MMX Mineração e Metálicos S.A.
NI 43-101 Technical Report
Corumbá Iron Project
Brazil

Mineração e Metálicos S.A.
Praia do Flamengo 154/4°
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SRK Project Number 162703

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Effective Date: September 30, 2007
Report Date: March 10, 2008

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Summary (Item 3)

SRK Consulting (US), Inc., (SRK) was commissioned by MMX Mineração e Metálicos S.A. (MMX) to prepare a Canadian Securities Administrators (CSA) National Instrument 43-101 (NI 43-101) Technical Report for the Corumbá Iron Project (Corumbá Project) located in Mato Grosso do Sul State, Brazil. The subject of this report is Mine 63, an operating mine producing Lump and Sinter Feed, and an exploration property, Urucum NE. The project is owned and operated by MMX Corumbá Mineração Ltda (MMX Corumbá), a subsidiary of MMX.

Property Description and Accessibility

The Corumbá Project is located near the city of Corumbá in the state of Mato Grosso do Sul, close to the border of Brazil and Bolivia, at coordinates 19º 11' 41"S and 57º 36' 50"W.

The Corumbá Project consists of Mine 63, an operating mine, and the Urucum NE and Rabicho exploration areas. Mine 63 is located approximately 19.5km from the city of Corumbá, the capital of Mato Grosso do Sul, Brazil; access is by paved highway BR-262 for 16km and then by unpaved roads to the property. Urucum NE is located at about 5 km eastern of Mine 63. Access is by paved highway BR-262 for 10 km from the city of Corumbá and then by unpaved road for 10 km

Project History and Ownership

MMX Corumbá controls 20 mineral rights in the Corumbá Project area, including two mining concessions covering the mine area, 16 exploration permits, and two requests for surveys. The mining concessions and permits cover a total area of 9495.98ha. The mineral resources and ore reserves reported in this report are completely contained within the mining and exploration concessions. MMX Corumbá controls the surface rights at the mine through lease agreements with the property owners and has permission from the landowners to conduct exploration on the Urucum NE resource area.

Sociedade Brasileira de Imoveis (SBI) started mining in the area in 1958, with the extraction of colluvial iron ore, and production of pig iron at its plant near the SBI port. When the price of pig iron dropped in 1973, SBI constructed a beneficiation plant for iron and manganese ore, which operated between 1974 and 1986. Between 1986 and 2000, activity was limited to underground mining for manganese ore. After 2000, production was restricted to mining and beneficiation of iron ore. MMX Corumbá acquired the mining concessions and the beneficiation plant in 2005 and started mining and processing operations in January 2006. Exploration at Urucum NE started in 2007.

Geology and Mineralization

The Corumbá Project lies within the Urucum iron-manganese district which is located along the Brazilian-Bolivian border and extends into the eastern areas of both Paraguay and Bolivia, and includes an area of 200km^2. The Urucum deposits are associated with banded iron formations (BIF), locally known as jaspelites, that are found in the Banda Alta Formation. The regional geology consists of Proterozoic-age igneous and metamorphic rocks, granite intrusions, and acid intrusives. The rocks are in faulted and unconformable contact and are overlain by Quaternary sedimentary deposits which account for approximately 60% of the cover in the area.

The mineralization at Mine 63 is hosted in deposits of colluvium and eluvium, and the mineralization at Urucum NE is hosted by colluvium. The Eluvium is located on the flank of

Urucum Mountain and was formed by in situ silica leaching and the subsequent enrichment of iron in the jaspelite of the Banda Alta Formation. The Colluvium consists of a detrital deposit that forms an elongate fan at the base of Urucum Mountain. The iron grade in the colluvium is higher near the source rock and decreases with distance from the source.

Exploration

MMX Corumbá conducted the first exploration at Mine 63 in November 2005. Although mining occurred on the property prior to the acquisition by MMX, no exploration had been done. MMX's exploration program consisted of hand digging exploration pits, referred to as shafts, channel sampling, and diamond core drilling. Assaying was initially done by Laboratório de Caracterização Tecnológica (LCT) in Sao Paulo and later by SGS Geosol Laboratorios Limitada (SGS) in Belo Horizonte. The pulps initially analyzed at LCT were subsequently sent to SGS/Geosol for check analysis. Laboratory QA/QC consisted of sending pulps to Ultra Trace Analytical Laboratories Pty Ltd (UT) in Australia for analysis. There was generally good correspondence between SGS and UT, and the SGS results were deemed acceptable for resource estimation purposes.

