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2 February 2011

Australian Securities Exchange
Level 8
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Dear Sir/Madam

Amended Preliminary Assessment Report - Los Pumas Manganese Project

For disclosure purposes, please refer below for the amended Technical Report issued in Canada by the Company. The Technical Report is issued for the purposes of qualification of the Final Short Form Prospectus in respect of the Canadian portion of the recent capital raising.

Yours faithfully
SOUTHERN HEMISPHERE MINING LIMITED

Derek Hall
Company Secretary

Los Pumas Project, Chile

Technical Report

Prepared by Coffey Mining Pty Ltd on behalf of:

Southern Hemisphere Mining Limited

Effective Date: 20 December 2010

Qualified Person: Ian Dreyer, BSc (Geol), AusIMM

MINEWPER00

DOCUMENT INFORMATION

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	Mr Hernandez (Non QP) compiled the report from different sources and was supervised by Mr Dreyer		

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Document Review and Sign Off

Primary Author

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1 SUMMARY

1.1 Introduction

Southern Hemisphere Mining Limited (“SHM”) is assessing resources of manganese identified in the Parinacota district of Northern Chile, and at a distance of 175 kilometres by road from the existing port of Arica. The resources are the subject of exploitation tenements owned by Minera Hemisferio Sur SCM (“MHS”), a Chilean company which is a wholly owned subsidiary of Southern Hemisphere Mining Limited. A measured and indicated resource of 14.30 million tonnes at a grade of 7.89% manganese and inferred resource of 4.01 million tonnes at a grade of 6.77% manganese at a block cut-off of 4% manganese has been established to date.

The resource will be mined by conventional open-pit methods, and has the advantage of a very low waste to resource ratio of approximately 0.9 to 1. The resource will be hauled to an on-site process plant comprising a crushing circuit and dense media separation circuits. Under the current process flow sheet the resource will be crushed to a size of less than 10 mm, and the size fraction smaller than 0.5 mm will be rejected. Rejects from the dense media separation will also be rejected and stockpiled on site as waste in dumps or as slimes in a slimes storage facility. Following metallurgical testing, however, it has been decided to revisit the process flow sheet and consider the inclusion of additional beneficiation steps that have been identified to increase the recovery of manganese units from the resource.

The mine and processing workforce will be accommodated in a refurbished hotel which will be owned by MHS. The hotel is located in the town of Putre, 35 kilometres from the mine. Electric power will be provided on site by diesel powered generator sets and water will be sourced from surface water 19 kilometres from the site. An access agreement has been signed with the owners of the land on which the exploitation tenements are located, and agreement also has been reached with the same owners for the provision of water.

Following beneficiation on site, approximately 300,000 tonnes of manganese product per annum grading 38% manganese, will be transported by truck to a purpose-built storage facility close to the port of Arica. At ship loading, the product will be relocated to a pre-loading facility within the port and adjacent to the loading berth.

The manganese product will be shipped to customers in China.

1.2 Preliminary Assessment

Coffey Mining has completed this Preliminary Assessment (PA) for the Los Pumas Project, as described under the various headings below.

Contributors to this PA are as shown in Table 2.6_1 and include Coffey Mining, Mineral Processors, SNC-Lavalin, and Arc Resources.

1.3 Facilities

The facilities for Los Pumas Project will include the following:

Open-Pit Mine

- Pits
- Ramps and haul roads
- Waste dumps
- Explosives storage

Beneficiation Plant

- Crushing Plant
- Coarse DMS Plant
- Fine DMS Plant
- Coarse and Fine Product Handling & Storage
- Product Waste Handling & Storage
- DMS Effluent Clarification & Solids Disposal
- Clarified Water Storage & Distribution
- Electrical Main Substation & Power Distribution
- Flocculant Plant
- Plant Internal and Access Roads
- Improvement of Road A-23

On Site Infrastructure

- Fresh Water supply from Water Source approx. 20km from Plant to Fresh Water Tank
- Water Treatment Plant & Potable Water Distribution
- Fire Water System
- Fuel Storage System
- Buildings: Administration, Warehouse, Maintenance / Mine Trucks Shop and Access Control
- First Aid Facilities
- Plant Controls & Communication Systems
- Sewage Reticulation & Treatment Plant
- Plant & Instrument Air

Off Site Infrastructure

- New Site Access road
- Upgrading A-23 Secondary Road from Putre to Plant
- Construction Camp at Putre (Upgrading existing La Vicuña Hotel)
- Port Facilities (Covered Stockpile, Offices, Truck Scale, Fence, Security and Loadings.

1.4 Ownership

The Los Pumas Manganese Project is owned 100% by Minera Hemisferio Sur SCM (MHS), a Chilean contractual mining company, which is 100% owned by Southern Hemisphere Mining (Aust) Pty Ltd (SHM), the Company's 100% owned subsidiary in Australia.

The Los Pumas Manganese Project comprises two (2) exploitation concessions; four (4) mining claims or "Manifestaciones" (exploitation concessions in process of being granted); twenty four (24) exploration concessions and twenty three (23) "Pedimentos" (exploration concessions in process of being granted).

The Los Pumas Project mineral resource is located on land, whose surface rights are privately owned by the Putre Community Land Owners (PCLO). MHS has executed an agreement with PCLO which grants MHS easement rights over the land. Subject to annual easement payments, these rights include the use of the land for all exploration and mining purposes, including the construction of plant, buildings and associated infrastructure for a 20 year period.

Under the Chilean Political Constitution of the Republic (PCR), the State of Chile has absolute dominion over all the mines and the mineral explored and exploited through mining concessions, which is different and independent from land surface rights.

MHS has obtained concession status for the Los Pumas Project land, which grants MHS the exclusive exploitation rights for an indefinite period to prospect and mine the concession area.

1.5 Geology and Mineralization

Los Pumas Manganese Project is part of the Tertiary and Quaternary volcanic sequences that forms the Andes Mountains in northern Chile.

The oldest rocks are of Oligocene – Miocene age, comprising volcano-sedimentary sequences including basaltic to dacitic flows and pyroclastic rocks. The rocks can be found outcropping to the south, west and east of the Los Pumas manganese project.

The Lower Miocene to Middle volcanic complex is represented by partially eroded lava flows, and pyroclastic rocks of andesitic composition, basaltic to dacitic flows and sedimentary sequences. These latter units have been variously called the Atacama Gravels and Altos de Pica Formation.

The main river system that exposes the Los Pumas mineralisation runs in a north-south direction and possibly represents a major shear structure that potentially has a strong control on the location of manganese mineralisation in the region.

The geology of the deposit is dominated by volcanic rocks of the Huaylas Formation (Upper Miocene age) and the Lauca Ignimbrite (Upper Pliocene). These have been subsequently overlain by Pleistocene pyroclastics, andesites and dacites and sedimentary units including primarily pumice, ignimbrites and a mixture of acid volcanic rocks (dacites and rhyodacites).

The Lauca Ignimbrite is important in that this unit hosts the majority of the manganese mineralisation at Los Pumas. The manganese has formed mantle style mineralisation, having been hydrothermally injected into the flat ignimbrite layer along paths of weakness associated with subvertical faults, preferentially orientated NNW, with subordinate structures oriented N-S and ENE.

Resource characterization indicated that a single manganese mineral, Cryptomelane, was identified in all resource types.

1.6 Hydrogeology

A hydrogeological report was prepared by Aquaconsult, a specialist consultant, of Santiago, Chile. The report described the regional hydrogeology and recommended some targets for the purpose of sourcing water. These targets varied from near to a considerable distance from the Project site.

During the exploration drilling program, three holes were drilled in areas which appeared to have a reasonable prospect of encountering water. Water was encountered in aquifers at varying depths; however the quantity of water present was not measured as being able to sustain project requirements.

A water supply has been established approximately 19 km from the Project site, and an agreement has been reached with the owners of the land to supply water at the rate required by the Project.

1.7 Status of Exploration

Los Pumas manganese project was first identified during World War II when a German company excavated a number of small trenches and underground openings in both the mantle and vein mineralisation. The result of this work is not available, nor is there any record of additional exploration up until the work commenced by MHS in September 2008.

The project opportunity was identified by the MHS Exploration Manager, Mr Igor Collado, who has been responsible for initially identifying the potential and for all exploration work completed to date. The work completed by MHS to date has included:

- Regional reconnaissance.
- Project scale mapping of the Los Pumas Project.
- 22 grab samples from outcrops.

- 32 diamond drill holes for a total of 651 m
- 487 reverse circulation (RC) holes for a total of 14,204 m.
- 4 winzes for a total depth of 62 metres.

1.8 Data Acquisition

Drilling

The Los Pumas project was drilled between the end of 2008 and mid 2010. A total of 519 holes of 5 ½" RC and diamond core were completed for 14,855 m by June 2010.

Holes were mostly drilled in average 25m depth. Holes were drilled on a spacing of approximately 50m by 50m in the northern area varying until 200m by 200m in the southern area. Where applicable, infill resource drilling was carried out to a spacing of 25m by 25m. The manganese mineralization is predominantly horizontal so the mineralized intercepts represent the true thickness of mineralization.

Additional drilling was undertaken using HQ and NQ size standard wireline diamond core drilling to allow for the taking of metallurgical samples and calculating bulk density readings.

There were also 4 winzes, each being 1.5 m by 1.5 m in plan, with a total of 62 m for the purpose of obtaining samples suitable for metallurgical testing.

Bulk Density

MHS made 158 density tests, principally from physical bulk density measurements for the current diamond drilling (core).

Resource Characterization

Samples of what were initially identified as the four distinct resource types occurring in the deposit were sent to a specialist laboratory for mineralogical studies. These four resource types were consolidated into three classifications. The three classifications were identified as follows with their short-hand identifying descriptions:

- UG1 Block & Ash (Andesite – Dacite)
- UG3 Ignimbrite
- UG4 Volcanic Sediment

The following information was established for each sample:

1. Global Mineralogical Composition
2. Mineralogical Composition Mineral Base
3. Degree of Liberation and Mn Resource sizes
4. Petrographic Study on transparent section

5. Calcographic Study in polished section

For metallurgical purposes a total of 98 samples were analysed; 87 in Transmin (Peru) and 11 large samples in Mintek (South Africa).

1.9 Data Reliability

Drilling campaign was initiated on 16 December 2008 employing RC and diamond core taking samples at 1m intervals. Samples were transported to the Andes Analytical Assay Limitada (AAA) laboratory located at Arica airport for sample preparation. This sampling and sample preparation methodology complies with international industry standards. This laboratory has an ISO 9001:2008 certification. The samples were analysed by four acid digest and ICP AES FP (6 elements).

Field duplicates were prepared in the field (1 in 20 or 5%) by passing the bulk RC 1m sample through the splitter to produce a second 5kg sample. This was then sent to the laboratory to be prepared and analysed in the same manner described above. The results show excellent precision, which suggests that the sampling methodology was adequate.

A total of 58 pulp samples were sent to ALS Chemex in La Serena for Umpire Assays analysis by four acid ICP-AES (and by AAS for Mn >10%). ALS submitted 1 standard, one blank and one pulp duplicate as part of the QAQC program.

Drilling, surveying, geological logging, sample preparation and assaying procedures have been completed to accepted industry standards.

1.10 Mineral Resources

The estimation and classification of the resources was done by Coffey Mining in accordance with the guidelines set out in the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves of December 2004 as prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC).

The resource classification is also consistent with criteria laid out in the Canadian National Instrument 43-101, Standards of Disclosure for Mineral Projects of December 2005 (the Instrument) and the classifications adopted by CIM Council in November 2004.

The interpretation of the mineralisation was divided into two domains, a high grade domain and a low grade domain. A grade of 4% manganese was used to distinguish between the domains. Despite the 4% assay grade cut-off used to distinguish the high grade domain there are some blocks within this domain with lower than 4% grade due to inclusions of low grade assays within the wire frame. Similarly some of the blocks in the low grade domain have grades above 4% manganese.

Table 1.9_1 **Los Pumas Project – South Hemisphere Mining** **Grade Tonnage Report** **(as at October 14th 2010)**								
Ordinary Kriging Estimate – High Grade Domain					**Ordinary Kriging Estimate – Low Grade Domain**			
Resource	**Mn% Lower Cutoff Grade**	**Tonnes (Mt)**	**Mn (%)**		**Resource**	**Mn% Lower Cutoff Grade**	**Tonnes (Mt)**	**Mn (%)**
Measured	0	7.8	8.04		Measured	0	12.66	1.08
	4	7.31	8.36			2	1.86	3.26
	10	1.92	12.41			4	0.4	5.51
Indicated	0	5.91	7.5		Indicated	0	51.54	0.87
	4	5.55	7.78			2	5.22	3.23
	10	0.98	11.95			4	1.042	5.5
Measured & Indicated	**0**	**13.71**	**7.81**		**Measured & Indicated**	**0**	**64.2**	**0.92**
	4	**12.86**	**8.16**			**2**	**7.09**	**3.24**
	10	**2.89**	**12.09**			**4**	**1.44**	**5.51**
Inferred	0	2.87	7.2		Inferred	0	536.11	0.44
	4	2.63	7.55			2	14.25	2.89
	10	0.24	11.82			4	1.38	5.28

A complete statement is given under Section 17

1.11 Mining

The resource model of the Los Pumas Deposit was subjected to preliminary pit analysis (Lerchs-Grossmann) to determine the extent to which resource could be economically mined.

1.11.1 In-Pit Resources

For mining estimates purposes a 2.5% Mn cut-off has been selected in alignment with the projected economics and expected recoveries of the project. Table 1.11.1_1 sets the resources at the 2.5% cut off from the resource inventory defined by Coffey Mining.

Table 1.11.1_1
Los Pumas Project – South Hemisphere Mining
Resource Estimates for a 2.5% Mn Cut-Off

Classification	Tonnes (Mt)	Mn (%)	SiO_2 (%)	Fe_2O_3 (%)	Al (%)	K (%)	P (%)
Measured HG	7.75	8.08	56.5	2.59	5.59	3.15	0.05
Measured LG	1.14	3.91	43.5	2.28	4.32	2.13	0.04
Total Measured	**8.89**	**7.55**	**54.83**	**2.55**	**5.43**	**3.02**	**0.05**
Indicated HG	5.90	7.51	55.8	2.86	5.75	3.07	0.05
Indicated LG	3.33	3.81	40.9	2.12	4.34	1.9	0.03
Total Indicated	**9.23**	**6.18**	**50.42**	**2.59**	**5.24**	**2.65**	**0.04**
Total Measured & Indicated	**18.12**	**6.85**	**52.59**	**2.57**	**5.33**	**2.83**	**0.05**
Inferred HG	2.86	7.2	55.5	3.05	5.92	2.86	0.06
Inferred LG	9.77	3.2	21.8	1.26	2.37	0.93	0.02
Total Inferred	**12.63**	**4.11**	**29.43**	**1.67**	**3.17**	**1.37**	**0.03**

The parameters in the design analysis were a mining cost of $2.21 per tonne of resource and waste, processing and product handling cost of $10.81 per ROM tonne, overall pit wall slopes of 50 degrees, metallurgical recovery of 60% of the manganese units and an FOB sale price of $7.40 per dmtu.

Table 1.11.1_2 sets out the quantities of resource within the Lerchs-Grossmann pit shells. These grades and quantities are the undiluted grades and quantities within the model.

Table 1.11.1_2 Los Pumas Project – South Hemisphere Mining In Pit Resources, plus 2.5% Mn							
Classification	**Tonnes (Mt)**	**Mn (%)**	**SiO_2 (%)**	**Fe_2O_3 (%)**	**Al (%)**	**K (%)**	**P (%)**
Measured HG	7.40	8.24	56.55	2.58	5.59	3.18	0.05
Measured LG	0.82	4.25	43.44	2.26	4.28	2.09	0.03
Total Measured	**8.22**	**7.84**	**55.24**	**2.55**	**5.46**	**3.07**	**0.05**
Indicated HG	5.17	7.87	55.88	2.80	5.74	3.12	0.05
Indicated LG	2.15	4.26	38.73	1.88	4.01	1.77	0.03
Total Indicated	**7.32**	**6.81**	**50.84**	**2.53**	**5.23**	**2.72**	**0.04**
Total Measured & Indicated	**15.54**	**7.84**	**53.17**	**2.54**	**5.35**	**2.91**	**0.05**
Inferred HG	2.23	7.72	55.20	2.99	5.90	2.91	0.06
Inferred LG	2.97	4.11	27.83	1.51	3.03	1.17	0.03
Total Inferred	**5.20**	**5.66**	**39.57**	**2.14**	**4.26**	**1.92**	**0.04**

The 15.54 million tonnes of measured and indicated resources within the Lerchs-Grossmann pit shells indicates that 86% of the total measured and indicated resource within the deposit will be converted to reserve. Of the 12.6 million tonnes of inferred resource within the model 5.2 million tonnes are contained within the Lerchs-Grossmann shell. Measured & indicated resources account for 75% of material inside the Lerchs-Grossmann pit shells, with the remaining 25% being inferred.

In the financial models of the project an allowance has been made for dilution of resource during mining based on the study of geological sections, the thickness of the resource and the upper and lower contacts' diluting grades. The dilution allowed was 30% of the resource volume at a grade of 2.2% Mn.

To test the effect at this stage of the project of the relative importance of the inferred resources within the pit shells, two financial models have been developed, one which shows the effects of converting inferred resources to reserves and the other which treats all inferred resources as waste. Both models show internal rates of return in excess of 45%. The first has a net present value (NPV) in excess of US$90 million while the latter has an NPV of over US$60 million when using a 10% discount rate.

This shows that the deposit has a strong economic potential and that the conversion of inferred resources to measured or indicated resources will secure an important increase in NPV.

Summary tables showing the results of these sensitivities regarding the inclusion or not of inferred resources as potential feed to the plant are presented below:

Table 1.11.1_3 Los Pumas Project – South Hemisphere Mining In Pit Mineral Inventory, plus 2.5% Mn, Diluted NO INFERRED RESOURCES		
Total material movement	dry bcm	17,617,660
Waste mined	dry bcm	8,627,403
Resource mined	Diluted dry bcm	8,990,258
Resource mined	Diluted dry tonnes	20,050,750
Resource grade	Diluted % Mn	6.18%
Stripping Ratio	waste/resource	0.96
Life of Mine	yrs	8.5
Inferred resource	Diluted dry bcm	0
	Diluted dry tonnes	0
	Diluted % Mn	0.00%

Table 1.11.1_4 Los Pumas Project – South Hemisphere Mining In Pit Mineral Inventory, plus 2.5% Mn, Diluted INFERRED RESOURCES INCLUDED		
Total material movement	dry bcm	23,070,784
Waste mined	dry bcm	10,940,513
Resource mined	Diluted dry bcm	12,130,271
Resource mined	Diluted dry tonnes	26,976,881
Resource grade	Diluted % Mn	5.84%
Stripping Ratio	waste/resource	0.90
Life of Mine	yrs	10.5
Inferred resource included in resource mined	Diluted dry bcm	3,067,639
	Diluted dry tonnes	6,768,194
	Diluted % Mn	4.35%

1.11.2 Statement of Preliminary Assessment – Preliminary in Nature

This Preliminary Assessment, is preliminary in nature, and includes inferred mineral resources in the base case financial analysis. Inferred resources are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the preliminary assessment will be realised.

Mineral resources that are not mineral reserves do not have demonstrated economic viability.

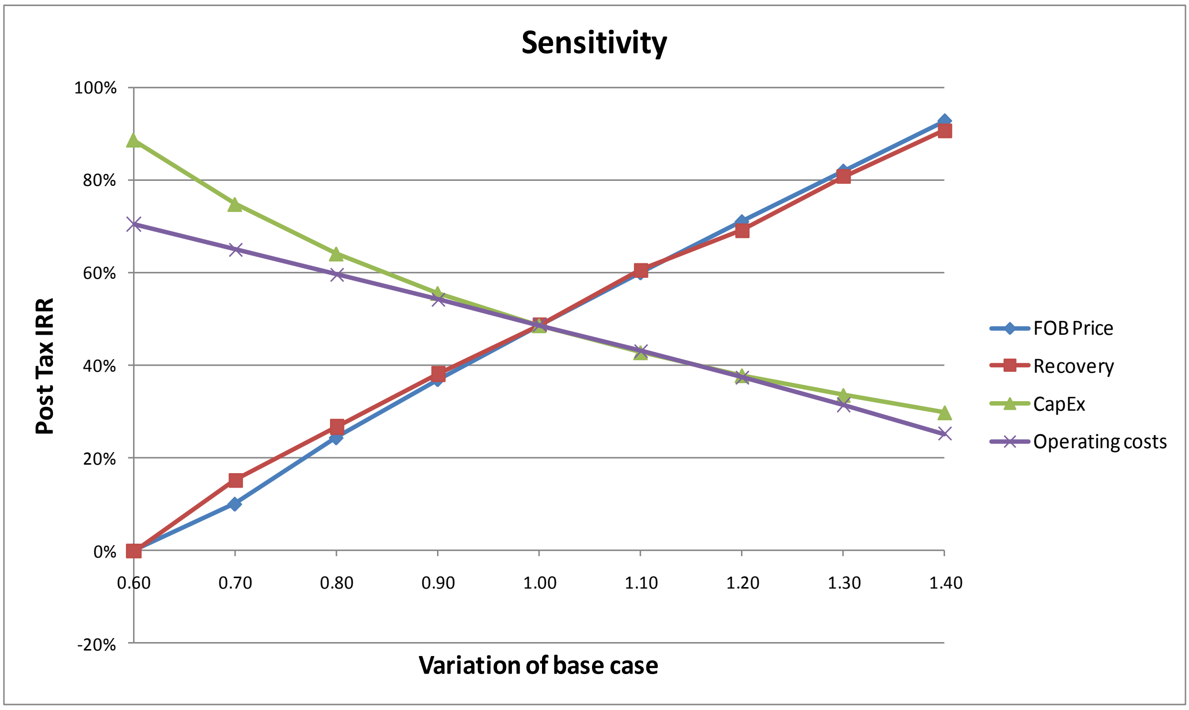
The sensitivity considered in the preliminary mining plan showed however that if they are not included as resource but classified as waste in the mining operation, the financial outcome continues to be strong giving further support to proceed with the next phases of the project with regard to the conversion of this ground to the measured or indicated resources categories, resource modelling, metallurgical test work for optimisations and pit optimisations.

1.12 Financial Evaluation

The financial evaluation of the Project was undertaken using the discounted cash flow ("DCF") method. A project net present value ("NPV") of $91 million and a project after tax internal rate of return ("IRR") of 49% have been calculated.

The following sensitivity graph indicates the robustness of the project.

Figure 1.12_1
Los Pumas Project – South Hemisphere Mining
Financial Evaluation Sensitivity to Key Variables



1.13 Environmental Approval

A Declaración De Impacto Ambiental (DIA) has been submitted to the Authorities and the approval process is currently underway. A series of public meetings are being held to educate the communities as well as the Authorities, and the statutory program of answering formal questions from the Authorities by means of the provision of Addenda. Environmental approval of the project is expected at the end of January 2011.

1.14 Key Performance Indicators

The key performance criteria for the initial and continuing viability of the Project are:

- Commodity price
- Processing yield
- Resource Reserve / Resource reconciliation
- Product grade
- Capital cost
- Design capacity / plant throughput
- Project Funding / working capital
- Cashflow management
- Unit operating cost / cash cost of production.

1.15 Risk Analysis

Future development of the Project is dependent upon a number of factors including, but not limited to:

- the delineation of economically recoverable mineralisation
- favourable geological conditions
- receiving the necessary approvals from all relevant authorities and parties
- seasonal weather patterns
- unanticipated technical and operational difficulties encountered in extraction and production activities
- mechanical failure of operating plant and equipment
- unexpected shortages or increases in the price of consumables, spare parts and plant and equipment
- cost overruns
- access to the required level of funding
- contracting risk from third parties providing essential services
- time delays

On commencement of production, the operations may be disrupted by a variety of risks and hazards which are beyond the Company’s control, including environmental hazards, industrial accidents, technical failures, labour disputes, unusual or unexpected rock formations, flooding and extended interruptions due to inclement or hazardous weather conditions and fires, explosions or accidents. No assurance can be given that the Company will achieve commercial viability through the development or mining of the Project and treatment of resource.

A Risk Analysis Workshop for the project was carried out and six areas of Risk were identified as “Very High Level”. Policies and actions for mitigation were defined at the implementation phase of the project.

1.16 Conclusions and Recommendations

The preliminary assessment indicates a strong economic potential. It is recommended that additional work required for the Project to proceed to the Feasibility Study stage be undertaken.

2 INTRODUCTION

2.1 Scope of Report

This Report is prepared for Southern Hemisphere Mining Ltd. (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 who commissioned Coffey Mining Pty Ltd (Coffey Mining) for the purpose of providing a Preliminary Assessment (PA) on SHM's Los Pumas manganese project, located in Northern Chile.

Coffey Mining was retained to prepare the PA, by or under the supervision of its Qualified Persons.

Other Qualified Persons have been the authors of different portions of the PA but all Qualified Persons have provided an Author Certificate and consent as required under Part 8 of NI 43-101.

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.

2.2 Principal Sources of Information

In addition to site visits undertaken to the Los Pumas Project, the authors of this report have relied extensively on information provided by SHM, discussions with SHM management and a number of studies completed by other Qualified Authors

The principal sources of information are found in Section 21 of this report.

Coffey Mining 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.

2.3 Site Visit

Coffey Mining personnel that have visited the site have been, Mr Beau Nicholls, in March 2009, then Coffey Mining's Geology Manager – Brazil to focus on the exploration drilling campaign and QA/QC elements of such work in preparation for the mineral resource estimates, and Mr. Ian Dreyer, Principal Audit Geologist who completed a site visit on 15 December 2010, responsible for the latest resource update of 14 October 2010, with the aim of confirming earlier applied criteria and particularly focusing on mining dilution, selectivity and grade control aspects.

2.4 Authors' Qualifications and Experience

Coffey Mining is an international mining consulting firm specializing in the areas of geology, mining and geotechnical engineering, metallurgy, hydrogeology, hydrology, tailings disposal, environmental science and social and physical infrastructure.

The Qualified Person (as defined in NI 43-101) for the purpose of this report is Mr. Ian Dreyer who supervised the work of Mr. Manuel Hernandez, both employees of Coffey Mining.

Mr Ian Dreyer is a professional geologist with over 22 years of experience in the geology and evaluation of mineral properties internationally. Mr Dreyer is a member of Australasian Institute of Mining and Metallurgy ("AusIMM") 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 visited the site of Los Pumas Project on December 2010. Mr. Dreyer is currently employed as Principal Geologist with the firm of Coffey Mining Pty Ltd.

Mr Dreyer has also supervised the work of compilation of this PA made by Mr. Manuel Hernandez, a professional mining engineer with over 30 years of experience in mining and evaluation of mineral properties internationally. Mr Hernandez is currently employed as Business Development Manager – South America with the firm of Coffey Mining Pty Ltd.

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 an employee of Coffey Mining and is a 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.

2.5 Units of Measurements

All monetary terms expressed in this report are in United States dollars ("US$") 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^2) or hectares (ha) for area; and percentage (%) to express grades.

2.6 Independence

Neither Coffey Mining, nor the authors of this report, has any material interest in Southern Hemisphere Mining or related entities or interests. Our relationship with Southern Hemisphere Mining 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.

Specific sections of the report that the Qualified Persons are responsible for are provided in Table 2.6_1 and are repeated in the attached Qualified Persons certificates.

Table 2.6_1

Qualified Persons - Report Responsibilities

Who		**Section**
Ian Dreyer	(Coffey Mining)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17,18.1, 18.6,19, 20, 21
Tony Mason	(Mineral Processors)	16
Andrew Richards	(Arc Resources Pty Ltd)	18.7
Daniel Gauthier	(SNC-Lavalin)	Sub Section 18.2
Robin Jones	(SNC-Lavalin)	Sub Section 18.3
Pierre Dubuc	(SNC-Lavalin)	Sub Sections 18.4 and 18.5

2.7 Abbreviations

A full listing of abbreviations used in this report is provided in Table 2.7_1 below.

