

## Quarterly Activities Report

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30 April 2014

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Matthew Wood  
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Brian McMaster  
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Amarbaatar Chultem

**Issued Capital:**

241.75 million shares

ASX Symbol: HAR

# MARCH 2014 QUARTERLY ACTIVITIES REPORT

Haranga Resources Limited (“the Company”) is pleased to report that during the March 2014 quarter the Company’s operations have been focused on completing previously planned work programmes and planning the Company’s 2014 activities to successfully bring the Selenge iron ore project (“the Selenge project”) into the development stage.

## HIGHLIGHTS

- The Company has commenced the Detailed Environmental Impact Assessment (DEIA) of the Selenge project, which forms part of the Mining License application process to the Mineral Resource Authority of Mongolia (MRAM).
- Targeting possible off take partners in China, the Company is studying an alternative option to accomplish the pilot scale metallurgical test. An optimized design flowsheet for the test work has been generated.
- As agreed in the Pre-Mining Agreement (PMA) with the Mineral Resource Authority of Mongolia (MRAM), a comprehensive study for infrastructure solutions such as road, railway, electricity and water supply for potential open pit mine and beneficiation plant at the Selenge project has commenced.
- Feasibility study geotechnical slope design proposal by an independent expert is being reviewed which will be followed by the completion of the geotechnical purpose drill plan. The field work will then commence to complete a Mine Design.
- A hydrogeological drilling plan to study water characterisations and underground hydrogeological conditions for the open pit has been completed.
- In order to increase the Resource base to ensure a longer life of mine (LOM), the Company is targeting an additional drilling programme to be approved by MRAM in the coming weeks.

## DEVELOPMENT ACTIVITIES

The Company's flagship Selenge iron ore project is transitioning into its Development stage after the completion of the successful Exploration phase.

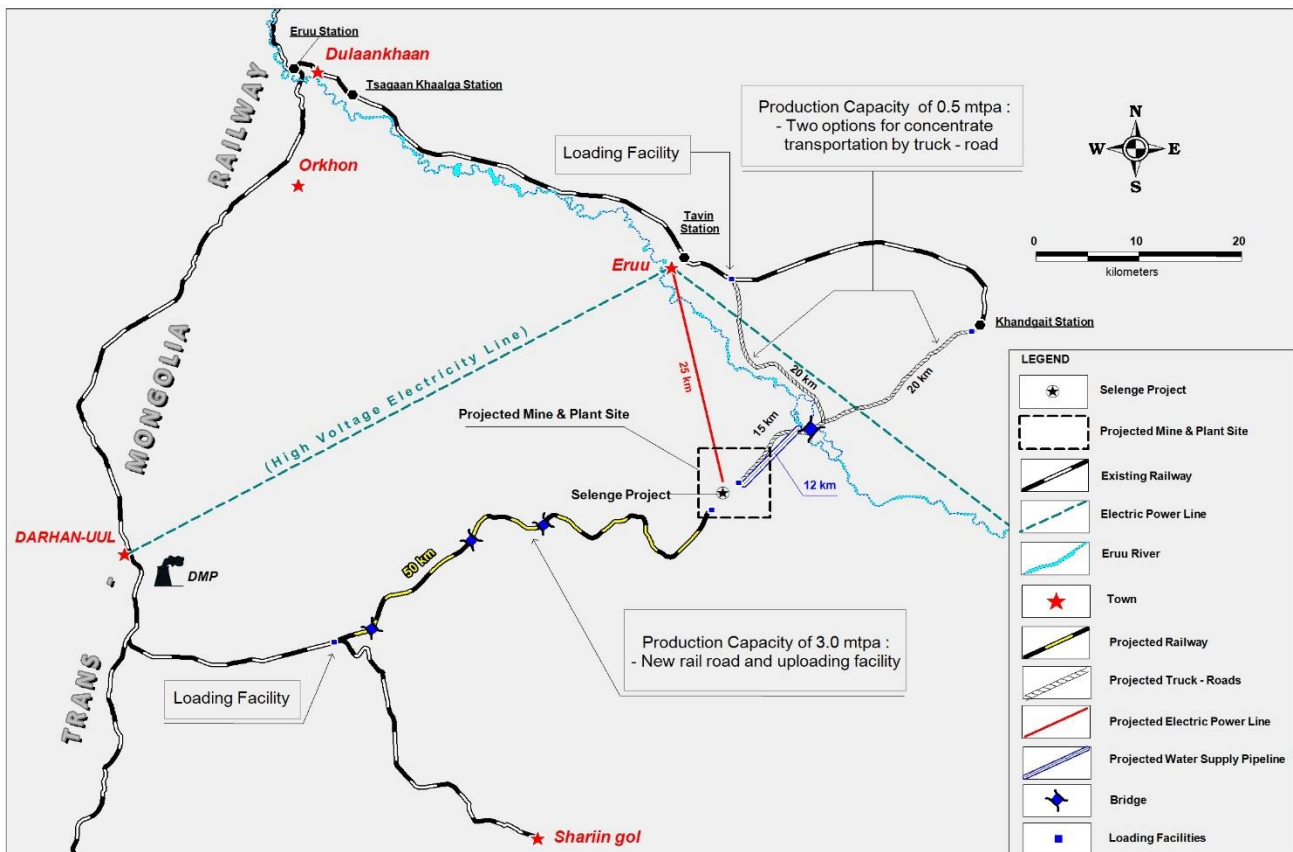
The Selenge project is ideally located in the heart of Mongolia's premier iron ore development region with excellent access to the main trans-Mongolian rail line and nearby rail spurs. The Company has signed a Memorandum of Understanding (MOU) with both the Mongolian Railway Authority and the Ministry for Transportation requesting up to 5Mtpa of rail capacity from 2015 onwards.