Exploration at Urucum NE started in 2007, with a program of shaft excavation. The samples were prepared at the Mine 63 laboratory and were analyzed at SGS in Belo Horizonte. Laboratory QA/QC consisted of inserting standards samples and duplicates into the sample stream, and a check assay program with ALS Chemex Laboratory in Australia. Analysis of the QA/QC by Agoratek International indicated that there may be a low bias in Al_2O_3 and a high bias in P by SGS. The bias is being further investigated by Agoratek, and the database is considered acceptable for resource and reserve estimation.

Resources and Reserves

The resources were estimated by Prominas, a geologic and engineering consulting company in Belo Horizonte, Brazil. The Mine 63 area was divided into two separate models: the Eluvium area and Colluvium area. The Eluvium area has two rock types: eluvium and a smaller component of colluvium. The Colluvium area also has two rock types: colluvium and a smaller component of cemented breccia. Three dimensional solids were constructed for the two areas based on drillhole cross-sections.

The drillhole assays were composited into 5m lengths from the top of the hole, with breaks at the lithologic contacts; intervals of 2m or less were included with the preceding composite if the lithologies were the same, resulting in a minimum length of 3m and a maximum of 7m. Shaft and channel samples with lengths greater than 6m or which were located within 10m of a drillhole were excluded from the compositing routine. Internal waste intervals which were not assayed were assigned a value of zero prior to compositing.

Variography studies were done for each rock type in the Colluvium and Eluvium areas. Separate block models were created for the Colluvium and Eluvium areas with block sizes of 50 x 50 x 5m and 25 x 25 x 5m respectively. The 3D geologic models were used to assign a rock code and percentage to the blocks. Variography studies were done for each rock type in each area. Grade was estimated with ordinary kriging. Classification into Measured, Indicated, and Inferred Resources was based on kriging variance and regression slope. The total mineral resources, including ore reserves, of Mine 63 are tabulated in Table 1.

Table 1: Mineral Resources – Mine 63- Corumbá Project*

Classification	Mt	Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	(%)	LOI (%)
Measured	5.2	60.92	8.27	2.62	0.08	0.03	0.14	1.75
Indicated	40.4	51.90	16.81	2.67	0.06	0.53	0.14	1.51
Stockpiles	0.1	60.40	9.28	2.53	0.08	0.05	0.14	1.69
Total Indicated	**40.5**	**51.92**	**16.79**	**2.67**	**0.06**	**0.53**	**0.14**	**1.51**
Measured and Indicated	45.6	53.06	15.85	2.67	0.06	0.47	0.14	1.54
Inferred	14.0	53.26	16.08	2.83	0.06	0.55	0.15	1.67

* Tonnes are reported on a wet basis
Fe Cut-off grade is 30%

At Urucum NE, there is a single geologic domain, the Colluvium. The deposit was modeled as a gridded seam model (GSM), where the x and y dimensions of the block are fixed and the z dimension is variable. The assays were composited into a single composite for each shaft, resulting in an average length of 4.4m, with a minimum of 2m and a maximum of 5m. The 3D geologic solid was used to assign a rock code and percentage to the blocks. Variography was conducted in all horizontal directions and no preferred orientation was found was selected as best representing the mineralization. Grade estimation was by ordinary kriging in a three-pass procedure where each succeeding pass used a longer search range. The blocks were were assigned a resource classification according to the pass in which they were estimated. The resources at Urucum NE are given in Table 2.

Table 2: Mineral Resources – Urucum NE- Corumbá Project*

Classification	Tonnage (M t)*	Fe(%)	SiO_2 (%)	Al_2O_3 (%)	P(%)	Mn(%)	TiO_2 (%)	LOI (%)
Measured	3.17	55.23	15.2	3.09	0.056	0.12	0.18	1.72
Indicated	34.00	53.03	18.14	2.97	0.055	0.34	0.18	1.8
Measured and Indicated	37.17	53.22	17.89	2.98	0.055	0.32	0.18	1.79
Inferred	32.84	50.95	19.53	3.78	0.054	0.44	0.2	2.19

*Tonnes are reported on a wet basis
Fe cut-off grade (CoG) is 20%

Ore Reserves – Mine 63

In December 2006, a Lerchs Grossman pit optimization routine was run on the Mine 63 mineral resources in December 2006 using the following parameters:

- Mass recovery: 66%;
- Average product value: US$32/t;
- Mine cost RoM: US$1.38/t; Mine cost waste: US$1.00/t;
- Plant cost: US$3.39/t product;
- Transportation cost: US$3.12/t product;

- GandA: US$0.68/t product;
- Density: Colluvium 3.16g/cm^3; Eluvium 3.60g/cm^3; and
- Pit slope: 47^o Colluvium; 48^o Eluvium.

The reserves reported below were depleted for mine production through September 2007. The total reserves for Mine 63 are listed in Table 2.

