

Australian Securities Exchange Level 8 Exchange Plaza 2 The Esplanade PERTH WA 6000

Dear Sir/Madam

# Llahuin Copper-Gold Project – Technical Report for JORC Resource Upgrade (the "Report")

For disclosure purposes, please refer below for a Report: "Mineral Resource Estimate - Llahuin Copper Project, Coquimbo Region, Chile" as released in Canada. The resource reported has been prepared in accordance with the Canadian Institute of Mining (CIM) National Instrument 43-101 and complies with the requirements of the JORC Code (refer to announcement September 10, 2012).

## Competent Person's Statement - JORC

The information in this Report that relates to Exploration Results or Mineral Resources is based on information compiled by Mr Ian Dreyer. Mr Dreyer is Regional Manager of Andes Mining Services Ltd and is a Chartered Professional Member of the Australasian Institute of Mining and Metallurgy. Mr Dreyer has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the December 2004 Edition of the "Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Dreyer consents to the inclusion in the Report of the matters based on this information in the form and context in which it appears.

Yours faithfully

Derek Hall Company Secretary



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# Mineral Resource Estimate - Llahuin Copper Project, Coquimbo Region, Chile

# NI 43-101 Technical Report

On Behalf of – Southern Hemisphere Mining Limited

Effective Date – 10<sup>th</sup> September 2012

Qualified Persons:	lan Dreyer	BSc (Geo) CP MAusIMM	
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# **Table of Contents**

1	Summ	ary	7
	1.1	Introduction	7
	1.2	Location	7
	1.3	Ownership	7
	1.4	Geology and Mineralization	8
	1.5	Status of Exploration	9
	1.6	Mineral Resources	. 10
	1.7	Copper Equivalent Calculation	. 11
	1.8	Conclusions and Recommendations	. 11
2	Introdu	uction	. 13
	2.1	Scope of Work	. 13
	2.2	Forward-Looking Information	. 13
	2.3	Principal Sources of Information	. 14
	2.4	Site Visit	. 14
	2.5	Authors' Qualifications and Experience	. 14
	2.6	Units of Measurements and Currency	. 14
	2.7	Independence	. 14
	2.8	Abbreviations	. 15
3	Relian	ce on Other Experts	. 16
4	Dropor	to Dependention and Leasting	47
4	Flober	ty Description and Location	. 17
4	4.1	Project Location	
-			. 17
-	4.1	Project Location	. 17 . 17
-	4.1 4.2	Project Location Type of Mineral Tenure	. 17 . 17 . 18
-	4.1 4.2 4.3	Project Location Type of Mineral Tenure Area of the Property	. 17 . 17 . 18 . 19
-	4.1 4.2 4.3 4.4	Project Location Type of Mineral Tenure Area of the Property The Nature and Extent of the Titles	. 17 . 17 . 18 . 19 . 19
-	4.1 4.2 4.3 4.4	Project Location Type of Mineral Tenure Area of the Property The Nature and Extent of the Titles Mining Property	. 17 . 17 . 18 . 19 . 19 . 19
-	4.1 4.2 4.3 4.4	Project Location         Type of Mineral Tenure         Area of the Property         The Nature and Extent of the Titles         Mining Property         4.5.1       Mining Concessions in Chile         4.5.2       Access to the Necessary Lands for the Execution of Mining Work         4.5.3       Water Rights	. 17 . 17 . 18 . 19 . 19 . 19 . 19 . 20
-	4.1 4.2 4.3 4.4 4.5	Project Location         Type of Mineral Tenure         Area of the Property         The Nature and Extent of the Titles         Mining Property         4.5.1       Mining Concessions in Chile         4.5.2       Access to the Necessary Lands for the Execution of Mining Work         4.5.3       Water Rights         4.5.4       Specific Tax to the Mining Activities	. 17 . 17 . 18 . 19 . 19 . 19 . 19 . 20 . 20
-	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul>	Project Location         Type of Mineral Tenure         Area of the Property         The Nature and Extent of the Titles         Mining Property         4.5.1       Mining Concessions in Chile         4.5.2       Access to the Necessary Lands for the Execution of Mining Work         4.5.3       Water Rights         4.5.4       Specific Tax to the Mining Activities         Royalties / Agreements and Encumbrances	. 17 . 17 . 18 . 19 . 19 . 19 . 19 . 20 . 20 . 20
-	4.1 4.2 4.3 4.4 4.5	Project Location         Type of Mineral Tenure         Area of the Property         The Nature and Extent of the Titles         Mining Property         4.5.1       Mining Concessions in Chile         4.5.2       Access to the Necessary Lands for the Execution of Mining Work         4.5.3       Water Rights         4.5.4       Specific Tax to the Mining Activities	. 17 . 17 . 18 . 19 . 19 . 19 . 19 . 20 . 20 . 20
5	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul>	Project Location         Type of Mineral Tenure         Area of the Property         The Nature and Extent of the Titles         Mining Property         4.5.1       Mining Concessions in Chile         4.5.2       Access to the Necessary Lands for the Execution of Mining Work         4.5.3       Water Rights         4.5.4       Specific Tax to the Mining Activities         Royalties / Agreements and Encumbrances	. 17 . 17 . 18 . 19 . 19 . 19 . 20 . 20 . 20 . 21
	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul>	Project Location         Type of Mineral Tenure         Area of the Property         The Nature and Extent of the Titles         Mining Property         4.5.1       Mining Concessions in Chile         4.5.2       Access to the Necessary Lands for the Execution of Mining Work         4.5.3       Water Rights         4.5.4       Specific Tax to the Mining Activities         Royalties / Agreements and Encumbrances         Environmental Liabilities and Permits	. 17 . 17 . 18 . 19 . 19 . 19 . 20 . 20 . 20 . 21 . <b>22</b>
	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul> 4.6 4.7 Site Loce	Project Location	. 17 . 17 . 18 . 19 . 19 . 19 . 20 . 20 . 20 . 21 . 22
	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul> 4.6 4.7 Site Lo 5.1	Project Location	. 17 . 17 . 18 . 19 . 19 . 19 . 20 . 20 . 20 . 20 . 21 . 22 . 22
	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul> 4.6 <ul> <li>4.7</li> </ul> Site Loc <ul> <li>5.1</li> <li>5.2</li> <li>5.3</li> </ul>	Project Location	. 17 . 17 . 18 . 19 . 19 . 19 . 20 . 20 . 20 . 20 . 21 . 22 . 22 . 22
5	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul> 4.6 <ul> <li>4.7</li> </ul> Site Loc <ul> <li>5.1</li> <li>5.2</li> <li>5.3</li> </ul>	Project Location	. 17 . 17 . 18 . 19 . 19 . 19 . 20 . 20 . 20 . 20 . 20 . 21 . 22 . 22 . 22 . 22
5	<ul> <li>4.1</li> <li>4.2</li> <li>4.3</li> <li>4.4</li> <li>4.5</li> </ul> 4.6 <ul> <li>4.7</li> <li>Site Lo</li> <li>5.1</li> <li>5.2</li> <li>5.3</li> <li>History</li> </ul>	Project Location	. 17 . 17 . 18 . 19 . 19 . 19 . 20 . 20 . 20 . 20 . 21 . 22 . 22 . 22 . 22 . 22 . 25

	6.3	Production History	25
7	Geolo	gical Setting and Mineralization	27
	7.1	Regional Geology	27
	7.2	Project Geology and Mineralization	29
8	Depos	sit Types	34
9	Explo	ration by SHM	36
	9.1	Rock Chip Sampling	36
	9.2	Geophysics	
10	Drillin	g	38
	10.1	Introduction	38
	10.2	Drilling Procedures	38
	10.3	Drilling Orientation	40
	10.4	Surveying Procedures	40
		10.4.1 Accuracy of Drillhole Collar Locations	40
		10.4.2 Down-hole Surveying Procedures	40
11	Sampl	le Preparation, Analyses and Security	42
	11.1	Sampling Method and Approach	42
		11.1.1 Diamond Core Sampling	42
		11.1.2 Reverse Circulation Sampling	
		11.1.3 Logging	
	11.2	Sample Security	
	11.3	Sample Preparation and Analysis	
	11.4	Adequacy of Procedures	44
12	Data V	/erification	45
	12.1	Drillhole Database	45
	12.2	Analytical Quality Control	45
		12.2.1 Field Duplicates	45
		12.2.2 Blanks	
		12.2.3 Standards	
	40.0	12.2.4 Umpire Assays	
	12.3	Bulk Densities	
	12.4	Adequacy of Data	
13		al Processing and Metallurgical Testing	
14		al Resource Estimates	
	14.1	Introduction	
	14.2		
	14.3	Geological Modelling	
	14.4	Sample Selection and Compositing	
	14.5	Basic Statistics	
	14.6	Variography	
	14.7	Block Modelling	61

	14.8	Grade Estimation	63
	14.9	Model Validation	63
	14.10	Ancillary Fields	67
	14.11	Resource Classification	67
	14.12	Mineral Resource	69
15	Miner	al Reserve Estimates	70
16	Mining	g Methods	70
17	Recov	very Methods	70
18	Projec	ct Infrastructure	70
19	Marke	et Studies and Contracts	70
20	Capita	al and Operating Costs	70
21	Econo	omic Analysis	70
22	Adjac	ent Properties	70
23	Other	Relevant Data and Information	70
24	Interp	pretation and Conclusions	72
25	Recor	mmendations	72
	25.1	Exploration and Resources	72
	25.2	Mineral Resource and Evaluation Budget	72
26	Refere	ences	74
27	Date a	and Signature Page	75
28	Certifi	icates of Qualified Persons	76

# List of Tables

Table 1.6_1 – Grade Tonnage Report	11
Table 2.8_1 – List of Abbreviations	15
Table 4.2_1 – Llahuin Project – Concession Status	17
Table 10.1_1 – Exploration Drilling Summary	38
Table 10.2_1 – RC Data Removed from Grade Estimate	39
Table 10.2_2 – Twin Hole Comparison for Llahuin and Cerro de Oro	40
Table 14.7_1 – Summarised Block Model Parameters for all Models	62
Table 14.7_2 – Block Model Attributes List	62
Table 14.8_1 – Search Parameters	63
Table 14.11_1 – Confidence Levels of Key Criteria	67
Table 14.12_1 – Grade Tonnage Report - Llahuin Project	69
Table 26.2_1 – Proposed Resource and Evaluation Budget	73

# List of Figures

Figure 1.2_1 – Project Location	7
Figure 1.4_1– Deposit Locations	9
Figure 4.1_1 – Project Location Plan	17
Figure 4.3_1 – Tenement Plan	18
Figure 5.1_1 – Llahuin - Location Plan	23
Figure 5.2_1 – Llahuin - Physiography	24
Figure 6.3_1 – Llahuin Open Pit – Looking South West	26
Figure 7.1_1 – Area Surrounding the Llahuin Project – Regional Geology	27
Figure 7.2_1 – Deposit Locations	30
Figure 7.2_2 – Llahuin Project – Project Geology	31
Figure 7.2_3 – Hand Specimen – Typical Veining within Llahuin Porphyry	32
Figure 7.2_4 – Outcrops – Typical Veining within Llahuin Porphyry	32
Figure 7.2_5 – Core Specimens – Llahuin Porphyry – Bornite/Chalcopyrite Vein	33
Figure 7.2_6 – Core Specimens – Llahuin Porphyry – Disseminated Chalcopyrite in Volcanics	33
Figure 8_1 – Genetic Model for Porphyry Copper Deposits – Sillitoe 2011	34
Figure 9.2_1 – Llahuin Project – Induced Polarisation Survey	37
Figure 10.2_1 – Central Porphyry Zone – Drillholes Used In Estimate	39
Figure 11.1_1 – Llahuin Project – Diamond Core Presentation	43

Figure 12.2.1_1 – Llahuin – Field Duplicates - Cu	46
Figure 12.2.1_2 – Llahuin – Field Duplicates - Au	46
Figure 12.2.2_1 – Llahuin – Blank Samples - Cu	47
Figure 12.2.3_1 – Standards – Medium Grade Cu	48
Figure 12.2.4_1 – Umpire Assays-Cu	48
Figure 12.2.4_1 – Umpire Assays-Au	49
Figure 12.3_1 – Bulk Density Measurements	50
Figure 14.3_1 – Schematic Cross Section Looking North Showing Geological Units	54
Figure 14.3_2 – Schematic Cross Section Showing Grouped Geological Units	54
Figure 14.3_3 – Log Probability Chart for Cu of Major Geological Units	55
Figure 14.3_4 – Log Probability Chart for Au of Major Geological Units	55
Figure 14.4_1 – Sample Length (m) – All Drilling	56
Figure 14.5_1 – Log Probability Chart (Cu) – Central Porphyry Zone Composites	57
Figure 14.5_2 – Log Probability Chart (Au) – Central Porphyry Zone Composites inside Cu Grade Shell	58
Figure 14.5_3 – Log Probability Chart (Au) – Central Porphyry Zone Composites inside Au Grade Shell	58
Figure 14.5_4 – Log Probability Chart (Au) – Cerro de Oro Zone Composites inside Cu Grade Shell	59
Figure 14.5_5 – Log Probability Chart (Au) – Cerro de Oro Zone Composites inside Au Grade Shell	59
Figure 14.6_1 – Horizontal Continuity Map (Cu) – Central Porphyry Zone inside Cu Grade Shell	60
Figure 14.6_2 – Horizontal Variogram (Cu) – Central Porphyry Zone inside Cu Grade Shell	61
Figure 14.9_1 – Central Porphyry Zone Cu Model - Cross Section and Drillholes	64
Figure 14.9_2 – Central Porphyry Zone- Au Model - Cross Section and Drillholes	65
Figure 14.9_3 – Cerro de Oro Zone Cu Model - Cross Section and Drillholes	66
Figure 14.9_4 – Cerro de Oro Zone- Au Model - Cross Section and Drillholes	66
Figure 14.11_1 – Central Porphyry Zone - Cross Section –Typical Resource Coding	68
Figure 23_1 – Location Map - Chilean Copper Belt	71

# 1 SUMMARY

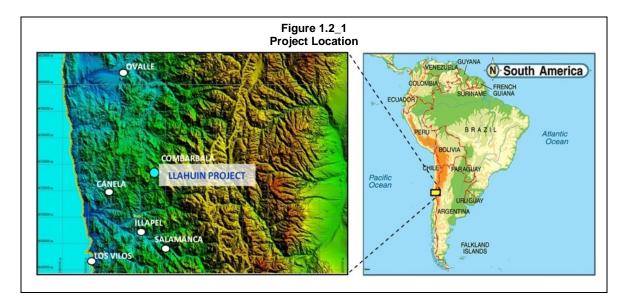
### 1.1 Introduction

Andes Mining Services Ltd (AMS) has been commissioned by Southern Hemisphere Mining Limited (SHM) to prepare an updated Mineral Resource Estimate for the Llahuin Cu-Au Project, located within the Coquimbo region of central Chile.

The Mineral Resource Estimate has been prepared under the guidelines of Canadian Institute of Mining (CIM) National Instrument 43-101 and accompanying documents 43-101.F1 and 43-101.CP (NI43-101), and is JORC Compliant.

#### 1.2 Location

The Llahuin Project is located within the Coquimbo region of central Chile, approximately 240km north of Santiago, and 17km south of the town of Combarbala as displayed in Figure 1.2\_1. The project is located 56km east of the coast and the Pan-American Highway. The topographical coordinates of a central point within the project are East 71° 01'29" and North 31° 20'23" (Datum Long/Lat UTM projection, International Reference Ellipsoid 1924, La Canoa datum 1956, Time/Area 19).