### Infrastructure

As agreed in the Pre-Mining Activities Agreement with the Mineral Resource Authority of Mongolia, a comprehensive study for infrastructure solutions such as truck transportation, railway, electricity and water supply for a potential open pit mine and beneficiation plant at the Selenge project is underway.

Field studies were conducted to examine the selected infrastructure development options depending on the Selenge project's two different concentrate production capacity scenarios. In a smaller (0.5Mtpa) capacity scenario, consideration was given to two options of iron concentrate transportation by truck-road; (i) to Eruu sub-provincial center and Tavin station & loading facility; and/or (ii) to connect with Khandgait station & loading facility to get onto the BTEG existing rail road. In a larger (3.0Mtpa) capacity case, a new rail road is planned that will connect to the existing Shariin Gol coal mine railway. In terms of the power supply, the Company is investigating the construction and installation of a new electricity transmission line (25km) from the main 110kV high-voltage power grid between the sub-provincial towns of Darkhan city, Eruu and Bugant. Additional studies are being conducted to determine if approximately, a 12km pipeline can be built from Eruu River for the open pit mine and beneficiation plant complex. The following map highlights the preliminary results of this work.

**Figure 1. The Infrastructure of the Selenge projects**



## Metallurgical test works

Samples were reviewed to represent the actual four main ore domains (type and grain size of the minerals) at Selenge iron ore deposits: (i) banded magnetite skarn (BMS: 40%-52%), (ii) magnetite skarn (25%-39%), (iii) magnetite garnet skarn (13%-18%), and (iv) garnet phyrrotite skarn (5%-8%). The samples are currently with the Customs Office waiting final approval for shipping to the ALS Technical Centre in Wangara, Western Australia.