Table 2.7_1

List of Abbreviations

	Description
$	United States of America dollars
"	inches
µ	microns
3D	three dimensional
AAS	atomic absorption spectrometry
ADR	adsorption, desorption and refining
Ag	silver
Al	aluminium
ARD	acid rock drainage
As	arsenic
Au	gold
AusIMM	Australasian Institute of Mining and Metallurgy
Ba	barium
bcm	bank cubic metres
Be	beryllium
Ca	calcium
CaO	calcium oxide
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
cm	centimetre
Co	cobalt
Cu	copper
DDH	diamond drillhole
DMT	dry metric ton
DTM	digital terrain model
E (X)	easting
EIA	environmental impact assessment
EPCM	engineering, procurement and construction management
equ	equivalent
Fe	iron
FEL	front end loader
g	gram
G&A	general and administration
g/t	grams per tonne of gold
GDP	gross domestic product
ha	hectare
HDPE	high density poly ethylene
Hg	mercury
hp	horse power
HQ_2	63.5mm inside diameter diamond drill rod/bit/core
hr	hours
IRR	internal rate of return
ISO	International Standards Organisation
JORC	Joint Ore Reserves Committee (of the AusIMM)
k	thousand
kg	kilogram
kg/t	kilogram per tonne
km	kilometres
km^2	square kilometres
kPa	kilopascal
kW	kilowatt

	Description
kWhr/t	kilowatt hours per tonne
l/hr/m^2	litres per hour per square metre
lb	pound (weight)
M	million
m	metres
Ma	million years
MIK	Multiple Indicator Kriging
mm	millimetres
Mn	manganese
Moz	million ounces
Mtpa	million tonnes per annum
MW	megawatt
N (Y)	northing
NaCN	sodium cyanide
NI	National Instrument (of Canadian stock exchange)
NPV	net present value
NQ_2	47.6mm inside diameter diamond drill rod/bit/core
NSR	net smelter return
ºC	degrees centigrade
OK	Ordinary Kriging
O_2	oxygen
P_{80}	80% passing
P90 -75µ	90% passing 75 microns
PAF	potentially acid forming
PFS	Pre-feasibility study
ppb	parts per billion
ppm	parts per million
ppm	parts per million
QAQC	quality assurance quality control
QC	quality control
RC	reverse circulation (drilling)
RC	refining charge
RC	reverse circulation
RL (Z)	reduced level
ROM	run of mine
RQD	rock quality designation
SD	standard deviation
SG	Specific gravity
Si	silica
SG	Specific gravity
t	tonnes
t/m^3	tonnes per cubic metre
TC	treatment charge (smelting)
tpa	tonnes per annum
tpd	tonnes per day
TSF	tailings storage facility
TSX	Toronto Stock Exchange
UTM	Universal Transverse Mercator (coordinate system)
VAT	Value Added Tax
WMT	wet metric ton

3 RELIANCE ON OTHER EXPERTS

3.1 Technical

The Qualified Persons, authors of this PA, state that they are Qualified Persons for those areas as identified in appropriate Qualified Persons "Certificate of Author" in Section 23.

The authors have relied upon information derived from the following reports:

- Transmin Metallurgical Consultants - Report on Dense Medium Separation Phase IV – June 2010
- Mintek – Gravity Beneficiation Testwork – October 2010
- Aquaconsult - Exploration of Water Resources – January 2010

3.2 Legal

The authors have also relied upon information derived from Quinzio and Cia – Legal Opinion Los Pumas Project – October 2010

Neither Coffey Mining nor the authors of this report are qualified to provide extensive comment on legal issues, including status of tenure, and taxation associated with the Los Pumas property referred to in Section 4 of this report. Assessment of these aspects has relied heavily on information provided by Southern Hemisphere Mining's legal advisors which has not been independently verified by Coffey Mining, and this report has been prepared on the understanding that the properties are, or will be, lawfully accessible for evaluation, development, mining and processing.

Coffey Mining does not accept any responsibility or liability in any way whatsoever to any person or entity in respect of these parts of this document, or any errors in or omissions from it, whether arising from negligence or any other basis in law whatsoever.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Background

4.1.1 Economy

Chile has a market-oriented economy characterised by a significant level of foreign trade and a reputation for strong financial institutions and sound policy that have given it the strongest sovereign bond rating in Latin America.

Economic Snapshot – Chile (Source: http://www.dfat.gov.au/)

Economic statistics	2010 (a)	2009	2008	2007
GDP (US$bn) (current prices):	199.2	161.6	170.9	164.2
Real GDP growth (% change year on year):	5.0%	-1.5%	3.7%	4.6%
Current account balance (US$m):	-1,360	4,217	-2,513	7,459
Inflation (% change year on year):	1.7%	1.70%	8.70%	4.40%

(a) Recent data subject to revision

Chile's principal export destinations 2009		
Rank	Country	% of Total
1	China	23.10%
2	United States	11.30%
3	Japan	9.00%
22	Australia	0.90%

Chile's principal import destinations 2009		
Rank	Country	% of Total
1	United States	18.70%
2	China	13.30%
3	Argentina	11.90%
21	Australia	0.60%

Chile has one of the highest nominal GDP per capita in Latin America and is ranked in the Global Competitiveness Report issued by the World Economic Forum as the most competitive economy in Latin America and the 30th in the world for 2009-10. Exports account for more than one-fourth of GDP, with commodities making up some three-quarters of total exports. Copper alone provides one-third of government revenue.

4.1.2 Legal

The basic elements of the mining property system in Chile, considering its nature, constitution and exercise, are the following:

(i) The Mining Concession, considering its concept, juridical nature, procedure of constitution and terms.

(ii) Obligations of the Concessionaire.

(iii) Access to the necessary lands for the performance of mining work.

(iv) Water rights.

(v) Specific Tax to the Mining Activities.

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 (“derecho real”) 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 is briefly explained in the following section. Such as stated, it can be of two kinds: exploration concessions and exploitation concessions or mining claims.

The exploration concession has an initial duration of 2 years that can be extended up to 4, for which extension it is a requirement to waive one half of the concession surface area. The exploration concessions grants rights to prospect and explore the concession area and also it entitles its concessionaire to the right to convert it into an exploitation concession during its effective period.

On the other hand, the exploitation concession or mining claim (also referred to as “Pertenencia”) has an indefinite effective period and grants exclusive rights to prospect and mine the concession area. Having an exploration concession is not a prerequisite to apply for an exploitation mining concession.

With respect to the surface comprehended by a mining concession, these must configure a parallelogram of straight angles (square or rectangle) whose capacity, according to the type of concession, may be (a) Mining exploration concession: A minimum of 100 hectares and a maximum of 5,000 hectares, per concession, and only a single concession can be requested; (b) mining exploitation concession: The minimum per concession is 1 hectare and the maximum of 10 hectares, a group of several mining claims that comprise up to 1000 hectares may be requested jointly.

For a concession to enjoy preemptive rights over a given area or portion of the national territory, the awardee must be recognized as a "discoverer”. Such quality is granted under the Chilean mining law to the petitioner who first starts the procedure to incorporate a mining concession in a specific vacated area and who is granted the claimed mining concession rights. Hence, starting the procedure in an area which is free of mining concessions is critical to be awarded such preemptive rights so as to exercise the powers granted under the concession type.

The Chilean regulations allow the initiation of such concession claim procedures even if there are preemptive rights in the requested area. More importantly, an exploration mining concession maybe obtained where there exists another exploration and/or exploitation concession belonging to a third party, in which case the new and overlapped concession do not have preemptive rights in the area and moreover the annulment of the overlapping concessions may be requested by the preemptive right concessionaire.

As indicated, these mining concessions can be constituted only with respect to the mineral substances that the COL may determine susceptible of exploration and exploitation, called concedable substances, which are defined as all those mineral, metallic and non metallic substances and, in general, any fossilized substances regardless of the natural form in which they may be found with the exception of those which COL declares as not concedable, which are: (i) liquid or gaseous hydrocarbons, (therefore it does not include mineral coal, which is concedable); (ii) lithium, (iii) deposits of any nature existing in the maritime waters subject to national jurisdiction and (iv) the deposits of any kind situated, fully or partially, in zones that, according to the law, are determined as of importance for national safety with mining effects. These substances can only be exploited directly by the State or its enterprises, or through administrative concessions or special operating contracts.

Obligations of the Concessionaire (Holder of the mining concession)

The only obligations contemplated in Chilean legislation which must be satisfied by a mining concessionaire is the payment of a claim fee, in fulfilment of the obligation of protection that the PCR imposed on the titleholders of mining concessions (“Amparo”).

With regard to the obligation of “Amparo”, once the mining concession is constituted, its owner is obliged to comply with such obligation, requirement that is imposed by the State to maintain the mining concession effective and in its patrimony. The regime of Amparo in Chile consists in the payment of an annual advanced claim fee (“Patente de Amparo” or “Patente Minera”) within the month of March of each year, whose amount varies if it is an exploration or exploitation concession. For each hectare or fraction that comprises an exploration concession, the sum equivalent to 1/5 of a Monthly Tax Unit (“UTM”) must be paid (approx. US$ 1.3 at the present exchange) and for the same area that the exploitation concession comprises, the sum equivalent to 1/10 of a UTM (approx. US$ 6.7 at the present exchange) must be paid. There is no other obligation in Chile to keep the mining concession in force, such as the minimum investment or performance of a mining activity.

Access to the necessary lands for the execution of mining work

In view of the separation of the property rights of the mining concession and 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, and once this is constituted.

During the proceedings for the constitution of the mining concession the titleholder of a Pedimento (request for exploration mining concession) or Manifestacion (request for exploitation mining concession) may carry out all the work that is necessary to constitute the mining concession (the necessary physical recognition for these purposes, which includes the execution of the survey in the case of the Manifestacion). Additionally, the titleholder of a Manifestation is authorized to carry out all the necessary work to recognize the mine, becoming owner of the mineral substances that it obtains as a result of these works, but in no case the titleholder of the Manifestacion can carry out commercial exploitation of the mineral rights without the prior granting of the definitive exploitation concessions. If the owner of the surface land or any other person presents opposition for the petitioner or Manifesting Party to carry out the work referred to, the competent judge must authorize the help of public force if there is a favourable report of SERNAGEOMIN (Servicio Nacional de Geología y Minería) on the need of such work.

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 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.

Also, 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 of traffic or access, of electric services and of occupation in the terms and scopes of article 120 of the MC, easements that cannot be imposed in land where permanent constructions exists or which are covered by plantations of forests, vineyards and fruits.

Water Rights

The Mining Concessions grant the concessionary (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.

Specific Tax to the Mining Activities

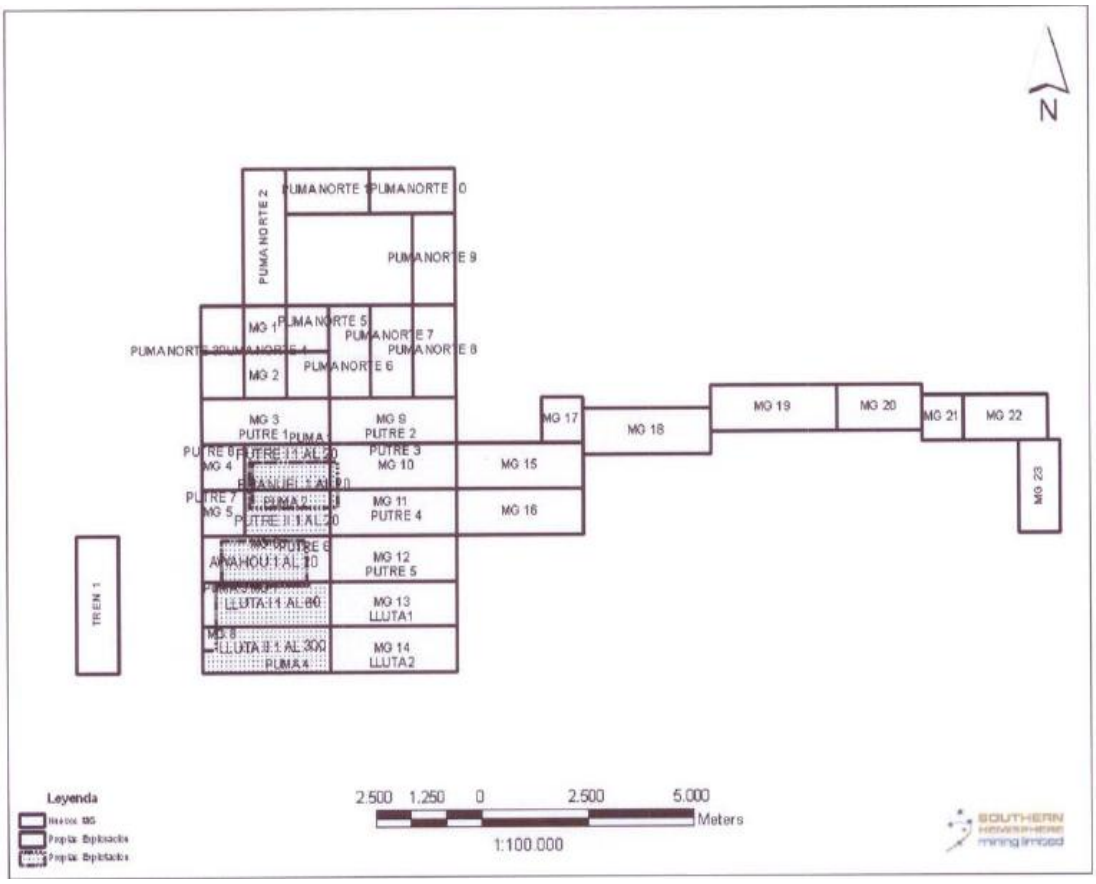
There is a tax applied to persons who carry out mining exploitation on a certain volume of sales of mineral substances. This tax is progressive and is charged over the “operational income” (net taxable income deducted operational expenditures) of a mining producer at rates ranging from 0% (annual sales less than 12,000 tons of pure copper or its equivalent) to 5% (annual sales more than 50,000 of pure copper or its equivalent). This is a tax applied only to a mining producer and not to mining prospectors.

Currently the President has sent to the Congress a bill for amending this specific tax, so to increase for an initial period of three years the tax burden of mining producers of over 50,000 tons of copper per year or copper equivalent, from a 5% to a range that will vary between a 6 to a 9% calculated upon what is defined as "mining operational margin" and which depends on the final revenues and not on annual sales. For those companies which are currently part of an invariability contract subscribed by the State of Chile, and which accepts to introduce to their contracts the amendment of the specific mining tax when approved by the Congress and therefore accept to increase their special taxation for a period of three years, the State of Chile will grant them an extension of the tax invariability for up to eight additional years. Once the initial period of 3 years elapses, the companies will go back to the special mining tax regime already contemplated in their current invariability contracts, and during the extension period of 8 years the mining tax will be determined in a range between 6 and 9% upon their mining operational margin.

4.2 Area of the Property

The Los Pumas Project covers an aggregate area of 9,044 Ha. Figure 4.2_1 depicts the tenement plan of the project.

Figure 4.2_1
Los Pumas Project – South Hemisphere Mining
Tenement Plan



4.3 Project Location

The Project is located in Northern Chile near the border with Peru and not far from the Bolivian border. It is in the Arica – Parinacota region (Region XV). The Project is 35 km from Putre, the capital of the Parinacota Province in the Arica-Parinacota Region. It is located 140 km east of Arica, at an altitude of 3,860 metres.

The geographic coordinates of the Los Pumas Manganese Project are Latitude -18.04, Longitude -69.63.

Figure 4.3_1
Los Pumas Project – South Hemisphere Mining
Project Location Plan

4.4 Type of Mineral Tenure

The Los Pumas Manganese Project is owned 100% by Minera Hemisferio Sur SCM (MHS), a Chilean contractual mining company, which is 100% owned by Southern Hemisphere Mining (Aust) Pty Ltd (SHM), the Company's 100% owned subsidiary in Australia.

The project Mining Concessions comprises:

Two (2) Exploitation Concessions properly constituted which are in good standing and are registered under the domain of MHS. These concessions are named Awahou 1/20 and Emanuel 1/20 each of which total 200 ha, covering the initial years of exploitation. The project is based on the exploitation of the concedable resources located on such concessions

Twenty four Exploration Concessions properly constituted which are in good standing and are registered under the domain of MHS.

Four "Manifestaciones" and twenty three "Pedimentos" part of the Los Pumas Project, have until this date observed all the requirements contemplated in the Mining Code as procedural and formal requirements and all of them are registered in the name of MHS and therefore are of its sole and exclusive domain. All of these concessions are detailed in the Legal Opinion cited in section 3 of this report.

Table 4.4_1
Los Pumas Project – South Hemisphere Mining
Tenement Schedule

	Type	Name	Area - Ha	Status	Date	Expiration Date	Initiation Date
1	Exploitation	Emanuel	200	Constituted	24-Aug-10		
2	Exploitation	Awahou	200	Constituted	14-Jul-10		
3	Exploitation	LLuta I 1/60	249	In Process			14-Oct-08
4	Exploitation	LLuta II 1/300	285	In Process			14-Oct-08
5	Exploitation	Putre I, 1/20	86	In Process			9-Oct-08
6	Exploitation	Putre II, 1/21	124	In Process			9-Oct-08
		Subtotal	1,144				
1	Exploration	Lluta 1	300	Constituted	2-Jul-09	2-Jul-11	
2	Exploration	Lluta 2	300	Constituted	2-Jul-09	2-Jul-11	
3	Exploration	Puma 1	200	Constituted	18-May-09	18-May-11	
4	Exploration	Puma 2	200	Constituted	18-May-09	18-May-11	
5	Exploration	Puma 3	300	Constituted	18-May-09	18-May-11	
6	Exploration	Puma 4	300	Constituted	18-May-09	18-May-11	
7	Exploration	Puma Norte 1	200	Constituted	16-May-10	16-May-12	
8	Exploration	Puma Norte 2	300	Constituted	6-Jul-09	6-Jul-11	
9	Exploration	Puma Norte 3	200	Constituted	28-Nov-09	28-Nov-11	
10	Exploration	Puma Norte 5	200	Constituted	7-Jul-09	7-Jul-11	
11	Exploration	Puma Norte 6	200	Constituted	16-Mar-10	16-Mar-12	
12	Exploration	Puma Norte 7	200	Constituted	17-Mar-10	17-Mar-12	
13	Exploration	Puma Norte 8	200	Constituted	17-Mar-10	17-Mar-12	
14	Exploration	Puma Norte 9	200	Constituted	16-Mar-10	16-Mar-12	
15	Exploration	Puma Norte 10	200	Constituted	27-May-10	27-May-12	
16	Exploration	Putre 1	300	Constituted	15-May-09	15-May-11	
17	Exploration	Putre 2	300	Constituted	15-May-09	15-May-11	
18	Exploration	Putre 3	300	Constituted	15-Jul-09	15-Jul-11	
19	Exploration	Putre 4	300	Constituted	15-Jul-09	15-Jul-11	
20	Exploration	Putre 5	300	Constituted	15-Jul-09	15-Jul-11	
21	Exploration	Putre 6	300	Constituted	15-Jul-09	15-Jul-11	
22	Exploration	Putre 7	100	Constituted	15-Jul-09	15-Jul-11	
23	Exploration	Putre 8	100	Constituted	15-Jul-09	15-Jul-11	
24	Exploration	Tren 1	300	Constituted	11-Mar-10	11-Mar-12	
		Subtotal	5,800				
	Pedimentos						
1	Exploration	MG 1	300	In Process			5-Jul-10
2	Exploration	MG 2	300	In Process			5-Jul-10
3	Exploration	MG 3	300	In Process			5-Jul-10
4	Exploration	MG 4	300	In Process			5-Jul-10
5	Exploration	MG 5	300	In Process			5-Jul-10
6	Exploration	MG 6	300	In Process			5-Jul-10
7	Exploration	MG 7	300	In Process			5-Jul-10

	Type	Name	Area - Ha	Status	Date	Expiration Date	Initiation Date
8	Exploration	MG 8	300	In Process			5-Jul-10
9	Exploration	MG 9	300	In Process			5-Jul-10
10	Exploration	MG 10	300	In Process			5-Jul-10
11	Exploration	MG 11	300	In Process			5-Jul-10
12	Exploration	MG 12	300	In Process			5-Jul-10
13	Exploration	MG 13	300	In Process			5-Jul-10
14	Exploration	MG 14	300	In Process			5-Jul-10
15	Exploration	MG 15	300	In Process			1-Oct-10
16	Exploration	MG 16	300	In Process			1-Oct-10
17	Exploration	MG 17	100	In Process			1-Oct-10
18	Exploration	MG 18	300	In Process			1-Oct-10
19	Exploration	MG 19	300	In Process			1-Oct-10
20	Exploration	MG 20	200	In Process			1-Oct-10
21	Exploration	MG 21	200	In Process			1-Oct-10
22	Exploration	MG 22	200	In Process			1-Oct-10
23	Exploration	MG 23	200	In Process			1-Oct-10
		Subtotal	6,300				
		Total	**13,244**				
Property area totals **9,044** Ha. Pedimentos MG1 to MG14 (4,200 Ha) are replacement for existing concessions							

The annual claim fees for each mining concession – whether in process or already granted - that is part of the Los Pumas Project has been paid on due time. On the other hand the Specific Tax to the Mining Activities is not applicable to the mining concessions because its titleholder currently does not carry any mining exploitation activity.

Neither of such Mining Properties is subject to liens, prohibitions, embargoes or lawsuit of any kind.

4.5 The nature and extent of the Titles

The background of legal aspects under 4.1.2 described the nature and extent of the concessions. The only obligation contemplated in Chilean legislation which must be satisfied by a mining concessionaire is the payment of a claim fee, in fulfilment of the obligation of protection that the PCR provides to the titleholders of mining concessions.

The exploration concession has an initial duration of 2 years that can be extended up to 4, for which extension it is a requirement to waive one half of the concession surface area.

The Los Pumas Project mineral resource is located on land, whose surface rights are privately owned by the Putre Community Land Owners (PCLO). MHS has executed an agreement with PCLO which grants MHS easement rights over the land. Subject to annual easement payments, these rights include the use of the land for all exploration and mining purposes, including the construction of plant, buildings and associated infrastructure for a 20 year period.

MHS has obtained concession status for the Los Pumas Project land, which grants MHS the exclusive exploitation rights for an indefinite period to prospect and mine the concession area.

Separate arrangements are underway with PCLO, which will allow MHS to purchase the water rights from PCLO.

Coffey Mining has not independently verified, nor is it qualified to independently verify, the legal status of the Los Pumas Project tenements, and has relied on information provided by SHM solicitors “Quinzio and Vegara”, located in Santiago, Chile. In preparing this report Coffey Mining has assumed that the tenements are, or will prove to be, lawfully accessible for evaluation.

4.6 Boundaries of Properties

As described under 4.1.2 **Access..**, during the proceedings for the constitution of the mining concession the titleholder of a Pedimento, a request for exploration mining concession or Manifestacion, a request for exploitation mining concession, may carry out all the work that is necessary to constitute the mining concession including the physical recognition for these purposes, which includes the execution of the topographical survey in the case of the Manifestacion – Exploitation Concession.

4.7 Outside Property Boundaries

Los Pumas area is an old Manganese mining district; however there exists minimal mining working activity on neighbouring properties. To the south of Los Pumas area at about 1km distance, the northern most part of the Parque Nacional Lauca (National Park) is situated.

4.8 Royalties / Agreements and Encumbrances

Los Pumas project should not be subject to Specific Tax to the Mining Activities as defined under 4.1.2 as its production will not reach the equivalent of 12,000 t of copper per year. The property is not subject to other payments or agreements and encumbrances

4.9 Environmental Liabilities and Permits

Coffey Mining is not aware, nor have we been made aware, of any environmental liabilities associated with the Los Pumas Project.

Regarding permitting, the project requires the approval of a DIA (Environmental Impact Assessment) in accordance with the System of Environmental Assessment (SEIA). MHS presented the DIA for evaluation by the Regional Committee for the Region of Arica and Parinacota on the 27th July 2010 in Arica. The document was then distributed to the public and published on the internet for the purpose of eliciting questions from Government Departments and Authorities, as well as private citizens.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Access

The Los Pumas Project is located in northern Chile, approximately 175km or 3 hours drive east of Arica, the major port city in the number 15 region of Chile (approximately 1,700km north of the capital city Santiago). Arica is serviced by domestic flights between Santiago and a number of cities in Chile, and is located within 1 hours drive from Tacna, the southernmost city of Peru. Access from Arica to the Los Pumas Project is via the International Highway from Arica to La Paz (CH11) to the regional administrative centre of Putre, then via the all weather gravel road (A023) to the project area.

5.2 Physiography and Climate

The Los Pumas Project is located in the High Andes, on the edge of the Gorge Allan Lluta River, with elevations ranging from 3,500m to 5,000m above sea level. The project elevation is at 3,500m.

The temperature ranges between -15° to -5°C at night and 5° to 20°C during the day, with an annual rainfall of between 100 and 440mm.

5.3 Local Resources and Infrastructure

The main railway line between La Paz and Arica runs approximately 1km from the Los Pumas manganese project. Figure 5.3_1 below shows the railway passing approximately 20m from the “Railway target” (which is one of the early stage exploration prospects of SHM located 1km from Los Pumas). This railway is currently being rehabilitated; however no official anticipated completion date is available.

It is important to highlight in this section the infrastructure given that manganese is a bulk commodity and infrastructure becomes very important to a projects economics when considering the transport to the nearest market.

The project is located 175km by a very good sealed road which is the major road between Bolivia and the port facilities in Arica. Figure 5.3_2 below is the current port facilities in Arica which handle all the base metal and tin concentrate products currently transported by trucks on the main road to Arica.

Coffey Mining reviewed the Arica port, which at the time of the visit was loading lead concentrate from Bolivia for export. The containment shed was negatively ventilated and well sealed with new equipment as would be expected from the main export port for Bolivia. The port storage facility has a capacity of approximately 25,000t and would require shuttling of material from a designated storage stockpile to the port during the loading of larger vessels. It is expected that the manganese concentrate would be handled in a similar fashion.

Figure 5.3_1
Los Pumas Project – South Hemisphere Mining
Existing La Paz – Arica Railway Line (Not Operational)

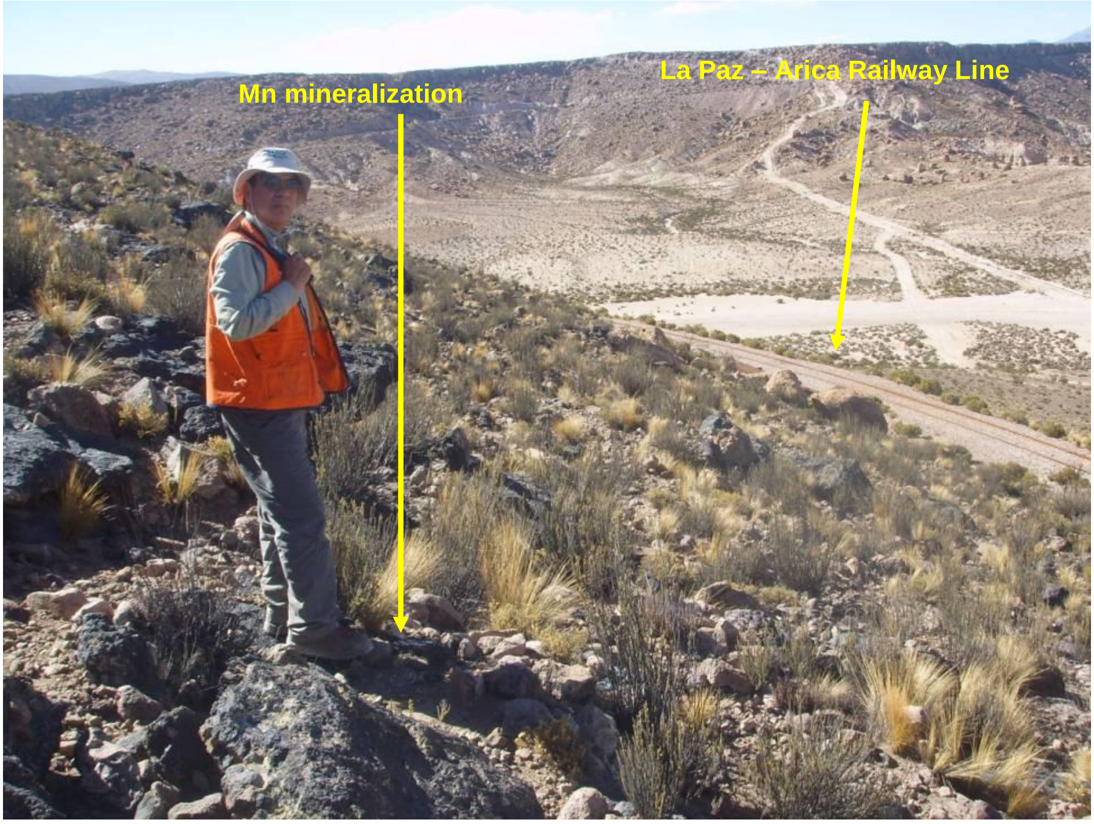
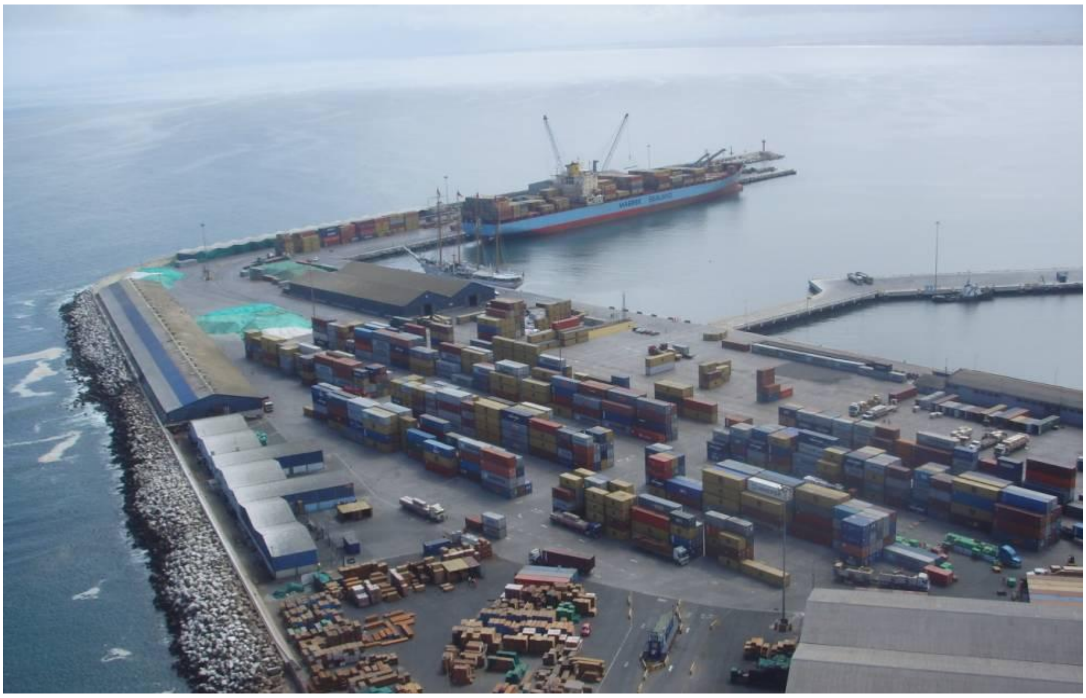


Figure 5.3_2
Los Pumas Project – South Hemisphere Mining
Arica Port Facilities



The city of Arica has a population of over 300,000. There is limited industry in the region that is not associated with farming and the import and export industry. A suitable workforce would be available in Arica and the local town of Putre as required for developing a mine. Professional mining personnel would possibly not be available in the city as no mining culture is evident, although Chile has many mining professionals that can easily access the project via numerous weekly domestic flights to Arica.