#### 1.3 Ownership

The Llahuin project is located within the "Amapola" concessions, some granted to MPS and others subject to an option to purchase via Minera Panamericana S.C.M (MPS).

MPS is 100% owned by Pan American Mining Pty Ltd (PAM), SHM's 100% owned Australian subsidiary. In July 2011, MPS executed an Option to Purchase Agreement (Llahuin Option Agreement), as detailed in Section 4 of this report, which has been duly executed and constitutes the legal, valid and binding obligations for each party.

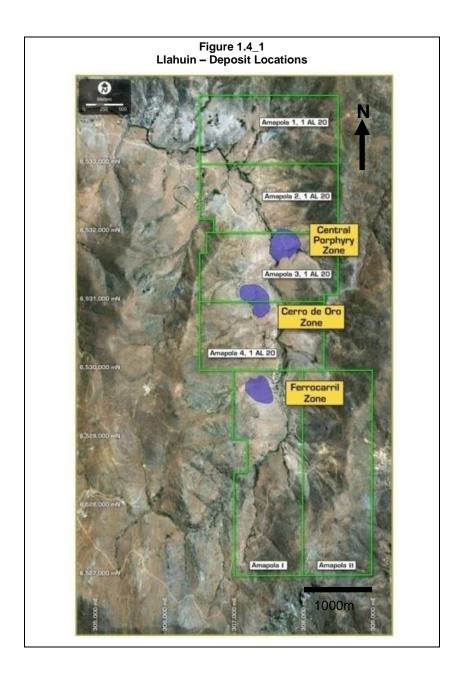
### 1.4 Geology and Mineralization

The Llahuin Deposit is a porphyry copper-gold system with medium sized early dioritic stocks that exhibits propylitic to potassic (biotite) alteration and is emplaced in a north-south trending regional fault system.

Argillic-quartz sericite alteration zones are evident in both the upper zones and margins of the hydrothermal system within the volcanic wall rocks.

At the Llahuin Project, a NNE trending elongated late granodioritic stock intrudes the early dioritic porphyry. The mineralization in the Llahuin porphyry is related to the early dioritic porphyry stock with abundant stockworks of quartz and variable amounts of magnetite, biotite, tourmaline, actinolite, calcite, copper oxides, iron oxides and some pyrite, chalcopyrite, covelite, chalcocite and molybdenite. The mineralization is mainly associated with veinlet systems, with copper mineralization present as chalcopyrite.

The Llahuin Project consists of the Central Porphyry Zone, which was previously known as the Llahuin Porphyry, the Cerro de Oro Zone and the Ferrocarril Zone as displayed in Figure 1.4\_1 below. The Central Porphyry Zone is a typical Cu-Au porphyry system with associated stockwork mineralization. The Cerro de Oro Zone lies almost entirely within volcanic rock and is interpreted as the stockwork cap to an underlying porphyry system. There are explosive breccia style textures associated with this deposit. The Ferrocarril Zone is underexplored and is not well understood.



### 1.5 Status of Exploration

There have been various exploration phases on the Llahuin exploitation concessions including two drill holes completed in 2004 and an artisanal open pit and underground excavation. Results of the historical drilling, exploration and exploitation activities prior to SHM's involvement are not readily available.

This report gives details of exploration undertaken by SHM from June 2011 to August 2012. At the date of this report, further exploration drilling is being carried out at and around the Llahuin Deposit. The results of this drilling will be incorporated into future mineral resource estimates.

The work completed by SHM to-date has included:

- Regional reconnaissance, rock chip sampling and geophysics.
- Project scale mapping at 1:2000 scale of the Llahuin Project.
- 30 diamond drill (DDH) holes for a total of 11,367m.
- 124 reverse circulation (RC) holes for a total of 22,445m.

#### 1.6 Mineral Resources

The Llahuin Project mineral resource estimate is based on 30 DC (11,367m) and 124 RC holes (22,445m) drilled at a spacing of between 50m x 50m to 200m x 200m. Only data received as at  $17^{th}$  August 2012 has been used in this estimate. SHM is continuing an ongoing infill, extensional and exploration drillhole program.

The mineral resource estimate has been constructed within 0.10% Cu and 0.10g/t Au grade shells. Multiple lithological units have been grouped together, based upon statistical properties and visual review of cross sections.

The mineral resource has been reported above at a cut-off grade of 0.28% CuEq, although not within an optimised open pit shell. An independent mineral resource has been estimated comprising a measured and indicated mineral resource of 144.9Mt at 0.30% Cu, 0.10 g/t Au, and 0.006% Mo. An inferred mineral resource of 16.7 Mt at 0.27% Cu, 0.06 g/t Au and 0.004% Mo has also been estimated as displayed in Table 1.6\_1.

The resource has been reported to the base of drilling at approximately 400m vertical depth below surface.

The statement has been classified by Qualified Person Ian Dreyer BSc (Geology) MAusIMM (CP) in accordance with the Guidelines of NI 43-101 and accompanying documents 43-101.F1 and 43-101.CP. The statement is also JORC compliant. It has an effective date of 10th September 2012.

	Grade	Table 1	.6_1 rt - Llahuin Projec	t				
Ordinary Kriged Mineral Resource Estimate – 10 <sup>th</sup> September 2012								
	(Blo	ck Model – 5mE	X 10mN X 6mRL)					
•	Million Tonnes		Measured	Resource				
Area	Million Tonnes –	Cu (%)	Au (g/t)	Mo (ppm)	CuEq (%)			
Total Project	88.9	0.33	0.09	0.006	0.42			
			Indicated	Resource	•			
Total Project	56.0	0.25	0.11	0.005	0.35			
			Measured an	nd Indicated	•			
Total Project	144.9	0.30	0.10	0.006	0.40			
		Inferred Resource						
Total Project	16.7	0.27	0.06	0.004	0.33			

## 1.7 Copper Equivalent Calculation

The copper equivalent (CuEq) calculation represents the total metal value for each metal, multiplied by the conversion factor, summed and expressed in equivalent copper percentage. These results are exploration results only and no allowance is made for recovery losses that may occur should mining eventually result. It is the qualified person's opinion that the elements considered have a reasonable potential to be recovered as evidenced in similar porphyry copper mines in Chile. Copper equivalent conversion factors and long-term price assumptions used are stated below:

CuEq Formula= Cu % + Au (g/t) x 0.72662 + Mo (%) x 4.412

Price Assumptions: Cu (US\$3.40/lb), Au (US\$1,700/oz), Mo (US\$15/lb)

#### 1.8 Conclusions and Recommendations

- The project is being systematically explored and drilled.
- The Central Porphyry, Cerro de Oro and Ferrocarril Zones are targets which remain open in all directions.
- The level of geological understanding across the project area is moderate, although it has improved with the use of additional diamond drillholes.
- The use of a different drilling orientation (drill direction=060°) in much of the recent phase of diamond drilling into the Central Porphyry Zone has produced somewhat higher grades in the core of this deposit, when compared to the combined RC and diamond drilling of the previous phase of drilling (drill direction=300°).
- There is no evidence of any geological bias, such as drilling along high grade zones or structures, in the new drill orientation (drill direction=060°).

- The replacement of a number of RC holes with DC holes in the estimate improves the confidence of the grade estimate and has partially removed the previous issue of using some wet RC samples in the estimate. The wet RC samples may have led to either grade smearing or grade loss, through washing out fine mineralised material.
- The quantity and quality of standards inserted into the sample stream by SHM has not improved and this requires rectification.
- SHM has twinned 3 RC holes with DC holes. There is insufficient information at present to draw any conclusions with any confidence, however AMS do not note any material differences between the DDH and RC drill hole results.
- Metallurgical testwork should commence immediately. This appears to be in hand.
- A geophysical assessment of the Ferrocarril Zone is warranted, followed by a 100m x 100m grid drilling pattern over the most prospective areas of this zone.
- Drill the Cerro de Oro Zone at depth to test for a potential Porphyry source.
- A budget of \$7.0 Million annually that consists of 1 DC rig and 1 RC rig, with appropriate staff, supervision, and technical support, is the appropriate level of expenditure for this project.
- AMS recommends that the project be advanced to a Preliminary Economic Assessment (PEA) level of evaluation and design.

# 2 INTRODUCTION

#### 2.1 Scope of Work

This Report is prepared for SHM, a reporting issuer in the Provinces of Alberta, British Columbia and Ontario, whose common shares are listed for trading on the TSX Venture Exchange (trading as SH) and the Australian Securities Exchange (trading as SUH). SHM commissioned AMS for the purpose of providing a Mineral Resource Estimate for their Llahuin Project in Chile.

This report is prepared in accordance with disclosure and reporting requirements set forth in National Instrument 43-101, Companion Policy 43-101CP, and Form 43-101F1, and complies with Canadian National Instrument 43-101 for the 'Standards of Disclosure for Mineral Projects' of December 2005 (the Instrument), and the resource and reserve classifications adopted by CIM Council in November 2004 and updated in 2011. The resource is also JORC compliant.

### 2.2 Forward-Looking Information

This report contains "forward-looking information" within the meaning of applicable Canadian securities legislation. Forward-looking information includes, but is not limited to, statements related to the capital and operating costs of the Llahuin Project, the price assumptions with respect to copper and gold, production rates, the economic feasibility and development of the Llahuin Project and other activities, events or developments that SHM expects or anticipates will or may occur in the future. Forward-looking information is often identified by the use of words such as "plans", "planning", "planned", "expects" or "looking forward", "does not expect", "continues", "scheduled", "estimates", "forecasts", "intends", "potential", "anticipates", "does not anticipate", or "belief", or describes a "goal", or variation of such words and phrases or state that certain actions, events or results "may", "could", "would", "might" or "will" be taken, occur or be achieved.

Forward-looking information is based on a number of factors and assumptions made by the authors and management, and considered reasonable at the time such information is made, and forward-looking information involves known and unknown risks, uncertainties and other factors that may cause the actual results, performance or achievements to be materially different from those expressed or implied by the forward-looking information. Such factors include, among others, obtaining all necessary financing, licenses to explore and develop the project; successful definition and confirmation based on further studies and additional exploration work of an economic mineral resource base at the project; as well as those factors disclosed in SHM's current Annual Information Form and Management's Discussion and Analysis, as well as other public disclosure documents, available on SEDAR at www.sedar.com.

Although SHM has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking information, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. There can be no assurance that forward-looking information will prove to be

accurate. The forward-looking statements contained herein are presented for the purposes of assisting investors in understanding SHM's plan, objectives and goals and may not be appropriate for other purposes. Accordingly, readers should not place undue reliance on forward-looking information. SHM and the authors do not undertake to update any forward-looking information, except in accordance with applicable securities laws.

#### 2.3 Principal Sources of Information

In addition to site visits undertaken to the Llahuin Project, the author of this report has relied extensively on information provided by SHM and discussions with SHM management. A full listing of the other principal sources of information is included in Section 27 of this report.

AMS has made all reasonable enquiries to establish the completeness and authenticity of the technical information provided and identified. A final draft of this report was provided to SHM, along with a written request to identify any material errors or omissions, prior to lodgement.

### 2.4 Site Visit

Mr Ian Dreyer visited the site on March 17<sup>th</sup> 2012 and August 13<sup>th</sup> 2012. He inspected the drill sites, drill core, logging, sample collection and storage procedures and facilities, and also observed all the available surface exposures of the deposit. Mr Dreyer also reviewed the quality control and assurance procedures at the mine and at AAA Ltda Laboratory.

### 2.5 Authors' Qualifications and Experience

The Qualified Person (as defined in NI 43-101) for the purpose of this report is Mr. Ian Dreyer.

Mr. Ian Dreyer is a professional geologist with 24 years of international experience in the geology and evaluation of mineral properties. Mr. Dreyer is a Chartered Professional Member of Australasian Institute of Mining and Metallurgy (MAusIMM (CP)) and has the appropriate relevant qualifications, experience and independence as defined in the Australasian VALMIN and JORC codes and a Qualified Person as defined in Canadian National Instrument 43-101. Mr. Dreyer is currently employed as Principal Geologist, South America with AMS.

### 2.6 Units of Measurements and Currency

All monetary terms expressed in this report are in United States dollars (\$) unless specified. Quantities are generally stated in SI units, including metric tonnes (t), kilograms (kg) or grams (g) for weight; kilometres (km), metres (m), centimetres (cm) and millimetres (mm) for distance; square kilometres (km<sup>2</sup>) or hectares (ha) for area; and percentage (%) and grams per tonne (g/t) to express grades. Ounces (oz), where used, refer to troy ounces.

### 2.7 Independence

Neither AMS, nor the author of this report has any material interest in SHM or related entities. Our relationship with SHM is solely one of professional association between client and independent consultant. This report is prepared in return for fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this report.

## 2.8 Abbreviations

A full listing of abbreviations used in this report is provided in Table 2.8\_1 below.

	Table 2.8_1				
	List of Abbrevia	ations			
	Description		Description		
\$	United States of America dollars	kWhr/t	kilowatt hours per tonne		
"	Inches	l/hr/m <sup>2</sup>	litres per hour per square metre		
μ	Microns	м	million		
3D	three dimensional	m	metres		
AAS	atomic absorption spectrometry	Ma	thousand years		
AMSA	Antofagasta Minerals S.A.	MC	Mining Code		
ASX	Australian Securities Exchange	Мо	Molydenum		
ASL	Above Sea Level				
Au	Gold	ml	millilitre		
AusIMM	Australasian Institute of Mining and Metallurgy	mm	millimetres		
bcm	bank cubic metres	MIK	Multiple Indicator Kriging		
СС	correlation coefficient	Moz	million ounces		
CIM	Canadian Institute of Mining, Metallurgy and Petroleum	MPS	Minera Panamericana S.C.M		
CLP	Chilean Pesos	Mtpa	million tonnes per annum		
cm	Centimetre	N (Y)	northing		
COL	Constitutional Organic Law	NPV	net present value		
CRM	certified reference material or certified standard	NNE	a north-north east direction		
CV	coefficient of variation	°C	degrees centigrade		
DC	diamond core	Oz	Troy Ounces		
DDH	Diamond Drill Hole	ОК	Ordinary Kriging		
DTM	digital terrain model	P80 -75µ	80% passing 75 microns		
E (X)	Easting	ppb	parts per billion		
EDM	electronic distance measuring	ppm	parts per million		
EIA	Environmental Impact Assessment	PRC	Political Constitution of the Republic		
equ	equivalent	psi	pounds per square inch		
Fe	Iron	PEA	Preliminary economic assessment		
G	Gram	QC	quality control		
g/m <sup>3</sup>	grams per cubic metre	QAQC	quality assurance quality control		
g/t	grams per tonne of gold	QQ	quantile-quantile		
HARD	Half the absolute relative difference	RC	reverse circulation		
HQ <sub>2</sub>	Size of diamond drill rod/bit/core	RL (Z)	reduced level		
Hr	Hours	ROM	run of mine		
HRD	Half relative difference	RQD	rock quality designation		
ICP-AES	inductivity coupled plasma atomic emission spectroscopy	SD	standard deviation		
ICP-MS	inductivity coupled plasma mass spectroscopy	SG	Specific gravity		
ISO	International Standards Organisation	Si	silica		
JORC	Joint Ore Reserves Committee (of the AusIMM)	SMU	selective mining unit		
kg	Kilogram	t	tonnes		
kg/t	kilogram per tonne	t/m <sup>3</sup>	tonnes per cubic metre		
km	Kilometres	tpa	tonnes per annum		
km <sup>2</sup>	square kilometres	TSX	Toronto Stock Exchange		
kW	Kilowatts	UC	Uniform conditioning		
		w:o	Waste to ore ratio		

# 3 RELIANCE ON OTHER EXPERTS

The author of this report, states that he is a Qualified Person for those areas as identified in appropriate Qualified Person's "Certificate of Author" in Section 28.