Table 3: Ore Reserves - Mine 63 Corumbá Project*

Classification	Kt	Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
Proven	4.3	61.03	8.26	2.55	0.08	0.03	0.14	1.67
Probable	25.0	54.74	14.96	2.51	0.06	0.43	0.14	1.45
Stockpile	0.1	60.40	9.28	2.53	0.08	0.05	0.14	1.69
Total Probable	**25.1**	**54.76**	**14.94**	**2.51**	**0.06**	**0.43**	**0.14**	**1.45**
Total Proven and Probabl	**29.4**	**55.68**	**13.96**	**2.51**	**0.06**	**0.37**	**0.14**	**1.48**

* Tonnes are reported on a wet basis.
Fe (CoG) for Eluvium is 48.0% and Fe (CoG) for Colluvium is 56.1%.
Average Fe price used in reserve isUS$32.02.

Metallurgy and Process

Metallurgical testing at Mine 63 consisted of:

- A study of the correlation between run-of-mine (RoM) and Lump to establish the cut-off grade; and
- A study of the mass recovery to define the product yield of Lump and Sinter Feed.

The results of the tests indicate that at Mine 63 the average grade of the RoM must be 54.8% Fe. The mass recovery percentages for Lump and Sinter Feed are 55% and 11%, respectively.

Environmental

The environmental program at Mine 63 includes reclamation concurrent with mining and at the end of the mine life. The reclamation plan consists of recontouring and revegetation of the tailings facility, the mine and plant areas and the waste dumps. The reclamation will be monitored following closure of the mine for a period of five years.

Economic Analysis – Mine 63

The LoM plan and economics are based on the following:

- Reserves of 29.4Mt at an average grade of 55.7% Fe;
- A mine life of 8 years, at a designed production rate of 4,101ktpy;
- An overall average process recovery rate of 55% for Lump product and 11% for Sinter product over the LoM;
  - Mining costs per tonne of product are based on contract mining and are US$3.46 for 2008 and US$3.30 for the remaining LoM, and
  - Process costs per tonne of product are US$3.79 for 2008 and US$2.98 for the remaining LoM.

- G&A costs are as shown;
    - Sundry costs - mine planning, quality control, administration - US$1.90/t-product for 2008 and US$1.58/t-product for the remaining LoM,
    - Product transport – mine to port - US$1.99/t-product for 2008 and US$1.69/t-product for the remaining LoM,
    - Port terminal cost are included in the sales expenses, and
    - Corporate costs – miscellaneous - US$2.22/t-product for 2008 and US$1.78/t-product for the remaining LoM.
- A cash operating cost of US$8.55/t-ore (US$12.97/t-product combined);
- Total capital expenditures of US$32.8M have been incurred in 2005, 2006, and 2007. These capital costs are amortized/depreciated in accordance with a straight-line depreciation method supplied by MMX. However, the capital costs are not included in the financial model; and
- Total sustaining capital costs of US$26.8M LoM are included. MMX included mine closure costs in the sustaining capital. There is no allowance for salvage value.

The base case economic analysis results, shown in Table 4, indicate an after-tax net present value of US$76M at a 10% discount rate.

Table 4: LoM Economic Results (US$000s)

Description		LoM Value
Ore		
Ore RoM (Mt)		29.4
Grade		
Iron		55.7%
Lump Ore		
Process Recovery		55%
Sinter Ore		
Process Recovery		11%
Gross Revenue		
Lump Product		$430,108
Sinter Product		$77,272
	Gross Revenue	**$507,380**
Royalty (Taxes)		
Royalties		($22,662)
	Gross Income from Mining	**$484.718**
	US$/-ore t $16.51	
	US$/t-product $25.03	
Gross Income from Mining		**$484,718**
Operating Costs		
Mining		($64,259)
Process		($86,798)
GandA		(100,097)
	Operating Costs	**($251,154)**
	US$/t-ore $8.55	
	US$/t-product $12.97	
	Operating Margin	**$233,564**
	US$/t-ore $7.95	
	US$/t-product $1206	
Income Tax		
Income Tax		($71,847)
	Total Tax	**($71,847)**
	US$/t-ore $2.45	
	US$/t-product $3.71	
	NIAT	**$161,717**
	US$/t-ore $5.51	
	US$/t-product $8.35	
Capital Costs		
Sustaining		$34,866
Equipment – sunk capital – operating mine		$0
Mine Closure/Reclamation – incl in sustaining		$0
	Total Capital	**($34,866)**
	Cash Flow	**$126,738**
	$NPV_{10\%}$	**$76,069**

Conclusions

The Corumbá Project consists of an operating mine that has been in production since July 2006, Mine 63, and an exploration property, Urucum NE. The mineral resources and ore reserves have been estimated by Prominas under the direction of MMX. The project is well documented with original sources of drill logs, assays, and various reports, as well as an electronic database.

