene distribution and lithium grade.</li> <li>Data mainly comprises geological logging and geochemical analysis of drill chips and drill core. No assumptions on the data have been made.</li> <li>The pegmatite dykes are generally planar in geometry for the most part, with some lensing and 'pinching'' observed locally which is typical of a structurally imitated pegmatite dyke swarm.</li> <li>The mineralised envelopes for Pilgangoora were based on drill intercepts of nominally &gt;0.30% Li<sub>2</sub>O using maximum of 2m (2 samples) internal dilution. The logged spodumene percentage was used as a guide for the wireframes. The mineralised zone wireframes were extrapolated to the edges of the drilling along and perpendicular to the strike to maintain geological consistency. Data from rock chip sampling, mapping and costean investigation from the 2009 exploration program was also used as a guide. Detailed logging of RC drill chips and diamond core was completed during 2012 and this information transferred to geological logging database. This provided a more robust control for the pegmatite and resource wireframe generation.</li> </ul>

Criteria	Commentary
	<ul> <li>All mineralised envelopes where aligned with the known interpreted mineralisation trend. No obvious fault systems were interpreted to off-set mineralisation trends to a significant amount.</li> </ul>
Dimensions	• The Pilgangoora mineralisation total length of the main Pilgangoora lithium mineralisation domain is approximately 1670 metres. Mineralisation thickness is variable in the order of 5-20 metres. Interpreted mineralisation has been modelled to approximately 280m down dip.
Estimation and modelling techniques	<ul> <li>Grade estimation using ordinary kriging was completed for one reportable element - Li<sub>2</sub>O%. Drill hole sample data was flagged using domain codes generate from 3D mineralisation domains and geological surfaces. Sample data was composited per element to a 1m down-hole length. There were no residual composites internal to mineralisation domain wireframes. Intervals with no assay were excluded from the compositing routine. The influence of extreme grade values were examined utilising top cutting analyst tools (grade histograms, log probably plots and coefficients of variation). A nominal 0.30% Li<sub>2</sub>O cut-off was used to interpret wireframes of mineralisation.</li> <li>Grade continuity was measured using geostatistical techniques. Directional variograms were modelled using traditional and normal score transformation semivariograms.</li> <li>MineSight® software was utilised.</li> </ul>
	• Checked against a previous JORC 2004 resource estimate completed in Septembe 2012.
	<ul> <li>It is not anticipated that by-products could be produced and no assumptions were made of by-products.</li> <li>No other elements or non-grade variables were estimated.</li> <li>The following parameters were adopted based on this analysis: a parent block siz of 4.0mE x 8.0mN x 2.0mRL; minimum and maximum number of composites of 1 and 24; no sub-blocking or discretisation (all domains).</li> <li>A single search ellipsoid was used to estimate each block. Sample data utilised was first composited according to the main Li20% item to a 1m down-hole length</li> <li>One search passes was used for interpolation of grade into the blocks of each</li> </ul>
	<ul> <li>AREA domain. Any un-estimated blocks were left 'as is'. Hard boundaries were applied between all estimated domains.</li> <li>No detailed assumptions have been made with regard to modelling of selective mining units, except future mining is expected to be using standard excavator an truck methods. The block sized utilised is in line with the general mining method assumptions</li> </ul>
	<ul> <li>No correlation between any variables is required as Li<sub>2</sub>O% was the only economic element considered.</li> <li>Refer to Estimation and Modelling Techniques section above. A range of outlier grade restriction was applied to all mineralised wireframes within given AREA</li> </ul>
	<ul> <li>The influence of extreme grade values were examined utilising top cutting analysis tools (grade histograms, log probably plots and coefficients of variation).</li> <li>Some non-assayed intervals are present in the database. These have been interpreted as non-mineralised intervals and assigned zero grade for the purposes of block grade estimation. In situations where non-mineralised intervals are included within broader mineralised intervals these non-mineralised intervals were incorporated into the interpreted solids.</li> </ul>
	<ul> <li>Model validation was carried out graphically and statistically to ensure that the block model grades accurately represent the input drill hole data. A number of methods were employed to validate the block model including: global mean comparison; visual comparison; trend plot comparison. The global mean</li> </ul>

comparison; visual comparison; trend plot comparison. The global mean comparison between drill composite grades and model grades within each of the mineralised zone wireframes shows that, globally, the estimates validate well within all well informed domains for both deposits. Cross sections were viewed on-screen and showed a good comparison between the drill hole data and the