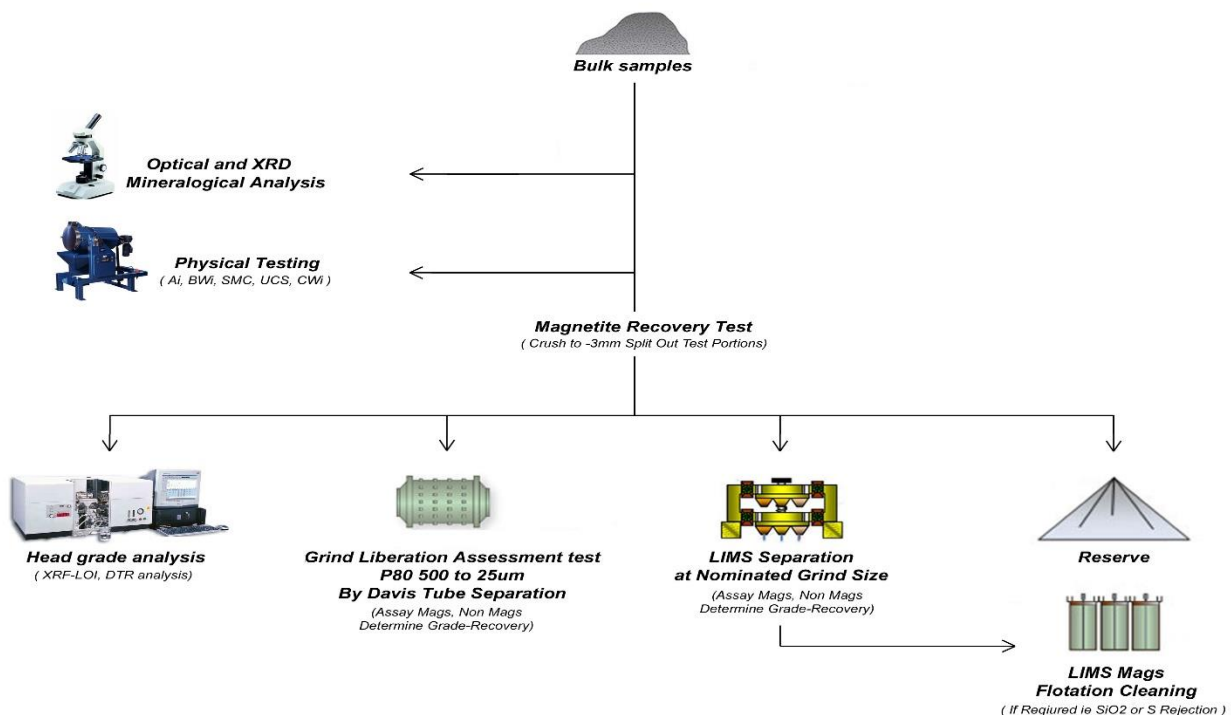
The samples will undergo detailed laboratory scale engineering analysis to define ore beneficiation and yield characteristics of Bayantsogt and Dundbulag deposits and to determine and establish a design flowsheet to complete metallurgical testing at pilot scale.

The analysis will be carried out in two sections:

- **First segment:** (i) Optical and XRD mineralogy, (ii) Physical testing to determine the Autogenous index, Bond work index and SAG mill comminution, (iii) test for Crusher work index and Ultimate compressive strength;
- **Second segment:** to generate data to assist in determining the Grade-Recovery characteristics of the ore the following works will be conducted and assayed: (i) Head grade analysis including XRF – LOI DTR analysis, (ii) Grind liberation assessment test (P80 500 to 25µm) by Davis Tube Separation, (iii) Low intensity magnetic separation (LIMS) at nominated grind size (75µm, 105µm, 125µm, and 150µm), and (iv) LIMS magnetics Flotation cleaning if required to reject silica (SiO<sub>2</sub>) and sulfur (S).

The results of this work will enable a second round of work to be planned to examine the variability of the ores and the possible determination and further refining the recovery process route. Actual throughput, energy and water consumption, nominal and design flowsheet for the potential processing plant will be estimated as a result of this test work.

**Figure 2. The technological design flowsheet from the preliminary scoping test programme (for detailed engineering analysis)**



## Pre-Mining Activities

The Company's 80% owned Mongolian subsidiary "Haranga Huder" LLC, which holds the MEL #11334X, signed PMA with MRAM) on 20 December 2013. This PMA covers the entire license area where the JORC compliant resource was estimated.