Neither AMS nor the author of this report are qualified to provide extensive comment on legal issues, including status of tenure associated with the Llahuin property referred to in this report. AMS has relied heavily on information provided by SHM, which has not been independently verified by AMS, and this report has been prepared on the understanding that the properties are, or will be, lawfully accessible for evaluation, development, and mining and processing.

# 4 PROPERTY DESCRIPTION AND LOCATION

## 4.1 **Project Location**

The Llahuin Project is at an elevation of approximately 1300m ASL and is located some 240km north of the Chilean capital of Santiago, 17km south of the town of Combarbala and is 56km from the coast and Pan-American Highway, as displayed in Figure 4.1\_1.



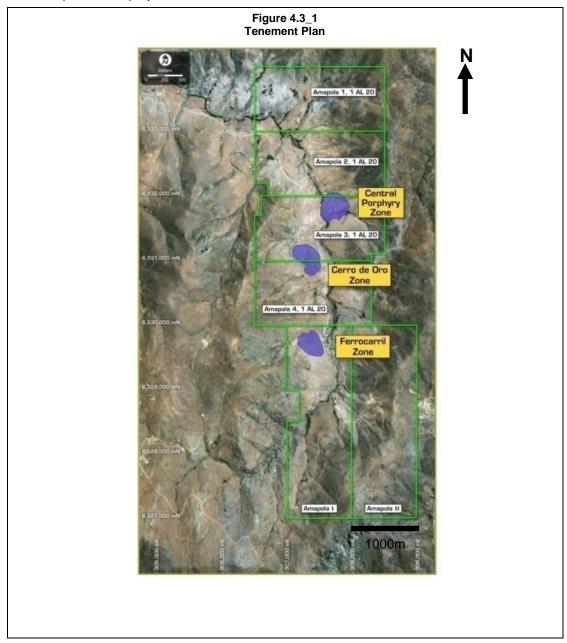
### 4.2 Type of Mineral Tenure

Apart from the Llahuin Option Agreement, the exploitation concessions are not known to be subject to liens, prohibitions, embargoes or lawsuit of any kind. The concessions are listed below in Table 4.2\_1.

	Table 4.2_1 Llahuin Project – Concession Status							
Licence Type Name Area - Ha Status Expiration Date Initiation								
1	Exploitation	Amapola 1 1 al 20	200	Constituted	N/A	2008		
2	Exploitation	Amapola 2 1 al 20	196	Constituted	N/A	2008		
3	Exploitation	Amapola 3 1 al 20	196	Constituted	N/A	2008		
4	Exploitation	Amapola 4 1 al 18	180	Constituted	N/A	2008		
5	Exploration	Amapola I	221	Constituted	N/A	2012		
6	Exploration	Amapola II	300	Constituted	N/A	2012		
		Total	1,293					

## 4.3 Area of the Property

The Llahuin Project covers an aggregate area of 12.93 km<sup>2</sup>. Figure 4.3\_1 depicts the tenement plan of the project.



### 4.4 The Nature and Extent of the Titles

The only obligations contemplated in Chilean legislation which must be satisfied by a mining concessionaire is the payment of a claim fee, and any negotiated surface rights payments.

AMS has not independently verified, nor is it qualified to independently verify, the legal status of the Llahuin Project concessions, and has relied on information provided by SHM. In preparing this report AMS has assumed that the tenements are, or will prove to be, lawfully accessible for evaluation.

### 4.5 Mining Property

### 4.5.1 Mining Concessions in Chile

The Political Constitution of the Republic (PRC) provides that the State of Chile has the absolute, exclusive, unalienable and imprescriptibly dominion over all the mines, and the mineral substances determined by Constitutional Organic Law (COL) as susceptible of such work may be explored and exploited through mining concessions.

The mining concession is an 'in rem' right on real property different and independent from ownership of surface lands, even if they have the same owner, that is, the separation of the dominion over the mining concession (that gives the right to explore and/or exploit mineral substances) and the ownership of the surface land where it is intended to perform mining exploration and exploitation work is confirmed.

The mining concession is transferable and transmissible, susceptible to mortgage and other real rights, and in general, of any act or contract; and is ruled by the same civil laws as the rest of the real estate properties, unless they are contrary to the COL or Mining Code (MC)

The mining concessions are constituted in a non contentious judicial procedure which can be of two kinds: exploration concessions and exploitation (mining) concessions

The exploration concessions have an initial effective period of 2 years but this period can be extended to 4 years by halving the concession surface area.

The exploitation concessions have an indefinite effective period and grants exclusive rights to prospect and mine the concession area, provided the annual patent fees are paid.

### 4.5.2 Access to the Necessary Lands for the Execution of Mining Work

In view of the separation of the property rights of the mining concession from the surface land, the MC establishes special laws and regulations on this matter. Access to the surface lands is provided during the proceedings carried out for the mining concession.

Once the mining concession is constituted to carry out exploration and/or exploitation work as the case may be, its titleholder must obtain written permission from the titleholders of surface lands and additionally, if this is the case, from some administrative authorities. This is if the performance of the work affects or can affect populated places of public interest or of national security, as detailed in articles 14, 15 and 17 of the MC.

Once the mining concession is constituted, it grants the titleholder the right to impose special mining easements on surface lands after a determination of the indemnifications to be paid to the owner of the land, agreed with it or fixed judicially. The mining easements can be for traffic or access, for electric services and for occupation. In the terms and scopes of article 120 of the MC, easements cannot be imposed in land where permanent constructions exist or which are covered by plantations of forests, vineyards and fruits.

#### 4.5.3 Water Rights

The Mining Concessions grant the concessionary (the holder of the mining concession) the right to use the water resources found while developing exploration and/or exploitation works, only for the purposes of the exploration and/or exploitation works. In case that no water resources are found in the course of the mining works, such resource shall be secured by incorporating and/or purchasing water rights from the State of Chile, through the Dirección General de Aguas by proving both the existence of the water resources requested and the existence of a project justifying the use thereof.

### 4.5.4 Specific Tax to the Mining Activities

There is a specific tax on the operational income of the mining activity obtained by a mining operator. This progressive tax rate ranges from 0.5%, if the value of the annual sales exceeds the amount equivalent of over 12,000t of fine copper, to 4.5% if the annual sales exceed the value of 40,000t up to the value of 50,000t.

If the sales exceed the value of 50,000t of fine copper, the tax is applied on the mining operational margin and the progressive tax rate ranges from 5% to 14% on operational margin. The operational taxable income on which this tax is applied is determined in a particular way. Certain expenses such as losses from past periods, accelerated depreciation of fixed assets, etc are not allowed for this purpose. The mining operational margin is determined as a ratio of the operational taxable income to the mining operational turnover.

### 4.6 Royalties / Agreements and Encumbrances

During the exploration phase, the Llahuin project is not subject to any known payments or agreements and encumbrances, other than the Llahuin Option Agreement and any negotiated surface rights payments.

Upon exploitation, the project is subject to the option agreement detailed below.

In July 2011, MPS executed an Option to Purchase Agreement (Llahuin Option Agreement). The details of this agreement are summarised below:

- The Llahuin Option Agreement is a unilateral option to purchase agreement between MPS and Juan Sebastian Astudillo (Offeror), granted by means of a public deed executed at the Santiago Notary Public office of Ms. Antonieta Mendoza Escalas on July 8<sup>th</sup>, 2011.
- In addition to the Llahuin Mining Properties, the Llahuin Option Agreement also includes:
- (a) the inherent water rights or those that according to article 110 of the Chilean Mining Code may pertain to the Llahuin Mining Properties, and those that benefit or may benefit the Llahuin Mining Properties and which the Offerors and persons related to them may eventually possess, have use or dispose of in any fashion;
- (b) any type of rights concerning the surface lands, including ownership, and/or easements, that may come to or pertain to the Llahuin Mining Properties and/or the Offerors and persons related to them, obtained for the benefit of the Llahuin Mining Properties;
  - The Llahuin Option Agreement refers to the following exploitation concessions: "Amapola Uno, 1 AL 20", "Amapola Dos, 1 AL 20", "Amapola Tres, 1 AL 20" and "Amapola Cuatro, 1 AL 18", all located in the city of Combarbalá, Province of Limarí, Fourth Region of Coquimbo covering an area of 7.72 sq kms.
  - By virtue of the Llahuin Option Agreement, MPS acquired the right to explore the Llahuin Mining Properties, and irrevocably, the right to opt to acquire their ownership, at its discretion.
  - The total option consideration for the acquisition of the Amapola licenses is \$1,875,000. To date progress payments totalling \$588,908 have been paid, leaving a balance of USD \$1,286,092 which at SUH option, can be paid in cash or SUH shares listed on TSX-V by January 8, 2013.
  - To determine the value of such shares, the Volume Weighted Average Price (VWAP) of transaction of such shares in the Stock Exchange of Toronto during the last seven business days prior to the date on which the payment of this last installment is paid, will be calculated.
  - In order to secure the performance of the Offeror's obligations under the Llahuin Option Agreement, Juan Sebastian Astudillo granted a lien over the Llahuin concessions by way of registering the Llahuin Option Agreement with the Combarbala Mining Warden.
  - The Llahuin Option Agreement was registered in Conservator of Mines, Combarbala on July 21, 2011.

### 4.7 Environmental Liabilities and Permits

AMS is not aware, nor has it been made aware, of any environmental liabilities associated with the Llahuin Project.

# 5 SITE LOCATION, CLIMATE AND PHYSIOGRAPHY

### 5.1 Location and Access

The Llahuin Project is located in central Chile, approximately 240km north of Santiago. The project area lies approximately 17km south of the town of Combarbala (population 14,000), as shown in Figure 5.1\_1, and can be accessed from Combarbala by well maintained gravel roads.

A central point from within the project area gives UTM coordinates of 6,531,800 N and 307,700 E (Datum Long/Lat PSAD56).

### 5.2 Physiography and Climate

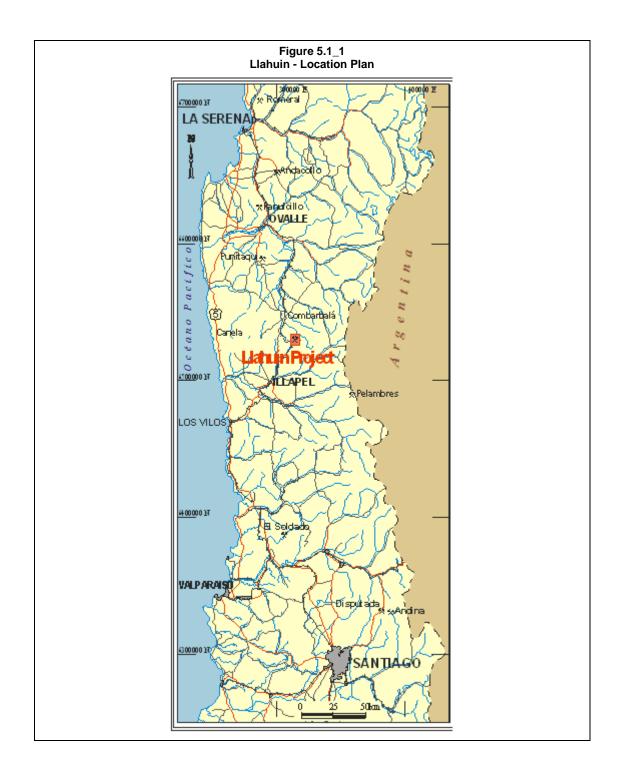
The Llahuin Project is located at an altitude of 1,300m ASL on the flanks of the Llahuin Valley, as displayed in Figure 5.2\_1. The area is characterized by a moderate relief depicted by mountain ranges and flat zones with deep ravines and steep slopes, with altitudes ranging from 1,000 to 1,500m above sea level.

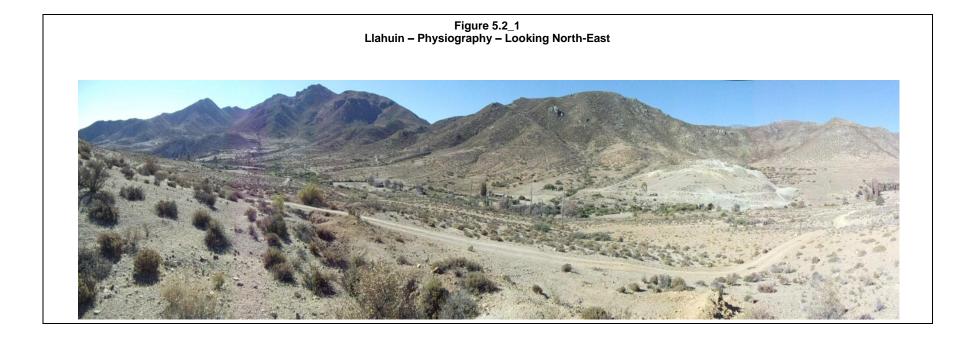
The climate is semi-arid with a relative humidity of around 50%. Summer temperatures range from 24°C to 33°C with cool nights typical of semi-arid climates. Winter temperatures are generally above freezing. Annual rainfall is around 200mm but long periods of drought and heavy rains are not rare in the region. The vegetation found is typical of the semi-arid climate and has adapted to the dryness and low relative humidity of the climate.

### 5.3 Local Infrastructure

Local infrastructure is considered excellent. Access to the project area is good, and a high tension electricity line is located within 5km of the project capable of delivering sufficient power needs for the project etc. A railway line near the project area extends to two ports (Los Vilos and Coquimbo). In addition, two airstrips in good condition are located within 16km of the project area. The supply of food, water, fuel and communication is available in the towns of Combarbala and Illapel.

Water is available in the region in surface springs and underground aquifers. Water for exploration purposes is readily available.





# 6 HISTORY

### 6.1 Ownership History

The known history of the project commences with Cominco Resources Ltd, which undertook exploration activities in 1983. Antofagasta Minerals S.A. (AMSA) acquired the project in 2004, and joined the numerous small mining properties generating a unified and simplified area for exploration. At the beginning of 2011, a subsidiary of SHM reached a commercial agreement required to acquire this project from Mr. Sebastian Astudillo who acquired the project from AMSA on the same date.

#### 6.2 Exploration History

The Llahuin Project has been the subject of several exploration programs developed by various mining companies over the years that have focused their efforts on the exploration for copper and gold resources.

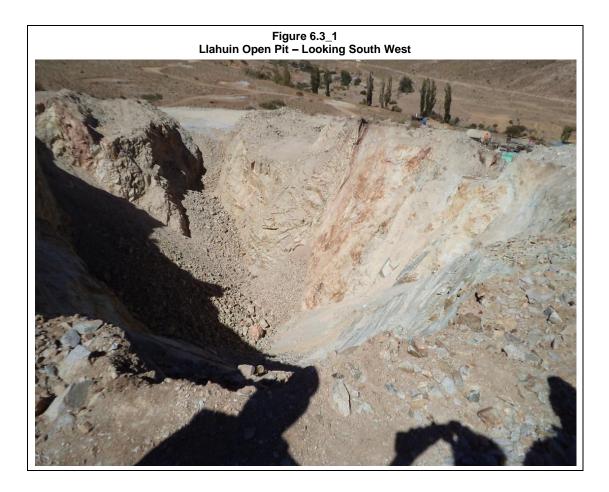
In 1983, Cominco undertook surface sampling and geophysical profiles of induced polarization along with completing 7 drill holes. Results to these drillholes have not been located by AMS.