6 HISTORY

6.1 Ownership History

No information on the ownership history of the Los Pumas Project has been sourced or provided.

6.2 Exploration History

The Los Pumas Project was first identified during World War II when a German company excavated a number of small trenches and underground openings in both the mantle and vein mineralization. The result of this work is not available, nor is there any record of additional exploration up until the work commenced by SHM in September 2008.

6.3 Resource History

Mineral Resources have been quantified for the Los Pumas Project in May 2010 by Coffey Mining. The approach taken is similar to the current resource estimate with the following material differences in the May 2010 estimate:

- Unassayed samples were treated as missing samples
- The interpretation was a cross sectional one. No flitch plans were produced.
- The number of composites used in the interpolation was a minimum of 4 and a maximum of 24.

No top cuts have been applied to composites in either estimate.

The total May 2010 resource including all categories (Measured, Indicated and Inferred) at 4% Mn cutoff was 17.49Mt @ 8.34% Mn. This is a combination of high grade domain and low grade domain.

6.4 Production History

Mineral production appears to be confined to limited artisanal activity associated with the early German activity.

7 GEOLOGICAL SETTING

7.1 Regional Geology

The Los Pumas Project is part of the Tertiary and Quaternary volcanic sequences that forms the Andes Mountains in northern Chile.

The oldest rocks are of Oligocene – Miocene age, comprising volcano-sedimentary sequences including basaltic to dacitic flows and pyroclastic rocks. The rocks can be found outcropping to the south, west and east of the Los Pumas Project.

The Lower Miocene to Middle volcanic complex is represented by partially eroded lava flows, and pyroclastic rocks of andesitic composition, basaltic to dacitic and sedimentary sequences. These latter units have been variously called the Atacama Gravels and Altos de Pica Formation.

The Upper Miocene - Pliocene is characterized by volcanic sequences (domes, lava flow and pyroclastic deposits) of andesitic to dacitic composition with intercalated alluvial material.

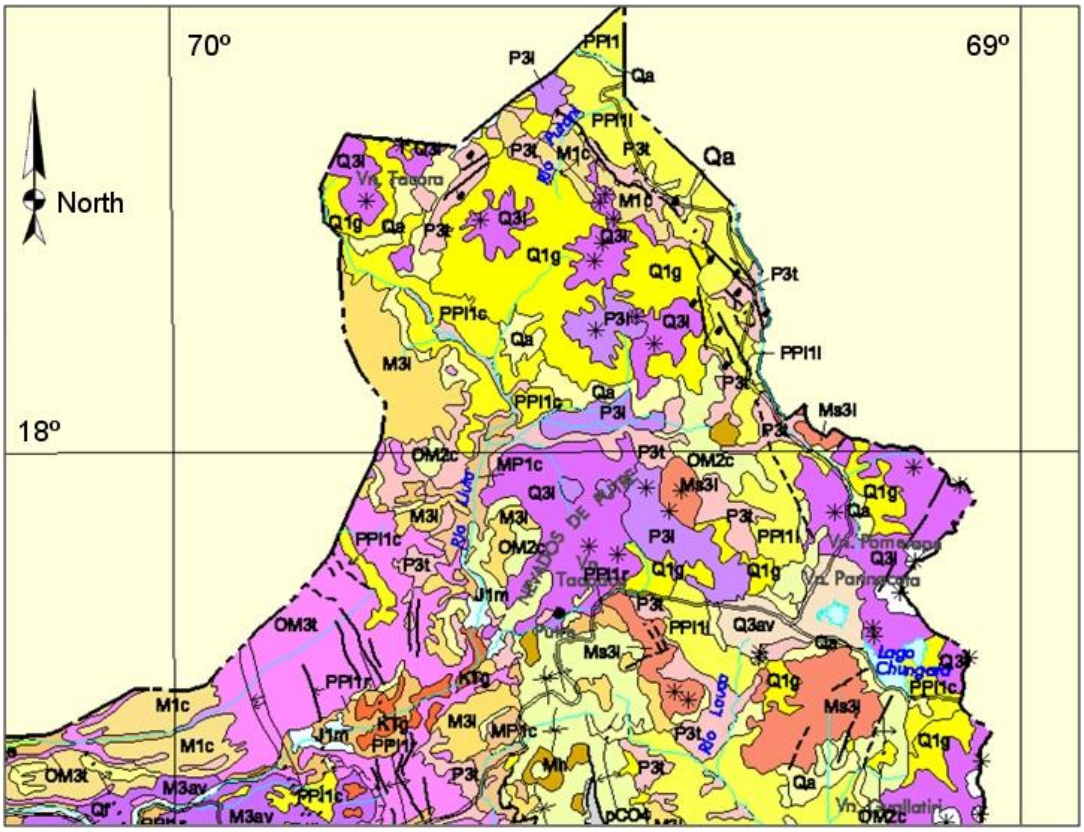
The Pliocene - Pleistocene volcanic complex consists of lava flows and pyroclastic rocks of variable composition from rhyolites to andesites.

The Pleistocene - Holocene and Quaternary sequences are again represented by strata volcanoes and volcanic complexes of basaltic to rhyolitic composition. This includes the Taapacá, Parinacota and Lascar volcanoes which are found in the region.

The main river system that exposes the Los Pumas mineralization runs in a north-south direction and possibly represents a major shear structure that potentially has a strong control on the location of manganese mineralization in the region.

Figure 7.1_1 below shows the regional geology for the northern part of Chile (figure supplied by SHM).

Figure 7.1_1
Los Pumas Project – South Hemisphere Mining
Regional Geology Map of Northern Chile



Qa
Pleistoceno-Holoceno
Depósitos aluviales, subordinadamente coluviales o lacustres: gravas, arenas y limos. En la Depresión Central, regiones I a III: abanicos aluviales.

Q1g
Pleistoceno-Holoceno
Depósitos morrénicos, fluvioglaciales y glacilacustres: diamictos de bloques y matriz de limo/arcilla, gravas, arenas y limos. En la Cordillera Principal, regiones I a IV. En la Depresión Central, regiones IX y X: en

PPl1c
Plioceno-Pleistoceno
Conglomerados, areniscas, limolitas y arcillolitas, generalmente consolidados, de facies principalmente aluviales, subordinadamente lacustres y eólicas. En las regiones I a III forman abanicos aluviales inactivos

MP1c
Mioceno Superior-Plioceno
Secuencias sedimentarias clásticas de piedemonte, aluviales, coluviales o fluviales: conglomerados, areniscas y limolitas. En las regiones I a IV: formaciones Huaylas, Lauca y Pastos Chicos, Gravas del Copiapó; en la región XI: Formación Galeras.

M1c
Mioceno Inferior-Medio
Secuencias sedimentarias de abanicos aluviales, pedimento o fluviales: gravas, arenas y limos con ignimbritas intercaladas. En las regiones I a III: formaciones Diablo, Chucal, Altos de Pica (superior) y Gravas de Atacama; en las regiones VIII a IX: Formación Cura-Mallín (superior); en la región XI: Formación Las Dunas.

OM2c
Oligoceno-Mioceno
Secuencias volcanosedimentarias: lavas basálticas a dacíticas, rocas epiclásticas y piroclásticas. En la Cordillera Principal, regiones I a IX: formaciones Lupica, Escabroso, Abanico, Coya-Machalí, Cura-Mallín (inferior).

Q3i
Cuaternario
Estratovolcanes y complejos volcánicos: lavas basáticas a riolíticas, domos y depósitos piroclásticos andesítico-basálticos a dacíticos; principalmente calcoalcalinos; adakíticos al sur de los 47ºS. En la Cordillera Principal, regiones I a III: volcanes Taapaca, Parinacota, Láscar y Ojos del Salado. Principalmente

P3t
Plioceno
Depósitos piroclásticos dacíticos a riolíticos parcialmente soldados. Principalmente en la Cordillera Principal, regiones I a III: ignimbritas Lauca, Puripicar, Atana, Tucúcaro, Patao y Laguna Verde.

P3i
Plioceno
Centros volcánicos: lavas, domos y depósitos piroclásticos andesíticos a dacíticos, conos de piroclastos y lavas basálticas a andesítico-basálticas. En la Cordillera Principal, regiones I a III: volcanes Larancagua, Miño, Peñas Blancas y Laguna Escondida; en la región XI: centros volcánicos de la península de Taitao.

Ms3i
Mioceno Superior
Centros y secuencias volcánicas: lavas, domos y depósitos piroclásticos, andesíticos a dacíticos, con intercalaciones aluviales, asociados a depósitos epitermales de Au-Ag. En la Cordillera Principal, regiones I a IV: volcanes Choquelimpie, Copiapó, Wheelwright y Formación Vacas Heladas.

M3i
Mioceno Inferior-Medio
Complejos volcánicos parcialmente erosionados y secuencias volcánicas: lavas, brechas, domos y rocas piroclásticas andesítico-basálticas a dacíticas. En la Cordillera Principal, regiones I a VIII: complejos volcánicos Doña Inés y Ojos de Maricunga; formaciones Cerro Las Tórtolas y Farellones.

7.2 Project Geology

The Los Pumas manganese project is located immediately to the west of the Taapaca volcano in a geographical area called the “altiplano” (high plateau). It is adjacent to the north-south trending Lluta River, where several other minor manganese occurrences have been identified.

The geology of the Los Pumas Project is dominated by volcanic rocks of the Huaylas Formation (Upper Miocene age) and the Lauca Ignimbrite (Upper Pliocene) as shown in Figure 7.2_1. These have been subsequently overlain by Pleistocene pyroclastics, andesites and dacites and sedimentary units including primarily pumice, ignimbrites and a mixture of acid volcanic rocks (dacites and rhyodacites). Six major volcanic centres are clearly visible from the Los Pumas Project with the closest being approximately 4km to the east.

Figure 7.2_1
Los Pumas Project – South Hemisphere Mining
Panoramic View of the Major Geological Features
Looking East

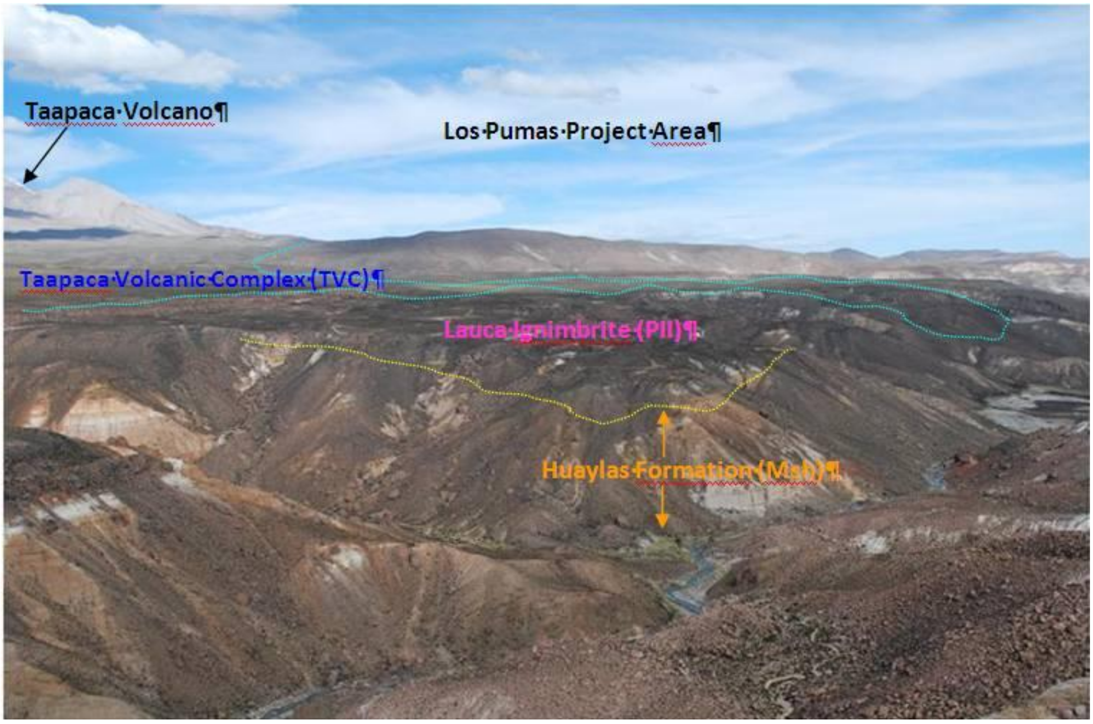
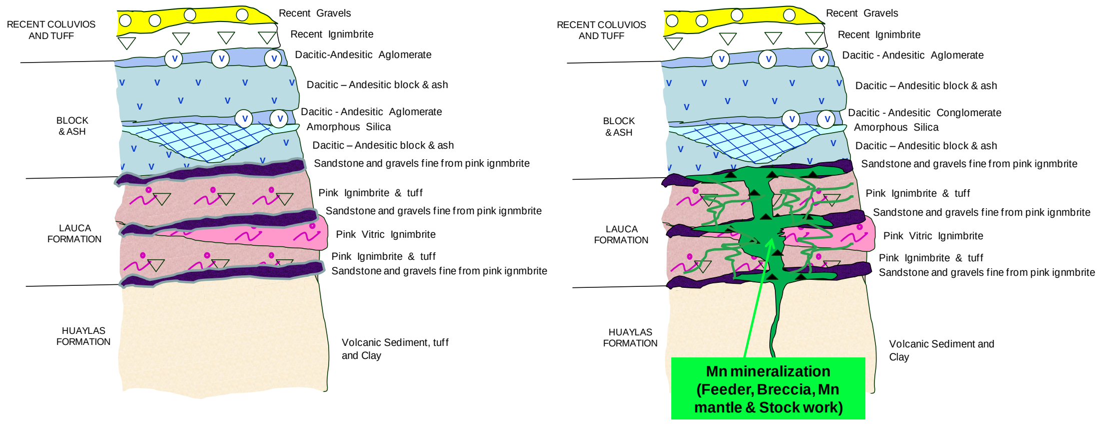


Figure 7.2_2 below shows a schematic stratigraphic column with the manganese mineralization shown in green.

Figure 7.2_2
Los Pumas Project – South Hemisphere Mining
Schematic Stratigraphic Column with the Typical Manganese Mineralization



The major formations are summarized below:

7.2.1 Huaylas Formation (Msh)

This is Miocene in age, as defined by Salas (1966), comprising sedimentary and sub-horizontal volcanics, which fill depressions in the Precordillera and high Andes Mountains.

At the Los Pumas Project the footwall to the mineralization is semi-consolidated gravel, sandstone and limonitic volcanic sediments, moderately stratified, in continuous layers that are centimetres to 10's of metres in thickness.

7.2.2 Lauca Formation (PIPI)

The Lauca Formation (Pliocene - Pleistocene) was defined by Munoz (1988) as a continental sub-horizontal sedimentary sequence.

In the Los Pumas Project, the Lauca Formation is represented by a subunit called the Lauca Ignimbrite, which consists of a pyroclastic flow deposit, composed of mainly rhyolite.

There are two pyroclastic flow units in the Los Pumas area, each about 5m to 10m thick. The lower unit is strongly pink in colour, rich in ash and pumice, while the upper level is less pink in colour.

The Lauca Ignimbrite is important in that this unit hosts the majority of the manganese mineralization at Los Pumas. The manganese has formed mantle style mineralization, having been hydrothermally injected into the flat ignimbrite layer along paths of weakness associated with subvertical faults, preferentially orientated NNW, with subordinate structures oriented N-S and ENE.

In the Los Pumas area, the Lauca Ignimbrite is interrupted by a dacitic to andesitic ignimbrite flow derived from the Taapaca Volcanic Complex (TVC).

Figure 7.2_3
Los Pumas Project – South Hemisphere Mining
Drilling DDHLP006: Lauca Formation - Pink Ignimbrite

7.2.3 Taapaca Volcanic Complex (TVC)

The Taapaca Volcano is a large dacitic to andesitic volcano located to the east of the Los Pumas Project. The main products of this volcano are block flow and ash flow rocks, with a dacitic-andesitic composition.

8 DEPOSIT TYPES

The primary exploration model associated with the Los Pumas Project is ‘manto’ style mineralization comprising sub-horizontal, stratabound deposits (or mantos) and their sub-vertical feeder zones.

The manto model involves the introduction of mineralized hydrothermal solutions via steeply dipping feeder zones usually expressed as faults or breccia zones. These solutions then selectively invade and mineralise relatively porous and permeable horizons within the adjacent stratigraphic profile. Where a feeder zone successively intersects a series of permeable horizons within the stratigraphy, stacked mineralized mantos may be developed. These stacked mantos are often characterized by a vertical metal zonation.

The feeder structures are characteristically higher grade than the mantos, especially immediately below the manto horizon however the manto deposits themselves are frequently of significantly greater dimensions. The deposit size is usually a function of the size, number and frequency of feeder structures, the volume of mineralising hydrothermal fluids, and the width and permeability of the manto horizon.

9 MINERALIZATION

The manganese mineralization at Los Pumas is divided into the north and south targets and is separated by the Taapaca volcanic dacitic-andesitic flow (approximately 1km). The north target is approximately 1.7km by 0.6km in area and approximately 1m to 10m in thickness, while the south target is 1km by 0.2km in area and a similar thickness.

Mineralization outcrops from surface in most cases, extending up to a maximum depth of 30m below surface.

The Lauca Ignimbrite is important in that this unit hosts the majority of the manganese mineralization identified at Los Pumas. The manganese has formed mantle style mineralization having been hydrothermally injected into the flat ignimbrite layer along paths of weakness associated with subvertical faults, preferentially oriented N-NW, with subordinate structures oriented N-S and ENE as shown in Figures 9_1 and 9_2.

Figure 9_1
Los Pumas Project – South Hemisphere Mining
Mantle Style Manganese Mineralization (Cryptomelane)

The metallurgical testwork completed by SHM indicates that Cryptomelane is the only manganese mineral represented.

The volcanic sediments located in the footwall of the mineralization are more ductile in nature and have not been as pervasively mineralized, although still contain narrow, high grade manganese veinlets and stockwork mineralization. This style of mineralization is also observed in the andesite flow that separates the north and south targets. This narrow, high grade mineralization was the focus of small underground mining activity undertaken by the Germans during World War II.

Figure 9_2
Los Pumas Project – South Hemisphere Mining
EW Schematic View of the Mineralized Stratigraphy with Manganese Shown in Green

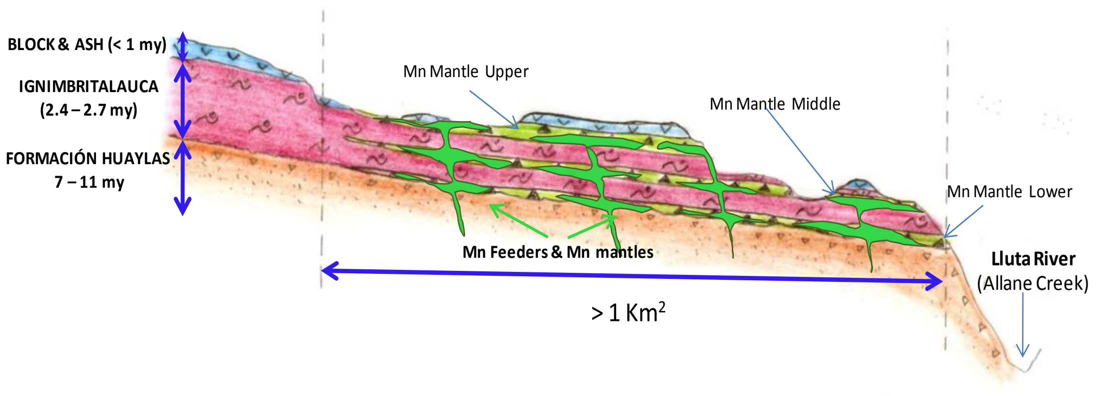
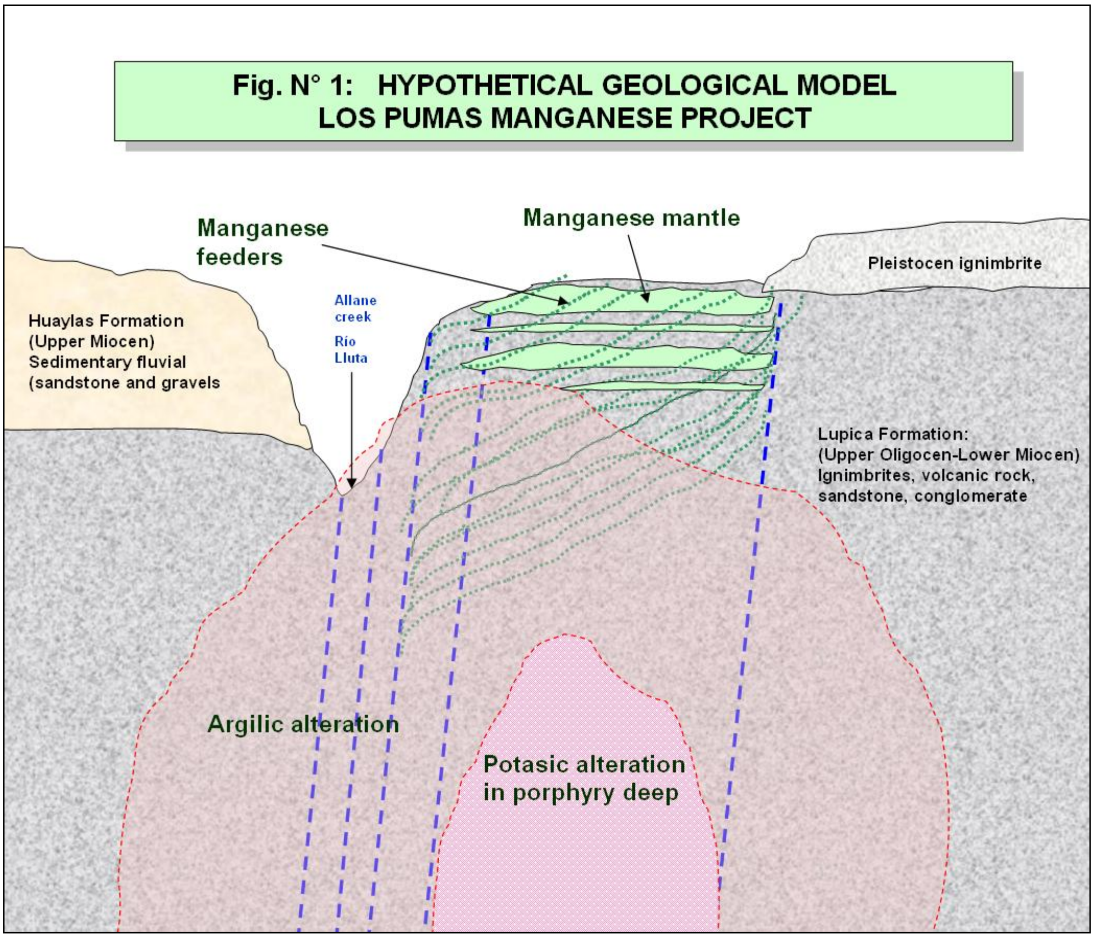


Figure 9_3 below is a graphical representation of the possible genesis of the manganese mineralization with the source potentially being a deeper porphyry body.

Figure 9_3
Los Pumas Project
Genetic Model



10 EXPLORATION

The project opportunity was identified by the SHM Exploration Manager, Mr. Igor Collado, who has been responsible for initially identifying the potential and for all exploration work completed to date. The work completed by SHM to date has included:

- Regional reconnaissance mainly in the form of travelling to various farming areas and asking if people have seen “black rock”.
- Project scale mapping of the Los Pumas Project.
- 32 diamond drilling (DD) holes for a total of 652.2m
- 487 reverse circulation (RC) holes for a total of 14,204m
- 25 pit samples for a total of 30m.

All exploration has been undertaken by SHM personnel with the use of an independent drilling contractor as required.

11 DRILLING

The Los Pumas project was drilled in early 2009 with the first hole commencing on the 16th December 2008. A total of 487 holes of RC were completed for 14,204m by about July 2010. The company contracted to undertake the drilling was AC Perforations, utilising an Ingersoll Rand reverse circulation drill rig with a 5 ½" face sampling hammer.

Holes were mostly drilled to an average 25m depth. Holes were drilled on a spacing of approximately 50m by 50m in north area varying to 200m by 200m in south area. Recent drilling has infilled some pockets of the northern area to 25m x 25m. The manganese mineralization is predominantly horizontal so the mineralized intercepts represent close to the true thickness of mineralization.

Additional drilling was undertaken by SHM using DC drilling to allow for metallurgical samples along with Bulk density and where applicable infill resource drilling to be completed. Core was drilled to HQ and NQ size using standard wireline drilling.

Coffey Mining considers the drilling type and methodology appropriate for the project and style of mineralization although would recommend angled holes to try to define the sub vertical manganese feeder zones associated with the regional faults.

The drillholes were not surveyed downhole but given the short length and the fact that the holes are vertical, Coffey Mining does not consider this a material issue.

Drill collars have been recorded using a total station to +/- 3cm accuracy. All drill collars have been labelled and preserved.

12 SAMPLING METHOD AND APPROACH

The RC samples were taken on 1m intervals and split to 5kg using a riffle splitter. The 5kg samples were then sieved with the RC chips stored in a chip tray for later reference, and the chip trays were photographed. The chips were then logged by SHM taking note of the manganese mineralization and lithology. The bulk reject samples have been retained at the Los Pumas Project. Samples were not weighed by SHM but Coffey Mining noted that the sample bags (shown in the Figure 12_1 below) are of relatively equal size, suggesting good (or at least consistent) recoveries from the RC drilling.

Figure 12_1
Los Pumas Project – South Hemisphere Mining
RC Bulk Reject Bag Farm (even sample size observed)

Diamond drill core was marked up on geological intervals but not exceeding 1m in length. The core was then cut in half using a diamond core saw. Half the sample was taken and broken up and submitted to the laboratory for analysis while the remaining ½ core has been used in a combination of metallurgical and bulk density testwork while the remainder has been stored for future reference.

13 SAMPLE PREPARATION, ANALYSES AND SECURITY

Samples of up to 5kg in weight were transported to the Andes Analytical Assay Limitada (AAA) laboratory located at Arica airport for sample preparation. These samples were crushed to 80% passing 10# and then split using a Jones riffle splitter to generate a 1kg fraction. This 1kg fraction was then pulverised using an LM2 pulveriser to 90% passing 75 microns to produce a 50g sub-sample for analysis.

Coffey Mining considers this sampling and sample preparation methodology to be of international industry standard. The chain of custody noted by Coffey Mining is also to accepted industry standards with little room for error and sample mixing given the procedures in place.

14 DATA VERIFICATION

14.1 Assay

50g pulps were then sent by air to the AAA laboratory in Santiago. This laboratory has an ISO 9001:2008 certification. The samples were then analyzed by four acid digest and ICP AES (34 elements).

14.2 QAQC

14.2.1 Standard Data

No certified standards have been included in the assay methodology by SHM. Coffey Mining recommends that in future SHM submit certified manganese standards at a rate of 5% of the total samples to ensure laboratory accuracy.

14.2.2 Duplicate Data

Field duplicates were prepared in the field (1 in 20 or 5%) by passing the bulk RC 1m sample through the splitter to produce a second 5kg sample. This was then sent to the laboratory to be prepared and analyzed in the same manner described above.

The results were analyzed by Coffey Mining and are presented in Figure 14.2.2_1 below and show excellent precision which suggests that the current sampling methodology is adequate.