Under this PMA, the Company is allowed to build an open pit mine and processing plant complex after completion and submittal of the Feasibility Study together with a Mine Design.

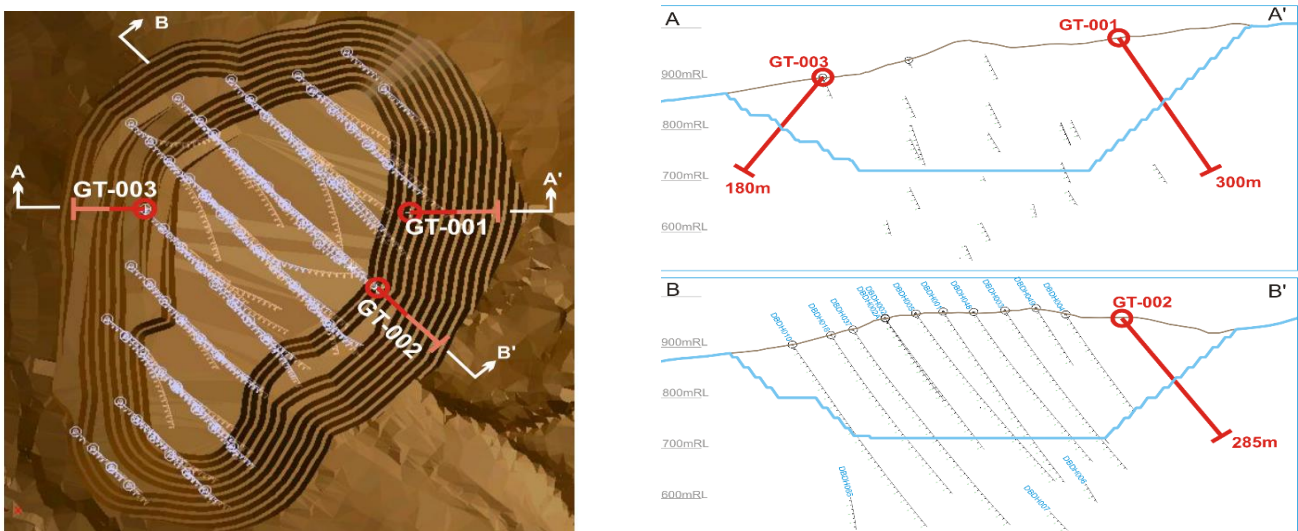
## Geotechnical Study

In order to complete a Mine Design, as part of the PMA activities, a bankable feasibility study level Geotechnical Slope Design proposal by an independent expert is being reviewed. In line with this purpose, the geotechnical drilling plan is completed, and the field work will soon commence.

A request for a proposal was sought and received for the upcoming feasibility level geotechnical site investigation, analysis and the generation of slope design criteria. The programme is planned to commence in June 2014 and will include the drilling of triple tube geotechnical boreholes with orientated core. Specifically, the following works will be carried out:

- A minimum of six geotechnical bore holes will be used in the site investigation for a total of 1,575 m at Dund Bulag and Bayantsogt. To increase data density on the planned pit walls additional geotechnical logging will be performed on previously drilled resource boreholes;
- The depth of soil cover at the down slope side of the planned pit crests will be determined;
- A detailed structural geology assessment at the deposit scale, producing 3D solid/surface models will be completed;
- Geotechnical Laboratory test work comprising of approximately 30 unconfined and tensile strength, 10 tri-axial and 20 direct shear tests, performed to the necessary standards;
- Hydrogeological investigation focusing on the South East slopes, together with ground water pore pressure numerical modelling; and
- Geotechnical slope design criteria using the following methods;
  - Bench scale kinematic structural analysis; and
  - Inter-ramp and overall slope kinematic structural and limited equilibrium analysis.