In 2004, AMSA conducted a prospecting program in the area that included a geological mapping at a scale of 1:2000 and 3 RC and 2 DDH holes. The drill holes were concentrated in the area of Central Porphyry Zone below the small open pit. These holes identified several zones of Cu, Au and Mo mineralization. Results of these drillholes have not been located by AMS.

#### 6.3 **Production History**

The area of Llahuin (otherwise known as the El Espino mining district) is an old mining district that has historically been mined for gold and copper mineralization. Artisanal mining activities have focused mainly on vein-style mineralization.

The Llahuin Open Pit, as displayed below in Figure 6.3\_1 is located at the center of the Central Porphyry Zone. Its mining history dates back to the 18<sup>th</sup> century and has continued up until 2 years ago. A vein in the centre of the pit was mined at widths of between 1m to 3m with reported grades between 1% and 10% Cu and between 1g/t and 5g/t Au.

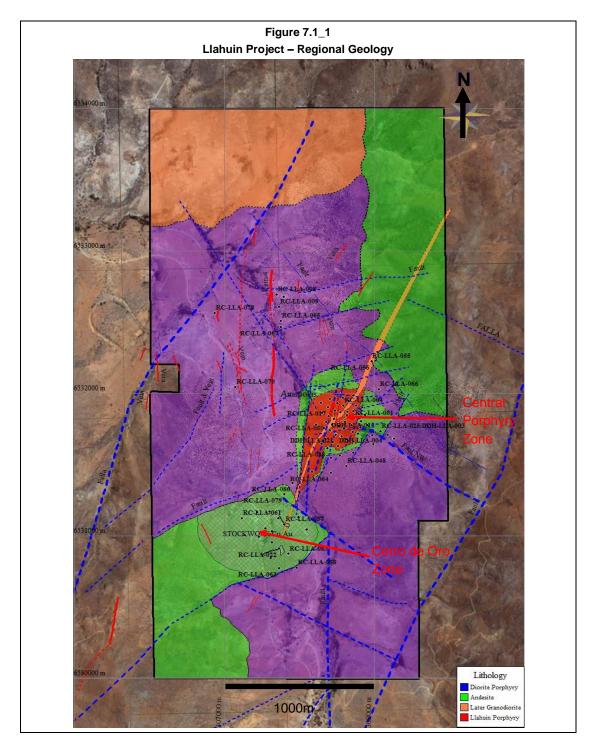


No formal records exist of the material and grades mined from this open pit.

# 7 GEOLOGICAL SETTING AND MINERALIZATION

# 7.1 Regional Geology

The regional geology is characterized by a series of stratified volcanic and volcaniclastic rocks, which are part of the Arqueros Formation and Quebrada Marquesa Formation (Aguirre et al., In Rivano et al., 1991) of Neocomian age, and Barremian-Albian, respectively. These formations are intruded by several intrusive stocks as displayed in Figure 7.1\_1.



The Arqueros Formation is represented by a large sequence of volcanic flows and andesitic breccias, with interbedded sandstone and epiclastic breccias, which form a northwest-trending homocline that dips to the east. This formation is concordant, and sometimes occurs as interdigitations within the sedimentary units of the Quebrada Marquesa Formation, including marls, limestones, shales, sandstones, conglomerates, and gypsum. The Arqueros Formation commonly displays ductile deformation with the development of open folds.

Both stratigraphic sequences are intruded by plutons from the Illapel Super Unit and the San Lorenzo Unit. The first is represented mainly by Cretaceous granodiorite and diorite quartzite. The second unit is represented by a Late Cretaceous - Paleogene dioritic porphyry.

The regional structural geological framework has played an important role on the control and distribution of lithologic units. Numerous geological faults are recognized, which may have displaced major blocks of ground, at district and local scale.

These faults have controlled the location of various intrusives and mineralization, and have been fundamental in the development and control of the mineralization through emplacement of mineralized stocks / vein networks.

There are three sets of faults with orientations N-S, NE-SW and NW-SE as displayed in Figure 7.1\_1. Most of the structures are inclined between 70° and 85°, and show oblique movements, with mainly horizontal displacements, and to a lesser extent vertical displacements.

## 7.2 Project Geology and Mineralization

The Cu-Au-Mo porphyry at Llahuin comprises three mineralized bodies of variable extent, namely the Central Porphyry Zone, the Cerro de Oro Zone, and the Ferrocarril Zone as displayed in Figure 7.2\_1. They are all associated with a stockwork hosted in a porphyritic dioritic to monzonitic intrusion, as displayed in Figure 7.2\_2. This figure only covers the Central Porphyry and Cerro de Oro Zones, and has not been updated for the Ferrocarril Zone. Mineralization extends to over 600m in depth within the Central Porphyry Zone.

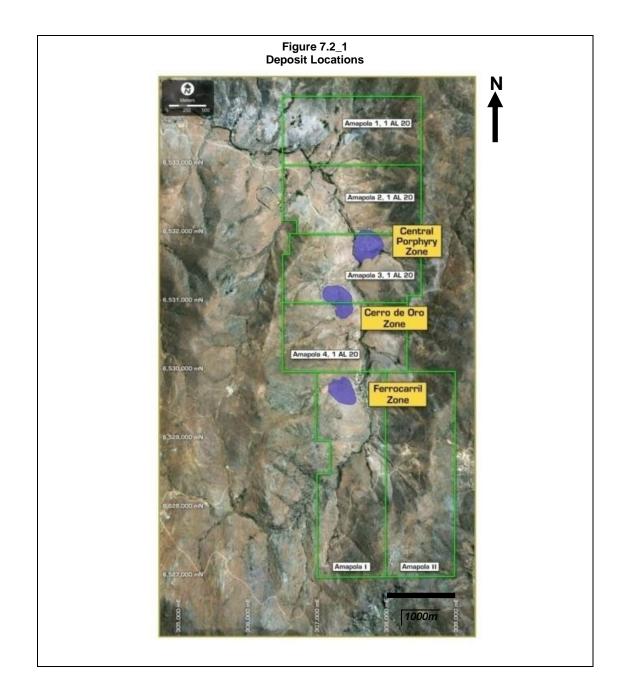
The high grade mineralization occurs as disseminations along hairline fractures as well as within larger veinlets. The high grade mineralization typically contains between 0.2-1.0% copper, with smaller amounts of other metals such as gold and molybdenum.

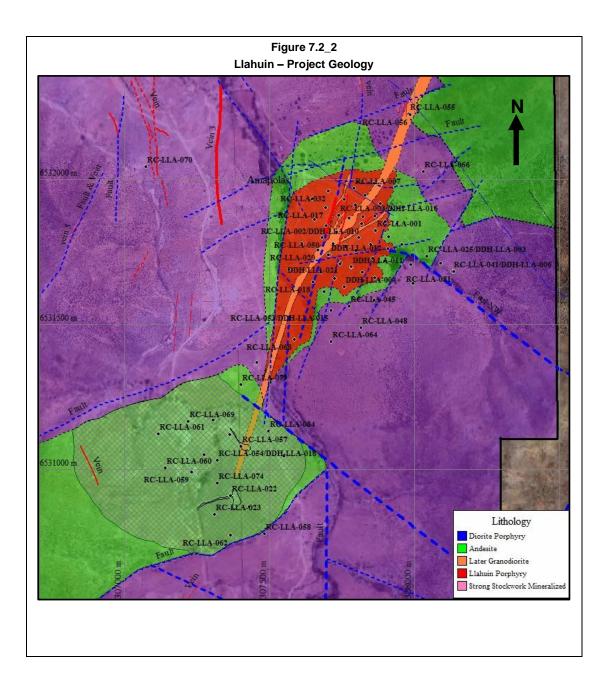
The higher grade mineralization is hosted in the central zone of the dioritic porphyry stock, which contains Cu and Au mineralization associated with potassic alteration. The stockwork, which facilitated the alteration, contains chalcopyrite, smaller amounts of bornite, molybdenite, and some minor pyrite. Both quartz stockwork and magnetite stockwork are present.

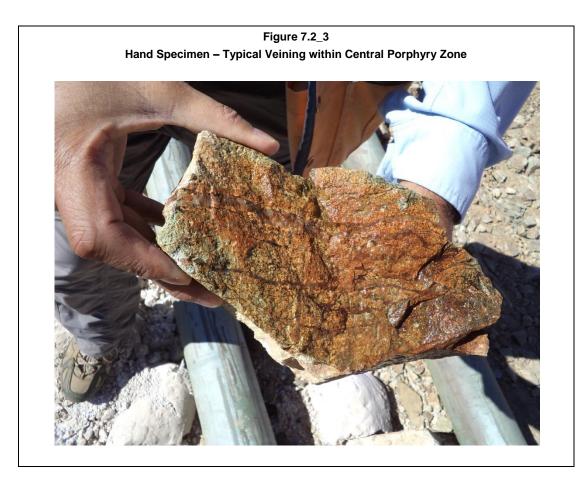
Lower grade mineralization is found in the volcanic units on the flanks of the Central Porphyry Zone.

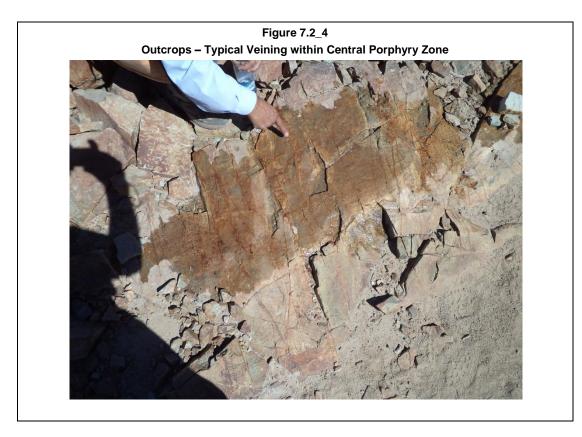
The Central Porphyry Zone comprises a series of porphyritic intrusions of medium to fine grained dioritic and monzonitic composition that intrude volcanic rocks of the Marquesa Formation (Cretaceous), which are strongly brecciated, mineralized and silicified as a hornfels unit The higher grade part of the system has intense potassic alteration, as evidenced by intense secondary biotite disseminated and veinlets. The potassic alteration is accompanied by quartz stockwork, and magnetite stockwork. The higher grade mineralization corresponds to chalcopyrite-bornite-molybdenite, in some cases accompanied by pyrite. Samples of mineralization styles are displayed in Figures 7.2\_3 to 7.2\_6.

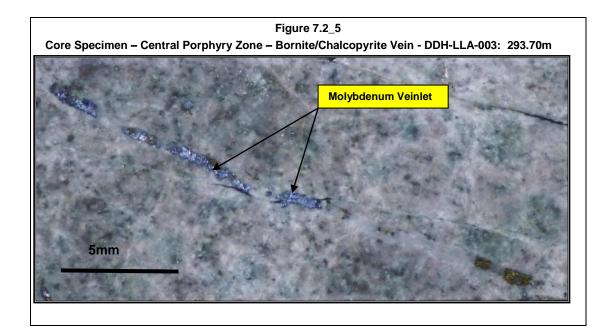
The mineralization consists of three main zones: the Central Porphyry Zone, the Cerro de Oro Zone (which is located 1km to the south of the Central Porphyry Zone), and the Ferrocarril Zone. The surface expression of the Cerro de Oro Zone has been drilled, but the underlying intrusive has yet to be tested. The Cerro de Oro Zone is seen as the stockwork cap to a potentially larger porphyry deposit that lies predominantly within volcanic rocks.

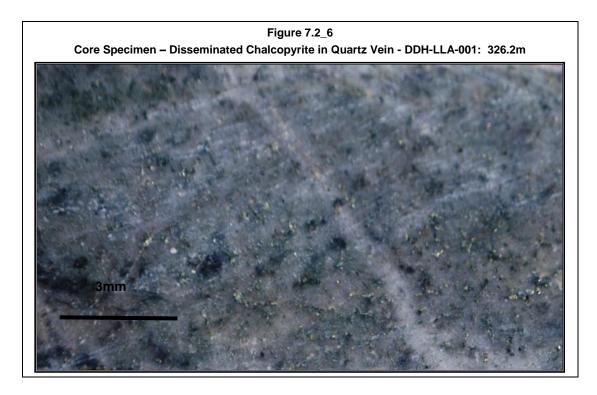






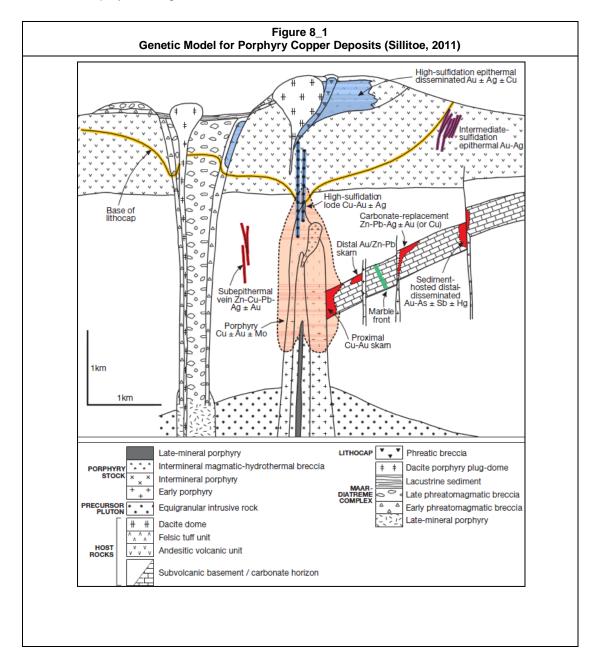






# 8 DEPOSIT TYPES

This region in Chile is dominated by Porphyry Cu-Au deposits and to a lesser extent vein type and manto type Au deposits. The economic Cu and Au mineralization occurs most commonly in stockwork disseminated mineralization associated with porphyry copper deposits. Mineralization also occurs in both veins and, to a lesser extent, mantos, although there are no observed mantos across the SHM concessions. This deposit fits well with the model by Sillitoe, as displayed in Figure 8\_1.



These Porphyry Cu-Au deposits are hosted in stratified and intrusive rocks, and have a mineralogy characterized by chalcopyrite, bornite, specularite, magnetite, pyrite, calcite and quartz. Commonly, the associated alteration is rich in epidote, chlorite, sericite and clay. In general, deposits are of small magnitude, but with significant grades of Cu and Au, which have allowed the development of a small small-scale mining. The main mining districts in the area are the Farellón Sanchez Farellón Vasquez Lahuín Plains, El Espino and Llahuín Porphyry systems, the latter displaying a strong presence of potassic alteration, given by secondary biotite, accompanied by much magnetite, and quartz stockwork.

# 9 EXPLORATION BY SHM

Exploration has comprised rock chip sampling, geophysics and drilling. No updated information on surface sampling is presented since the March 2012 resource estimate. The geophysics has also not been updated in this report for the new Ferrocarril Zone.