No laboratory pulp duplicate data are available from AAA laboratory.

14.2.3 Umpire Assays

A total of 58 pulp samples were sent to ALS Chemex in La Serena for analysis by four acid ICP-AES (and by AAS for Mn >10%).

ALS submitted 1 standard, one blank and one pulp duplicate as part of the QAQC program. Coffey Mining reviewed the ALS QAQC report and noted no issues with the internal QAQC.

The results were analyzed by Coffey Mining and are presented in Figure 14.2.3_1 below.
No comparison has been made with XRF analysis.

Coffey Mining considers the sample preparation and analytical method to be appropriate for Los Pumas and the data suitable for resource estimation but recommends that certified standards be utilised in future to be able SHM to monitor assay accuracy.

14.2.4 Blanks

A total of 22 blank samples were sent to AAA laboratory. The results were reviewed by Coffey Mining and are presented in Figure 14.2.4_1 below. Coffey Mining recommends that in future an increased number of blanks are submitted to assess laboratory processes.

Figure 14.2.2_1

Los Pumas Project – South Hemisphere Mining
Comparative Analysis of Field Duplicate Data

Summary
(All Data)

	Mn_ori	Mn_dup	Units			Result
No. Pairs:	513	513			Pearson CC:	0.99
Minimum:	0.00	0.00	%		Spearman CC:	0.70
Maximum:	28.32	26.43	%		Mean HARD:	2.28
Mean:	1.69	1.67	%		Median HARD:	0.00
Median	0.00	0.00	%			
Std. Deviation:	3.75	3.75	%		Mean HRD:	0.23
Coefficient of Variation:	2.22	2.24			Median HRD	0.00

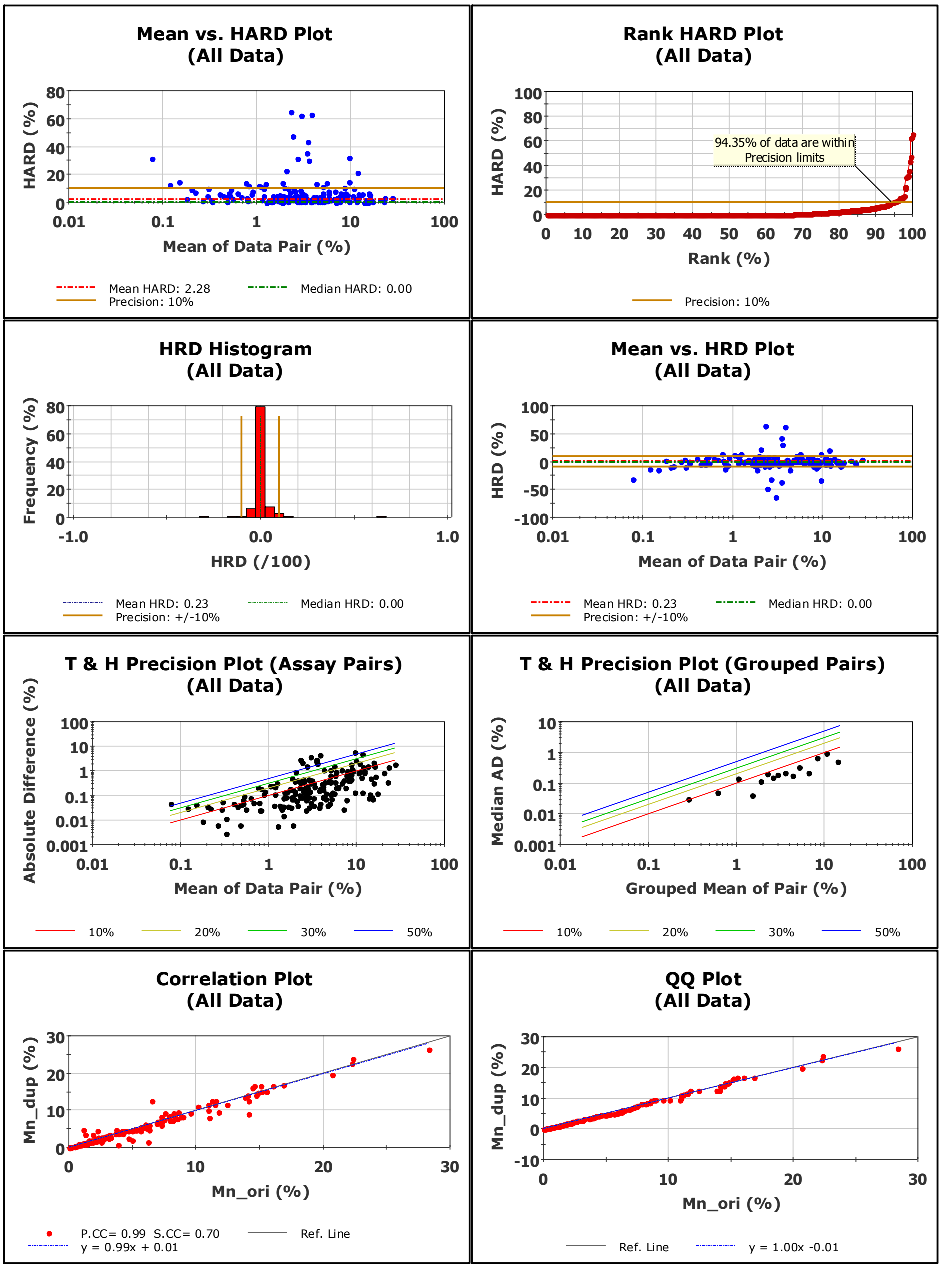


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Figure 14.2.3_1

Los Pumas Project – South Hemisphere Mining
Comparative Analysis of Umpire Assays

Umpire Assay AAA x ALS Chemex (All Data)

	Mn_AAA	Mn_ALS	Units			Result
No. Pairs:	58	58			Pearson CC:	0.66
Minimum:	0.10	0.09	%		Spearman CC:	0.72
Maximum:	34.11	28.60	%		Mean HARD:	19.90
Mean:	4.31	5.64	%		Median HARD:	5.33
Median	2.92	3.15	%			
Std. Deviation:	5.45	6.54	%		Mean HRD:	-3.12
Coefficient of Variation:	1.27	1.16			Median HRD	1.99

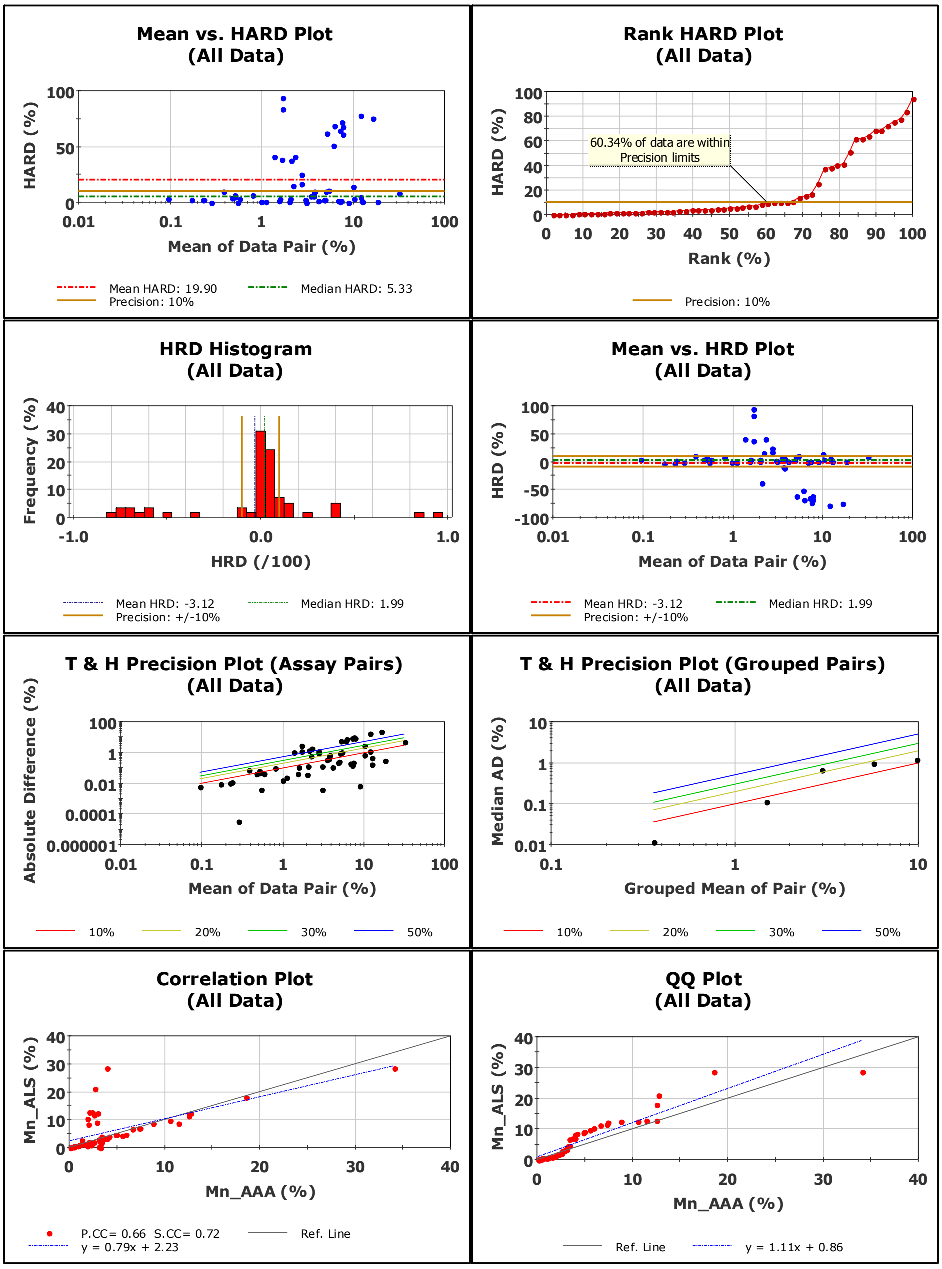

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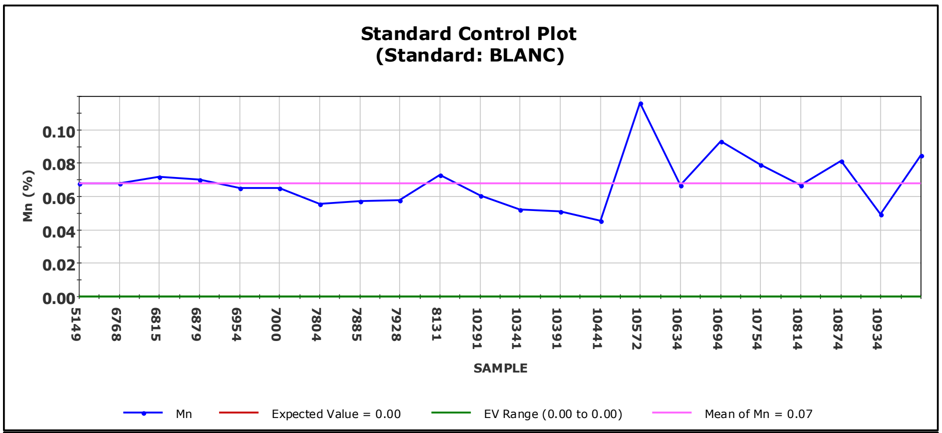
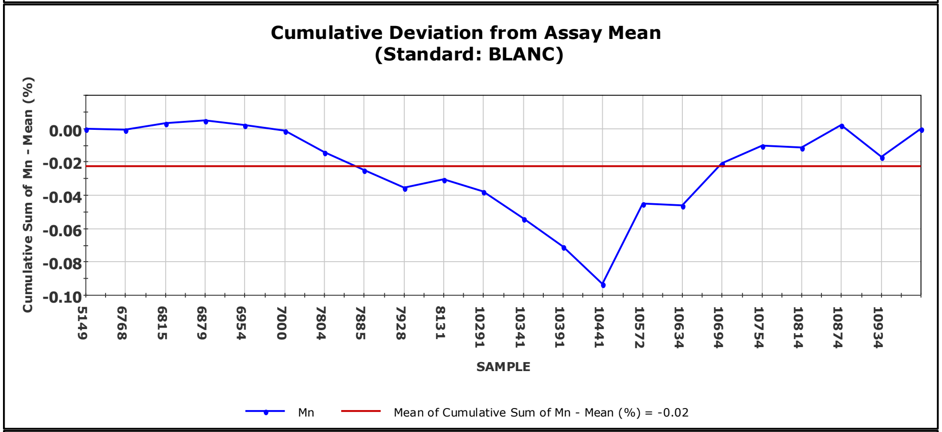
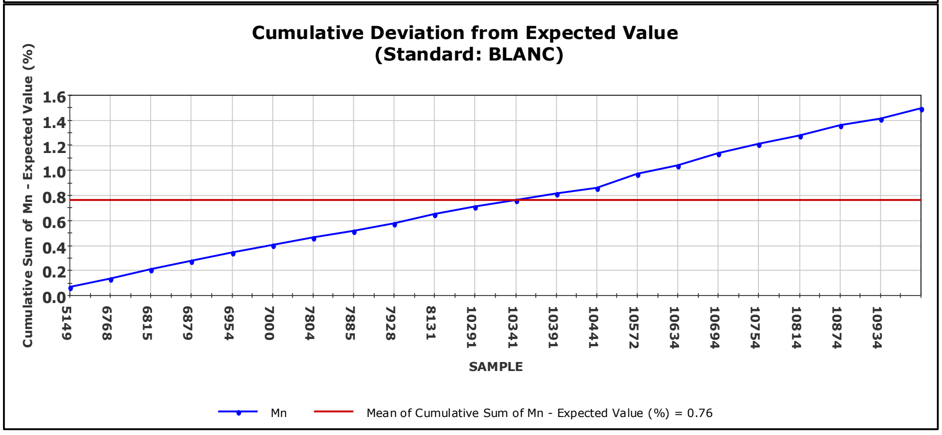
Figure 14.2.4_1
Los Pumas Project – South Hemisphere Mining
Blank Analysis

Summary
(Standard: BLANC)

Standard:	BLANC	No of Analyses:	22
Element:	Mn	Minimum:	0.05
Units:	%	Maximum:	0.12
Detection Limit:	-	Mean:	0.07
Expected Value (EV):	0.00	Std Deviation:	0.02
E.V. Range:	0.00 to 0.00	% in Tolerance	0.00 %
		% Bias	0.00 %
		% RSD	23.07 %







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15 ADJACENT PROPERTIES

There are no adjacent advanced manganese properties in the region.

16 MINERAL PROCESSING AND METALLURGICAL TESTING

Mineral Processors (WA) Pty Ltd (Mineral Processors) was engaged by the Company to provide metallurgical consulting services. Mineral Processors has 22 years experience in the use of heavy media separation techniques in the upgrading of manganese resources sourced from major producers.

Mineral Processors has overseen the metallurgical testing of the Los Pumas manganese mineralisation, to determine its suitability for upgrading by means of a dense media plant.

Testing was carried out by Transmin Laboratory in Lima, Peru, and Mintek in Randburg, Gauteng, South Africa.

The Transmin work was carried out initially on surface samples, subsequently on drill chips from the reverse circulation drilling programs and finally on splits from diamond drill core. A total of 87 samples were analysed. Samples were subjected to heavy liquid separation (HLS) tests to provide an indication of the amenability of the mineralisation to upgrading through dense media separation.

Further testing was undertaken by Mintek on 11 larger samples collected from four winzes at Los Pumas. They undertook numerous tests on the samples delivered to them which included crushed particle size and grade analyses, HLS testing, dense media pilot plant testing and comminution tests.

The object of the later stages of the Transmin testing and the Mintek testing was to provide further information about the processing characteristics of the Los Pumas mineralisation.

The proposed metallurgical process was selected on the basis of the initial HLS test work and focused on a conventional Dense Media Separation (DMS) circuit for proven ease of operation and reliable results. It was recognized from the HLS test work that the particle top size that would be presented to the plant would need to be reduced from a standard DMS configuration which, if the properties of the resource allow, consists of a lump and a fines circuit catering for a particle top size of 75 mm to 80 mm.

It was deduced that a top size of 10 mm was needed to ensure reasonable liberation of the manganese units without generating excessive fines below the cut-off limit for product sales. The cut-off limit adopted was 0.5 mm; hence a product size range of minus 10 mm plus 0.5 mm was selected.

The proposed plant is designed to treat 2.5 million tonnes of resource feed per annum. It consists of a three stage crushing circuit, screening facilities, and two stage dense media separation.

In order to minimize the generation of minus 0.5 mm particles, which would report to rejects and slimes, the crushing circuit was specified to consist of mineral sizers for primary and secondary crushing and a toothed roll crusher for tertiary crushing, with the aim of producing no more than 10% of particles less than 0.5 mm in size.

The DMS plant is split into a coarse (10 mm x 2 mm feed particle size) and a fine (2 mm x 0.5 mm feed particle size) circuits in order to achieve the maximum efficiency from cyclones with diameters suited to the size ranges.

At Los Pumas there are a number of different lithological units, each of which exhibit very different densimetric characteristics.

From the data presented by SHM, with respect to the proportions of each lithology within the estimated resource, the grade, yield and recovery estimates that have been assigned to these as shown on the following table:

Table 16.3_1
Los Pumas Project – South Hemisphere Mining
Lithology, % of Resource, Recovery & Manganese Concentrate Grade

Lithology	% of Resource	Recovery %	Conc. Grade % Mn
UG1	29.0	60.0	38.0
UG2/3	49.0	63.0	41.5
UG4	22.0	55.0	30.0
Total	100	60.4	38.0

It appears entirely reasonable that the Block and Ash and ignimbrite resources (UG-1 and UG-2/3) resource types identified above can achieve or exceed these manganese recovery and concentrate grades while the UG-4 resource only demonstrates two examples of beneficiation performance from the test work undertaken to date than can justify the expectation of 55% recovery at a grade of 30 % Mn in concentrate.

The performance for UG-1 and UG-2/3 used in the above overall table are conservative figures from the data available and whilst the UG-4 performance cannot be substantiated there is reasonable expectation it can be achieved.

The concept of blending of concentrates from the optimum densimetric beneficiation of each individual resource type and based upon the characterisation of resource blocks within those resource types is entirely legitimate.

The details of which resources can be “creamed” to produce high grade concentrate without significant reduction in recovery and which resources should be processed to give acceptable recovery, albeit at a low grade, requires refining based upon further test work programs.

17 MINERAL RESOURCE ESTIMATES

17.1 Introduction

Coffey Mining completed the geological modelling for the Los Pumas deposit, with the guidance of the SHM chief geologist. Coffey Mining used the Ordinary Kriging (OK) method to estimate Mn (%), SiO_2 (%), Fe_2O_3 (%), Al (%), K (%) and P (%).

17.2 Database Review

Coffey Mining was provided with the digital databases, topography, a set of cross sectional based strings of the high grade domain and a large number of 1m interpreted flitch plans of lithology and mineralization as a base for interpretive review and modelling work.

Coffey Mining inspected photos of the RC chip trays and DC drilling against geological logging and manganese assays. A reasonable correlation was seen between lithology, logging and assays. No major data issues were identified. The data was found to be internally consistent with appropriate coding of data types and mineralized domains.

The high grade domain contains 167 samples that are not assayed as they appeared to be low or very low grade based on visual inspection from SHM. These samples have been re-set to a 'default' grade of 0.5% Mn. This is the average grade of the low grade domain composites. These samples were treated as 'unrecovered' in the May 2010 estimate.

The low grade domain contains a significant proportion of unassayed samples. These samples have been set to a default grade of 0.0% Mn.

17.3 Geological Modelling

Coffey Mining has modelled cross sections on 25m spacing in the north target and 50-100m spacing in the south target (Figure 17.3_1). The geological model was based on the lithological logging and interpretation and was separated in three lithologies, as presented below:

- Code 1 – Block and Ash Geological Unit: includes andesite / dacite tuffs, ignimbrites, pumice, sandstone and agglomerate of andesitic composition, amorphous silica and eventually manganese mantle.
- Code 3 – Undifferentiated Ignimbrite and Lauca Geological Unit (Pink Ignimbrite): Includes Ignimbrite Pink, Pink Vitric ignimbrite, ignimbrite, Sandstone with pink composition of eroded ignimbrite, manganese mantle.
- Code 4 – Huaylas Geological Unit (Volcanic Sediment): Includes undifferentiated volcanic sediment, sandstone, ignimbrite, clay areas, Manganese Mantle, etc.
- Unit 3 was sub-divided in the May 2010 estimate in to two units: Pink ignimbrite and undifferentiated ignimbrite. These have been amalgamated into one unit under instruction from SHM.

- A grade based envelope was interpreted by SHM in cross section using a 4% Mn as the criteria for interpretation. The minimum down hole length is 1m with and no maximum length of internal waste was defined.
- Cross sections were sliced to 1m flitch plans. An initial plan interpretation was completed. The edge dilution was found to be excessive when comparing sample statistics of the cross sectional interpretation and the 1m flitch plan interpretation.
- This necessitated a refinement to the plan interpretation to ensure edge dilution on zones was reduced and was completed under the close supervision of Mr. Igor Collado.
- These flitch plans were then wire framed in Surpac and formed the basis of the high grade domain wireframe.
- The low grade domain consists of all samples not included within the high grade domain.

Coffey Mining completed the visual validation using the snap to point Gemcom Surpac Software tool. Coffey Mining used the topography limit to constrain horizontally and the 3,650m depth to constrain vertically the geological model. Coffey Mining has modelled a high grade Mn envelope based on a 4% Mn lower limit (Figure 17.3_2).

Typical E-W cross sections are shown for the north target (Figure 17.3_3).

Figure 17.3_4 present the 3D geological model and Figure 17.3_5 presents the Mn (%) high grade domain.

Figure 17.3_1
Los Pumas Project – South Hemisphere Mining
SHM E-W Cross Sections

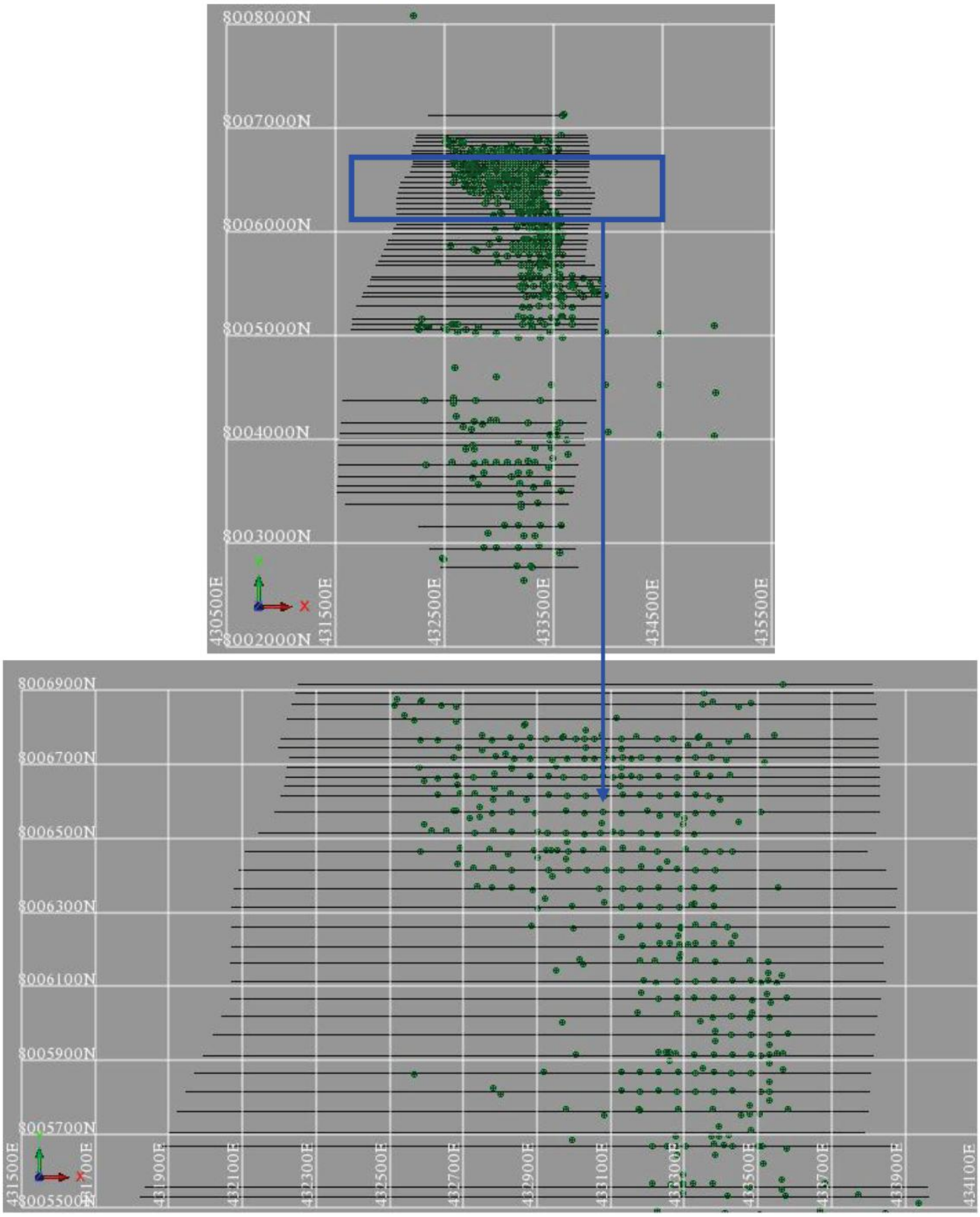


Figure 17.3_2
Los Pumas Project – South Hemisphere Mining
Coffey Mining E-W Cross Sections.
Interpretation Snapped to Drillholes

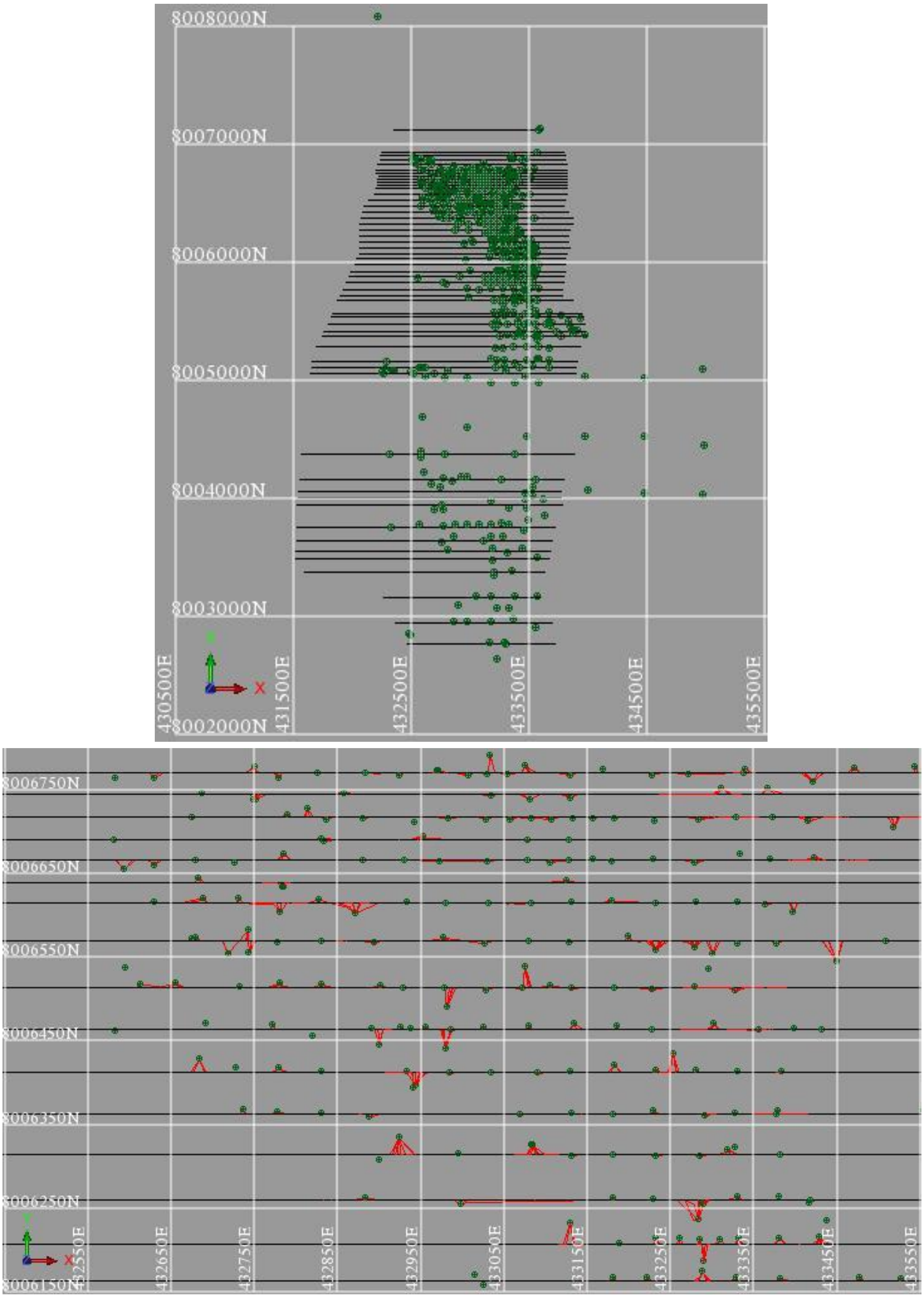


Figure 17.3_3
Los Pumas Project – South Hemisphere Mining
E-W Cross Section – North Zone (8005468 N)
High Grade Mn Domain