**Figure 3. Geotechnical Drilling (shown example: Dundbulag cross sections)**



## Hydrogeological Study

As part of the PMA activities, the Company will conduct the study in two directions: (i) to determine water characterizations i.e. underground water conditions and to study its influence on open pit mine operations; and (ii) study water supply options, both surface and underground water sources, available in the vicinity of the potential mine and processing plant site. The Scope of Work is approved by the Water Authority of the Ministry of Environment and Green Development (MEGD) of Mongolia.

The hydrogeological study will focus on the Dundbulag deposit site water characterisation. For this purpose the following timeframe is targetted:

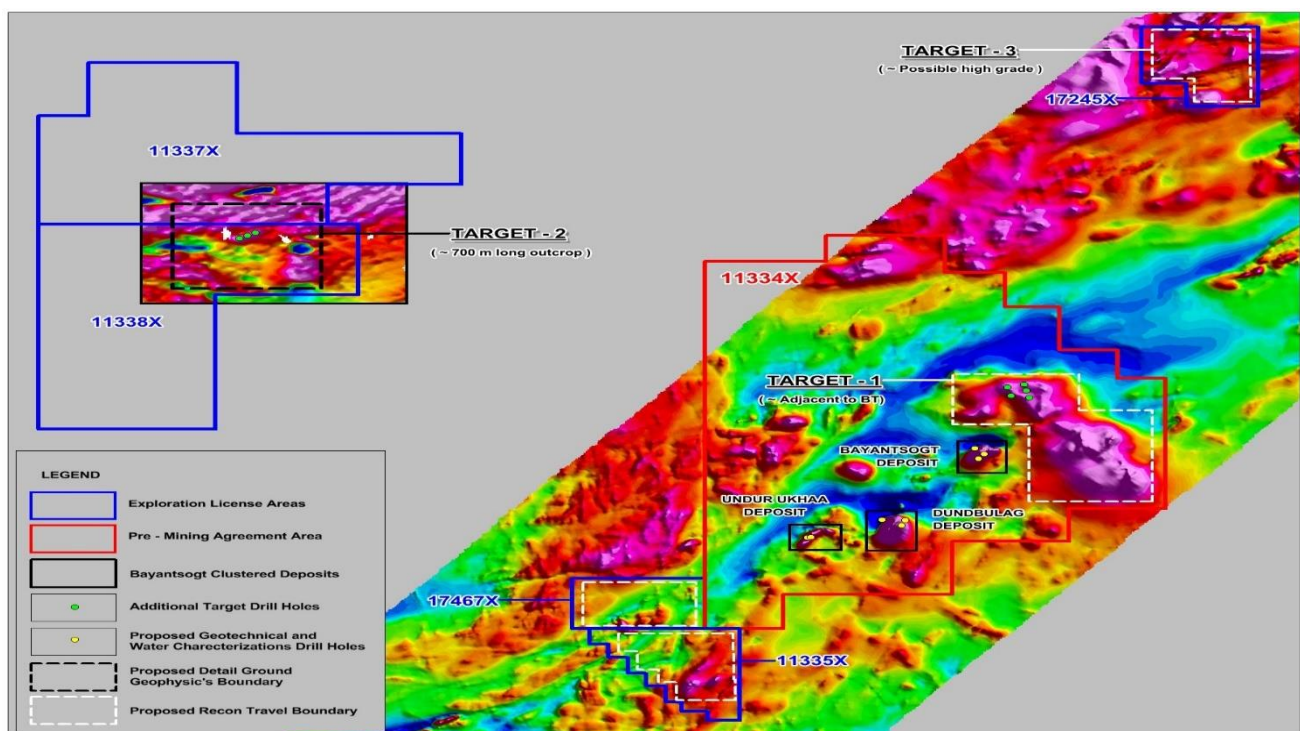
1. A Contractor selection and examination/review to be completed in May 2014;
2. The field hydrogeological drilling to define water supply alternatives (surface & underground) to be completed by September 2014. In line with this, the company has commenced a research of the surface water resource along/near Eruu river area in cooperation with the local government.
3. In accordance with the PMA, the Company has planned to drill 2 hydrogeological boreholes with maximum depth of 250 meters at Dundbulag site to define underground hydrogeological conditions and water characterisations by September, 2014.