### 9.1 Rock Chip Sampling

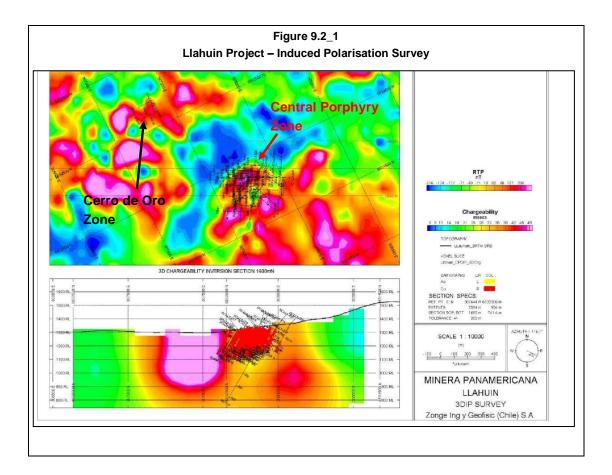
The rock chip sampling has been focussed on a few of the visible veins on the northern concessions, and other areas where roads and tracks, that have been easy to construct, have been located. A total of 223 outcrop samples have been collected, however results are not presented here, as samples are randomly spaced and not likely to assist in evaluating the deposit given their poor spatial representation.

The policy of drilling, in preference to surface sampling, is wise in the opinion of the author as it is likely that most of the higher Cu grades within the Cerro de Oro and Ferrocarril Zones are located at some depth below the surface.

### 9.2 Geophysics

There are no additional geophysical surveys presented in this report since May 2012.

A geophysical survey consisting of ground magnetics and induced polarisation (IP) was conducted by Zonge Ingenieria Y Ge Ofisica (Chile) S.A. (Zonge) between September and October 2011. The magnetic survey was conducted on 100m spaced lines and the IP survey was conducted on 200m spaced lines. There was a strong correlation between the IP results and mineralization and the predictive geophysical model suggested that drilling to the south-east of Central Porphyry Zone and at depth is warranted, as displayed in Figure 9.2\_1.



# 10 DRILLING

### 10.1 Introduction

SHM commenced drilling at the Llahuin property in June 2011 and as at 17<sup>th</sup> August 2012 had completed a total of 22,445m of RC drilling in 124 holes and 11,367m of DC in 30 holes, as summarized below in Table 10.1\_1.

Table 10.1_1         SHM Exploration Drilling Summary					
Zone	RC Holes	RC Metres	DC Holes	DC Metres	
Central Porphyry	68	12,362	27	10,515	
Cerro de Oro	36	6,682	3	852	
Ferrocarril	14	2,486			
North of Central Porphyry Zone	6	915			
Total	124	22,445	30	11,367	

The Central Porphyry Zone and the Cerro de Oro Zone have been drilled on a spacing of 50m by 50m in the upper portions and 100m x 100m in the lower portions of the deposits. The drill spacing on the Ferrocarril Zone is irregular and is based on accessing opportunistic drill sites at present.

The Ferrocarril Zone is drilled on a widely spaced irregular pattern that makes use of current infrastructure.

RC holes are mostly drilled to an average depth of 200m. Some RC holes were extended by diamond drilling to an average depth of 650m on grid spacing of 100m by 100m.

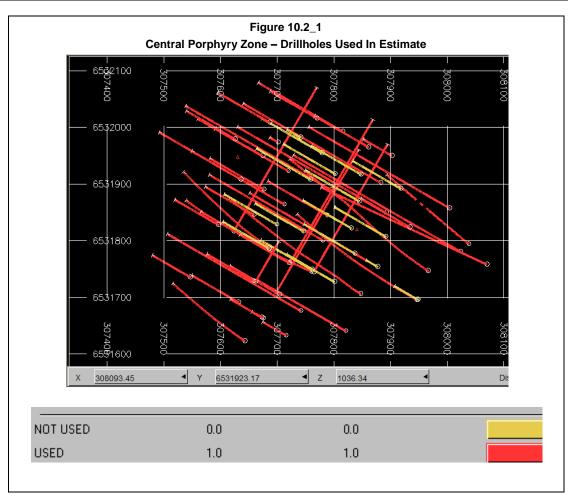
### 10.2 Drilling Procedures

The drilling has been completed by three drilling companies. They are HSB Sondajes, Geosupply and Raul/Mimoz Ltd.

The water table is generally encountered between 50m and 190m down hole. Where the water table is encountered, a rotary splitter is used to assist with RC sample quality. Approximately sixty percent (60%) of the RC samples are wet. This issue has been partially remediated by more recently drilling more diamond holes. Duplicated RC data, or old RC holes in close proximity to new DC holes, have been removed from the data set used for the grade estimate for the Central Porphyry Zone only (Figure 10.2\_1). The RC holes removed are also presented in Table 10.2\_1. This accounts for 3,177m or represents 25% of the RC drilling completed to date on the Central Porphyry Zone.

There is a slight resource grade drop, but significant tonnage increase when these holes are removed from the resource.

Table 10.2_1 RC Data Removed from Grade Estimate					
BHID	x	Y	Z	DEPTH	
RCLLA-001	307,845.5	6,531,870.0	1,346.8	208	
RCLLA-004	307,779.5	6,531,955.2	1,340.6	244	
RCLLA-005	307,803.1	6,531,918.2	1,349.7	200	
RCLLA-011	307,759.5	6,531,908.4	1,349.6	220	
RCLLA-013	307,848.7	6,531,917.2	1,348.4	203	
RCLLA-014	307,918.9	6,531,892.1	1,352.9	196	
RCLLA-015	307,801.8	6,531,727.7	1,333.5	194	
RCLLA-016	307,831.8	6,531,822.2	1,340.6	198	
RCLLA-021	307,700.2	6,531,828.9	1,329.8	216	
RCLLA-031	307,742.0	6,531,982.3	1,331.8	56	
RCLLA-034	307,838.0	6,531,777.7	1,336.3	208	
RCLLA-036	307,762.2	6,531,749.0	1,326.3	210	
RCLLA-039 A	307,878.0	6,531,754.3	1,339.2	48	
RCLLA-042	307,686.7	6,531,786.7	1,317.9	190	
RCLLA-044	307,892.4	6,531,807.4	1,341.5	210	
RCLLA-046	307,984.5	6,531,676.0	1,354.0	178	
RCLLA-073	307,747.4	6,531,816.7	1,337.1	198	
TOTAL				3,177	



The twin hole data comparison is inconclusive (Table 10.2\_2). AMS concludes that there is insufficient data to make a definitive comparison, and that the twins are sufficiently far enough apart to explain some of the grade differences. AMS recommends that SHM drills approximately 10 more twin holes to determine the bias that may exist in the RC holes.

Table 10.2_2           Twin Hole Comparison for Llahuin and Cerro de Oro									
Twin Pair	Zone	Hole	XCOLLAR	YCOLLAR	ZCOLLAR	From	То	Cu	Au
1	Llahuin	RCLLA-036	307,762.2	6,531,749.0	1,326.3	8	210	0.25	0.11
1	Llahuin	DDLLA-011	307,761.1	6,531,746.2	1,326.5	8	210	0.20	0.09
2	Cerro De Oro	RCLLA-054	307,307.8	6,531,086.9	1,359.3	0	200	0.13	0.13
2	Cerro De Oro	DDLLA-018	307,304.5	6,531,085.7	1,358.8	0	200	0.19	0.20
3	Cerro De Oro	RCLLA-095	307,143.1	6,531,312.4	1,359.6	2	210	0.16	0.05
3	Cerro De Oro	DDLLA-028	307,144.5	6,531,310.0	1,355.9	0	208	0.27	0.07

Prior to March 2012, DDH was performed predominantly as tails at the termination of some of the RC holes. DDH performed from April 2012 has been from the surface, although only 3 twin holes have been completed. The majority of the new diamond drilling is on the 060° orientation. The use of diamond drilling in preference to RC in the modelling is a wise approach as now the sample quality in the deposit is of greater confidence.

The DC recovery is generally greater than 90% and whilst fractured in areas of higher grade mineralization, it is generally competent and intact.

#### **10.3 Drilling Orientation**

Drillholes have been orientated on two main directions (grid): 060° and 300°. The reasoning behind using two drill directions is to ensure that structures which may not outcrop, or may not be clear on the surface are tested systematically. The change in orientation of much of the new drilling, since the last resource update in March 2012 has encountered both high and low grades in the Central Porphyry Zone. The author has observed three diamond core holes and has reviewed the core photography of all new holes and is confident that the new high grade intercepts, post March 2012, are not biased by drilling along specific high grade structures.

#### **10.4** Surveying Procedures

#### **10.4.1** Accuracy of Drillhole Collar Locations

The precision of the standard hand held GPS units is poor in this portion of Chile so a licensed surveyor was employed to pick up the new drillhole locations and the topography. The survey was performed by Mr. Luciano Alfaro Sanders. The collars picked up to within 3cm accuracy. This accuracy was not able to be checked, however the relative positions of the drillholes has been confirmed during the site visits.

#### 10.4.2 Down-hole Surveying Procedures

Some DC holes have been down hole surveyed using a non-magnetic gyroscopic instrument. The deviation on these holes is minimal. The holes tend to deviate to the north by two to three degrees per hundred metres, and they both steepen and flatten in dip, usually by one to two degrees per hundred metres.

The more recently drilled DC holes have not been downhole surveyed and this needs to be remediated in the future.

RC holes have not been downhole surveyed due to magnetic interference. RC holes are commonly drilled to the west at 60° degrees with lengths between 100m to 200m.

AMS considers the locations of the drillholes and surface surveys along with the topographic survey, to be suitable for a global mineral resource estimate, however the local precision of the estimate is likely to be poor given the lack of down hole surveys on the recent diamond drillholes.

# 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

#### 11.1 Sampling Method and Approach

#### 11.1.1 Diamond Core Sampling

DC samples are taken on 2m intervals. In some places, this sample interval overlaps lithological contacts, although contacts are hard to determine in places due to pervasive alteration. Drill core has not been orientated for structural measurements. The core is cut lengthways with a diamond saw and half-core is sent for assay.

The ½ core is bagged every 2m and sent for preparation, while the remaining ½ core is returned to the cardboard core box, as displayed in Figure 11.1\_1 below. A wooden lid is placed on the box, and it is stored in a weatherproof concrete shed for future reference.

Blanks and field duplicates are inserted at irregular intervals, at a range of between 1:20 and 1:50. All samples are placed in calico bags and then into plastic bags and cable tied.

Three DC holes were reviewed by the author, with no major recovery issues noted which are usually associated with either oxidised or heavily faulted or cavernous ground. The new core photographs, post March 2012, have been reviewed digitally.

#### 11.1.2 Reverse Circulation Sampling

RC samples are collected at 1m intervals from RC-LLA-001 to RC-LLA-014 and then 2m intervals in RC holes numerically thereafter. The samples are processed through a rotary splitter when wet. The author has observed the rotary splitter in action, and is satisfied that it is an effective sampling device. The samples are quartered in riffle splitters. Sub-samples weigh approximately 5kg and are collected in calico sample bags. Blanks and Field Duplicates are inserted at irregular intervals of between 1:20 and 1:50. All samples are placed in plastic bags and cable tied.

#### 11.1.3 Logging

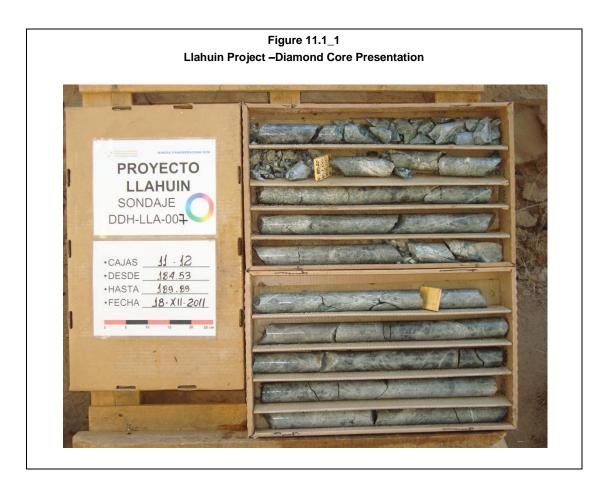
Diamond core is logged in detail for geological and structural information. Whole core is routinely photographed. The photographs are generally of high quality and resolution. DC and RC chip logging is conventional and appropriate.

Core recovery has not been routinely recorded for all drillholes. Observed core recovery is generally 95% or higher and infrequently 70-80% or less. The lower recoveries occur mainly in the heavily faulted zones. AMS recommends that all core holes have core recoveries routinely recorded.

## 11.2 Sample Security

DC is currently transported directly to the Llahuin exploration camp (approximately 1km from drilling operations) to the core preparation and storage base. After logging, core samples are marked for splitting and sampling by SHM geologists. Each core sample is placed in a plastic bag for transporting via truck to Andes Analytical Assay Ltda laboratory in Santiago.

Reference material is retained and stored on site, including half-core and photographs generated for diamond drilling, and duplicate pulps and residues of all submitted samples. All pulps are stored at the Llahuin exploration camp.



### **11.3** Sample Preparation and Analysis

The entire sample preparation and analysis procedure was performed by AAA Ltda Laboratory in Santiago, Chile. The laboratory has been audited by the author, who is satisfied that the procedures in place are of high quality. Sample preparation and analysis procedures are:

- Drying and weighing of whole sample, for between 2 and 24 hours depending upon moisture content, at 70 degrees C;
- Primary crushing of sample to -2mm;
- Sample homogenization and splitting to a 1kg sub-sample;
- Pulverization to 80% passing -150 mesh;

- Splitting of pulverized material to 400 gram pulp;
- Fire assay for Au (1100 degrees C), AAS, if Au is > 3 g/t then the analysis is gravimetric. The Quoted detection limit is 0.01 g/t Au;
- Aqua Regia method of analysis for Cu and Mo. Quoted detection limit is 0.001% Cu and 0.001% Mo.

#### 11.4 Adequacy of Procedures

The sampling methods, chain of custody procedures, and analytical techniques are all considered appropriate and are compatible with accepted industry standards.

# 12 DATA VERIFICATION

#### 12.1 Drillhole Database

The data is housed in a series of spreadsheets. The higher grade intercepts in the spreadsheets were checked by AMS to the original scanned laboratory certificates and no issues were found.

The logging was checked on site and it is relatively consistent, except where there are large tracts of strong potassic alteration. Where there are large tracts of strong potassic alteration it can be difficult to differentiate in the core between the volcanics and the porphyry.

Hard copies of original paper drill logs, daily drill reports, core photos, assay results, and various ancillary logging features are stored on site at Llahuin.

#### 12.2 Analytical Quality Control

One hundred and thirty nine (139) blanks have been inserted into the sample stream. This is a very low proportion of the total samples (1%), although there are no signs of contamination. One thousand, three hundred and thirty six (1,336) laboratory standards have been analysed in a large variety of Cu and Au grade ranges and there is no apparent bias of any significance. SHM should submit commercial standards to ensure that there is no drift in the laboratory results as they are dealing with low grade orebodies.

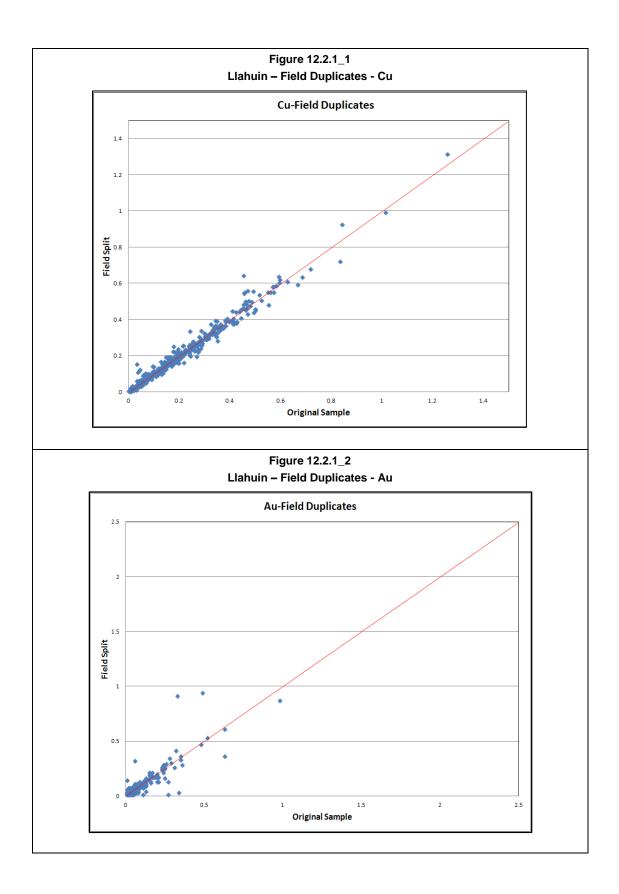
Four hundred and fifty five (455) field duplicates have been taken, only on RC holes. The accuracy for Cu is very good. The accuracy for Au is moderate, although most of the variance is in samples below 0.05 g/t Au and this is likely to be a combination of both sample and assay error, given the very low grades.