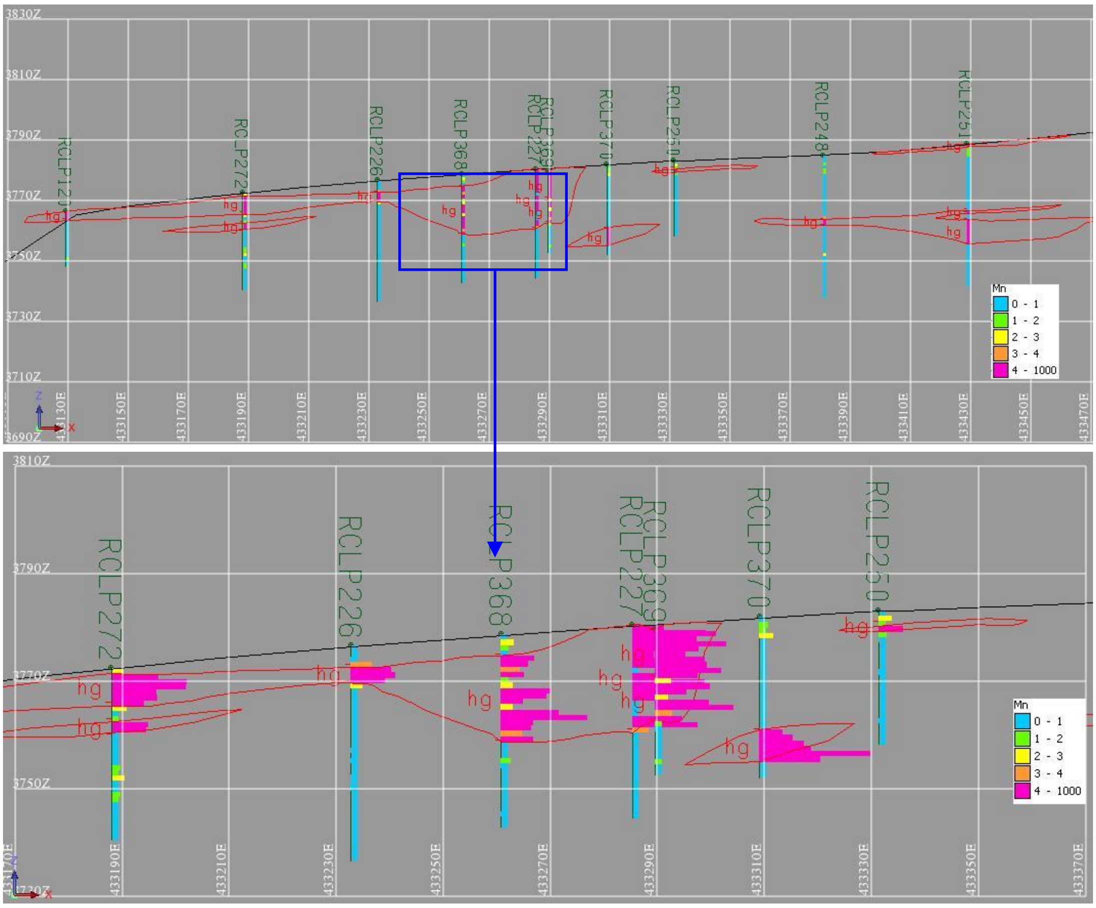
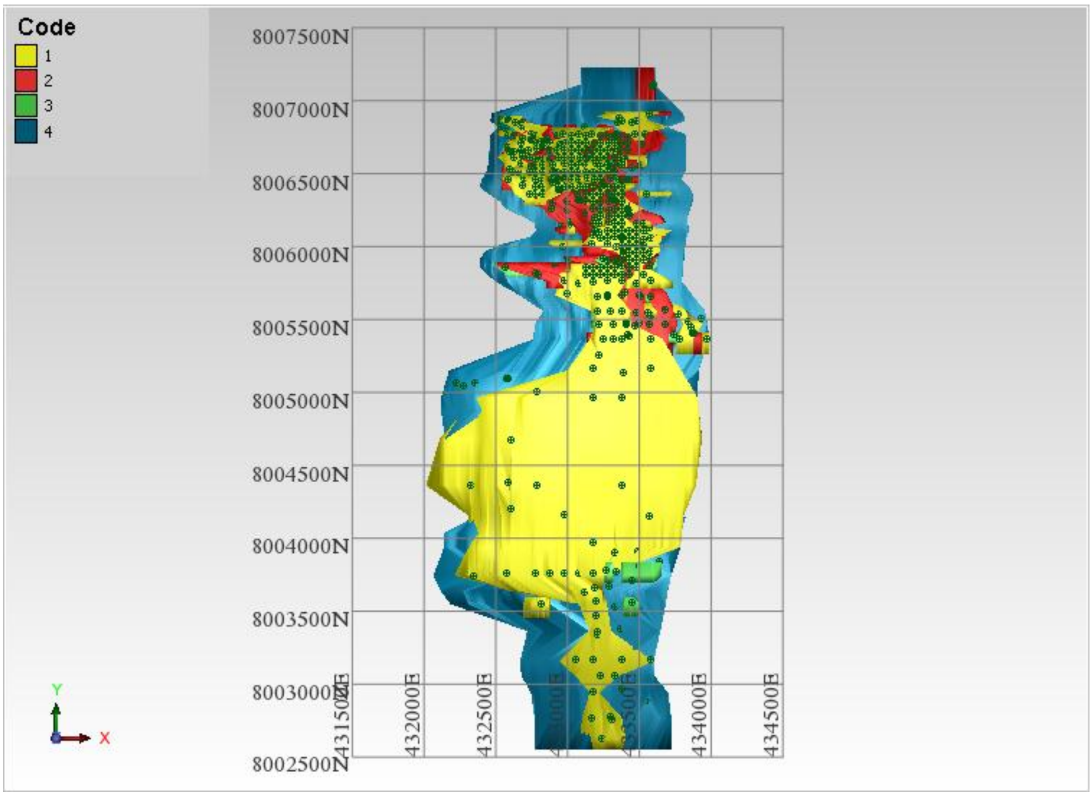


Figure 17.3_4
Los Pumas Project – South Hemisphere Mining
3D Geological Model



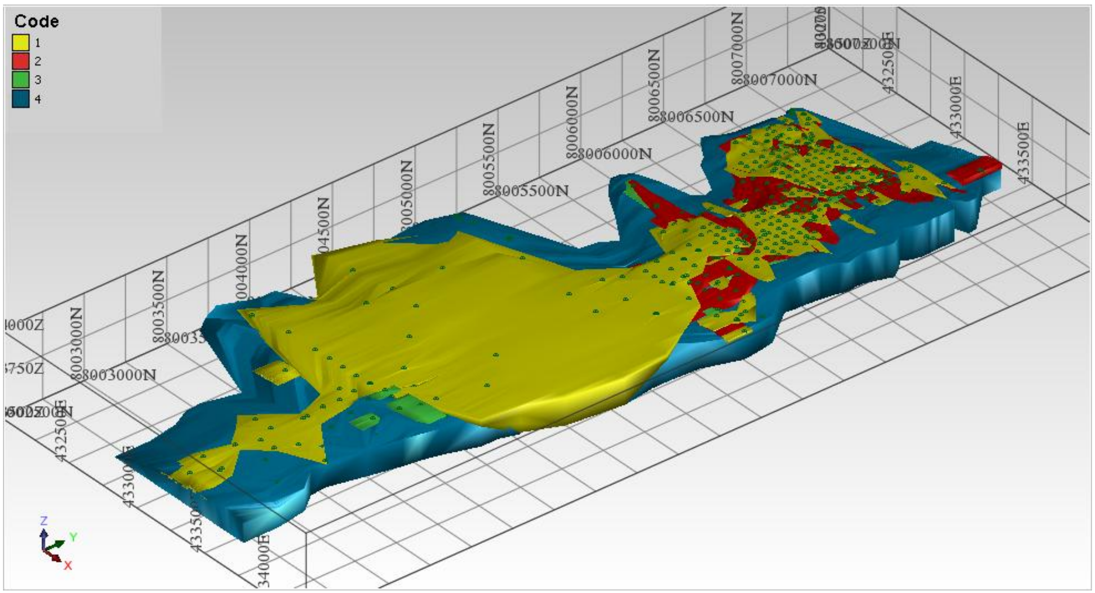
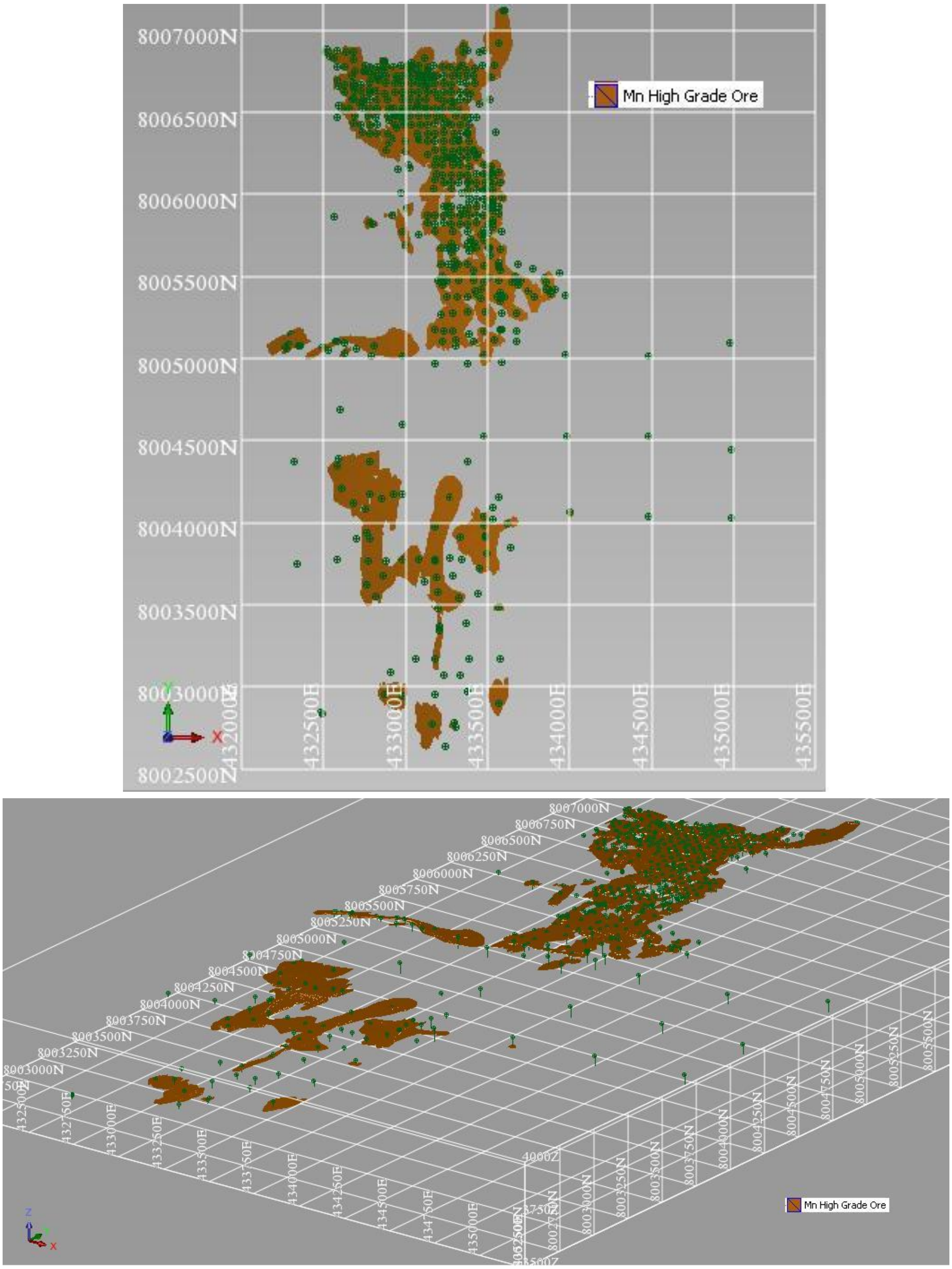


Figure 17.3_5
Los Pumas Project – South Hemisphere Mining
3D High Grade Domain



17.4 Sample Selection and Compositing

Samples were selected for the resource estimate by:

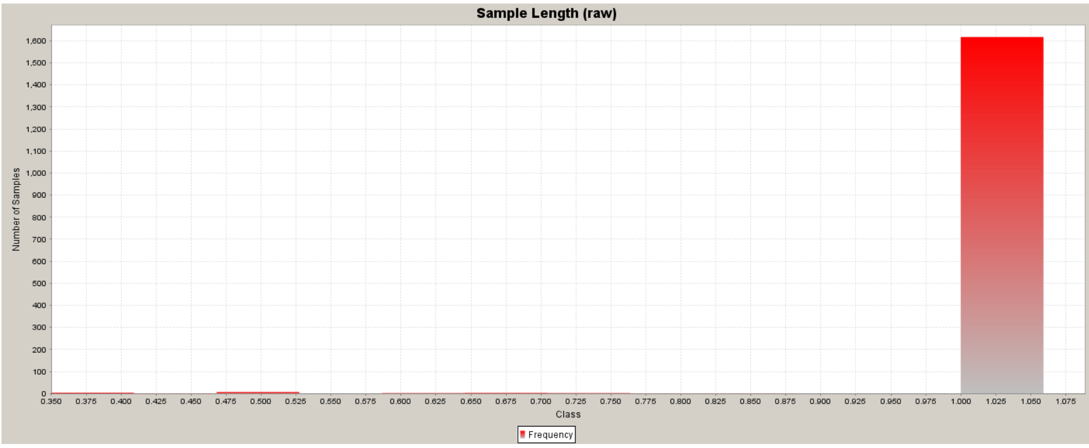
- Selecting the samples within the high grade domain 1m flitch plan based wireframe
- Selecting samples, not within the high grade Mn domain plan interpretation wireframe, but between the modelled lithology surfaces as separate data sets for lithology codes 1, 2 and 4.

The selection of samples from the plan wireframe on the flat lying high grade domains has introduced additional hanging wall dilution and loss of some samples on the footwall when compared to using a cross sectional wireframe. This is analogous to a diluted resource, based on bench composites, when compared to resource data selected within a cross sectional interpretation.

The sectional interpretations were not wireframed so it is not possible to quantify the volume or grade dilution, when compared to the plan wireframe. This needs to be resolved in future resource updates.

Samples were composited to 1m length with residuals <0.75m. The composite lengths were decided by the statistical analysis of the raw sample length histogram (Figure 17.4_1) and the minimum interpretation thickness of 1m.

Figure 17.4_1
Los Pumas Project – South Hemisphere Mining
Sample Length Histogram



Coffey Mining carried out a comparative study with the samples from RC and DC twin holes to confirm if there was any sample bias. The review showed a high level of precision and therefore the different drill types have been combined for estimation (Table 17.4_1).

Table 17.4_1 Los Pumas Project – South Hemisphere Mining RC versus DC Drilling		
Statistical Analysis	**Mn (%) RC**	**Mn (%) DC**
Samples	158	158
Minimum	0.05	0.32
Maximum	42.24	35.33
Mean	8.81	7.87
Std. Deviation	6.70	6.42
Variance	44.90	41.29

17.5 Basic Statistics

The statistical analysis was undertaken based on 1m composites separated into the high grade and low grade domains. Coffey Mining reviewed Mn (%), SiO_2 (%), Fe_2O_3 (%), Al (%), K (%) and P (%). Figures 17.5_1 and 17.5_2 present basic statistics for Mn (%) high grade and low grade domains respectively. The other basic statistics for all elements are in Appendix B.

Table 17.5_1 presents the statistical summary for the high grade domain and low grade domains.

Table 17.5_1 Los Pumas Project – South Hemisphere Mining Basic Statistics Summary							
Variable	**Mean**	**Variance**	**Std Dev**	**CV (%)**	**Samples**	**Minimum Value**	**Maximum Value**
High Grade Domain							
Mn (%)	7.98	30.05	5.48	69%	2 461	0	43.20
SiO_2 (%)	56.22	58.37	58.37	104%	2 447	0	87.92
Fe_2O_3 (%)	2.66	2.72	2.72	102%	2 447	0	17.11
Al (%)	5.54	2.46	2.46	44%	2 447	0	9.71
K (%)	3.11	1.05	1.02	33%	2 447	0	5.33
P (%)	0.05	0.001	0.04	79%	2 447	0	0.35
Low Grade Domain							
Mn (%)	0.57	2.42	5.36	948%	12 360	0	36
SiO_2 (%)	20.31	931.25	30.52	150%	12 352	0	98
Fe_2O_3 (%)	0.99	3.09	1.76	178%	12 352	0	14
Al (%)	2.11	10.54	3.25	154%	12 352	0	10
K (%)	0.93	2.26	1.50	161%	12 352	0	5
P (%)	0.01	0.00	0.03	211%	12 352	0	1

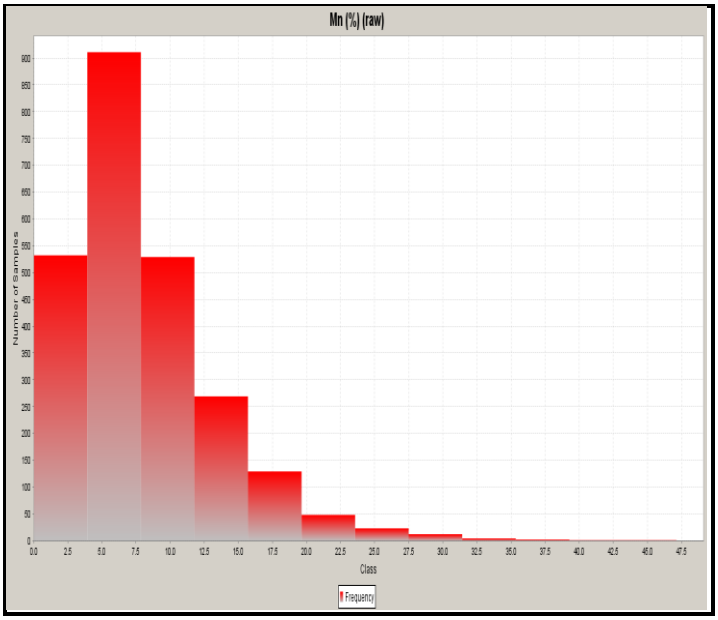
Figure 17.5_1
Los Pumas Project – South Hemisphere Mining
Basic Statistics Mn (%) High Grade Domain

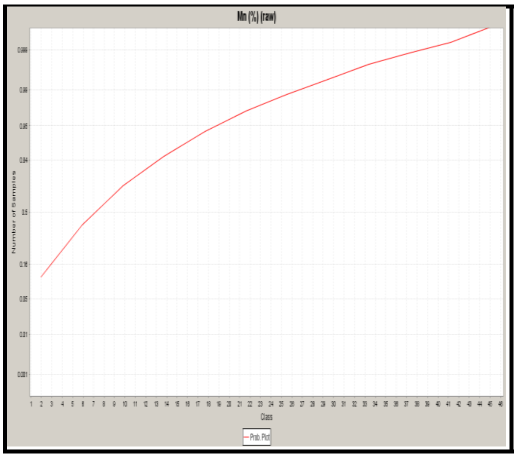
Target:	**Los Pumas**
Lithology:	Ore HG
Variable:	**Mn (%)**

Sample:	**2 461**
Minimum:	0.00
Maximum:	**43.20**
Classes:	12
Interval (Sturges):	**3.51**

Quantiles	
2.5%:	0.59
5.0%:	1.27
25.0%:	4.20
Mediana:	6.71
75.0%:	10.43
95.0%:	18.65
97.5%:	21.65

Mean:	**7.98**
Variance:	30.05
Std. Dev:	**5.48**
CV:	69%
Range interquartil:	**6.23**





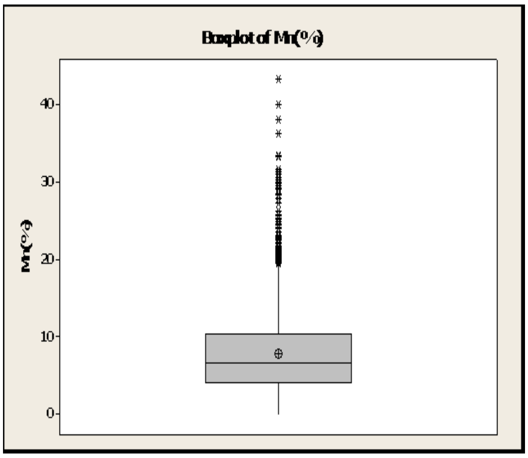


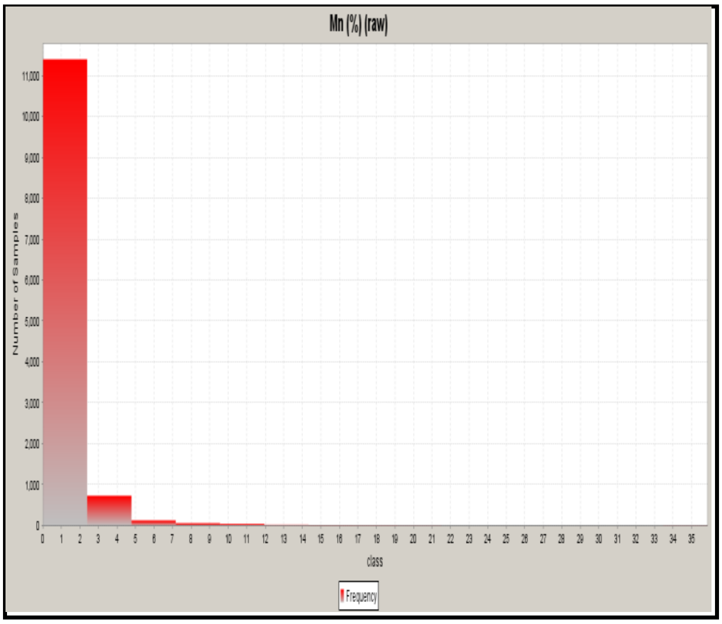
Figure 17.5_2
Los Pumas Project – South Hemisphere Mining
Basic Statistics Mn (%) Low Grade Domain

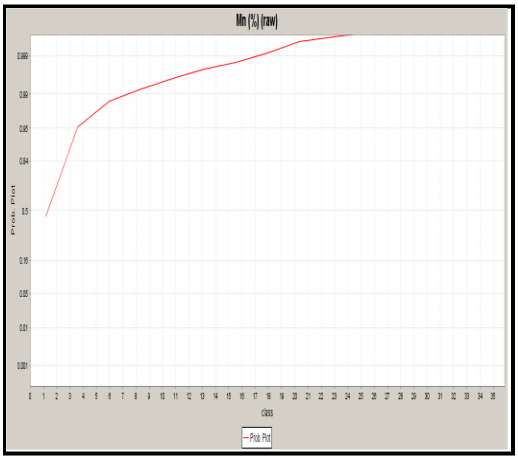
Target:	Los Pumas
Lithology:	Ore LG
Variable:	Mn (%)

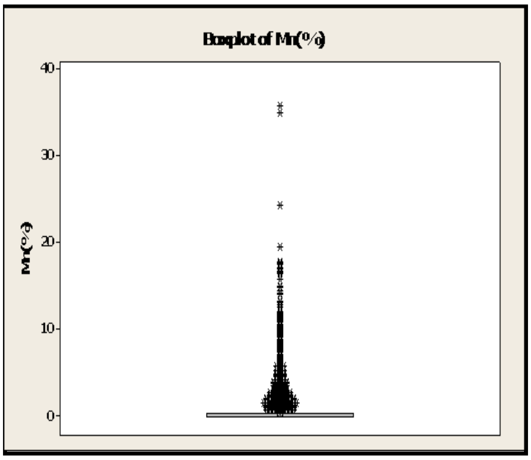
Sample:	12 360
Minimum:	0.00
Maximum:	35.85
Classes:	15
Interval (Sturges):	2.45

Quantiles	
2.5%:	-
5.0%:	-
25.0%:	-
Mediana:	-
75.0%:	0.33
95.0%:	3.13
97.5%:	4.00

Mean:	0.57
Variance:	2.42
Std. Dev:	5.36
CV:	948%
Range interquartil:	0.33







17.6 Variography

The variography was generated by Coffey Mining using Gemcom Surpac mining software. The final variograms and variogram models used for nugget variance and major, semi-major and minor axis calculation, for Mn in the high grade domain and low grade domain are displayed in Figures 17.6_2 and 17.6_3 respectively.