The Company will carry out hydrogeological studies in combination with geotechnical study works.

## 2014 Target Drilling Program

In order to increase the Resource base to ensure a longer life of Mine (LOM), an additional target drilling plan has been submitted to be approved by MRAM. The Company is expecting approval within the current quarter.

**Figure 4. Target drill plan map**



Target 1 is associated with the Bayantsogt magnetite skarn hill and lies within the structural corridor that contains the major iron ore deposits in the region. This drilling target is located in the PMA license area where the JORC Compliant Resources\* have been delineated. Target 2 is an outcrop that extends to 700m at

the ground surface and suggests a significant mineralised zone. This drilling target is located within the exploration licenses of #11338X and #11337X.

### **Detailed Environmental Impact Assessment**

As a part of the Mining License (ML) application process, the Company has successfully passed the review of the Environmental Baseline Study of the Project by the Department of Environment and Natural Resources of MEGD of Mongolia. Following this, it was approved for the Company to proceed and conduct the Detailed Environmental Impact Assessment (DEIA) based on the General Environmental Impact Assessment that was released to the Company by MEGD. This document provided the framework and guidelines for completing DEIA.

Within this framework, the Company is conducting relevant works in cooperation with the local government.

### **Independent Techno Economic Assessment of the Selenge Project**

It is the Company's intention to update an independent techno economic (TE) assessment of the Project based on the final results of the pilot scale metallurgical test work. This TE assessment will then use a valuation model, OREX, which is the next stage of ORVAL. (Table 2 shows the summary result of 3Mtpa scenario ORVAL study)\*\*.

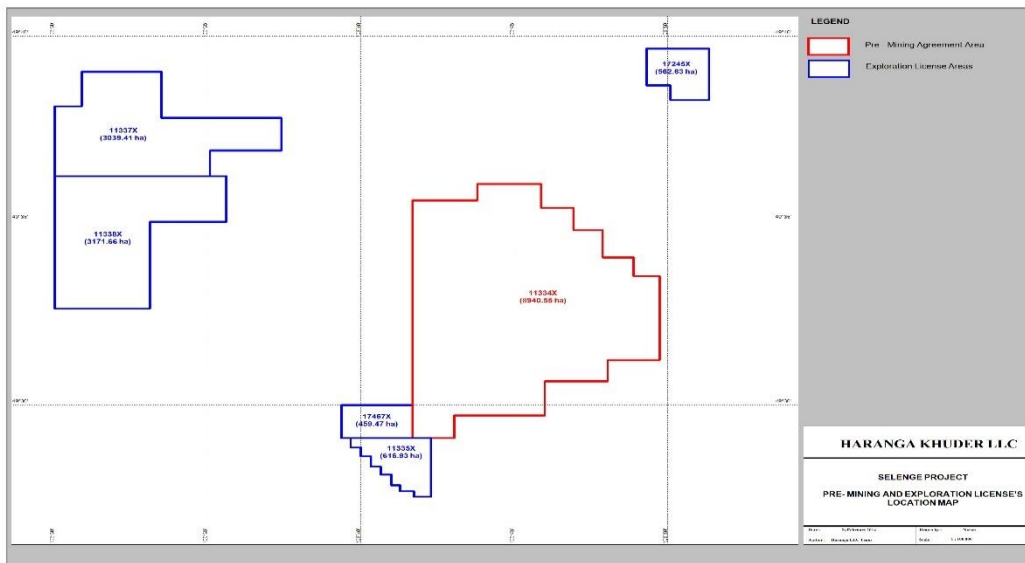
In addition, the Company is working to assess and study in depth a smaller scale production capacity scenario to achieve earlier production and positive cash flow. The results of the previous ORVAL study of this scenario demonstrated an exceptionally high IRR of 148.5% generating the average annual revenue of AU\$65.1M and NPV of AU\$40.2M during the initial 5 years of operation. The Company is now working towards improving the economics of this scenario based on additional adjusted input data including: (i) initial mine blocks that are being optimized by the Whittle model, (ii) installing a grid line for power supply instead of diesel electricity generation, and (iii) studying the concentrate transportation road by truck to get onto BTEG rail and loading facility considering a lower CAPEX for a start-up operation.