One hundred and ninety four (194) umpire assays were performed at the request of the author due to the non-submission of standards. The second laboratory chosen was ALS in Santiago. The repeatability on Cu is very good with no evidence of drift between laboratories. There is more spread in the Au results, with low grades being slightly lower and higher grades being higher at ALS when compared to AAA.

#### 12.2.1 Field Duplicates

Field duplicates have only been taken on RC holes. They have been collected as a sub-split of the sample mass at the RC rig by riffle splitting. The duplicates are taken at irregular intervals of approximately one duplicate per hole.

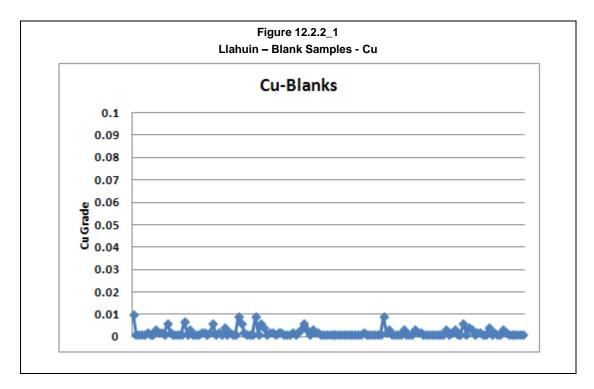
The precision of the field splits is very good for Cu, as displayed in Figure 12.2.1\_1, however is poor for Au, particularly below 0.05 g/t, as displayed in Figure 12.2.1\_2, although this is a function of very low grades, as well as sample and laboratory detection limits. This variance in Au field duplicate grades, at very low grades, is not seen as material to the resource estimate.



#### 12.2.2 Blanks

One hundred and thirty nine (139) blanks have been inserted into the sample stream. This is a very low proportion of the total samples (1%), although there are no signs of contamination. AMS recommends that the insertion rate for blanks needs to increase dramatically to at least 3% of total samples submitted.

Blanks have been inserted in random batches and show no signs of contamination for Cu, as displayed in Figure 12.2.2\_1, or for Au.

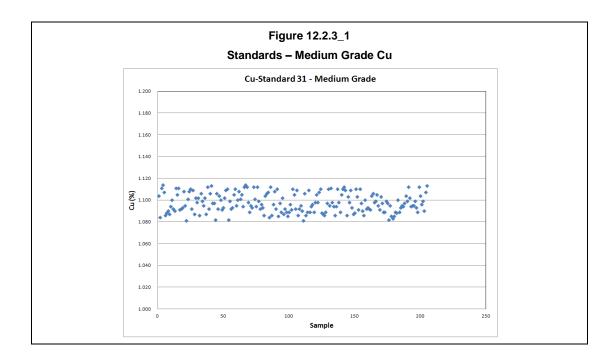


#### 12.2.3 Standards

One thousand, three hundred and thirty six (1,336) laboratory standards have been analysed in a large variety of Cu and Au grade ranges and there is no apparent bias of any significance.

The standards are inserted by the laboratory and are of multiple grade ranges for Cu and Au. All results are acceptable. All data sets display >90% of data having a precision within 10%. An example of a medium grade standard is shown in Figure 12.2.3\_1.

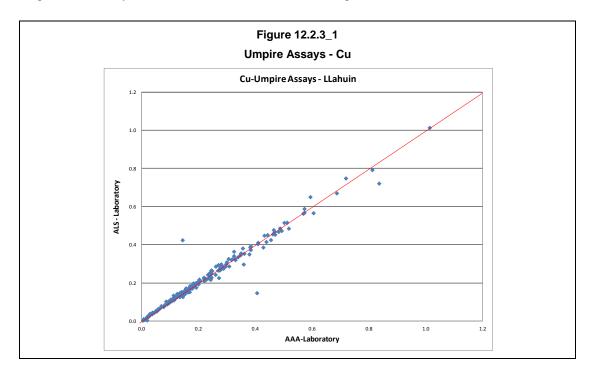
AMS strongly recommend that SHM should submit commercial standards to ensure that there is no drift in the laboratory results as they are dealing with low grade mineralisation.

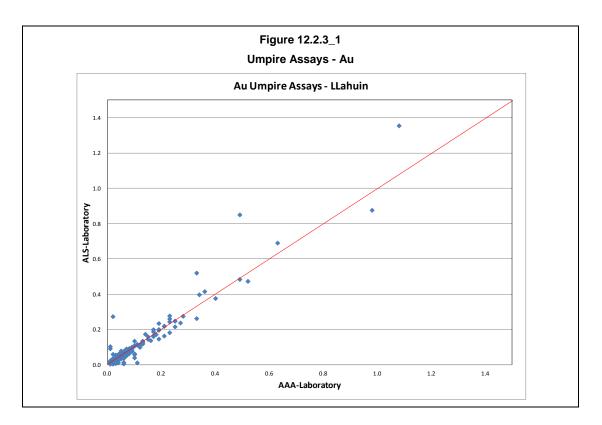


## 12.2.4 Umpire Assays

One hundred and ninety four (194) umpire assays were performed at the request of the author due to the non-submission of standards by SHM. The second laboratory chosen was ALS in Santiago. The repeatability on Cu (Figure 12.2.4\_1) is very good with no evidence of drift between laboratories. There is more spread in the Au results, with low grades being slightly lower and higher grades being higher at ALS when compared to AAA.

AMS recommends that a further 500 umpire analyses are performed, specifically targeting the low grade Au assays in the RC holes, and to a lesser degree in the DC holes.



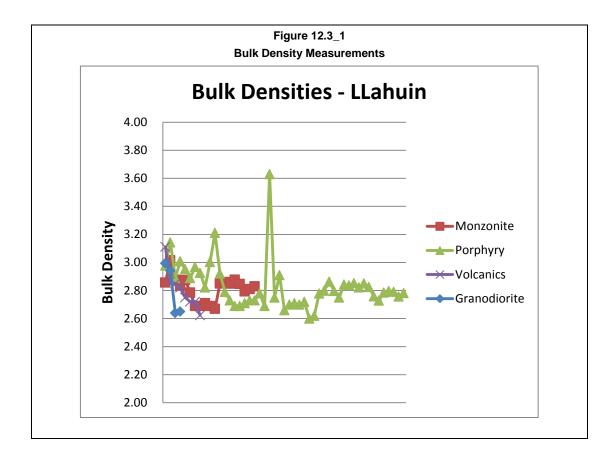


#### 12.3 Bulk Densities

Bulk densities assigned to the mineral resource estimates were derived by SHM using the Archimedes method, water-immersion (wax) on 80 core samples. Whilst the total data set is low, the results are clustered about the mean for each rocktype. One high value in the Porphyry was cut back to 3.0g/cm<sup>3</sup> as it was considered abnormal for this kind of lithology. The average values determined for the various lithological domains are within industry standard.

One average bulk density (2.8g/cm<sup>3</sup>) was used for the mineralised domain as there is little variation in bulk density between Volcanics, Porphyry and Monzonite, which all form the base lithologies for the mineralised domain. The bulk densities for each rock type are displayed in Table 12.3\_1.

AMS recommends for that at least 500 bulk densities are required to form a more reliable estimate of the bulk density for this deposit. This will also allow density/grade relationships to be established, which may be of benefit for more accurate grade modelling techniques in the future.



## 12.4 Adequacy of Data

The blanks, standards and field duplicate data returned display acceptable precision and accuracy suitable for mineral resource estimation for Cu, although some questions still exits over the adequacy of the Au grade data. Given the low levels of Au in the estimate, this is not seen as material to the project at this stage.

Future QAQC should be carried out in a more systematic way. SHM should insert their own commercial standards into the sample stream, rather than relying upon laboratories to check their own precision.

# 13 MINERAL PROCESSING AND METALLURGICAL TESTING

There has been no metallurgical testwork completed to date due to the stage of this project.

# 14 MINERAL RESOURCE ESTIMATES

#### 14.1 Introduction

AMS have estimated the Mineral Resource for the Llahuin Project utilising drilling data as of 17<sup>th</sup> August 2012. All grade estimation was completed using Ordinary Kriging (OK) for Au, Cu and Mo. This estimation approach was considered appropriate based on review of a number of factors, including the quantity and spacing of available data, the interpreted controls on mineralization, and the style of mineralization. The estimation was constrained within separate Cu and Au grade shells which are based on both population statistics and geological controls.

The mineral resource estimate is based upon 30 diamond holes (11,367m) and 124 RC holes (22,445m) with the vast majority of the drilling completed at a spacing of approximately 50m by 50m to 100m by 100m in the Central Porphyry and Cerro de Oro Zones. The Ferrocarril Zone is an exploration target and is yet to be systematically drilled.

#### 14.2 Database

A spreadsheet was provided for use in modelling (LLAHUIN DATABASE 17-Aug-2012.xlsx)

The following checks were performed on the spreadsheet:

- Holes that had no collar data.
- Overlaps in sample intervals.
- Gaps in sample intervals.
- Matching the geological logging length to the hole sample length.

There were no material errors noted within the database.

The drillholes were imported Datamine and their locations were compared to the topographic surface provided and the match was acceptable. There was no requirement to make any adjustments to the collars of the drillholes.

### 14.3 Geological Modelling

The lithological units, as displayed in Figure 14.3\_1 were interpreted in cross section and then the statistics for each unit were compared for the Llahuin porphyry deposit. The Cerro de Oro Zone is almost entirely located within volcanics so this approach was not required for this domain. The Ferrocarril Zone is purely an exploration target at present, so grade shells were constructed without any geological foundation.

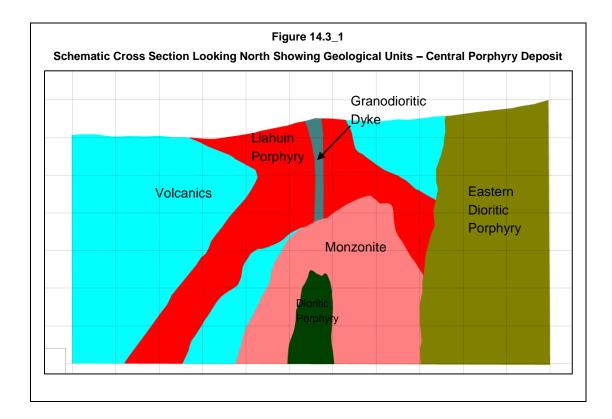
A visual review of the logged alteration found that there was only weak correlation between logged alteration intensity and grade. The relationship is moderate between quartz veining and grade, and a stronger relationship exists between sulphide percentage and grade. Time did not permit the interpretation of these two features. It is suggested that this should be examined in the future as it may have some impact on estimates.

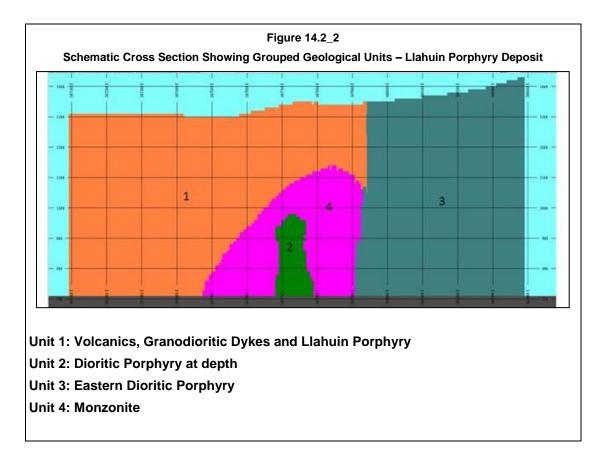
A review of the new core and surface exposures confirmed that there is little or no oxidation present at surface.

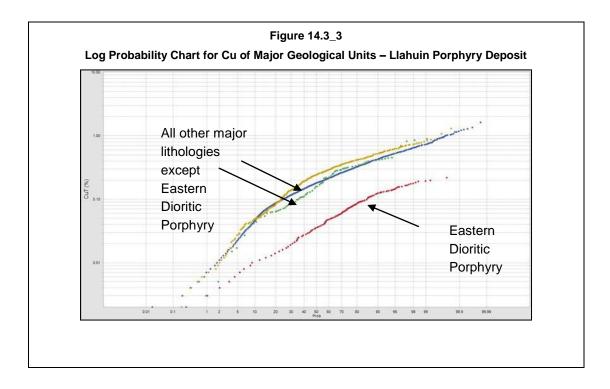
The porphyry, volcanics, granodioritic dykes, dioritic porphyry and the monzonite were grouped together as a single unit named a super-unit, for estimation purposes, which are units 1, 2, and 4, for the Central Porphyry Zone based on the statistics previously generated in March 2012, which are presented in Figure 14.3\_3 and 14.3\_4 and a review of cross sections. It is clear that new data presented between March 2012 and August 2012 makes no material difference to these curves or visual observations on cross sections. The eastern diorite unit, unit 3, is almost entirely unmineralised and its position was updated, but grades were not estimated.

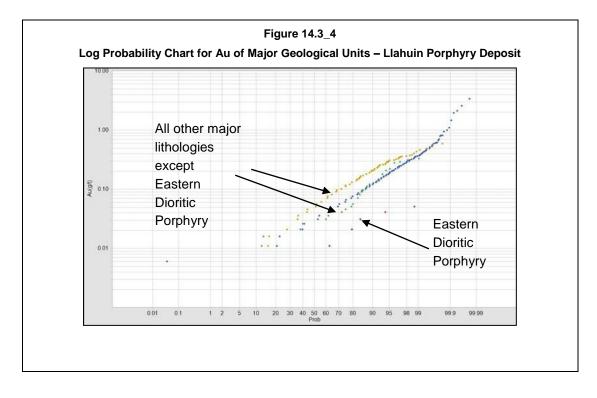
Separate 0.10% Cu and 0.10 g/t Au grade shells were then chosen within the super-unit, based upon population statistics. The eastern diorite unit was not modelled in this update as it is clearly uneconomic.

The Cerro de Oro Zone and Ferrocarril Zone were also modeled within separate 0.10% Cu and 0.10 g/t Au grade shells, mainly for consistency purposes. There have been no strong lithological controls yet established for these zones, with mineralization occurring in Volcanics and Porphyry Lithologies.