SRK has reviewed and validated the sample database, topography, geologic interpretation, and the resource estimation parameters. The resource block model has been verified through visual examination and by construction of swath plots through the deposit. The resource estimate follows industry standards and the resource classification is in accordance with CIM guidelines.

The metallurgical testwork has been reviewed by SRK and found to be valid.

MMX has the necessary mining and environmental permits and surface agreements to operate Mine 63 at the Corumbá Project and to conduct exploration at the resource area of Urucum NE.

The Corumbá Project team draws on its experience in the design and operation of Mine 63. The LoM is relatively short, the initial capital has been spent, and as such, the project is straightforward and does not require the extensive sensitivity analysis which is typical with long life projects. It is very likely this ore body will be extracted in the manner and time frame proposed by the operators.

The project economics indicate that:

- The Corumbá Project exhibits robust economics with a $NPV_{10\%}$ of US$76M; and
- SRK considers the Corumbá Project to be a relatively low-risk project given its relatively short mine life, good mining conditions,and conventional mining and processing methods.

Recommendations

The resource database could be improved by the following procedures in future programs:

- Sample intervals should be no longer than the bench height at the mine. This procedure would eliminate the problem of sample support where intervals longer than 6m were excluded from the compositing routine; and
- Intervals of internal waste should be analyzed with the same procedures as the surrounding samples. This would eliminate the doubts about the grade and the subsequent assignment of zero gradeto these intervals. MMX has instituted this practice with the 2007 exploration programs.

The resource estimate procedure at Mine 63 should be re-examined following future drilling and sampling programs to see if it could be simplified. The current estimation procedure is technically correct, but may be more complex than required for this deposit.

As mining progresses, a program of mined to model reconciliation should be instituted. This is a standard practice in mine operations and aids in evaluation and refining of the resource model.

The laboratory quality assurance/quality control (QA/QC) at Urucum NE indicates that there may be a bias in analyses of Al_2O_3 and P by SGS. SRK recommends this bias be further investigated.

1 Introduction and Terms of Reference (Item 4)

SRK Consulting (US), Inc., (SRK) was commissioned by MMX Mineração e Metálicos S.A. (MMX) to prepare a Technical Report for Mine 63 and Urucum NE of the Corumbá Iron Project (Corumbá Project) located in Mato Grosso do Sul State, Brazil to meet the requirements of Canadian National Instrument 43-101 (NI 43-101). Mine 63 is a producing iron ore mine and Urucum NE is an exploration property, both owned and operated by MMX Corumbá Mineração Ltda (MMX Corumbá) which is 70% owned by MMX and 30% by Centennium Asset Mining Fund LLC. Certain definitions used in this executive summary are defined in the body of this technical report.

This report reflects the most recent mineral resource and ore reserve estimation based on data produced through September 30, 2007.

1.1 Terms of Reference and Purpose of the Report

This Technical Report is intended to be used by MMX to further the development of the Property by providing an audit of the mineral resource and ore reserve estimates, classification of resources and reserves in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) classification system, and evaluation of the project.

MMX may also use the Technical Report for any lawful purpose to which it is suited. This Technical Report has been prepared in general accordance with the guidelines provided in NI 43-101 Standards of Disclosure for Mineral Projects.

1.2 Sources of Information

The underlying technical information upon which this Technical Report is based represents a compilation of work performed by MMX and several independent consulting firms. The studies and additional references for this Technical Report are listed in Section 20. SRK has reviewed the project data and incorporated the results thereof, with appropriate comments and adjustments as needed, in the preparation of the Technical Report.

1.3 Effective Date

The effective date of the resources and reserves stated in this report is September 30, 2007. The report date is March 10, 2008.

1.4 Reliance on Other Experts (Item 5)

SRK's opinion contained herein is based on information provided to SRK by MMX throughout the course of SRK's investigations. The sources of information include data and reports supplied by MMX and MMX Corumbá personnel as well as documents cited in Section 20.

1.5 Material Litigation

SRK has been advised by MMX that there is no litigation concerning the Corumbá property.

1.6 Qualifications of Consultant (SRK)

The SRK Group comprises of 750 staff, offering expertise in a wide range of resource engineering disciplines. The SRK Group's independence is ensured by the fact that it holds no equity in any project and that its ownership rests solely with its staff. This permits SRK to provide its clients with conflict-free and objective recommendations on crucial judgment issues. SRK has a demonstrated record of accomplishment in undertaking independent assessments of mineral resources and mineral reserves, project evaluations and audits, technical reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies and financial institutions worldwide. The SRK Group has also worked with a large number of major international mining companies and their projects, providing mining industry consultancy service inputs.

This report has been prepared based on a technical and economic review by a team of consultants sourced principally from the SRK Group's Denver US office. These consultants are specialists in the fields of geology exploration, mineral resource and mineral reserve estimation and classification, open pit mining, mineral processing and mineral economics.