Criteria	Commentary
	<ul> <li>block model grades. A volume comparison between the volume of the block model cells within each mineralised zone and the volume of the corresponding wireframe. The results were in acceptable limits.</li> <li>Grade interpolations that were completed using three estimation methods: nearest neighbour, inverse distance squared and ordinary kriging. The global block model statistics for the ordinary kriging model were compared to the global inverse distance squared and nearest neighbour model values. Globally, there is close agreement between the ordinary kriging model and inverse distance squared and nearest neighbour model values. Globally, there is close agreement between the ordinary kriging model and inverse distance squared model and nearest neighbour model. Comparisons were made using all blocks.</li> <li>The visual comparisons of block model grades with composite grades for each of the three zones and ore bodies show a reasonable correlation between the values. No significant discrepancies were apparent from the sections and plans reviewed. In some outlying portions of the model larger discrepancies are reflected as a result of lower drill density. There is a degree of smoothing apparent from the ordinary kriging, which reflects the data density to a great extent.</li> <li>Block Model validation was carried out graphically and statistically to ensure that the block model grades accurately represent the input drill hole data. A number of methods were employed to validate the block model including:     <ul> <li>Global mean comparison,</li> <li>Visual comparison, and</li> <li>Bench trend plot comparison.</li> </ul> </li> <li>The global mean comparison between drill composite grades and model grades within each of the mineralised zone wireframes for the Li<sub>2</sub>0% item shows that globally, the estimates compare favourably within all the well drilled parts of the main mineralised domains. Some localised bench variations are observed with the bench trend plots. These areas of variation are due to the inheren</li></ul>
Moisture	The tonnages are estimated on a dry basis.
Cut-off parameters	<ul> <li>A nominal cut-off of 0.30% Li<sub>2</sub>O was used to define the mineralised envelope, based on a change of population on a probability plot.</li> <li>A revision of the previously used 0.8 0% Li2O lower cut-off following advice from Altura Mining Limited that a Prefeasibility Study (PFS) recently carried out by Engineering consultants Orelogy in November 2015 revealed that a lower operation economic cut-off was likely to prevail at Pilgangoora. Ravensgate reviewed the Orelogy work and agreed that a revision of the Li2O(%) reporting lower cut-off is warranted following the release of some updated economic cut-off findings from the Prefeasibility Study. An ultimate schedule based upon publically available financial inputs from the Mt Cattlin Operation was also adopted by Orelogy for sensitivity analysis and evaluation.</li> <li>Ravensgate has reviewed the information contained Orelogy's Prefeasibility Study report relating to the economic parameters and cut-off grades referred to in report sections relating to :         <ul> <li>Data and Model Review.</li> <li>Mining Cost Estimate.</li> <li>Development of Mine Design Criteria.</li> <li>Pit Optimisation.</li> <li>Scheduling</li> </ul> </li> <li>Ravensgate's opinion is that the use of a 0.40% Li2O lower cut-off as described from the Mt Cattlin based sensitivity analysis may now be used for reporting the lithium resource at Pilgangoora. The cut-off grade of a 0.40% Li2O for the stated Mineral Resource Estimate is determined from current economic parameters and currently reflects potential anticipated mining practices.</li> </ul>