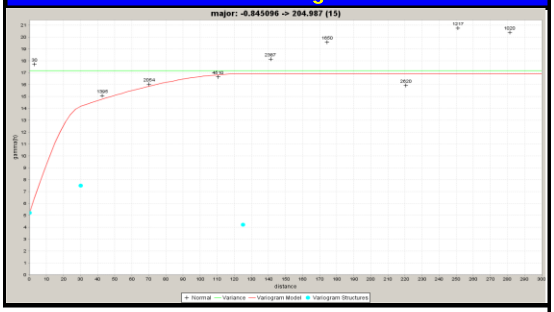
Figure 17.6_1
Los Pumas Project – South Hemisphere Mining
Variogram Mn (%) High Grade Domain

Target	Los Pumas
Ore:	High Grade
Variable:	Mn(%)

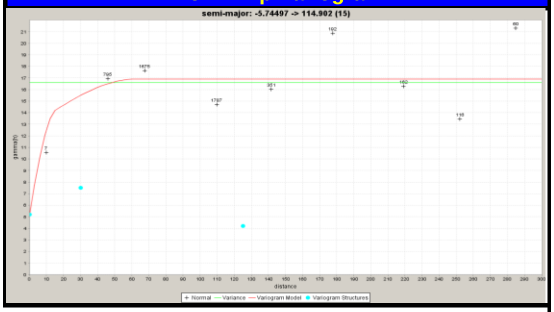
Variogram structures		
Model	Spherical	
Structure	Sill	Range
Nugget	5.20	-
1	7.50	30
2	4.20	125

Ellipse Orientation	
Bearing	204.99
Plunge	-0.85
Dip	-5
Major/Semi-major	2
Major/Minor	10.30

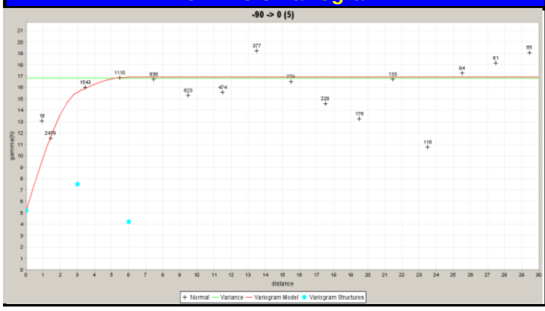
Strike Variogram



Down Dip Variogram



Downhole Variogram



Non Down Dip Variogram

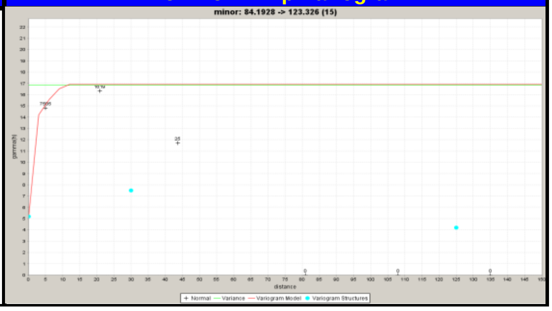
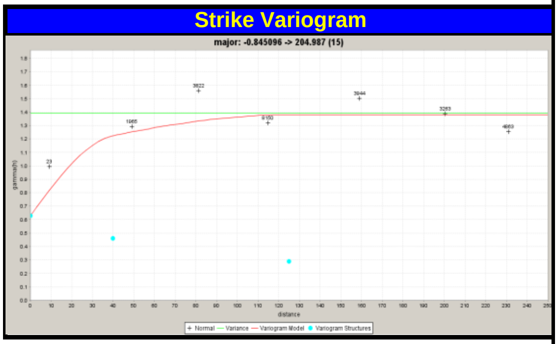


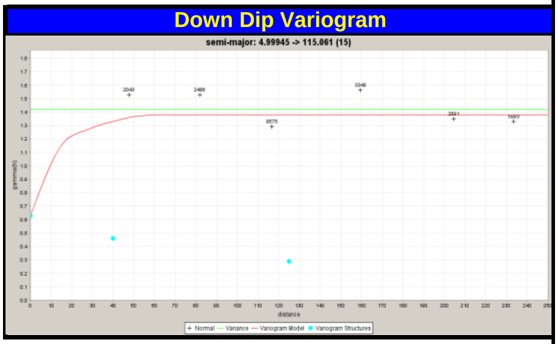
Figure 17.6_2
Los Pumas Project – South Hemisphere Mining
Variogram Mn (%) Low Grade Domain

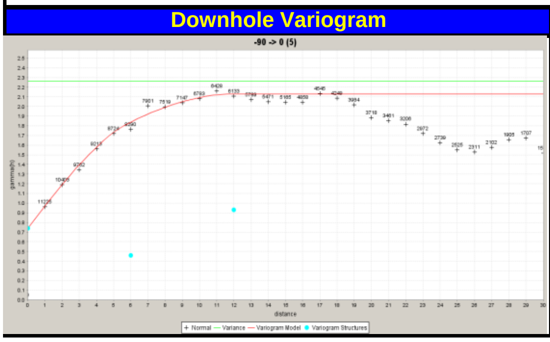
Target	Los Pumas
Ore:	Low Grade
Variable:	Mn(%)

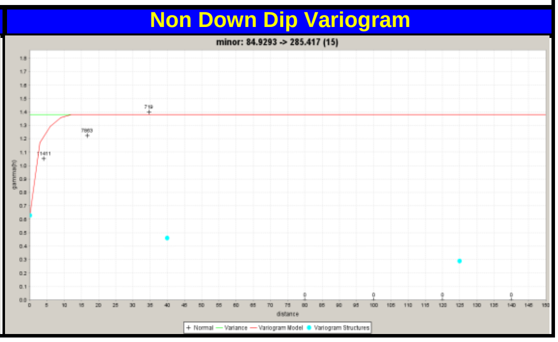
Variogram structures		
Model	Spherical	
Structure	Sill	Range
Nugget	0.63	-
1	0.46	40
2	0.29	125

Ellipse Orientation	
Bearing	204.99
Plunge	-0.85
Dip	-5
Maior/Semi-maior	2
Maior/Menor	10.62









A summary of the findings by Coffey Mining are listed below; Table 17.6_1 summarizes the variogram parameters used for the mineralized zones:

- Downhole variography showed a nugget of approximately 31% of the total sill to Mn (%) high grade domain and 46% of the total sill to Mn (%) low grade domain.
- Major continuity was determined to be towards 205° with 5° dip and 1° plunge for both Mn high grade and low grade domain (Gemcom Surpac Software Rotation).
- 2 spherical schemes were used to model the experimental directional variograms; overall range was:
  - 125m in the major direction, 62m in the semi-major direction and 12m in the minor direction for Mn (%) high grade domain.
  - 80m in the major direction, 40m in the semi-major direction and 8m in the minor direction low grade domain

Table 17.6_1 Los Pumas Project – South Hemisphere Mining Summary Variogram Parameters									
Variable (%)	**Co**	**C1**	**Range 1 (m)**			**C2**	**Range 2 (m)**		
			Major	**Semi-Major**	**Minor**		**Major**	**Semi-Major**	**Minor**
Mn (%) High grade domain									
Mn	5.20	7.50	30	15	3	4.20	125	62	12
SiO_2	31.00	25.00	50	25	5	24.00	125	62	12
Fe_2O_3	0.10	0.90	45	22	4	0.40	125	62	11
Al	0.23	1.00	50	25	5	0.56	125	62	12
K	0.08	0.20	60	30	6	0.49	125	62	12
P	0.00003	0.0003	50	25	5	0.0002	125	62	12
Mn (%) Low grade domain									
Mn	0.63	0.46	40	20	4	0.29	80	40	8
SiO_2	6.86	14.50	30	15	3	10.50	80	40	8
Fe_2O_3	0.10	0.45	40	20	4	1.01	80	40	8
Al	0.15	0.17	30	15	3	0.64	80	40	8
K	0.0370	0.11	20	10	2	0.60	80	40	8
P	0.0001	0.001	30	15	3	0.001	80	40	8

*Gemcom Surpac Rotation Method

17.7 Block Modelling

The block model was generated using the Gemcom Surpac mining software package version 6.1.1. A parent block size of 25mE x 25mN x 2mRL was selected with sub-blocking to 12.5mE x 12.5mN x 1mRL cell size to improve volume representation of the interpreted wireframe models. The model is shown in Table 17.7_1. Each block was characterized by a series of attributes, as described in the Table 17.7_2.

This model was imported into Datamine for 3-d checks and was then exported as a CSV file and delivered to SHM ensuring that volume and grade integrity was maintained in the process.

Table 17.7_1 Los Pumas Project – South Hemisphere Mining Block Model Parameters			
	East	**North**	**Elevation**
Minimum Coordinates	431,500	8,002,000	3600
Maximum Coordinates	434,500	8,007,500	3900
Parent Block size (m)	25	25	2
Sub-Block Size (m)	12.5	12.5	1

Table 17.7_2 Los Pumas Project – South Hemisphere Mining Datamine Block Model Attributes List		
Attribute	**Type**	**Description**
IJK	Real	Parent Cell Identifier
XC	Real	Centroid of cell easting
YC	Real	Centroid of cell northing
ZC	Real	Centroid of cell RL
XINC	Real	Cell easting dimension
YINC	Real	Cell northing dimension
ZINC	Real	Cell RL dimension
lito	Integer	Lithology : 1=Ash, 3=Ignimbrite, 4=Volcanics
resource	Integer	0=unclassified,1=measured, 2=indicated, 3=inferred
SG	Real	Bulk Density
ore	Integer	0=waste,1=high grade domain, 2=low grade domain
Mn	Real	Mn (%) grade estimated by ordinary kriging
SiO_2	Real	SiO_2(%) grade estimated by ordinary kriging
Fe_2O_3	Real	Fe_2O_3 (%) grade estimated by ordinary kriging
Al	Real	Al (%) grade estimated by ordinary kriging
K	Real	K (%) grade estimated by ordinary kriging
P	Integer	P (%) grade estimated by ordinary kriging

Model Validation

A comparison between the measured volume of the solid generated for the high grade domain and the volume model displays good correlation. Table 17.7_3 summarizes this comparison. The filling of the volumes of the low grade domain was visually checked, as there are gaps in some of the surfaces due to geological features and this does not facilitate an easy method of checking volumes.

Table 17.7_3 Los Pumas Project – South Hemisphere Mining Volume Comparison Geological Model versus Block Model			
Code	**Solids Volume**	**Block Model Volume**	**Solids/Blocks Volume (%)**
High Grade Domain	7,753,844	7,742,188	99.8

Figure 17.7_1 shows the block model constrained by the geology and Figure 17.7_2 shows the block model constrained by the high grade domain.

Figure 17.7_1
Los Pumas Project – South Hemisphere Mining
Block Model Constrained by Codes

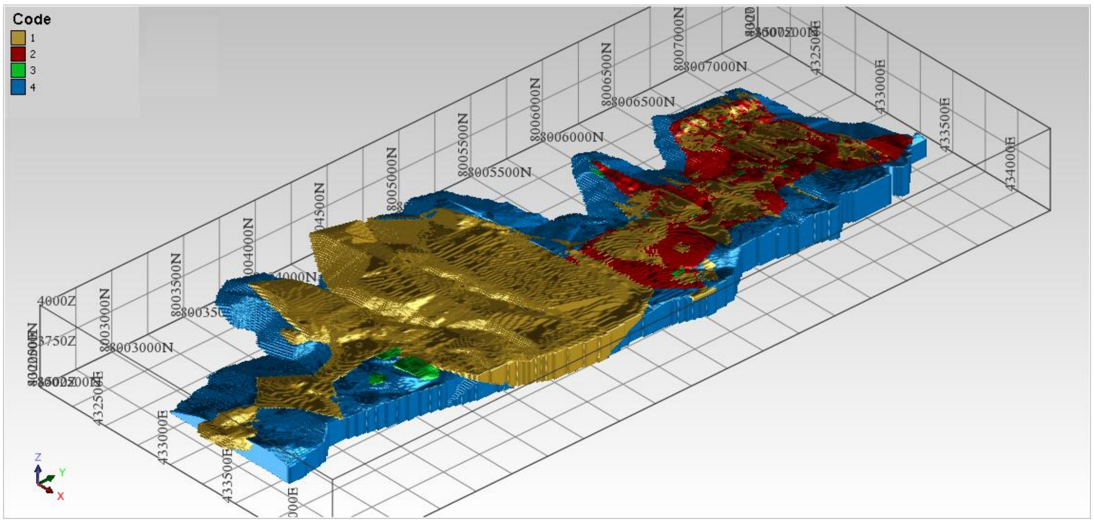
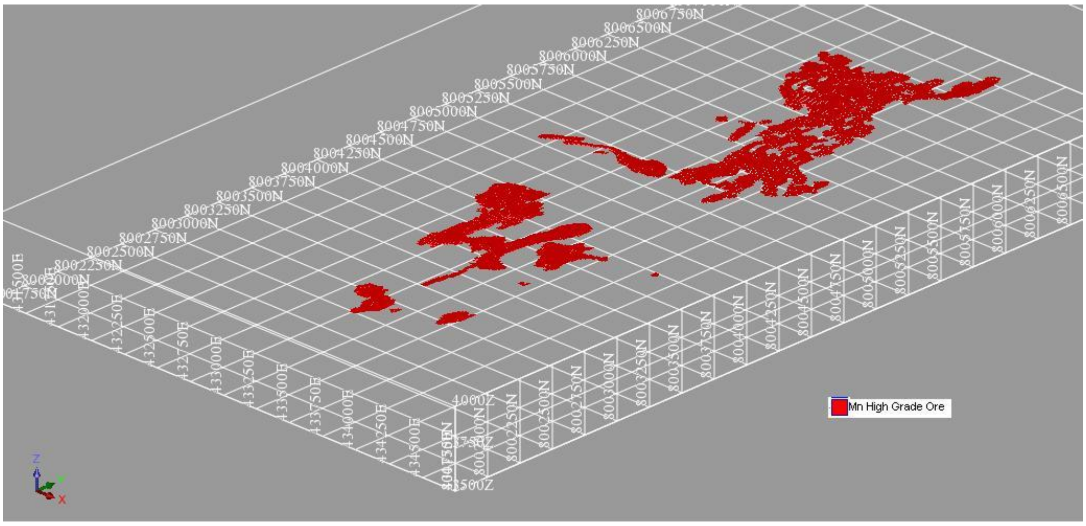


Figure 17.7_2
Los Pumas Project – South Hemisphere Mining
Block Model constrained by Mn (%) high grade domain



17.8 Grade Estimation

Grade estimation for Los Pumas was completed using Ordinary Kriging.

All boundaries within the low grade domain, between each lithology unit are treated as hard boundaries. The boundary between the low grade domain and the high grade domain is treated as a hard boundary also. The high grade domain interpolation also utilizes a hard boundary.

Coffey Mining used a 4 pass strategy. If no estimate is found in the first pass, the second ellipse is used. This process is repeated until all cells are estimated. The constraints used are presented in Table 17.8_1.

Table 17.8_1 Los Pumas Project – South Hemisphere Mining Ordinary Kriging Strategy – Mn (%) High Grade Domain					
Step	**Maximum Search Hor. Distance (m)**	**Maximum Search Vert. Distance (m)**	**Search**	**Minimum Sample Numbers**	**Maximum Sample Numbers**
1	50	8	Ellipsoid	3	8
2	100	8	Ellipsoid	3	8
3	200	8	Ellipsoid	3	8

Ellipsoid Orientation (Gemcom Surpac Rotation): Bearing 205°; Plunge -1°; Dip -5°
Anisotropy Factors: Semi-Major 2.0; Major/Minor 10

Table 17.8_2 Los Pumas Project – South Hemisphere Mining Ordinary Kriging Strategy – Mn (%) Low Grade Domain					
Step	**Maximum Search Hor. Distance (m)**	**Maximum Search Vert. Distance (m)**	**Search**	**Minimum Sample Numbers**	**Maximum Sample Numbers**
1	50	8	Ellipsoid	3	8
2	100	8	Ellipsoid	3	8
3	200	8	Ellipsoid	3	8
4	200,000	10,000	Ellipsoid	1	8

Ellipsoid Orientation (Gemcom Surpac Rotation): Bearing 205°; Plunge -1°; Dip -5°
Anisotropy Factors: Major/Semi-Major 2; Major/Minor 10

17.9 Cross Validation

The technique of cross validation was used to validate modelled variograms and to define a Kriging plan.

The cross validation technique consists of an estimation of the samples of the composite using self batch of samples. During the estimate of a sample, its analytical value is not considered in the estimate of the self value.

After the self values estimation the technique of Ordinary Kriging (OK) compare the estimated value to the analytical sample values ("real").

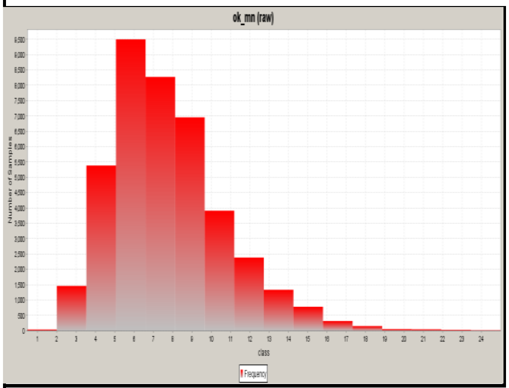
Coffey Mining realized two tests varying the maximum and minimum of samples and the vertical distance of the search ellipse. Figure 17.9_1 presents the results of the validation for test one, verified as better result of the kriging test. This step was chosen to avoid negative kriging weights. The means of the nearest neighbour and the OK estimate correlate well.

Figure 17.9_1
Comparison between Ellipsoid and Wireframes

Los Pumas Manganese Project

Target:	Los Pumas
Ore:	High Grade
Variable:	Mn (%)
Resource:	Measured, Indicated

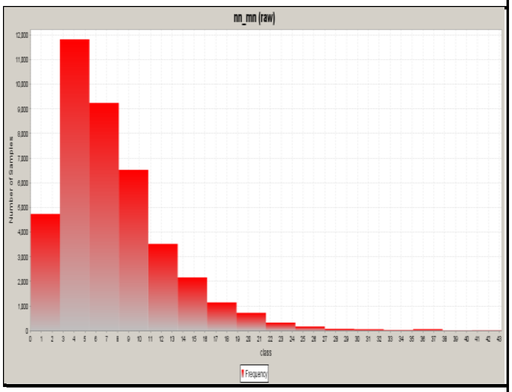
Ordinary Kriging



Number of Sample	40624
Minimum:	0.46
Maximum:	24.99
Mean:	7.76
Variance:	8.83
Standard Deviatio	2.97

Quantiles	
2.5%:	3.26
1° Quartil:	5.61
Median:	7.34
3° Quartil:	9.33
97.5%:	14.85

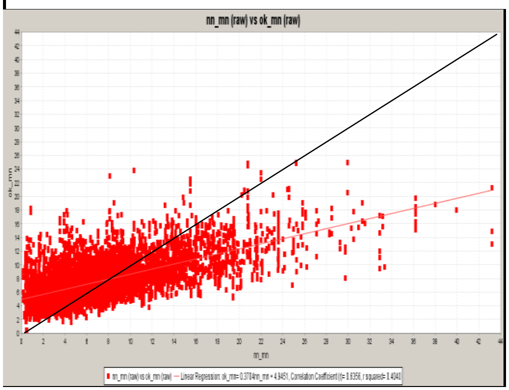
NN-Check



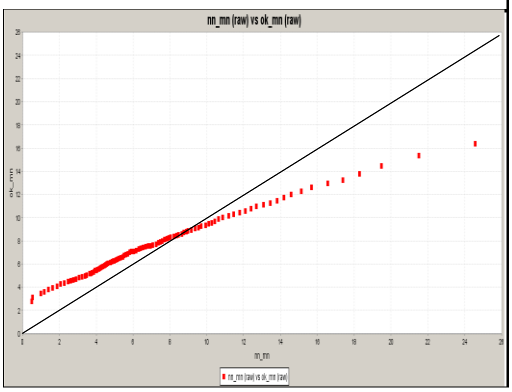
Number of Sample	40624
Minimum:	-
Maximum:	43.20
Mean:	7.60
Variance:	26.02
Standard Deviatio	5.10

Quantiles	
2.5%:	0.78
1° Quartil:	4.16
Median:	6.42
3° Quartil:	9.94
97.5%:	20.36

Correlation



Q-Q Plot



17.10 Bulk Densities

Coffey Mining used the bulk densities data provided by SHM to determine the average densities for each lithology modelled.

SHM determined the Bulk Density by undertaking physical measurements of core billets using the Archimedes method. A total of 157 bulk density measurements were undertaken. Table 17.10_1 presents the average bulk densities values for each lithology applied at the resource model.

Table 17.10_1 Los Pumas Project – South Hemisphere Mining Average Bulk Densities to Lithologies		
Lithology	**Mn (%) Limits**	**Average Bulk Densities (t/m^3)**
1	< 8.0% Mn	2.16
	> 8.0% Mn	2.36
3	< 8.0% Mn	2.04
	> 8.0% Mn	2.39
4	< 6.0% Mn	2.18
	> 6.0% Mn	2.61

17.11 Resource Classification

The resource classification for this deposit is based upon the interpolation pass.

- Pass 1 = Measured
- Pass 2 = Indicated
- Pass 3&4 = Inferred

17.12 Mineral Resource

The Mineral Resource for the Los Pumas Manganese Project is shown in Table 17.12_1 and 17.12_2 applying different cutoff grades for high grade and low grade domains.

Figures 17.12_1 and 17.12_2 presents the grade – tonnage curve for high grade domain and low grade domain respectively.

Table 17.12_1

Los Pumas Project – South Hemisphere Mining

Grade Tonnage Report
(as at October 14th 2010)

Ordinary Kriging Estimate – High Grade Domain

Resource	Mn% Lower Cutoff Grade	Tonnes (Mt)	Mn (%)	SiO_2 (%)	Fe_2O_3 (%)	Al (%)	K (%)	P (%)
Measured	0	7.80	8.04	56.47	2.59	5.59	3.14	0.05
	4	7.31	8.36	56.52	2.60	5.61	3.19	0.05
	10	1.92	12.41	53.30	2.34	5.15	3.45	0.05
Indicated	0	5.91	7.50	55.78	2.87	5.75	3.06	0.05
	4	5.55	7.78	55.92	2.86	5.76	3.11	0.05
	10	0.98	11.95	53.01	2.77	5.21	3.35	0.06
Measured and Indicated	**0**	**13.71**	**7.81**	**56.17**	**2.71**	**5.66**	**3.11**	**0.05**
	4	**12.86**	**8.16**	**56.31**	**2.69**	**5.66**	**3.16**	**0.05**
	10	**2.89**	**12.09**	**53.09**	**2.64**	**5.19**	**3.38**	**0.05**
Inferred	0	2.87	7.20	55.48	3.05	5.92	2.86	0.06
	4	2.63	7.55	55.48	3.09	5.98	2.89	0.06
	10	0.24	11.82	52.79	2.49	4.68	2.90	0.06

Figure 17.12_2

Los Pumas Project – South Hemisphere Mining

Grade Tonnage Report
(as at October 14th 2010)

Ordinary Kriging Estimate – Low Grade Domain

Resource	Mn% Lower Cutoff Grade	Tonnes (Mt)	Mn (%)	SiO_2 (%)	Fe_2O_3 (%)	Al (%)	K (%)	P (%)
Measured	0	12.66	1.08	66.02	3.18	6.66	3.04	0.04
	2	1.86	3.26	89.74	4.6	8.9	4.28	0.06
	4	0.40	5.51	74.72	4.06	7.44	3.62	0.06
Indicated	0	51.54	0.87	56.06	2.8	5.88	2.54	0.04
	2	5.22	3.23	84.86	4.26	8.9	3.98	0.06
	4	1.042	5.50	67.6	3.56	7.32	2.94	0.06
Measured and Indicated	**0**	**64.20**	**0.92**	58.68	2.9	6.08	2.68	0.04
	2	**7.09**	**3.24**	86.2	4.36	8.9	4.06	0.06
	4	**1.44**	**5.51**	70.76	3.78	7.36	3.24	0.06
Inferred	0	536.11	0.44	31.8	2.12	3.72	1.36	0.04
	2	14.25	2.89	48.48	2.8	5.26	2.08	0.04
	4	1.38	5.28	49.14	2.84	5.46	2.1	0.06

Figure 17.12_1
Los Pumas Project – South Hemisphere Mining
Grade x Tonnage Curve– High Grade Domain

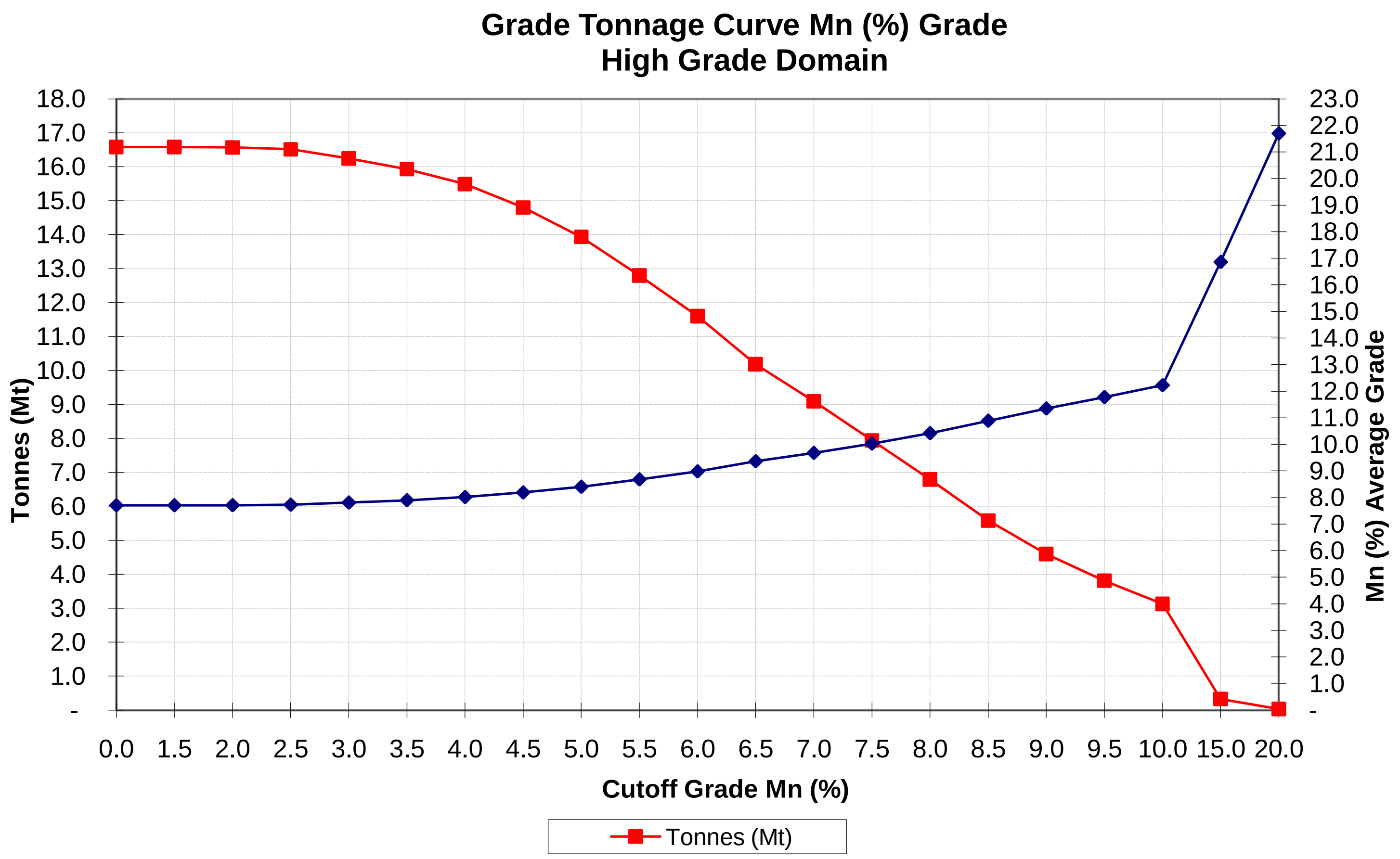
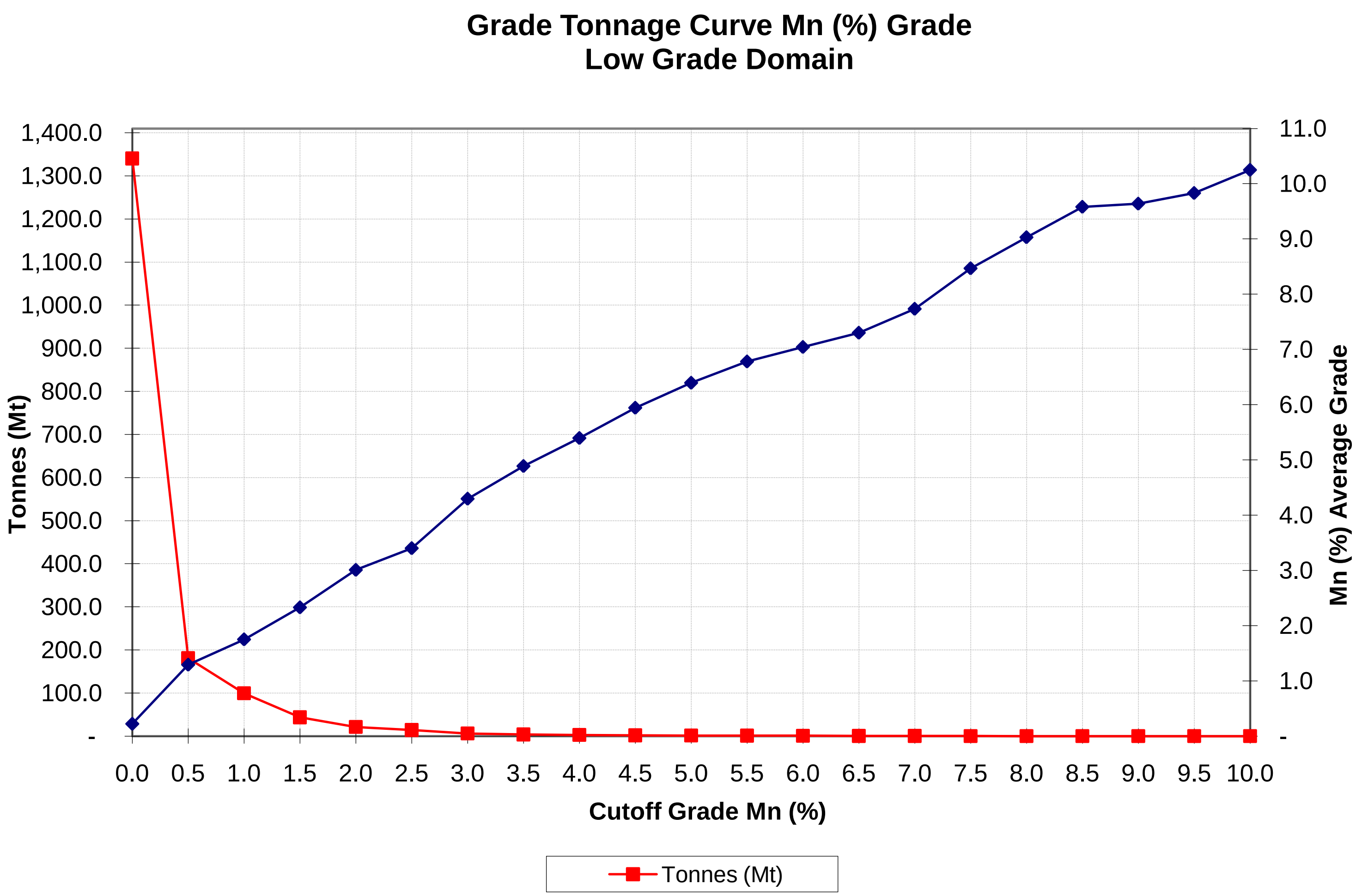


Figure 17.12_2
Los Pumas Project – South Hemisphere Mining
Grade x Tonnage Curve– Low Grade Domain



18 OTHER RELEVANT DATA AND INFORMATION

18.1 Mining

18.1.1 Basis of Preliminary Mining Design and Evaluation

The shallow nature of the mineralization at Los Pumas allows for the use of open pit mining techniques in retrieving material for processing. In order to determine the possible extent of the pits a pit optimization program was applied to the geological model produced by Coffey in October 2010.

Pit optimisation analysis, based on the Lerchs-Grossmann algorithm, produced a series of Lerchs-Grossmann pit shells. Volumes within these pit shells have been used in the financial modelling of the Project. In order to allow for detailed pit design at a later stage the waste volumes within the Lerchs-Grossmann pit shells have been increased by 80% in the early years of the financial analysis and 30% in the latter years. Detailed pit design will be required following re-assessment of the geological model.

An allowance for dilution during mining has been made in the mining schedule and subsequent economic analysis. It has been assumed that the mineralisation indicated the geological model will be diluted by a volume of 30% during mining operations. The grade of this diluting material is estimated to be 2.2% Mn.