Neither SRK nor any of its employees and associates employed in the preparation of this report has any beneficial interest in MMX or in the assets of MMX. SRK will be paid a fee for this work in accordance with normal professional consulting practice.

The individuals who have provided input to this technical report, who are listed below, have extensive experience in the mining industry and are members in good standing of appropriate professional institutions. The key project personnel contributing to this report are listed in Table 1.6.1.

Dr. Neal Rigby, Leah Mach, and Sten Johansson are the Qualified Persons (QP) for this report. Leah Mach visited the site between September 25 and 27, 2007. During the site visit, Ms Mach inspected the exploration shafts and drill core, laboratory, visited the processing plant, reviewed the general infrastructure of the mine, and toured the mine site. Ms Mach is responsible for the overall preparation of the report and specifically for Sections 1 through 13, 15.1 through 15.2, 16 and 18 through 22 of this Technical Report. Dr. Rigby visited the Corumbá Project property on January 6, 2006. Dr. Rigby inspected the exploration shafts, inspected the drill core, reviewed the general infrastructure of the mine, and toured the mine site. Dr. Rigby is the Qualified Person responsible for the review of the report and specifically for Sections 15.3 and 17. Sten Johansson, a qualified person for the report, also visited the site on September 25 through 27 and is responsible for Section 14. George Borinski visited the site on September 25 through 27, 2007.

Certificate of Authors are provided in Appendix A.

Table 1.6.1: Key SRK Project Personnel

Name	Discipline
Leah Mach	Resource Estimation, Project Manager, QP
Antonio Carlos Girodo	Resource Estimation and Reserve Conversion
Michael Elder	Mining and Infrastructure
S E E Johansson	Processing, QP
George Borinski	Environmental and Permitting
Dr. Antonio Peralta	Project Economics and Valuation
Dr. Neal Rigby	Project Review, Mining, QP

2 Property Description and Location (Item 6)

2.1 Property Location

The Corumbá Project is located near the city of Corumbá in the state of Mato Grosso do Sul, Brazil near the border with Bolivia, at coordinates 19º 11' 41"S and 57º 36' 50"W, shown in Figure 2-1. The project consists of several prospects and one operating mine. The operating mine, Mine 63, and the Urucum NE Project are the subjects of this Technical Report. Figure 2-2 shows the mining concessions and Figure 2-3 shows surface property ownership.

2.2 Mineral Titles

2.2.1 Brazilian Mining Legislation

According to Brazil's Constitution, the survey, exploration and exploitation of mineral resources shall occur under federal authorization or concession and only Brazilian citizens or companies organized under Brazilian laws with headquarters located in the country may be entitled to practice such activities and, therefore, to obtain mining rights.

In addition, mining rights in Brazil are governed by the Mining Code and further rules enacted by Brazil's National Department of Mineral Production (DNPM), which is the governmental agency which controls mining activities throughout the country.

2.2.2 Authorization for Exploration

As stipulated in Article 14 of the Mining Code and Article 18 of the Decree, mineral exploration comprises the work necessary to measure and evaluate a resource and its technical and economic feasibility. The cited legislation also determines that the exploration may be carried out by means of on-site and laboratory studies, geological and geophysical studies, and any other type of geological exploration work.

DNPM's Local Officer grants the authorization to an interested party by means of an exploration permit, the "Alvará de Pesquisa". In order to obtain the Exploration Permit, the titleholder files an application with the DNPM. After analysis of the application, DNPM may issue an Exploration Permit valid for a period of one to three years. This period may be extended, subject to analysis of the exploration by the DNPM. The holder of the Exploration Permit (i) may assign or transfer it, provided that the assignee fulfills the legal conditions to hold the title; (ii) may, at any time, waive the Exploration Permit; (iii) shall be exclusively responsible for damages caused to third parties as a result of the performance of the exploration; and (iv) that the holder shall submit to DNPM a detailed report on the exploration activities prior to the final term of the Exploration Permit.

After DNPM reviews the detailed technical report on the exploration activities, the agency decides whether the development is technically and economically feasible. DNPM may withhold approval of the exploration process in cases where the work is insufficient or in the case of technical deficiencies in the report.

If the exploitation is considered technically and economically feasible, DNPM will approve the project. The holder of the Exploration Permit will then have one year to apply for the mining exploitation permit or negotiate the mining right with third parties. DNPM will only provide one extension to this time period. The extension must be obtained prior to the expiration of the first one-year term, and there is only one allowed extension for one additional year.