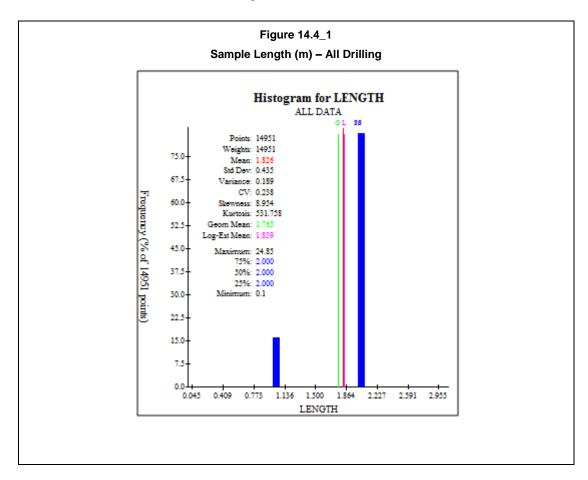


## 14.4 Sample Selection and Compositing

Samples were selected as either inside or outside the relevant Cu or Au grade shell for all three zones.

Compositing was on 2m intervals as this matches the majority of the sampling of the deposit as displayed in Figure 14.4\_1. The minimum composite length used was 1 m. There were no residuals. AMS decided to retain a 2 m composite, rather than a larger composite to mimic some of the grade variability often seen in porphyry copper deposits when they reach the grade control and mining stage.

Post compositing, a number of RC holes that are in close proximity to diamond drillholes were excluded from the data set used for the grade estimation, as detailed in Table 10.2\_1.

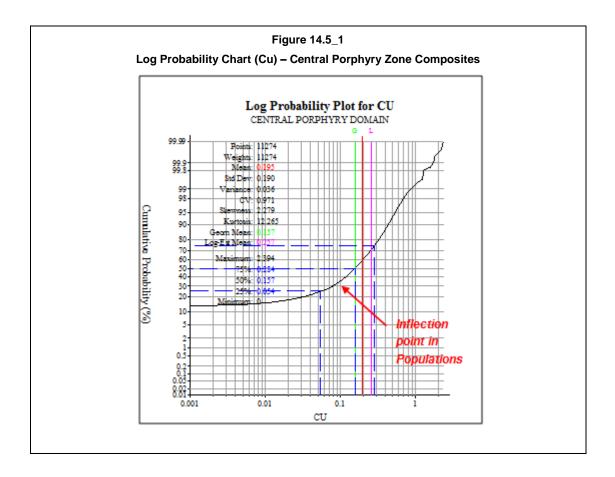


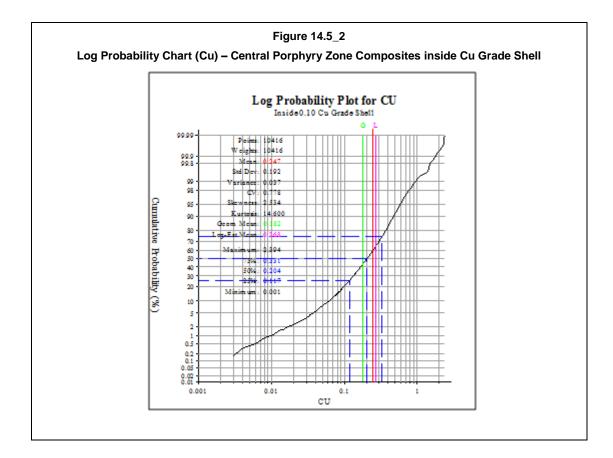
### 14.5 Basic Statistics

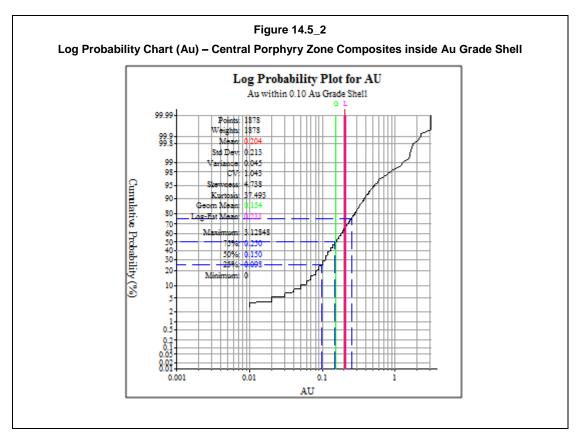
The statistics of each major lithological unit were reviewed as displayed in Figures 14.3\_3 to 14.3\_4 and the grouping of units at Central Porphyry Zone has been previously discussed.

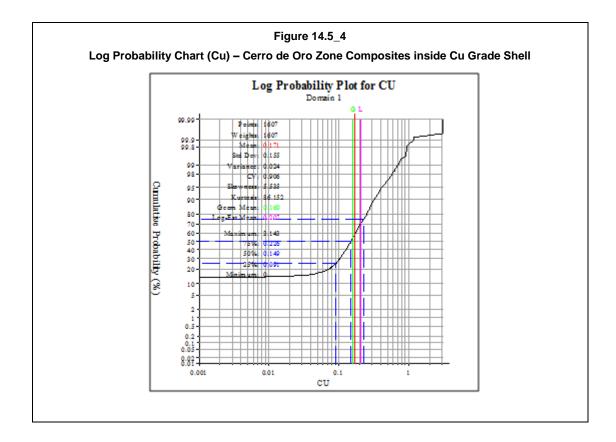
The grade shell of 0.10% Cu was chosen based upon a reasonably clear population break, as displayed in Figure 14.5\_1 and inspection of the data on cross sections. The grade shell of 0.10 g/t Au was chosen based upon inspection of data on cross sections. The population break for Au is not as clear on log probability plots as it is for Cu.

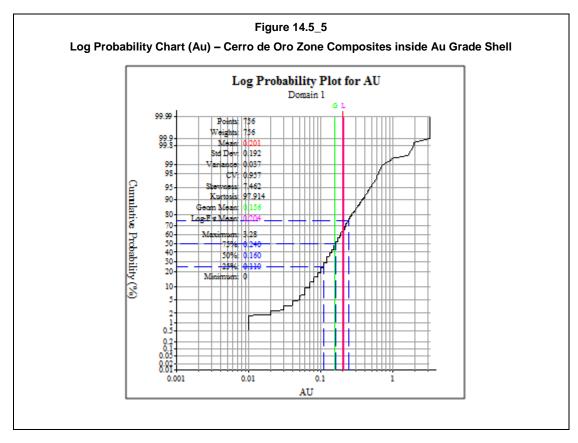
An analysis of the data suggests that the use of upper cuts is not warranted as displayed in Figures 14.5\_2 to 14.5\_5.









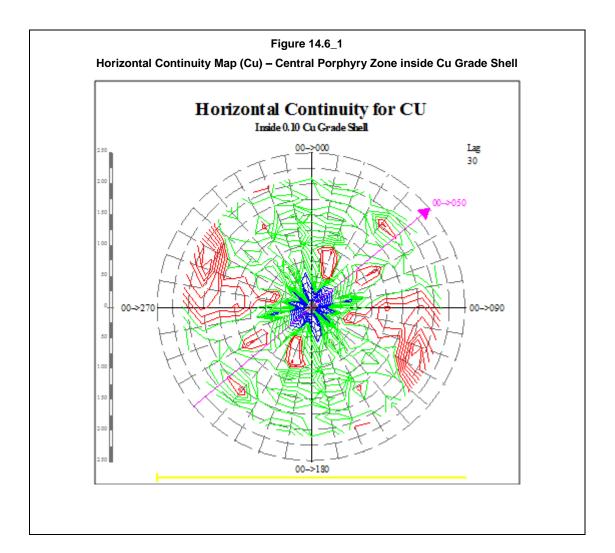


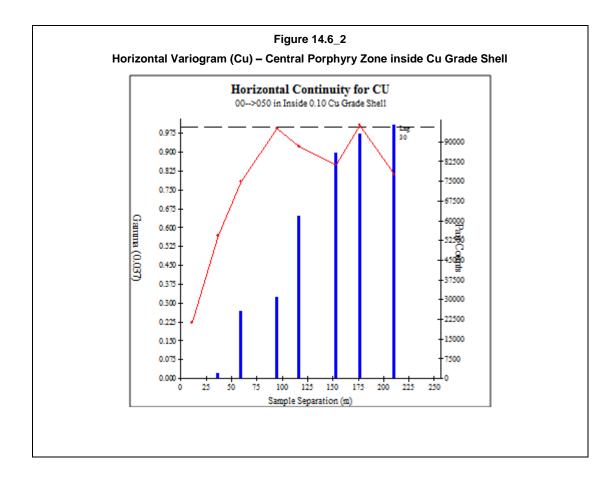
### 14.6 Variography

Robust normal variograms for Cu were generated for the Llahuin Porphyry and Cerro de Oro Zones. The Ferrocarril Zone has insufficient data for variography. Variograms were calculated on the uncut composite files for each zone.

The nugget for Cu accounts for approximately 20% to 60% of the total variance with 50-75% of the variance being encountered within the first 75-100m. An example of the typical variograms generated is displayed in Figure 14.6\_1 and 14.6\_2. Total ranges for Cu are in the order of 200m.

The variograms are orientated along the observed strike and dip of each zone. The variograms for Au are poor for all zones, when compared to the Cu variograms, and therefore the Cu variograms were utilised in the Au estimation. This is also the case for the Mo estimation.





#### 14.7 Block Modelling

Individual block models for each deposit were generated using Datamine mining software. A parent block size of 5mE x 10mN x 4mRL was selected. This smaller block size, relative to the drill grid, was chosen as it represents a mixture of a likely selective mining unit (SMU) and an attempt to mimic grade variability at the grade control stage. The different directions of drilling (060° and 300°) within the Central Porphyry Zone also presents a large amount of dense drilling and hence a smaller block size can be justified.

The cells were sub-blocked on grade shell boundaries only. All wireframes were checked visually to ensure that there was adequate filling with blocks. The block model parameters are shown in Table 14.7\_1. Each block was characterized by a series of attributes, as described in the Table 14.7\_2. The summarised extents of all block models are recorded.

Table 14.7_1						
Summarised Block Model Parameters for all Models						
	East	North	Elevation			
Minimum Coordinates	306,800	6,529,300	600			
Maximum Coordinates	308,200	6,532,700	1,800			
Parent Block size (m)	5	10	4			
Minimum Sub-Block Size (m)	1.25	2.5	1			

Table 14.7_2					
Block Model Attributes List					
Attribute	Туре	Description			
IJK	Numeric	Parent Cell Identifier			
XC	Numeric	Centroid of cell easting			
YC	Numeric	Centroid of cell northing			
ZC	Numeric	Centroid of cell RL			
XINC	Numeric	Cell easting dimension			
YINC	Numeric	Cell northing dimension			
ZINC	Numeric	Cell RL dimension			
RESCODE	Numeric	1=Measured, 2=Indicated, 3=Inferred, 4=Unclassified			
DENSITY	Numeric	Bulk Density			
INSITU	Numeric	0=Mined; 1 = Insitu			
AU	Numeric	Au (g/t) grade estimated by Ordinary Kriging			
CU	Numeric	Cu (%) grade estimated by Ordinary Kriging			
MO	Numeric	Mo (%) grade estimated by Ordinary Kriging			
CUEQ	Numeric	CuEq (%) grade; calculated			
NUMSAM	Numeric	Number of composites used in Estimate			
PASS	Numeric	Pass used in estimate			
DIST	Numeric	Average Distance of composites from block centroid			
VAR	Numeric	Kriging Variance			
AVEDIST	Numeric	Average distance to the composites used in Cu estimate			
AURES	Numeric	0=outside 0.10% Cu grade shell; 1=inside grade shell			
CURES	Numeric	0=outside 0.10 g/t Au grade shell; 1=inside grade shell			

### 14.8 Grade Estimation

Grade estimation was completed using Ordinary Kriging. Negative kriging weights were not utilised in the estimate.

The boundaries used for estimation are hard boundaries. Separate estimates are completed; both inside the grade shell and outside the grade shell for Cu and Au. Mo is estimated inside the Cu grade shell. Variable search parameters were used for each deposit based upon variography and data density as displayed in Table 14.8\_1.

Search Parameters							
	Search Directions			earch Param	neters	Expansions Factors	
		Dip/Dip	Search -	Search-	Search -		
Zone	Strike	Direction	Strike	Down Dip	Orthogonal	Pass 2	Pass 3
Llahuin	050	-80/140	75	75	75	2	3
Cerro De Oro	170	-10/260	100	100	40	2	4
Ferrocarril	0	0	75	75	75	-	-

The following parameters were utilised:

- The orientation of the search axes is identical to the variogram model orientations. In the case of the Ferrocarril Zone, a clear strike and dip of the mineralization was not evident, so an isotropic short range search was applied.
- The maximum number of composites used for any estimate was restricted to 16.
- A maximum of 2 composites were utilised from any one drillhole.
- All estimates were into parent cells and these estimates were discretised down to 5m (X) x 5m (Y) x 5m (Z).

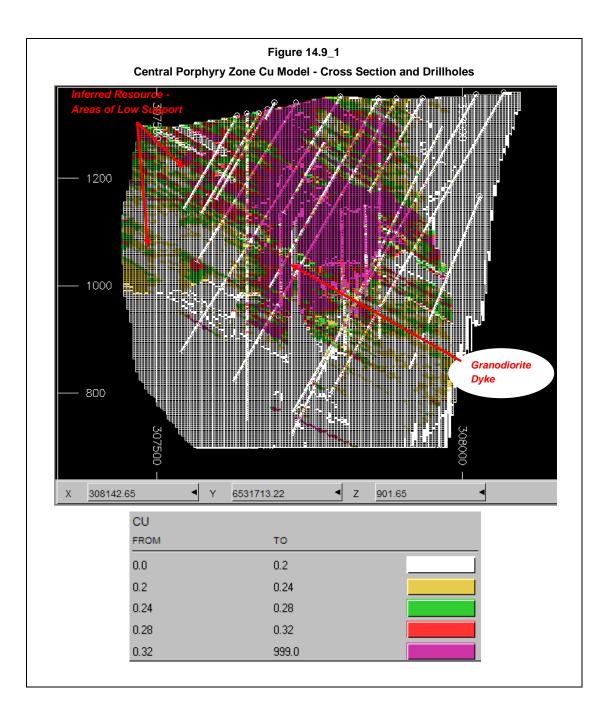
#### 14.9 Model Validation

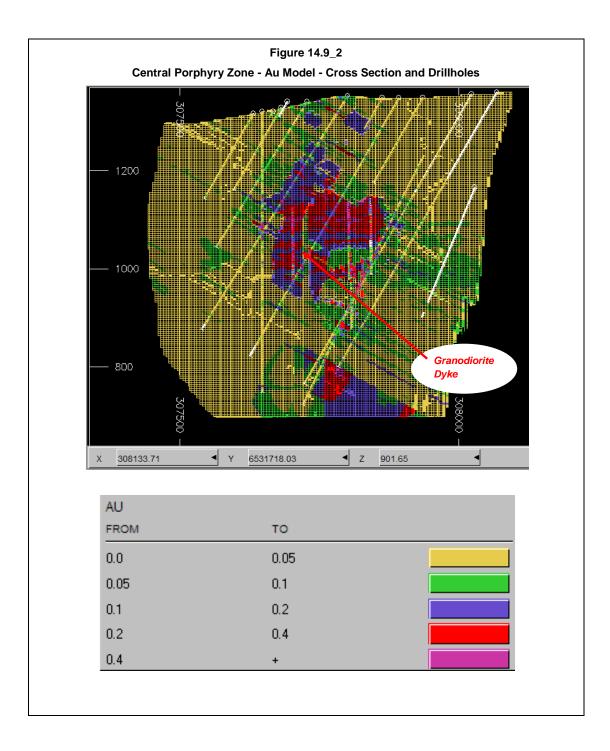
The model has been validated by reviewing model plots compared to composited data.