18.1.2 General Design Criteria

The mineralisation at Los Pumas occurs as sub-horizontal mantles. The mineralisation is rarely deeper than 30 metres below the surface. The possible economic effects on the project of various possible pit slope scenarios are therefore considered to be minor. Observations of the surface material, the drill cores and chips, and the products from the four winzes on site indicate that the ground is generally competent and dry. Other than this no specific geotechnical studies have been undertaken within the areas of the proposed pits.

None of the drilling or winzing in the areas proposed for mining has shown the presence of groundwater. Apart from the occasional light rain event mining at Los Pumas is not expected to be troubled by water inflows.

In this preliminary assessment of the Project the measured, indicated and inferred categories of resource have been considered when applying the pit design program to the model.

The inputs to the preliminary pit analysis were derived from quotations and separate studies undertaken by SHM and its consultants. These include a FOB sale price of $7.40 per dry metric tonne unit, recovery of 60% of the manganese units, 50 degree pit slopes, a mining cost of $2.21 per tonne of resource and waste moved, and an all-inclusive processing cost of $10.81 per ROM tonne.

18.1.3 Mine Design

The future detailed pit designs will be based on the results of further geological modelling and the results of pit optimisation analyses. The pits will be designed for excavation with back-acting hydraulic excavators and off-highway trucks.

Given the relatively thin nature of much of the mineralisation mining will need to be conducted with low bench heights. These will be in the order of two metres high.

Pits slopes will be dug at 60 degrees from the horizontal. Where slope heights exceed 20 metres safety berms of 5 metre widths will be constructed.

Although the mineralisation occurs over a 130 metre range of elevations it is only in a small number of instances deeper than thirty metres below the immediate surface.

In-pit haul roads will be designed with a maximum gradient of 1 in 9 (11.1%).

18.1.4 In-Pit Resources

The resource model of the Los Pumas Deposit was subjected to preliminary pit design analysis (Lerchs-Grossmann) to determine the extent to which resource could be economically mined.

For mining estimates purposes a 2.5% Mn cut-off has been selected in alignment with the projected economics and expected recoveries of the project. Table 18.1.4_1 sets the resources at the 2.5% cut off from the resource inventory defined previously by Coffey Mining.

Table 18.1.4_1
Los Pumas Project – South Hemisphere Mining
Resource Estimates for a 2.5% Mn Cut-Off

Classification	Tonnes (Mt)	Mn (%)	SiO_2 (%)	Fe_2O_3 (%)	Al (%)	K (%)	P (%)
Measured HG	7.75	8.08	56.5	2.59	5.59	3.15	0.05
Measured LG	1.14	3.91	43.5	2.28	4.32	2.13	0.04
Total Measured	**8.89**	**7.55**	**54.83**	**2.55**	**5.43**	**3.02**	**0.05**
Indicated HG	5.90	7.51	55.8	2.86	5.75	3.07	0.05
Indicated LG	3.33	3.81	40.9	2.12	4.34	1.9	0.03
Total Indicated	**9.23**	**6.18**	**50.42**	**2.59**	**5.24**	**2.65**	**0.04**
Total Measured & Indicated	**18.12**	**6.85**	**52.59**	**2.57**	**5.33**	**2.83**	**0.05**
Inferred HG	2.86	7.2	55.5	3.05	5.92	2.86	0.06
Inferred LG	9.77	3.2	21.8	1.26	2.37	0.93	0.02
Total Inferred	**12.63**	**4.11**	**29.43**	**1.67**	**3.17**	**1.37**	**0.03**

Table 18.1.4_2 sets out the quantities of resource within the Lerchs-Grossmann pit shells. The grades and quantities shown are the undiluted grades and quantities within the model.

Table 18.1.4_2
Los Pumas Project – South Hemisphere Mining
In Pit Resources, plus 2.5% Mn

Classification	Tonnes (Mt)	Mn (%)	SiO_2 (%)	Fe_2O_3 (%)	Al (%)	K (%)	P (%)
Measured HG	7.40	8.24	56.55	2.58	5.59	3.18	0.05
Measured LG	0.82	4.25	43.44	2.26	4.28	2.09	0.03
Total Measured	**8.22**	**7.84**	**55.24**	**2.55**	**5.46**	**3.07**	**0.05**
Indicated HG	5.17	7.87	55.88	2.80	5.74	3.12	0.05
Indicated LG	2.15	4.26	38.73	1.88	4.01	1.77	0.03
Total Indicated	**7.32**	**6.81**	**50.84**	**2.53**	**5.23**	**2.72**	**0.04**
Total Measured & Indicated	**15.54**	**7.84**	**53.17**	**2.54**	**5.35**	**2.91**	**0.05**
Inferred HG	2.23	7.72	55.20	2.99	5.90	2.91	0.06
Inferred LG	2.97	4.11	27.83	1.51	3.03	1.17	0.03
Total Inferred	**5.20**	**5.66**	**39.57**	**2.14**	**4.26**	**1.92**	**0.04**

The 15.54 million tonnes of measured and indicated resources within the Lerchs-Grossmann pit shell indicates that 86% of the total measured and indicated resource within the deposit will be converted to reserve. Of the 12.6 million tonnes of inferred resource within the model 5.2 million tonnes are contained within the Lerchs-Grossmann shell. The proportion of the measured & indicated to inferred resources is 75% to 25%.

This assessment is preliminary in nature and includes inferred mineral resources in the financial analysis. The inferred resources are such that they are too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the preliminary assessment will be realised.

Mineral resources that are not mineral reserves do not have demonstrated economic viability.

In the financial models of the project an allowance has been made for dilution of resource during mining based on the study of geological sections, the thickness of the resource and the diluting grades at the upper and lower contacts. The dilution allowed was 30% of the resource volume at a grade of 2.2% Mn.

To test the effect at this stage of the project of the relative importance of the inferred resources within the pit shells, two financial models have been developed, one which shows the effects of converting inferred resources to reserves and the other which treats all inferred resources as waste. Both models show internal rates of return in excess of 45%. The first has a net present value (NPV) in excess of US$90 million while the latter has an NPV of over US$60 million when using a 10% discount rate.

This shows that the deposit has a strong economic potential and that the conversion of inferred resources to measured or indicated resources will potentially secure an important increase in NPV.

Summary tables showing the results of these sensitivities regarding the inclusion or otherwise of inferred resources as potential resources to feed to the plant are presented below:

Table 18.1.4_3
Los Pumas Project – South Hemisphere Mining
In Pit Mineral Inventory, plus 2.5% Mn, Diluted
NO INFERRED RESOURCES

Total material movement	dry bcm	17,617,660
Waste mined	dry bcm	8,627,403
Resource mined	Diluted dry bcm	8,990,258
Resource mined	Diluted dry tonnes	20,050,750
Resource grade	Diluted % Mn	6.18%
Stripping Ratio		0.96
Life of Mine	yrs	8.5
Inferred resource	Diluted dry bcm	0
	Diluted dry tonnes	0
	Diluted % Mn	0.00%

Table 18.1.4_4
Los Pumas Project – South Hemisphere Mining
In Pit Mineral Inventory, plus 2.5% Mn, Diluted
INFERRED RESOURCES INCLUDED

Total material movement	dry bcm	23,070,784
Waste mined	dry bcm	10,940,513
Resource mined	Diluted dry bcm	12,130,271
Resource mined	Diluted dry tonnes	26,976,881
Resource grade	Diluted % Mn	5.84%
Stripping Ratio		0.90
Life of Mine	yrs	10.5
Inferred resource included in resource mined	Diluted dry bcm	3,067,639
	Diluted dry tonnes	6,768,194
	Diluted % Mn	4.35%

18.1.5 Statement of Preliminary Assessment – Preliminary in Nature

This Preliminary Assessment is indicative and includes inferred mineral resources (25%) in the financial analysis as a base case. The inferred resources are such that they are too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the preliminary assessment will be realised.

Mineral resources that are not mineral reserves do not have demonstrated economic viability.

The inclusion of inferred resources adds a degree of speculation when having the economic considerations applied to them. However the economic analysis considered in the preliminary mining plan showed that even if they are not included as resource but classified as waste in the mining operation, the financial outcome continues to be strong providing further support to proceed with the next phases of the project with regard to the conversion all or part of the inferred resources to the measured or indicated categories, resource modelling, metallurgical test work for optimisations and pit optimisations.

18.2 Design of Metallurgical Plant

18.2.1 Process Overview

Process flow sheets and design criteria have been developed by Mineral Processors (WA) Pty Ltd, on the basis of information received from the owner Southern Hemisphere Mining, based on drilling and metallurgical analysis performed from 2009 to date and in addition with the experience gained from similar operations.

A review of the drilling data and metallurgical test work reports has not been performed by SNC–Lavalin and its QP as the review and results interpretation were not part of its scope of work.

The processing facilities are designed according to the following parameters:

Ore production	(t/a)		2,500,000
Operating days per year (d/a)			348
Production Capacity	(t/a)		400,000
Ore head grade	% Mn.	Design 5 year average	8.6
		Range	4 - 15
Ore Specific Gravity	(SG)	Design	2.74
Concentrate grade	%Mn	(Average)	38
Manganese recovery %		Range	50% - 60%

Figure 18.2.1_1 below provides a General Process Block Diagram of the facilities

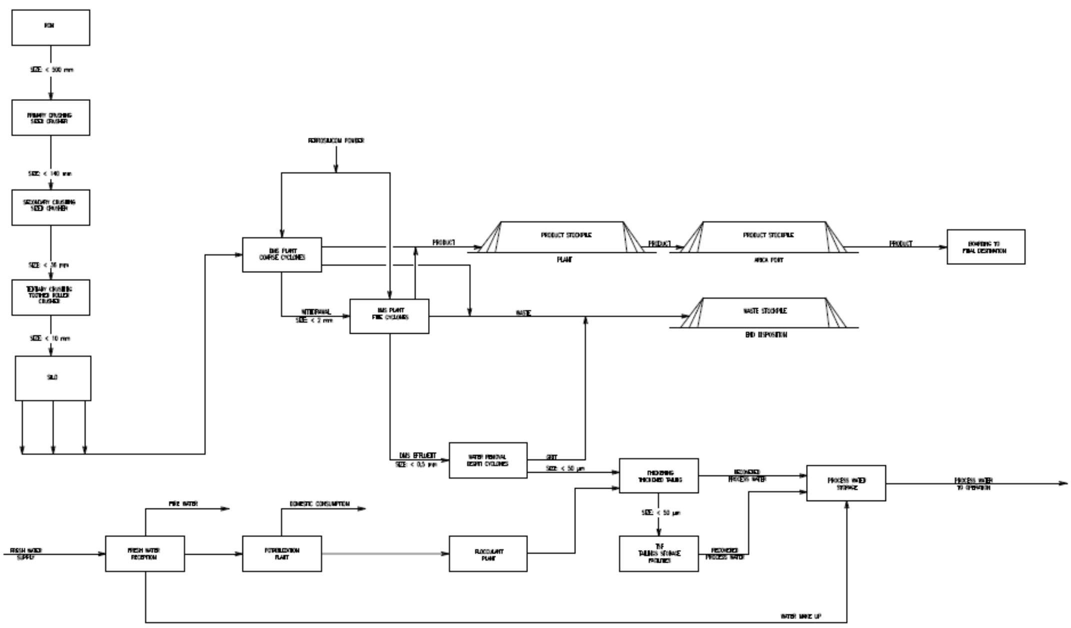


Figure 18.2.1_1 General Process Block Diagram

The overall metallurgical balance is given in Table 18.2.1_1 below. The balance is for design purposes only, and is based on the resource characteristics scheduled for mining during the 10 years mine life.

Table 18.2.1_1 Overall Metallurgical Balance

Ore Type Mixture	Flow (t/d)	Mn (%)	% Distribution
Ore	7,184	8.6	100.0
Manganese Product	1,150	38.0	70.7
Rejects	6,034	3.0	29.3

18.2.2 Process Facilities Overview

The processing facilities consist of a three stage crushing plant complete with crushers, screening; conveying; storing of crushed resource under 10 mm into a silo and a two stage (coarse and fines) dense media separation (DSM) plant. The manganese product from the DMS plant is conveyed to an open stockpile prior to transportation to Arica facilities by truck.

The rejects from the DMS plant are transferred to a dewatering plant to be separated into coarse and fines streams, by wet screening, cycloning and thickening processes. The fines are disposed as slimes into a slimes pond and the coarse particles are conveyed on a waste dump.

From the slimes pond, the redundant water is recovered and pumped to the recycled water pond.

The overflow from the thickener is collected and sent by gravity to the reclaim water pond and recycled to the processing facilities.

Make-up water, when required, is obtained from the fresh water pond fed from ground stream in the Taapaca volcano area.

Crushing Plant

The crushing circuit design is based on the preliminary process prepared by "*Mineral Processors (WA) Pty Ltd*", which has not been validated by SNC-Lavalin for purposes of this report, and the following process design parameters:

Capacity, dry (t/d)		7,184
Operating hours per day (h/d)		18
Availability (%)		72.5
Throughput rate, dry (t/h)	Design	408
In-situ resource (SG)		2.74
Bulk Density (t/m^3)		1.6
Moisture (%)	Average	2

Feed size (mm)	Maximum	500
Product size (mm)		10

A mineral sizer is selected as primary crusher for capacity, run of mine lump feed size, 140 mm passing product, minimal fines generation.

One dust collection system is provided in the primary crushing plant area.

The secondary crushing section includes a screen and a crusher in open circuit. The screen oversize (over 36 mm) is discharged into the roll crusher and the undersize goes directly to the tertiary crusher section.

The tertiary crusher section consists of two (2) screens installed in series followed by a tertiary crusher (toothed roll crusher type). The crusher discharge is returned in a close loop to the screens for final sizing, to obtain a final crushed material under the 10 mm size. The screen undersize is the final product and is conveyed to a 1,750 t live capacity silo.

The secondary and tertiary crushing section is also serviced with a second dust collection system for dust control.

Coarse and Fines Dense Media Separation (DMS) Plant

Preliminary designs were prepared by "Mineral Processors (WA) Pty Ltd" based on its expertise and other similar plants, but have not been validated by SNC-Lavalin for purposes of this report.

The DMS Plant has been defined as one Turn Key Package (TKP) to be provided by experienced suppliers that have the knowledge and expertise of the process.

The Coarse DMS Plant is fed by a belt conveyor reclaiming the resource underneath the silo stockpile. The conveyor discharge onto a DMS feed pulping box. The pulp flows onto a vibrating screen to separate the -2mm resource to be treated at the fines DMS plant.

The -10mm +2mm from the feed preparation screen is mixed with dense medium. The medium and resource mixture is then pumped to two dense medium cyclones. The cyclones separate the feed by density into two fractions, an overflow fraction (floats) and an under flow fraction (sinks).The overflow fraction of the two cyclones consists of reject materials and is conveyed to the reject pile for disposal. The underflow fractions consist of product and report to the coarse product collection conveyor

The magnetic separator recovers the dense medium for re-circulation to the pulping box.

The -2 mm material is pumped from the coarse DMS feed preparation screen underflow, and fed to the fines DMS feed preparation vibrating screen. The first part of the feed preparation screen deck is used to remove -0.5 mm material which is fed to the degritting and water removal circuit. The second part of the screen deck is used to dewater the -2mm +0.5mm fraction for removal of any adhering slimes.

The -2 mm +0.5 mm from the feed preparation screen is mixed with dense medium. The medium and resource mixture is then pumped to two dense medium cyclones. The cyclones separate the feed by density into two fractions, an overflow fraction (floats) and an under flow fraction (sinks).The overflow fraction of the two cyclones consists of reject materials and is conveyed to the reject pile for disposal. The underflow fractions consist of product and report to the coarse product collection conveyor

The magnetic separator recovers the dense medium for re-circulation to the pulping box.

A catchment sump with a floor spillage sump pump is provided for returning spillage into the medium.

Effluent and Water Handling

DMS effluent from the fines DMS plant is pumped into a degrit cyclone. The degrit cyclones overflows is re-used as make-up water, whilst the cyclones underflow streams discharge onto a dewatering screen

The oversize material from this screen is transferred to the waste conveyor system for disposal. The undersize stream would be returned to the degrit cyclone feed sump for re-use as make-up water.

The degrit cyclone feed sump is considered as a constant overflow tank, where the overflow of this sump gravitates to high-rate thickener. The thickener overflow gravitates into a clarified water pond for subsequent re-use as process water in the DMS plants. Thickener underflow is pumped to a slimes pond. A flocculent make-up and dosing plant provides a suitable, hydrated flocculent to the thickener to aid formation and maintenance of the thickener bed and assist with maintaining a clear overflow.

The pumped slimes are deposited in a tailings pond facility HDPE lined and capacity for an initial five year mine life. Clarified water from the slimes tailings deposition pond is returned to the clarified water pond via a water recovery pump.

Product handling and Stockpiling

The sinks fractions (product streams) from the coarse and fines DMS plants are conveyed and stacked on outdoor storage stockpiles.

Waste Handling and Storage

Rejects streams from the coarse, fines and grit of the DMS plants are collected, conveyed and stacked onto a waste dump.

Fresh and Potable Water

Fresh water is received in an open fresh water pond and distributed to the plant to feed potable water treatment plant, clarified water pond and the fire water net.

Plant Location

Plant location was defined based on the topography provided by MHS, analysis made and a site visit completed at the beginning of the study by MHS and SNC-Lavalin.

Refer to Figure 18.2.2_1 below for the General Site Layout of the facilities.

Figure 18.2.2_1 General Site Layout

18.3 Design of Infrastructure

18.3.1 Introduction

The design of infrastructure has been developed by SNC-Lavalin to a level of detail necessary to meet the Association for the Advancement of Cost Engineer's (AACE) standards for a class 3 estimate.

The infrastructure was designed to support a mine, plant and port to produce and ship approximately 325,000 tonnes of manganese per year with a total work force estimated at 213.

The following is a general description of the design infrastructure. This description is meant to offer the reader a general understanding of the key components of the design infrastructure. Forward-looking statements relate to future events or future performance and reflect current expectations and beliefs. By their nature forward-looking statements involve inherent risks and uncertainties and risks exist that forecasts and projections will not be achieved or that assumptions do not reflect future experience. Undue reliance should not be placed on these and other forward-looking statements.

18.3.2 Power and Distribution Systems

Electric power will be supplied by a packaged diesel generator sets owned and operated under a service contract provided by a third party company. The installed generating capacity will be approximately 3.63 Mw.

18.3.3 Port Facilities

Manganese product which is transported by truck from Los Pumas will be delivered to a storage facility located approximately ten kilometers from the port of Arica.

The storage facility is situated on 16,000 m2 of industrial land. Access to the facility is by an asphalt paved road. The product will be stored in a totally enclosed steel framed building, clad with a PVC membrane. The building has a storage capacity of approximately 45,000 tonnes of product.

To load the product in ships destined for China, the product will be transported by truck from the storage facility to a smaller pre-shipping storage building located in Terminal Puerto Arica (TPA) adjacent to the ship loading berth. The product will be loaded onto the ships directly from trucks as well as from this pre-shipping storage building.

18.3.4 Access Roads

Access from Arica to the Los Pumas Project area is via Route 11-CH and then onto the provincial road A-23 and then onto on a new access road which is approximately five and half kilometres long.

Route 11-CH is a national highway and is paved and in good condition. Provincial road A-23 currently consists of a granular material surface. The A-23 requires upgrading to bring it to a standard that meets the requirements of the additional traffic which will be introduced by the Project.

18.3.5 Water and Wastewater Systems

Fresh water is kept in a lined open fresh water pond. From the pond, it will be distributed to the plant to feed a potable water treatment plant, clarified water pond and the fire water network.

The potable water will be produced by a reverse osmosis treatment plant. The potable water is then distributed to the plant facilities and non process buildings.

A sewage treatment plant has been designed utilizing aeration and activated sludge technology to treat the raw sewage.

18.3.6 Waste Disposal Facilities

Slimes from thickener with approximately 54% solids are pumped to a tailings facility for the life of the project. Runoff water from the slimes tailings facility are returned to the clarified water pond. The Waste Disposal Facilities will have an approximate area of 160,000 m2.

18.3.7 Communications and Information Management Systems

The communications system for Los Pumas Manganese Project has been designed with hardware, software, links and services to provide data, voice, and networking capability. A fibre optic backbone will be installed to interconnect all of the LAN networks.

The communications and information systems include sub-systems for corporate IT, IP telephone and radio communications.

18.3.8 Hospital and Medical Facilities

The project will rely on the use of local medical clinics located at Putre as well as Arica's regional hospital which can be driven to in approximately two hours in the event that further treatment is required above what can be give at the local clinics.

18.3.9 First Aid Facilities

There will be a first aid facility located at the site, manned 24 hours per day, seven days per week by a qualified nurse. There will be an ambulance available full time. The First Aid facility will be sufficient for the treatment of minor injuries or illnesses, while the transportation of patients to Putre or Arica medical facilities will be available for the more serious cases.

18.3.10 Non Process Buildings

Various non process buildings and facilities have been designed to support the production of manganese:

- Administration offices
- Contractors offices
- Change rooms and ablution facilities
- Lunch rooms
- Mobile equipment workshop
- Plant workshop
- Warehouse
- Ferrosilicon storage

- Reagent storage
- Explosives storage
- Fuel storage
- Laboratory

18.3.11 Housing

Accommodation for the workforce will be provided by the Hotel Las Vicuñas. This facility was originally constructed to be the accommodation for the employees of the Choquelimpie gold and silver mine, which was developed by Billiton International Minerals.

A detailed survey has been undertaken of Hotel Las Vicuñas to identify the refurbishment required to provide a modern facility. The costs of hotel's refurbishment are included in the capital budget.

Amenities provided by Hotel Las Vicuñas include a full meal service in the hotel dining room, recreation areas, a wet bar, TV area and "public" internet access. The facility will be operated by an experienced catering services supplier.

Transportation from the Hotel Las Vicuñas in Putre to the mine site will be provided by bus

18.4 Capital Cost Estimates

18.4.1 Scope and Methodology

The capital cost estimate covers the scope of work defined in the Preliminary Economic Assessment (PEA) for the Los Pumas Project, as compiled by SNC-Lavalin Inc.

18.4.2 Basis of the Estimate

The methodology used to prepare the capital cost estimate is contained in the document SP910612-0000-33KA-0002, rev. 01. dated November 2, 2010, prepared by SNC-Lavalin. The Owner's Costs were developed and provided by MHS

The Summary Capital Cost Estimate is presented in table 18.4.2_1.

Table 18.4.2_1
Capital Cost Estimate

Ítem	Description	TOTAL (USD)
1	Direct Costs	$52,435,468
2	Indirect Costs	$8,377,820
3	Owners Costs	$5,304,177
3	Contingency	$8,177,967
	Capital Cost Estimated	**$74,295,432**

18.4.3 Accuracy Assessment

The capital cost estimate was prepared in compliance with the corporate standards guidelines for Capital Cost Estimate Classification for a Class 3 Budget Estimate, providing an accuracy range between +/-15%.

Engineering was developed in accordance to the required level to facilitate the production of the Class 3 Capital Cost Estimate, with a project definition equivalent to approximately 25% of the total engineering.

18.5 Operating Cost Estimates

18.5.1 Scope and Methodology

The OPEX estimate was developed by MHS/SNC-Lavalin based on information provided by SHM, SNC-Lavalin and third parties. SNC-Lavalin has not reviewed or validated any information provided by third parties for purposes of developing the OPEX estimate

The operating cost estimates include the operating costs of:

- mining
- the processing plant
- on-site and off-site services
- transportation costs to and from site
- product transportation
- shiploading of final product
- on-site and off-site overhead costs

Mining costs are in accordance with prices provided by an experienced specialist mining contractor as the result of a Request for Proposal.

Operating costs of the Processing Plant covered spares, consumables, lubricants, mobile equipment and maintenance costs. Maintenance costs are calculated according to the value provided by the vendor of spare parts of equipment, per year of operation. In the absence of the provision of the cost of parts by vendors, the cost of spares is considered as 5% of the equipment value.

For the calculation of the salaries and wages for staff, this information is contained in the document “Organization Model” N° SP910612+0000-49ER-0005, dated August 30, 2010, as prepared by SNC-Lavalin.

The most significant on-site services costs are those for the provision of laboratory service and the generation of electric power. The cost of the provision of laboratory service, are in accordance with a proposal received from a specialist provider of such services. The provision of electric power will be under a build, own and operate (BOO) contract, under which power will be paid on an installed capacity basis and for actual units of power supplied. Diesel fuel will be provided by MHS up to a guaranteed consumption rate provided by the BOO contractor. The provision of fuel will be in accordance with a supply contract with the fuel provider which has been the subject of a Request for Proposal.

The product haulage cost from the plant to the stockpile in Arica and from the stockpile to the port for shipping, are in accordance with a proposal received from an experienced contractor as the result of a Request for Proposal process.

The shiploading costs include the cost of Front End Loader to load trucks that carry the product from the stockpile at Arica to the port, stevedoring costs, and product sampling and analysis. An allowance has been made for demurrage cost on the basis of four vessels being delayed per year and two days delay per Vessel.

On-site and off-site overhead costs include for salaries and wages, supplies and consumables, services, insurances, transport and accommodation.

18.5.2 Cost Breakdown Structure (CBS)

The operational cost breakdown was provided by MHS from their previous experience in the operation of similar plants.

18.5.3 Basis of the Estimate

The Operational Cost Estimate was delivered in document SP910612-0000-49ER-0003, rev. 00, dated September 22, 2010, as prepared by SNC-Lavalin, in which is presented the estimated OPEX according to the cost breakdown structure and the basis of estimate in which is presented the methodology used for the preparation of the OPEX.

The Operational Cost Estimate is presented in Table 18.5.3_1.

Table 18.5.3_1

Operational Cost Estimate

Cost Centre	**Annual Cost (First Full Year)**	**Unit Cost / t Product (334,191 tpa)**
Mining	$9,859,645	$29.50
Processing	$8,050,224	$24.09
Minesite & Plant Services	$4,797,321	$14.36
Logistics	$11,399,554	$34.11
Site Overheads	$3,948,748	$11.82
Offsite Administration	$517,127	$1.55
Community Agreement Charges	$215,000	$0.64
Total	**$38,787,619**	**$116.06**

18.5.4 Accuracy Assessment

The Operation Cost Estimate (OPEX) provides an accuracy range between +/- 15%.

18.6 Los Pumas Manganese Product

18.6.1 General

The Los Pumas resource will have high silica content, which is an important element in the production of silico-manganese alloys. These products are critical components in the construction industry which has increasing demands in developing countries

18.6.2 Target Specification

Mn	38%	Minimum
Sio2	20% - 24%	Range
Fe	1.5%	Maximum
P	0.09%	Maximum
Al2o3	7%	Maximum

Sizing: 0.5 mm to 10 mm [Nominal]

18.6.3 Pricing Assumptions

The financial model assumes that the sale price of manganese product will be $7.40 per dry metric tonne unit, FOB Arica Port.

Please note that this is a forward looking statement and cannot be guaranteed to be the actual price received. $7.40 is above the current spot price but less than the forecast price for 2011 and 2012.

18.7 Economic Analysis

The financial evaluation of the Project was undertaken using the Discounted Cash Flow (DCF) method. This method of evaluation is based on the assumption that the value of an asset depends on its future cash flows, discounted to their Net Present Value (NPV) at an appropriate discount rate, usually the weighted average cost of capital. DCF valuations are particularly applicable to assets with limited lives.

The financial model of the Project predicts an after tax cash surplus of $219 million. Discounted over the life of the project this gives a NPV of $91 million. The discount rate used was 10%.

The IRR is the discount rate at which the NPV is zero. It can be viewed as the interest rate earned on monies invested in the project. The after tax IRR for the project is 49%. The financial model is based on full equity funding of all capital requirements.

The financial evaluation of the project indicates that there is a need for capital funding $82 million prior to generating revenues from sales. Sales revenues are expected to exceed the capital and operating costs in under two years from the start of operations.

The financial model is based on the processing of 27 million ROM tonnes of diluted resource. For this to occur there is a need to convert the inferred category of resource into either measured or indicated.

In the unlikely scenario where no inferred resource is converted and mined, the after tax cash surplus and NPV reduces to US$139 million and $63 million respectively (with an after tax IRR of 46%).

The parameters that have the largest influence on the financial model are the expected recovery of manganese units from the ROM resource and the sale price received for the product.

On the following pages the Mining and Processing Schedule, Table 18.7_1 and the Financials Pre-Debt Results, Table 18.7_2 are presented.