2.2.3 Concession for Mining Exploitation

After DNPM's approval of the exploration report, the interested party may apply for the concession of the mining exploitation, which is granted by Brazil's Ministry of Mines and Energy by means of a specific permit titled "Concessão de Lavra". Prior to granting the Exploitation Permit, DNPM shall verify that all legal requirements are fulfilled, including the prior exploration and the approval of the technical report by DNPM.

Under the Exploitation Permit, the holder of the mining rights shall be entitled to: (i) exploit the mine until it is completely exhausted; (ii) assign or transfer the title, provided that the assignee fulfills the legal conditions to hold the title; and (iii) waive the Exploitation Permit, subject to authorization by DNPM.

The holder of the exploitation permit has the responsibility to (i) exploit the mine according to a mining plan previously approved by DNPM; (ii) not interrupt the mining operation for a period of more than six consecutive months after the beginning of the operation; (iii) extract only minerals expressly mentioned in the Exploitation Permit; (iv) respect the applicable Environmental Law; (v) pay a financial compensation for the exploitation, the Financial Compensation for the Exploitation of Mineral Resources (CFEM).

2.2.4 MMX's Mineral Claims in Corumbá

MMX controls twenty mineral rights in the Corumbá Project area listed in Table 2.2.4.1 below. The total area covered by the mineral rights is 9495.98ha.

Table 2.2.4.1: Mineral Rights – Corumbá Project, Mine 63 and Surroundings

DNPM Process	Target	Municipality	Granting or Application Date	Former / Actual Owner	Area (ha)	Substance	Current Situation
807.200/71	Urucum NE	Ladário	26/03/1975	Luiz Arthur	995..62	Fe	Mining Request
823.955/71	Urucum NE	Ladário	26/12/1975	Mário Sérgio	370.04	Fe, Mn	Exploration Permit
868.253/05	Urucum NE	Ladário	13/09/2006	MMX Corumbá	635.24	Fe	Exploration Permit
868.045/05	Urucum NE	Ladário	08/09/2005	Eike Batista / MMX Corumbá	406.69	Fe	Exploration Permit
003.275/65	Rabicho	Ladário / Corumbá	28/02/1979	Gabrielle Haralyi	499.80	Fe	Mining Request
003.276/65	Rabicho	Corumbá	03/02/1975	Gabrielle Haralyi	500.10	Fe	Mining Request
003.277/65	Rabicho	Corumbá	29/09/1976	Gabrielle Haralyi	392.10	Fe	Mining Request
806.106/68	Rabicho	Ladário	31/08/1970	Mineração Dobrados	491.00	Fe	Mining Request
806.107/68	Rabicho	Ladário	31/08/1970	Mineração Dobrados	279.48	Fe	Mining Request
806.108/68	Rabicho	Ladário	18/11/1971	Mineração Dobrados	500.00	Fe	Mining Request
824.873/71	Rabicho	Corumbá	18/07/1973	Mineração Dobrados	999.45	Fe	Mining Request
868.252/05	Rabicho	Ladário	13/09/2006	MMX Corumbá	867.44	Fe	Exploration Permit
004.019/48	Mine 63	Corumbá/MS	6/02/84	SBI/ EBX Corumbaense (1)	349.33	Mn	Mining Permit
004.084/58	Mine 63	Corumbá/MS	21/05/81	SBI/ EBX Corumbaense	375.74	Fe	Mining Permit
868.046/05	Mine 63 Surroundings	Corumbá/MS	08/09/05	EFB / MMX (1) Corumbá	930.20	Fe	Exploration Permit
868.083/05	Mine 63 Surroundings	Corumbá/MS	23/06/05	Albertina / EBX Corumbaense	58.98	Fe	Exploration Permit
868.090/05	Mine 63 Surroundings	Corumbá/MS	08/09/05	EFB / MMX Corumbá	25.46	Fe	Exploration Permit
868.126/05	Mine 63 Surroundings	Corumbá/MS	03/11/05	EFB / MMX Corumbá	116.34	Fe	Exploration Permit
868.138/05	Mine 63 Surroundings	Corumbá/MS	30/06/05	EFB / MMX Corumbá	700.95	Fe	Survey Request
868.251/05	Mine 63 Surroundings	Ladário/MS	31/10/05	EBX Corumbaense	2.02	Fe	Survey Request

(1) CFEM – Financial Compensation for the Exploitation of Mineral Resources

Mine 63 and Surrounding Area

The reserves described in this report are restricted to the area covered by mining permits 004.019/48 and 004.084/58. Mining permit 004.019/48 was originally related to manganese ore. Subsequently, this was communicated to DNPM, as the first step to the new substance amendment. The feasibility report for iron ore was provided to DNPM using appropriate reporting procedures and forms, on March 22, 2006, together with the request for amendment of the title to also include iron.