### **Other Activities**

#### **Partial Relinquishment of Tenement areas**

The Company has partially relinquished some of the exploration areas from the existing Tenements. As a result of this, the total area of the PMA license is now 8,940.55 hectares.

**Figure 5. The PMA and Exploration Tenement Area**



## Board Changes

Following the resignation of Mr. Timothy Flavel, Mr. Brian McMaster was appointed as a Director of the Company.

**Erdene Tsengelbayar**

**Managing Director**

**Haranga Resources Limited**

\* The technical information contained in this announcement in relation to the JORC Code (2004) Compliant Resource for the Selenge Project Deposits has been reviewed by Mr Peter Ball of DataGeo Ltd, who is a member of the Australasian Institute of Mining and Metallurgy. Mr Ball has sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Mineral Resources and Ore Reserves'. Mr Ball consents to the inclusion in this report of the matters based on his information, and information presented to him, in the form and context in which it appears. Refer to the HAR ASX announcement dated 7 May 2013 for further details.

Table 1. JORC Resource Estimates Split by Deposit (Cutoff = 12.5% Fe)

Deposit	Measured		Indicated		Inferred		TOTAL	
	Mt	Fe Grade	Mt	Fe Grade	Mt	Fe Grade	Mt	Fe Grade
Dund Bulag	96.4	16.6	103.5	16.1			199.9	16.4
Bayantsogt	20.7	23.0	15.0	22.8	0.55	16.6	36.3	22.8
Undur Ukhaa	9.3	15.8	8.9	15.1			18.2	15.4
<b>TOTAL</b>	<b>126.4</b>	<b>17.6</b>	<b>127.4</b>	<b>16.8</b>	<b>0.55</b>	<b>16.7</b>	<b>254.4</b>	<b>17.2</b>

\*\* The information in this release is based on the Options Study Report prepared by GHD. This report was prepared on the basis of information provided by Mr. Kerry Griffin, the former Technical Director of Haranga Resources Limited. GHD consented to the inclusion in this release of the matters based on the Option Study Report and information presented to it, in the context in which it appears. Mr. Kerry Griffin consented to the inclusion in this release of the matters based on his information, in the context in which it appears.

The information in this release, which relates to Mineral Resources and exploration results was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported.

Table 2. The Summary Results from Independent Techno-Economic Assessment

(12.5% Discount Rate, US\$131.5/t Price for concentrate)

JORC Compliant Resource	Tonnage (Million tons)	Mine Life (LOM, years)	Annual Concentrate Production (Mtpa)	CAPEX (AU\$Mln)	Cash Cost (AU\$ per ton conc.)	NPV (AU\$Mln)	IRR (% , After tax)
<b>Indicated and Measured</b>	<b>253.8</b>	<b>16</b>	<b>3.0</b>	<b>562.4</b>	<b>64.0</b>	<b>457.8</b>	<b>47.6</b>

## Appendix 1 – Interests in mining tenements held

### Tenement table

Project	Location	Tenement	Interest (%) at beginning of quarter	Interest (%) at end of quarter	Acquired during the quarter	Disposed of during the quarter
SELENGE	Mongolia	11334X 11335X 11337X 11338X 17245X 17467X	80	80	-	-

### Summary of Expenditure Incurred per Project

Project	Quarter Cash Spend
	\$A'000
SELENGE	137
<b>Total</b>	<b>137</b>