Criteria	Commentary
	<ul> <li>Ravensgate cautions the reader that this updated resource summary can only be viewed with direct reference to the Orelogy Pre-Feasibility Study report and the use of the revised reporting lower cut-off is contingent upon the findings and recommendations from this report. These findings and recommendations may change at a future time due to fluctuations in mining costs and lithium market conditions.</li> </ul>
Mining factors or assumptions	<ul> <li>Future mining or mineral extraction at the Pilgangoora deposit is anticipated to be initially open pit mining. No other assumptions on mining methodology have been made.</li> </ul>
Metallurgical factors or assumptions	<ul> <li>Altura completed comminution and metallurgical studies for a 2012 Scoping study and established that a &gt; 6% Li<sub>2</sub>O spodumene concentrate can be produced using well tested and conventional gravity and dense media separation techniques. This work was completed using HQ size diamond core from representative drill holes located in different location of the pegmatite resource. Altura has since completed 5 additional representative HQ diamond holes in the pegmatite resource and these will be used for additional comminution and metallurgical studies.</li> <li>Orelogy considered a previous METS Scoping Study report (Nov 2012) which was based on preliminary laboratory testwork and assumed a concentrate grade of 6.0% Li<sub>2</sub>O could be achieved. Orelogy has proceeded with the PFS on the basis that this is sufficient metallurgical test work to justify the 0.35% Li<sub>2</sub>O project break-even cut-off. Previous work was based on higher head grades associated with higher cut-offs. Ravensgate is in agreement with Orelogy's viewpoint such that a 0.35% Li<sub>2</sub>O lower cut-off is now deemed acceptable for a resource reporting. Ravensgate understands that metallurgical test work is in progress and that once the expected positive results from this work are established.</li> <li>The Li<sub>2</sub>O Cut-Off Grade (COG) was based on the following using the basic formula:</li> </ul>
	COG = Process cost / (Recovery * Price):
	Initial Breakeven COG = Process cost / (Recovery * Price)
	= 23.52 / (0.866 * 77.80)
	= 0.3491% Li <sub>2</sub> O
	<ul> <li>Strategic schedules were generated using Maptek Evolution® on an annual calendar basis aiming to achieve the maximum value schedule from a number of different variations (scenarios).</li> <li>The financial inputs, costs and processing parameters, used in pit optimisation were applied on the base case scheduling scenarios along with further sensitivity analysis inputs and variations advised by Altura.</li> </ul>
Environmental factors or assumptions	<ul> <li>It has been assumed that there are no environmental factors which would prevent the eventual economic extraction of these deposits. Detailed environmental surveys and assessments will form a part of a feasibility study. Desk top environmental studies were completed over the Pilgangoora and a search of the DER database for Threatened Ecological Communities and threatened flora and fauna has been undertaken with no communities or species being identified. A EPBC protected matters search was also undertaken with no listed flora communities of concern. In October 2013 Altura's environmental consultants completed a Level 2 Flora and vegetation and a Level 1 Fauna field survey within the Pilgangoora project area and noted that no threatened communities had been recorded from this work. In the near future it is expected waste material will be tested for pH, pHFOX and EC. The results of the testing are expected to show that the pegmatite material to be close to neutral or slightly alkaline, and is very unlikely to generate acidity. Groundwater tests to date show variation from low calinity to moderatoly caline.</li> </ul>

salinity to moderately saline.

Criteria	Commentary
Bulk Density	<ul> <li>A total of 283 bulk density measurements have been recorded using 10 - 20 cm sections of fresh whole HQ size diamond core - these measurement included both pegmatite ore and waste rock. Measurements were carried out using the water displacement - Archimedes method. The fresh/un-oxidised core was waterproofed by wrapping in thin plastic film and placed in water with the displacement recorded.</li> <li>All bulk density measurements were on fresh competent rock. The thin plastic wrapping inhibited any moisture absorption.</li> <li>Only one lithological unit occurs with the mineralisation - pegmatite. No other unit intersected the mineralisation.</li> </ul>
Classification	<ul> <li>The Resource model uses a classification scheme based upon block estimation parameters including Kriging Variance, Number of composites in search ellipsoid informing the block cell and composite distance to block centroid. These inputs were used to derive relative confidence levels or 'quality of estimate index' (QLTY item) within the block model) which has a range of 1 to 3, where QLTY=1, 2 or 3 represents high, medium or low confidence respectively.</li> <li>Table 15 in the main resource estimation report summarises the criteria used to assist with the assignment of QLTY item values in the block model specific to all the known Pilgangoora mineralisation, coded as the ZON1=1-19 mineralisation domains.</li> <li>The three QLTY item parameters are further condensed into an unbiased RCAT item describing the confidence of the localized resource base in the block model. Preliminary Resource Classification Item - (RCAT) Values 1-3 - (Nominally ('Meas'), 'Ind' and 'Inf' [(1), 2 or 3] - Condensed from QLTY Item. No Measured resources for Pilgangoora are reported at this time.</li> <li>The input data is comprehensive in its coverage of the mineralisation and does not favour or misrepresent in-situ mineralisation.</li> <li>Classification by the Competent Person has also taken into account a range of other modifying factors commencing with the geological understanding of the Pilgangoora pegmatites which is a primary requirement to producing a robust resource estimation model. The validation of the block model shows good correlation of the input data to the estimated grades.</li> <li>The Mineral Resource estimate appropriately reflects the view of the Competent Persons.</li> </ul>
Audits or reviews	<ul> <li>No reviews or audits of the Ravensgate resource estimation have been undertaken, but an external audit is planned.</li> </ul>
Discussion of relative accuracy / confidence	<ul> <li>The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource into the Measured, Indicated and Inferred categories as per the guidelines of the JORC Code 2012.</li> <li>Approximately 10% of the inferred material has been extrapolated. Preparation of this resource report has been by a consultancy which is fully independent Preparation of this report has incorporated a peer review process as part of Ravensgate's QA procedures. This report has included an independent QAQC review of the drill data collected by Altura Mining Ltd.</li> <li>This statement relates to a global estimate of tonnes and grade.</li> <li>No production data is available.</li> </ul>