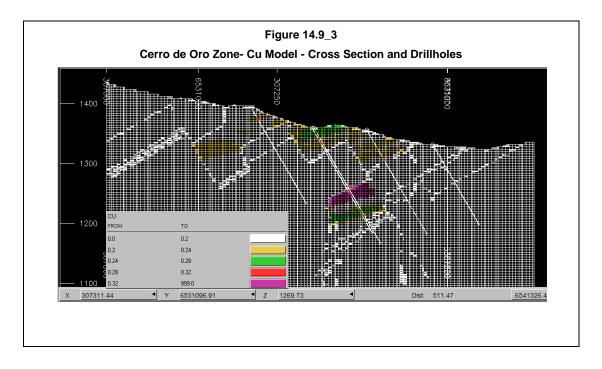
The checks performed were:

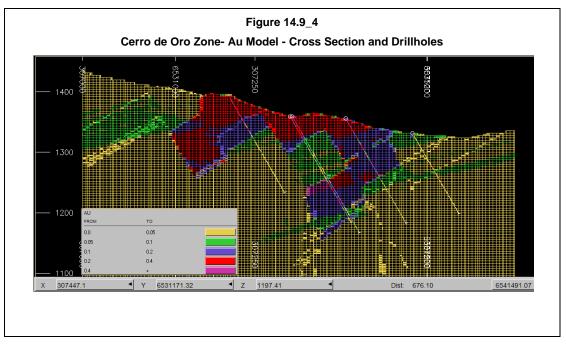
- Ensuring that the domain codes were honoured during estimation;
- Ensuring that the composites were honoured during estimation;
- Ensuring that individual composites did not have undue weight when only a few composites were used for an estimate.

In general, the model honours the data well, as evidenced by Figures 14.9\_1 to 14.9\_4.









### 14.10 Ancillary Fields

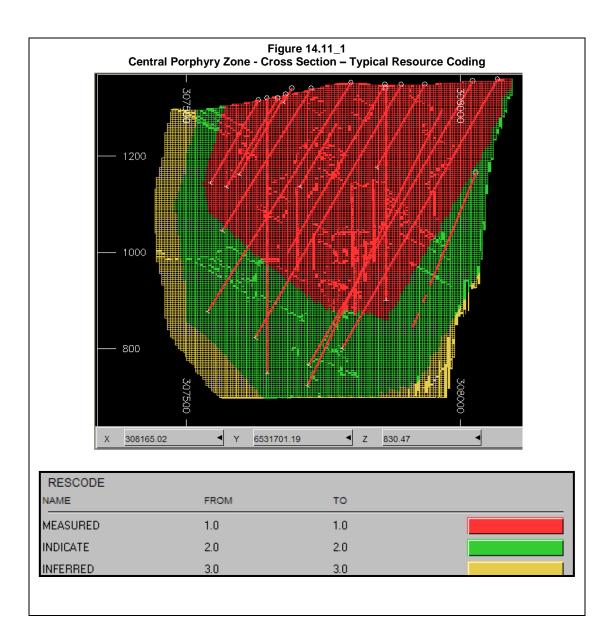
The Mineral Resource Estimate has been depleted to the August 30<sup>th</sup> 2012 topographic surface..

The bulk densities used in this Mineral Resource Estimate are displayed in Table 12.3\_1. There is no obvious oxidation profile and all bulk densities assume fresh rock from surface.

#### 14.11 Resource Classification

The mineral resource estimate has been classified as Measured, Indicated, and Inferred based on the confidence of the input data, geological interpretation, and grade estimation. This is summarised in Table 14.11\_1 as confidence levels of key criteria. An example of the style of classification adopted is displayed in Figure 14.11\_1.

	Table 14.11 1				
Confidence Levels of Key Criteria					
Items	Discussion	Confidence			
Drilling Techniques	RC and DDH – Moderate to good quality with good sample return	Moderate to High			
Logging	Standard nomenclature used.	Moderate			
Drill Sample Recovery	Good for all RC and all DC	Moderate to High			
Sub-sampling Techniques and Sample Preparation	1-2m samples are reliable to adequately represent the style of mineralization.	High			
Quality of Assay Data	Recent data available is reliable based on QAQC results and observed and documented practices.	Moderate			
Verification of Sampling and Assaying	Umpire Assays have returned acceptable results.	High			
Location of Sampling Points	Survey of all collars conducted with DGPS by professional surveyors. Topographic surface is detailed. Downhole surveys of reasonable quality; RC drilling has not been down hole surveyed due to magnetic interference; DC has been gyro surveyed for old holes pre-March 2012.	Low-Moderate			
Data Density and Distribution	Drilling on a notional 50m x 50m spacing consisting of RC and DC drilling to establish continuity.	Moderate to High			
Audits or Reviews	Logging and mapping checked on site.	Moderate			
Database Integrity	Assay certificates checked.	High			
Geological Interpretation	Mineralization interpretations are considered robust.	Moderate to High			
Estimation and Modelling Techniques	Ordinary Kriging is industry standard method.	High			
Cutoff Grades	Reasonable cutoff grades applied for the proposed mining method	High			
Mining Factors or Assumptions	Parent block size reflects likely SMU for mining.	High			
Metallurgical Factors or Assumptions	No work to date.	NA			
Tonnage Factors (Insitu Bulk Densities)	Sufficient bulk density work for global averages. In line with industry standard values adopted. Extra bulk densities are required for more confidence	Medium			



The majority of the 50m by 50m spaced drilling area has been classified as Measured Mineral Resource for the Central Porphyry Zone. There are sections of the Cerro de Oro Zone that are drilled on a 50m by 50m grid, but this section of the project is not as well understood as the Central Porphyry Zone, so the mineral resource classification was limited to Indicated Mineral Resource for this area. The majority of the 100m by 100m spaced drilling area at Central Porphyry Zone is classified as Indicated Mineral Resource. The Inferred Mineral Resource is typically projected down dip and along strike a further 50m from the edge of the Indicated Mineral Resource as displayed in Figure 14.11\_1.

The Ferrocarril Zone is entirely classified as Inferred Mineral Resource die to the low data density at this stage in the evaluation.

### 14.12 Mineral Resource

The statement has been classified by Qualified Person Ian Dreyer (AusIMM (CP)) in accordance with the Guidelines of National Instrument 43-101 and accompanying documents 43-101.F1 and 43-101.CP. The resource is also JORC compliant. It has an effective date of 10<sup>th</sup> September 2012. Mineral Resources that are not mineral reserves do not have demonstrated economic viability. AMS and SHM are not aware of any factors (environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors) that have materially affected the mineral resource estimate.

		Table 14.	12_1				
	Grade Tonnage Report - Llahuin Project						
	Ordinary Kriged Estimate – 10 <sup>th</sup> September 2012						
	(Block Model -	- 5mE X 10mN X 4	mRL) (Cut-off 0.2	8% CuEq)			
Zone	Million	Measured Resource					
20116	Tonnes	Cu (%)	Au (g/t)	Mo (ppm)	CuEq (%)**		
Central Porphyry	88.9	0.33	0.09	0.006	0.42		
Cerro de Oro	-	-	-	-	-		
Ferrocarril	-	-	-	-	-		
Total Measured	88.9	0.33	0.09	0.006	0.42		
			Indicated	Resource			
Central Porphyry	35.6	0.27	0.07	0.007	0.35		
Cerro de Oro	20.4	0.22	0.19	-	0.36		
Ferrocarril	-	-	-	-	-		
Total Indicated	56.0	0.25	0.11	0.005	0.35		
Measured and Indicated	144.9	0.30	0.10	0.006	0.40		
			Inferred F	Resource			
Central Porphyry	10.3	0.26	0.05	0.006	0.32		
Cerro de Oro	2.4	0.26	0.05	-	0.30		
Ferrocarril	3.9	0.31	0.06	-	0.35		
Total Inferred	16.7	0.27	0.06	0.005	0.33		

\*\* CuEq = Cu% + Au (g/t) x 0.72662 + Mo (%) x 4.412

Appropriate rounding has been applied

# 15 MINERAL RESERVE ESTIMATES

No mineral reserves have been estimated for the Llahuin Project.

### 16 MINING METHODS

Mining methods have not yet been formally assessed and documented.

## 17 RECOVERY METHODS

Recovery methods have not yet been formally assessed and documented.

## 18 PROJECT INFRASTRUCTURE

Project infrastructure has not yet been formally assessed and documented.

# **19 MARKET STUDIES AND CONTRACTS**

These items have not yet been formally assessed and documented.

# 20 CAPITAL AND OPERATING COSTS

Capital and operating costs have not yet been formally assessed and documented.

### 21 ECONOMIC ANALYSIS

An economic analysis has not yet been formally assessed and documented.

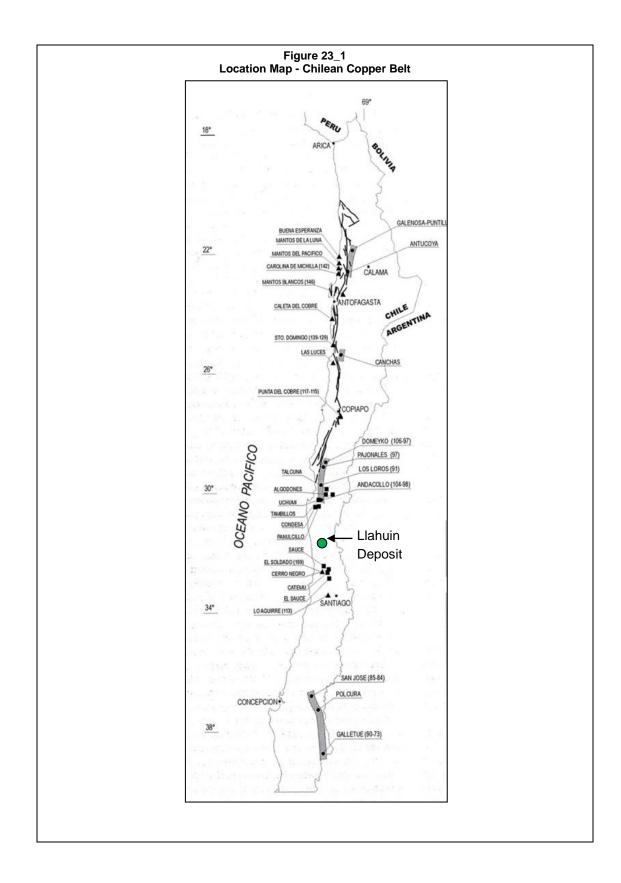
## 22 ADJACENT PROPERTIES

There are numerous developed properties in the Chilean Copper Belt that surround the Llahuin Deposit as displayed in Figure 23\_1, although they are located significant distances from the Llahuin Deposit.

Chile is well known as the major producer of Copper in the world and there are numerous similar porphyry copper deposits to Llahuin located in three major regions within the country.

# 23 OTHER RELEVANT DATA AND INFORMATION

AMS is not aware of other relevant data pertaining to the Llahuin Project.



# 24 INTERPRETATION AND CONCLUSIONS

SHM has undertaken a relatively systematic exploration program in the last year that has been successful in defining significant mineral resources of copper and gold. AMS concludes that there are no fatal flaws in the current mineral resource estimate.

# 25 RECOMMENDATIONS

### 25.1 Exploration and Resources

Drilling and studies completed to date have defined a Measured, Indicated and Inferred mineral resource at Llahuin. The data collected is considered to be of moderate quality and suitable for mineral resource estimation.

AMS makes the following specific recommendations:

- Continue exploration drilling the strike extensions of all zones
- To insert standards and more blanks into the sample stream in the field.
- Advance to a Preliminary Economic Assessment (PEA).
- A geophysical assessment of the Ferrocarril Zone, followed by a 100m x 100m grid drilling pattern over the most prospective areas of this Zone.
- Drill the Cerro de Oro Zone at depth to test for a potential Porphyry source.
- To drill at least 10 additional twin DC holes to check the reliability of the wet RC data.

# 25.2 Mineral Resource and Evaluation Budget

SHM has recommended the exploration budget as outlined in Table 26.2\_1. AMS considers this to be an appropriate level of expenditure on this project.

Table 26.2_1 Llahuin Project Proposed Resource and Evaluation Budget				
Activity Total (US\$)				
Drilling	\$ 5,000,000			
Assay	\$ 400,000			
Geophysics	\$ 400,000			
Geology	\$ 400,000			
Drill Sites, Vehicles, Setup, Logistics	\$ 400,000			
Metallurgy	\$ 150,000			
PEA	\$ 250,000			
Sub-total	<b>\$ 7</b> ,000,000			

The proposed expenditure of US\$ 7,000,000 in the next year is considered to be consistent with the potential of the Llahuin Project and is adequate to cover the costs of the proposed programs

# 26 **REFERENCES**

- AusIMM. 1995. Code and Guidelines for Assessment and Valuation of Mineral Assets and Mineral Securities for Independent Expert Reports (The Valmin Code) Issued April 1998. AusIMM.
- AusIMM. 1998. Code and Guidelines for Assessment and Valuation of Mineral Assets and Mineral Securities for Independent Expert Reports (The Valmin Code), issued April 1998. The Australasian Institute of Mining and Metallurgy.
- Zonge Ingenieria Y Ge Ofisica (Chile) S.A (Dec 2011) Report for Offset pole-dipole Induced Polarisation/Resistivity and Ground Magnetic Surveys at the Llahuin Project, Region 4, Chile.

# 27 DATE AND SIGNATURE PAGE

The "qualified person" (within the meaning of NI43-101) for the purposes of this report is lan Dreyer, who is the Principal Geologist of AMS in South America. The effective date of this report is 10<sup>th</sup> September 2012.

(signed by)

B.Sc Geol. MAusIMM (CP)

lan Dreyer Principal Geologist Andes Mining Services

Signed on the 18<sup>th</sup> October, 2012

# 28 CERTIFICATES OF QUALIFIED PERSONS



# Certificate of Qualified Person

I, Ian Dreyer, do hereby certify that:

- I have been working since 2012 as Principal Geologist with the firm Andes Mining Services Ltd. of Jose Pardo 1040, Miraflores, Lima Peru 27. My residential address is Jose Pardo 1040, Miraflores, Lima Peru 27.
- I am a practising geologist with 24 years of Mining and Exploration geological experience. I have worked in Australia, Africa, Indonesia and the Americas. I am a Chartered Professional Member of the Australian Institute of Mining and Metallurgy ("MAusIMM (CP)").
- 3. I am a graduate of the Curtin University and hold a Bachelor of Science Degree in Geology (1982).
- 4. I have practiced my profession continuously since 1988.
- 5. I am a "qualified person" as that term is defined in National Instrument 43-101 Standards of Disclosure for Mineral Projects (the "Instrument").
- 6. I visited the Llahuin Project on March 17th 2012 and August 13<sup>th</sup> 2012.
- 7. I am responsible for all sections of the technical report dated effective 10<sup>th</sup> September 2012 and titled "Mineral Resource Estimate - Llahuin Copper Project, Coquimbo Region, Chile"(the "Report").
- 8. I am independent of SHM pursuant to section 1.5 of the Instrument.
- 9. I have read the Instrument and Form43-101F1 (the "Form") and the Report has been prepared in compliance with the Instrument and the Form.
- 10. I do not have nor do I expect to receive a direct or indirect interest in the Llahuin Project of SHM and I do not beneficially own, directly or indirectly, any securities of SHM or any associate or affiliate of such company.
- 11. I have not had any prior involvement with the Llahuin Project of SHM.
- 12. As of the date of this certificate, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Lima, Peru, on 18<sup>th</sup> October 2012

(signed by)

BSc(Geology) MAusIMM (CP)

lan Dreyer Consulting Geologist