Table 18.7_1 Mining and Processing Schedule

SOUTHERN HEMISPHERE MINING LTD

LOS PUMAS MANGANESE PROJECT

MINING & PROCESSING SCHEDULE

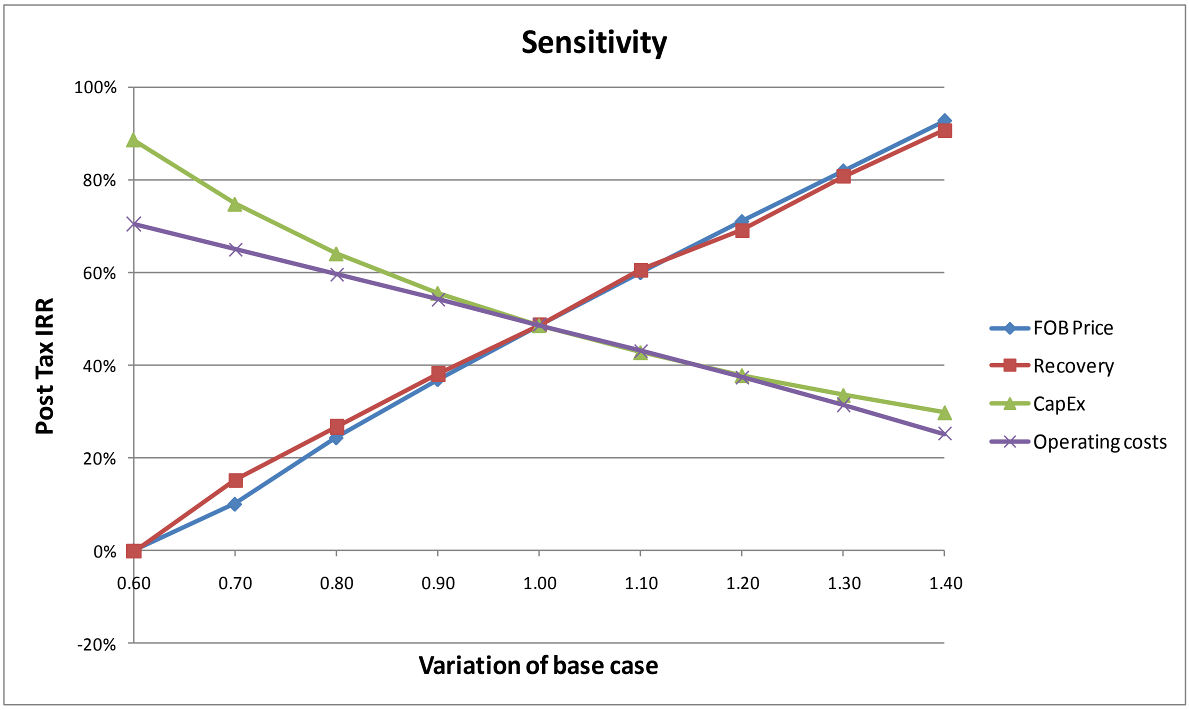
PHYSICALS SCHEDULE	Period		Total Year 2011/2012	Total Year 2012/2013	Total Year 2013/2014	Total Year 2014/2015	Total Year 2015/2016	Total Year 2016/2017	Total Year 2017/2018	Total Year 2018/2019	Total Year 2019/2020	Total Year 2020/2021	Total Year 2021/2022	Total
		Months												
PHYSICALS						**Dilution allowance**								
	yes					Waste added as % of modelled ore			30%					
MINING	Inferred resources included in the mining schedule					Grade of added waste Mn%			2.2%					
Summary - adjusted for dilution														
Total material movement	dry bcm		649,885	1,901,761	1,956,906	1,810,361	2,451,446	2,248,376	2,721,172	2,865,008	2,863,288	2,075,029	1,527,552	23,070,784
Waste mined	Dry bcm		273,432	731,113	792,233	563,328	1,175,981	918,438	1,228,473	1,949,317	1,825,997	1,034,516	447,686	10,940,513
Resource mined	Dil dry bcm		376,453	1,170,648	1,164,674	1,247,033	1,275,465	1,329,939	1,492,699	915,691	1,037,291	1,040,514	1,079,866	12,130,271
Resource mined	Dil dry tonnes		855,316	2,666,306	2,704,638	2,837,114	2,796,775	2,961,223	3,262,405	1,986,982	2,273,569	2,277,022	2,355,532	26,976,881
Resource grade	Dil % Mn		7.9%	7.9%	8.1%	7.2%	5.7%	5.9%	4.6%	4.2%	4.6%	4.6%	3.9%	5.84%
Stripping Ratio			0.7	0.6	0.7	0.5	0.9	0.7	0.8	2.1	1.8	1.0	0.4	0.9
ROM Stockpile movements														
Opening ROM	Dil dry tonnes		0	95,097	136,402	216,041	428,154	599,930	936,153	1,573,557	935,540	584,108	236,130	
	Dil % Mn		0.0%	5.0%	3.4%	3.1%	2.9%	2.9%	3.0%	2.9%	2.9%	3.0%	3.1%	
Added stocks	Dil dry tonnes		855,316	2,666,306	2,704,638	2,837,114	2,796,775	2,961,223	3,262,405	1,986,982	2,273,569	2,277,022	2,355,532	26,976,881
	Dil % Mn		7.9%	7.9%	8.1%	7.2%	5.7%	5.9%	4.6%	4.2%	4.6%	4.6%	3.9%	5.84%
Resource processed	Dil dry tonnes		760,219	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,591,661	26,976,880
	Dil % Mn		8.2%	8.1%	8.3%	7.6%	5.9%	6.2%	5.1%	3.9%	4.3%	4.4%	3.9%	5.84%
Closing ROM	Dil dry tonnes		95,097	136,402	216,041	428,154	599,930	936,153	1,573,557	935,540	584,108	236,130	1	
	Dil % Mn		5.0%	3.4%	3.1%	2.9%	2.9%	3.0%	2.9%	2.9%	3.0%	3.1%	3.8%	
PROCESSING														
Main Plant millfeed														
Total	Dil dry tonnes		760,219	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,625,000	2,591,661	26,976,880
	Dil % Mn		8.22%	8.06%	8.30%	7.59%	5.95%	6.20%	5.06%	3.88%	4.33%	4.40%	3.87%	5.84%
	Mn units x 10^6	x million	6.2	21.2	21.8	19.9	15.6	16.3	13.3	10.2	11.4	11.6	10.0	157.45
Product produced	Dry tonnes		98,656	334,191	344,149	314,628	246,602	257,038	209,727	160,656	179,444	182,499	158,429	2,486,021
	% Mn		38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%
	Mn units x 10^6		3.7	12.7	13.1	12.0	9.4	9.8	8.0	6.1	6.8	6.9	6.0	94.47
PRODUCT STOCKPILES (WHARF)														
Opening Stockpiles	Dry tonnes		-	23,656	7,847	1,996	16,624	13,227	20,264	4,992	15,648	20,092	2,591	
	% Mn		0.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	
Added Stocks	Dry tonnes		98,656	334,191	344,149	314,628	246,602	257,038	209,727	160,656	179,444	182,499	158,429	2,486,021
	% Mn		38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%
Product Shipped (sold)	Dry tonnes		75,000	350,000	350,000	300,000	250,000	250,000	225,000	150,000	175,000	200,000	161,021	2,486,021
	% Mn		38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%	38.00%
	Mn units x 10^6		2.9	13.3	13.3	11.4	9.5	9.5	8.6	5.7	6.7	7.6	6.1	94
Closing Stockpiles	Dry tonnes		23,656	7,847	1,996	16,624	13,227	20,264	4,992	15,648	20,092	2,591	0	
	% Mn		38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	
	Mn units x 10^6		0.90	0.30	0.08	0.63	0.50	0.77	0.19	0.59	0.76	0.10	0.00	

Table 18.7_2 Financials Pre - Debt Results

SOUTHERN HEMISPHERE MINING LTD LOS PUMAS MANGANESE PROJECT FINANCIALS PRE-DEBT													
Year ending	Jun-11	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20	Jun-21	Jun-22	TOTAL
Year counter	1	2	3	4	5	6	7	8	9	10	11	12	
Physicals													
Product shipped (tonnes)	-	75,000	350,000	350,000	300,000	250,000	250,000	225,000	150,000	175,000	200,000	161,021	2,486,021
Product Grade % Mn	0.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	
Operational cash flows													
Revenue	-	20,387,000	98,420,000	98,420,000	84,360,000	70,300,000	70,300,000	63,270,000	42,180,000	49,210,000	56,240,000	45,982,105	699,069,105
Operating costs	-	-14,997,205	-38,787,620	-39,159,865	-37,675,393	-38,294,555	-37,778,222	-32,903,479	-27,519,023	-28,166,127	-27,356,669	-25,323,193	-347,961,351
Gross profit	-	5,389,795	59,632,380	59,260,135	46,684,607	32,005,445	32,521,778	30,366,521	14,660,977	21,043,873	28,883,331	20,658,912	351,107,754
Financials													
Income statement													
Revenue	-	20,387,000	98,420,000	98,420,000	84,360,000	70,300,000	70,300,000	63,270,000	42,180,000	49,210,000	56,240,000	45,982,105	699,069,105
Operating costs	-	-14,997,205	-38,787,620	-39,159,865	-37,675,393	-38,294,555	-37,778,222	-32,903,479	-27,519,023	-28,166,127	-27,356,669	-25,323,193	-347,961,351
Interest	-	-	-	-	-	-	-	-	-	-	-	-	
Depreciation	-	-2,041,506	-18,596,825	-14,363,154	-11,226,738	-8,921,149	-7,052,772	-5,725,536	-4,658,224	-3,790,526	-2,779,523	-1,788,764	-80,944,718
Tax expense	-	-602,692	-7,386,400	-8,081,457	-6,382,416	-4,155,173	-4,584,421	-4,435,377	-1,800,496	-3,105,602	-4,698,685	-3,396,627	-48,629,347
Profit after tax	-	**2,745,597**	**33,649,156**	**36,815,525**	**29,075,452**	**18,929,123**	**20,884,585**	**20,205,607**	**8,202,257**	**14,147,744**	**21,405,123**	**15,473,521**	**221,533,690**
Closing retained earnings	-	2,745,597	36,394,752	73,210,277	102,285,729	121,214,852	142,099,437	162,305,044	170,507,301	184,655,046	206,060,168	221,533,690	
Balance sheet													
Cash	-9,186,777	-72,463,104	-30,471,893	19,425,398	60,181,165	88,990,195	116,001,735	141,903,042	156,286,000	172,642,726	195,622,998	218,828,650	
Accounts receivable	-	1,019,350	4,921,000	4,921,000	4,218,000	3,515,000	3,515,000	3,163,500	2,109,000	2,460,500	2,812,000	-	
Inventory	-	1,630,960	7,873,600	7,873,600	6,748,800	5,624,000	5,624,000	5,061,600	3,374,400	3,936,800	4,499,200	-	
Fixed assets	9,186,777	73,308,251	56,011,426	42,948,273	33,021,534	25,000,385	18,847,613	13,822,076	10,113,853	7,023,326	4,493,804	2,705,039	
Total assets	-	**3,495,457**	**38,334,133**	**75,168,271**	**104,169,499**	**123,129,580**	**143,988,348**	**163,950,218**	**171,883,253**	**186,063,352**	**207,428,002**	**221,533,690**	
Accounts payable	-	749,860	1,939,381	1,957,993	1,883,770	1,914,728	1,888,911	1,645,174	1,375,951	1,408,306	1,367,833	-	
Share capital?													
Borrowings		-	-	-	-	-							
Retained earnings	-	2,745,597	36,394,752	73,210,277	102,285,729	121,214,852	142,099,437	162,305,044	170,507,301	184,655,046	206,060,168	221,533,690	
Total liabs and equity	-	**3,495,457**	**38,334,133**	**75,168,271**	**104,169,499**	**123,129,580**	**143,988,348**	**163,950,218**	**171,883,253**	**186,063,352**	**207,428,002**	**221,533,690**	
Cash flow statement													
Operating cash received	-	20,387,000	98,420,000	98,420,000	84,360,000	70,300,000	70,300,000	63,270,000	42,180,000	49,210,000	56,240,000	45,982,105	699,069,105
Operating cash paid	-	-14,997,205	-38,787,620	-39,159,865	-37,675,393	-38,294,555	-37,778,222	-32,903,479	-27,519,023	-28,166,127	-27,356,669	-25,323,193	-347,961,351
Tax paid	-	-602,692	-7,386,400	-8,081,457	-6,382,416	-4,155,173	-4,584,421	-4,435,377	-1,800,496	-3,105,602	-4,698,685	-3,396,627	-48,629,347
Working capital movements	-	-1,900,450	-8,954,769	18,612	1,753,576	1,858,758	-25,817	670,163	2,472,477	-881,545	-954,373	5,943,367	
Capex	-9,186,777	-66,162,980	-1,300,000	-1,300,000	-1,300,000	-900,000	-900,000	-700,000	-950,000	-700,000	-250,000	-	
Net cash flow	**-9,186,777**	**-63,276,327**	**41,991,211**	**49,897,291**	**40,755,767**	**28,809,030**	**27,011,541**	**25,901,307**	**14,382,958**	**16,356,725**	**22,980,273**	**23,205,652**	**218,828,650**
After tax operating surplus	-	**4,787,103**	**52,245,980**	**51,178,679**	**40,302,190**	**27,850,272**	**27,937,357**	**25,931,144**	**12,860,481**	**17,938,270**	**24,184,645**	**17,262,286**	**302,478,407**
	10%	NPV_rate											
After tax NPV	**91,227,216**												
After tax IRR	**48.6%**												
Pre tax cash flow	**-9,186,777**	**-62,673,635**	**49,377,611**	**57,978,748**	**47,138,183**	**32,964,203**	**31,595,962**	**30,336,684**	**16,183,454**	**19,462,328**	**27,678,958**	**26,602,279**	**267,457,997**
Pre tax NPV	**99,236,244**												
Pre tax IRR	**58.7%**												

The sensitivity of this base case to key variables is shown in the following graph:

Figure 18.7_1
Los Pumas Project – South Hemisphere Mining
Financial Evaluation Sensitivity to Key Variables



This assessment is preliminary in nature and includes inferred mineral resources in the financial analysis. The inferred resources are such that they are too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the preliminary assessment will be realised.

Mineral resources that are not mineral reserves do not have demonstrated economic viability.

19 INTERPRETATION AND CONCLUSIONS

The preliminary assessment of the Los Pumas Project indicates that the Project has the potential to provide an economic mining and processing operation.

The success of the project will depend heavily on the achievable sale price for manganese product and the ability of the processing plant to recover manganese units from the ROM resource feed. Having said that, the high rate of return predicted allows for considerable negative variance from the predicted parameters before the project becomes un-economic. Further work in developing the Project is justified.

Re-assessment of the resource model, further investigations into the metallurgical characteristics of the resource, refinement of the processing plant flow sheet and completion of permitting processes are all required to advance the project.

20 RECOMMENDATIONS

20.1 Current Status

The Project currently has assessed almost all elements to the level of a Feasibility Study, however the clear indications from the metallurgical test work are that optimization of the process flow sheet is warranted. This dictates the flow sheet is “unfrozen” and additional circuits considered for the purpose of scavenging manganese units currently lost to rejects.

Engineering is currently to a level of 25% in all areas, which meets the criteria for a Feasibility Study. The majority of the engineering would remain untouched as a result of the flow sheet optimization, and would be carried forward as is to the finalized study. Additional engineering and cost estimation should be carried out upon finalization of the flow sheet, and the final Feasibility Study published.

It is estimated that the proposed additional test work, engineering and cost estimation will be completed by the end of February 2011.

20.2 Next Phase Work Plan

The next phase of the Project is to finalize the Feasibility Study following the completion of the additional metallurgical and process design work identified as being required to finalize the process flow sheet. The intention to optimize the process flow sheet stems from the results of metallurgical test work during this PA and the confirmation from customers that a proportion of product sized below 0.5 mm can be accepted.

Specifically the proposed test work involves:

- Crush/ grind floats sample to 100% -1.2mm and recombine with -0.5mm fines utilizing a crushing/grinding process selected to minimise fines production
- Carry out optical /scanning electronic microscope qualitative to semi-quantitative investigation including modal analysis and liberation analysis
- Carry out WHIMS testing on Slon on re-crushed / ground floats from previous DMS test work
- Treat sample over shaking table varying water flowrate, angle and vibration amplitude to indicate response to water gravity separation with spirals or hindered settlers
- Additional laboratory Heavy Liquid Separation testing on a range of metallurgical samples by lithology classifications to confirm yield allocations to resource types.

It is estimated that this test work report will be completed by the end of the first quarter in 2011. The expected cost for this work program is US$200,000.

On the basis of the test work, the new optimised process flow sheet will be designed following the selection of the most effective technology to be used to scavenge the additional viable manganese units from the re-crushed / re-ground floats produced in the current flow sheet.

This design work is expected to cost US$50,000 and also be completed during the first quarter of 2011.

In addition, further mineral resource modelling and estimation is warranted following the replacement of missing drill hole increment analyses, allowing the completion of the geostatistical resource body analysis.

This work is estimated to cost US$400,000 and be completed during the first quarter of 2011. Results of this work will be utilised in mine planning and scheduling for inclusion in further feasibility studies.

The process of obtaining necessary environmental approvals from government agencies is on-going. It is expected that during the first quarter of 2011 US$25,000 will be required for this process.

21 REFERENCES

Coffey Mining - Los Pumas Manganese Project, Chile Technical Report, 14 October 2010

SNC Lavalin Draft Report 15 December 2010

Mining and Processing Schedule - Southern Hemisphere Mining

Financial Life of Mine Summary - Southern Hemisphere Mining

Declaracion de Impacto Ambiental - Minera Hemisferio Sur SCM

22 DATE AND SIGNATURE PAGE

The effective date of this Technical Report entitled "Los Pumas Preliminary Assessment" is December 20, 2010. The undersigned have prepared and supervised this Preliminary Assessment in accordance with National Instrument 43-101F1 guidelines for Technical Reports.

I Dreyer B.A. Sc Geol. MAusIMM
Principal Consultant

20 December 2010

23 CERTIFICATES OF AUTHORS

23 CERTIFICATES OF AUTHORS

Certificate of Qualified Person

Los Pumas Project, Chile, Technical Report, December 20 2010,
Southern Hemisphere Mining Limited

1. I, Ian Dreyer, employed from April 2010 as a Principal Geologist with the firm of Coffey Mining Pty Ltd, of 1162 Hay street, West Perth, Australia, 6005. My residential address is number 140 Bustamante y Ballivian, San Isidro 27, Lima, Peru and I do hereby certify that:
2. I am a practising geologist with 22 years of Mining and Exploration geological experience. I have worked in Australia, Tanzania, Chile, Peru and Brazil. I am a member of the Australasian Institute of Mining and Metallurgy (AusIMM)
3. I am a graduate of Curtin University of Technology and hold a Bachelor of Applied Science Geology (1980 – 1982). I have practiced my profession continuously since 1988.
4. I am a "qualified person" as that term is defined in National Instrument 43-101 (Standards of Disclosure for Mineral Projects) (the "Instrument").
5. I visited the property that is subject of this report on December 15, 2010.
6. I am responsible for Sections 1 –15,17, 18.1, 18.6 and 19 – 21 of this report.
7. I have supervised the compilation work done by Manuel Hernandez, Civil Mining Engineer, from the referenced documentation to integrate the whole of this report.
8. I hereby consent to the use of this Report and my name in the preparation on documents for a public filing including a prospectus, an annual information filing, brokered or non-brokered financing(s), or for the submission to any Provincial or Federal regulatory authority.
9. I have read and understand National Instrument 43-101 and am independent of the issuer as defined in Section 1.4 and prior to visiting Los Pumas I had no involvement in or knowledge of the property that is the subject of this report.
10. I have read the National Instrument 43-101F1 (the 'Form') and the report has been prepared in compliance with the Form.

11 I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Property that is the subject of this report and do not hold nor expect to receive securities of Southern Hemisphere Mining Limited.

12 As of the date hereof, to the best of my knowledge, information and belief, the Techincal Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Santiago, Chile, on 20 December 2010

Ian Dreyer
Principal Consultant

B.A Sc Geol. MAusIMM

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5 January 2010
TO WHOM IT MAY CONCERN

CERTIFICATE OF AUTHOR

I, Andrew Richards, B.Sc(Hons), MAusIMM, MAIG do hereby certify that:

I am Director of Arc Resources Pty Ltd, of 143 Angelo Street, South Perth, Western Australia 6151.

I have a bachelor's degree in Science (Honours) from the University of Melbourne and have in excess of 31 years experience in the mining industry including positions as Managing Director of Dragon Mountain Gold Ltd, Chief Geologist with Newcrest Mining Ltd, Principal Consultant with Snowden Mining Industry Consultants and Senior Manager, Project Finance Unit for the Bank of Western Australia. I am a member of the Australian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists and meet the requirements to be a "qualified person" under the Canadian National Instrument 43-101 ("NI 43-101").

I have read NI 43-101 and believe that my contributions to the Technical Report have been compiled in accordance with the Instrument.

I am responsible for subsection 18.7 of the NI 43-101 Technical Report titled "Los Pumas Project, Chile Technical Report" dated December 20, 2010 that have been prepared in compliance with NI 43-101 and form and consent to the inclusion of these sections in the Technical Report.

I have not visited the site and have had no prior involvement with the property that is the subject of this Technical Report.

I am not aware of any material fact or material change with respect to the subject matter of this Technical Report that is not reflected in this Technical Report, the omission to disclose which makes this Technical Report misleading.

I am independent of the issuer applying all of the tests in section 1.4 of National Instrument 43-101.

Yours sincerely,

Andrew Richards
BSc(Hons),MAusIMM, MAIG
Director
Arc Resources Pty Ltd

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Date: 13 December 2010
Ref: J343\SHM 1012229A.doc

CERTIFICATE OF AUTHOR

I, Tony Frank Mason, Ph.D., C.Eng., F.I.M.M.M., do hereby certify that:

I am the principal metallurgist for Mineral Processors (WA) Pty Ltd, of 83A Wheatley Street, Gosnells, Western Australia 6110

I graduated with a Ph.D./B.Sc. (Engineering) in Metallurgy from Imperial College of Science & Technology, University of London on 7 August 1973.

I am a Fellow of the Institute of Materials, Minerals and Mining.

I have worked as a metallurgist for a total of 43 years in the mineral processing operations at numerous mining operations in many parts of Africa, South America, Australia, India, China and Indonesia.

I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.

I am responsible for section 16 of the NI 43-101 Technical Report titled Los Pumas Project, Chile Technical Report and dated 20 December 2010. that have been prepared in compliance with NI 43-101 and consent to the inclusion of this section in the Technical Report.

I have not visited the site and have had no prior involvement with the property that is the subject of this Technical Report.

I am not aware of any material fact or material change with respect to the subject matter of this Technical Report that is not reflected in this Technical Report, the omission to disclose which makes this Technical Report misleading.

I am independent of the issuer applying all of the tests in section 1.4 of National Instrument 43-101.

TF Mason

Tony F. Mason

Certificate of Qualified Person

Los Pumas Project, Chile, Technical Report, December 20, 2010, Southern Hemisphere Mining Limited

I, Daniel Gauthier, of Beloeil, Québec, Canada do hereby certify that:

1. I am currently employed as the Manager, Technology Group by:

   SNC-Lavalin Inc.
   455 René-Lévesque Blvd. West,
   Montréal, Qc
   Canada H2Z 1Z3

2. I graduated from the École Polytechnique of the Université de Montréal, with a mining engineering degree in 1975, and subsequently obtained a Master degree in Business Administration (M.B.A.) from University of Saskatchewan, Saskatchewan, in 1987.

3. I am member of Order of Professional Engineers of Québec, Québec Registration # 27646. I am a Member of the Canadian Institute of Mining, Metallurgy and Petroleum

4. I have worked as Junior metallurgist for Madeleine Mines from 1975 to 1977, as Tailing System Engineer, Mill Production Engineer and Assistant Mill Superintendent for Noranda, Mines Gaspé Division, from 1977 to 1981, as Process Engineer for Potash Corporation of Saskatchewan from 1981 to 1988, as Metallurgist for Kilborn et Associés Ltée from 1988 to 1994, as Senior Metallurgist and Project Manager (Metallurgy for Met-Chem Canada, from 1994 to 1997, as Chief Metallurgist, Minerals and Manager, Technology Group for SNC-Lavalin since 1997.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI43101") and certify that by reason of my education, affiliation with a professional association (as defined in NI43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI43-101.

6. I am responsible for subsection 18.2 Design of Metallurgical plant of the technical report titled "Los Pumas Project, Chile" and dated December 20, 2010 (the "Technical Report"), related to the Los Pumas Project, located in Northern Chile near the border of Peru and not far from the Bolivian border, in the Arica – Parinacota region (Region XV), 35 km from Putre.

7. I have not visited the Los Pumas project site and have had no prior involvement with the property that is subject to this Technical Report.

8. I have not worked on the Los Pumas Project prior to this Technical Report.

9. I am not aware of any material fact or material change with respect to the subject matter of section 18.2 of the Technical Report that I have been involved in and that is not reflected in section 18.2 of the Technical Report, the omission to disclose which makes section 18.2 of the Technical Report misleading.

10. I am independent of the issuer applying all of the tests in Section 1.4 of NI 43-101.

11. I have read national Instrument 43-101 and Form 43-101F1, and to my knowledge, section 18.2 of the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of section 18.2 of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated at Montreal, Québec, Canada, on 20 December 2010

Daniel Gauthier, eng.

Daniel Gauthier, Eng.
SNC-Lavalin

Certificate of Qualified Person

Los Pumas Project, Chile, Technical Report, December 20, 2010, Southern Hemisphere Mining Limited

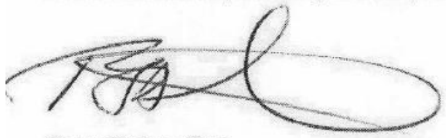
I, Pierre Dubuc, of St-Bruno, Québec, Canada do hereby certify that:

1. I am currently employed as the VP Projects Mining and Metallurgy Division by:

   SNC-Lavalin Inc.
   455 René-Lévesque Blvd. West,
   Montréal, Qc
   Canada H2Z 1Z3

2. I graduated from the École Polytechnique of the Université de Montréal, with a civil engineering degree in 1975.
3. I am member of Order of Professional Engineers of Québec, Québec Registration # 28021.
4. I have worked as the Engineering Manager for Quebec Cartier Mining. I have worked as a Project Manager for SNC-Lavalin since 1987.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI43101") and certify that by reason of my education, affiliation with a professional association (as defined in NI43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI43-101.
6. I am responsible for subsection 18.4: Capital Cost Estimate and 18.5: Operating Cost Estimate.
7. I have not visited the Los Pumas project site and have had no prior involvement with the property that is subject to this Technical Report.
8. I have not worked on the Los Pumas Project prior to this Technical Report.
9. I am not aware of any material fact or material change with respect to the subject matter of sections 18.4 and 18.5 of the Technical Report that I have been involved in and that is not reflected in sections 18.4 and 18.5 of the Technical Report, the omission to disclose which makes sections 18.4 and 18.5 of the Technical Report misleading.
10. I am independent of the issuer applying all of the tests in Section 1.4 of NI 43-101.
11. I have read national Instrument 43-101 and Form 43-101F1, and to my knowledge, sections 18.4 and 18.5 of the Technical Report have been prepared in compliance with that instrument and form.
12. I consent to the filing of section 18.4.and 18.5 of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated at Montreal, Quebec, Canada, on 20 December 2010



Pierre Dubuc, Eng.
SNC-Lavalin

Certificate of Qualified Person

Los Pumas Project, Chile, Technical Report, December 20, 2010, Southern Hemisphere Mining Limited

I, Robin Jones, of Vaudreuil, Québec, Canada do hereby certify that:

1. I am currently employed as a Project Manager by:

   SNC-Lavalin Inc.
   455 René-Lévesque Blvd. West,
   Montréal, Qc
   Canada H2Z 1Z3

2. I graduated from McGill University, with a mechanical engineering degree in 1983.

3. I am member of Order of Professional Engineers of Québec, Québec Registration # 38262. I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum.

4. I have worked as a Manufacturing Engineer, Senior Applications Engineer and a Technical Sales Representative for General Electric from 1983 to 1993; a Senior Electrical Engineer, Program Manager, Regional Operations Manager and Director, Safety and Loss Control for Lafarge from 1993 to 2005; a Project Manager for Strudes from 2005 to 2006; an Engineering Manager, Area Manager and Project Manager for SNC-Lavalin since 2006.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI43101") and certify that by reason of my education, affiliation with a professional association (as defined in NI43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI43-101.

6. I am responsible for subsection 18.3 (Design of Infrastructure) of the technical report titled "Los Pumas Project, Chile" and dated December 20, 2010 (the "Technical Report"), related to the Los Pumas Project, located in Northern Chile near the border of Peru and not far from the Bolivian border, in the Arica – Parinacota region (Region XV), 35 km from Putre.

7. I have not visited the Los Pumas project site and have had no prior involvement with the property that is subject to this Technical Report.

8. I have not worked on the Los Pumas Project prior to this Technical Report.

9. I am not aware of any material fact or material change with respect to the subject matter of subsection 18.3 of the Technical Report that I have been involved in and that is not reflected in subsection 18.3 of the Technical Report, the omission to disclose which makes subsection 18.3 of the Technical Report misleading.

10. I am independent of the issuer applying all of the tests in Section 1.4 of NI 43-101.

11. I have read national Instrument 43-101 and Form 43-101F1, and to my knowledge, subsection 18.3 of the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of subsection 18.3 of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated at Montreal, Quebec, Canada, on 20 December 2010

Robin Jones, Eng.
SNC-Lavalin