The registered owner of mining permits 004.019/48 and 004.084/58 is Sociedade Brasileira de Imoveis (SBI). MMX Corumbá is the present owner of 004.084/58 through a purchase agreement and is awaiting the change of ownership in the DNPM. MMX Corumbá controls 004.019/48 through a lease agreement with SBI.

There are an additional six exploration licenses in the Mine 63 area. The applications for permits 868.046/05, 868.090/05, 868.126/05 and 868.138/05 were originally made by Eike Batista, the principal shareholder of MMX, and the respective assignment of the right to MMX was requested from DNPM on June 23, 2006.

Permit 868.083/05 was originally owned by Albertina Maria Brazoli; the permit was purchased from Brazoli and the assignment of the right to MMX was requested from DNPM on November 22, 2006.

Urucum NE and Rabicho

There are four mineral permits in the Urucum NE area including three exploration permits and one application for mining. In the Rabicho area there are eight mineral permits including one exploration permit and seven applications for mining. All these permits, except two in the Urucum NE area which are held by MMX Corumbá, are controlled by the Haralyi family as individuals or through Mineração Dobrados. The permits held by individuals of the Haralyi family are in the process of being transferred to Mineração Dobrados.

MMX Corumbá executed a contract in July 2006 with the Haralyi family in which it was agreed that MMX Corumbá would purchase all shares in Mineração Dobrados for US$14M once all the permits were transferred to Mineração Dobrados. MMX Corumbá has paid US$1M as a down payment and will pay the remainder immediately upon transferal of all permits to Mineração Dobrados. MMX expects that the transfer will be complete in the first half of 2008.

2.2.5 Maintenance of Mineral Claims

In order to maintain the exploration permits in good standing, the holder must:

- Pay an Annual Tax per Hectare (TAH) to the DNPM until the end of exploration. The TAH is charged in the amount of (i) R$1.55/ha during the original term of the permit and (ii) R$2.34/ha during the extensions of the term. Note that costs per hectare are in Brazilian Reais;
- Pay expenses incurred by DNPM during inspections of the exploration area; and
- Submit an exploration work report before the expiration date of the term.

In order to maintain the exploitation permits (mining concessions) in good standing, the holder must:

- Pay the CFEM tax mentioned in Section 2.2.3 of this report;
- Pay the surface owner a compensation of 50% of the CFEM tax; and
- Present an annual report by March 15th of each year, describing all aspects of the mineral exploitation.

2.3 Location of Mineralization

SRK reviewed correspondence, pertinent maps and agreements to assess the validity of land tenure and ownership of the mining rights for the properties held by MMX. Mine 63 is located within the area covered by the mining permits 004.019/48 and 004.084/58 (shown in Figure 2-2). The Urucum NE resource is contained within exploration permits 807.200/71 and 823.955/71.

2.4 Legal Surveys

The mineral concessions in Brazil are paper filings and do not require the actual location of monuments on the ground. The filing includes descriptions of the corners of the concessions in Geographical Coordinate System with the South American Provisional 1956 datum (DATUM SAD_69).

The northern and eastern boundaries of the mineral concessions of Mine 63 are contiguous with Companhía Vale do Rio Doce's (Vale) boundaries and those corners are marked with concrete monuments. The monuments were established by Vale and have been confirmed by MMX.

2.5 Royalty Agreements and Encumbrances

There are no royalties as such on the Corumbá property. There is a tax, the Compensation for the Exploitation of Mineral Resources (CFEM), levied on the sale of raw or improved minerals. This tax is based on the type of commodity. The holder of the permit also is required to financially compensate the holder of the surface rights by an amount equal to 50% of the CFEM tax.

2.6 Environmental Liabilities

MMX has informed SRK that there are no known environmental liabilities in relation to the mineral rights and its previous owners.

2.7 Permits and Licenses

MMX Corumbá has been granted the following licenses and permits to conduct exploration and operate Mine 63:

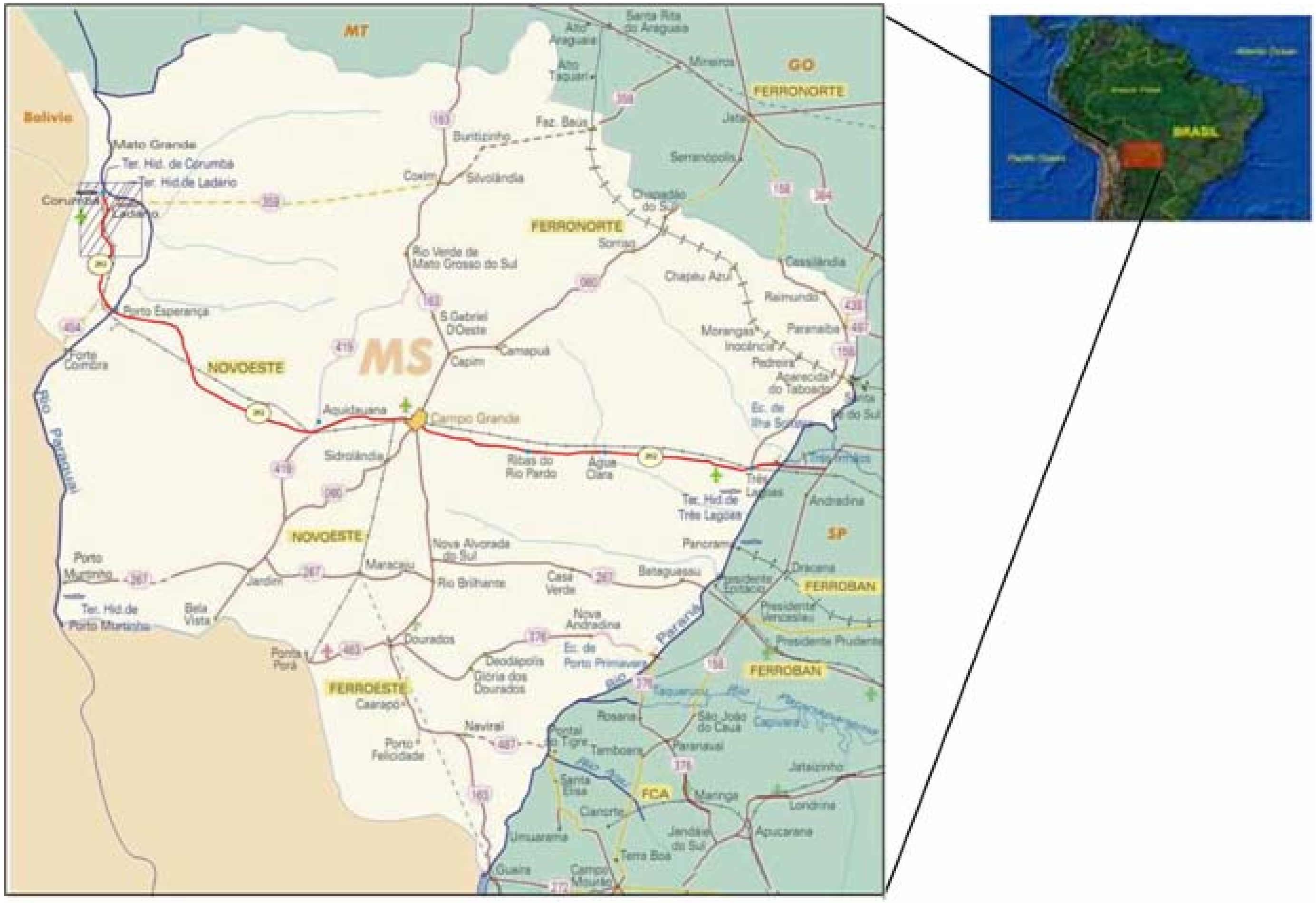
- Permit for disturbance of vegetation, ASV 073/2005, issued on October 26, 2005 by the Brazilian Institute for the Environment (IBAMA), for the installation of the mine infrastructure and for the development of mining operations covering 19.3ha;
- Permit for disturbance of vegetation, ASV 089/2006, issued on July 11, 2006 by IBAMA, for the execution of geological surveys covering 8.11ha;
- Operating License LO 002/1991 (Amended), issued on October 26, 2005 by IBAMA, authorizing 3.3Mtpy;
- Renewal of Operating License LO 002/1991 (Amended), issued on November 01, 2007 by IBAMA, authorizing 3.3Mtpy until November 1, 2011;
- Operating License LO 387/2006, issued on September 28, 2006 by Special Environment Secretariat/Mato Grosso do Sul (SEMA/MS) for the use of groundwater in the mine operations;
- Permit for vegetal suppression ASV 194/2007, issued on November 1, 2007 by IBAMA, for the construction of tailing dam, stockpile and opening new mining areas; and
- Statement of the State Environmental Agency authorizing exploration at Urucum NE area.

MMX has informed SRK that no other permits are required to conduct exploration or operate Mine 63 or conduct exploration at Urucum NE.

2.8 Surface Access

MMX Corumbá does not own the surface rights in the area of Mine 63, but has lease agreements with the owners. Part of the area is on SBI land and part is on the Fazenda São Francisco do Urucum. The lease agreement with the owner of the farm includes access to the plant area, and permission to use an area of 6ha for the tailings facility and to collect borrow material for the tailings dam from a 4ha area. MMX has exploration agreements with the surface owners at Urucum NE to open access roads, dig exploration shafts and collect samples.

The area of the mining concessions and the surface agreements are shown in Figure 2-3.



SRK Job No.: 162703.03

File Name: Figure 2-1.doc

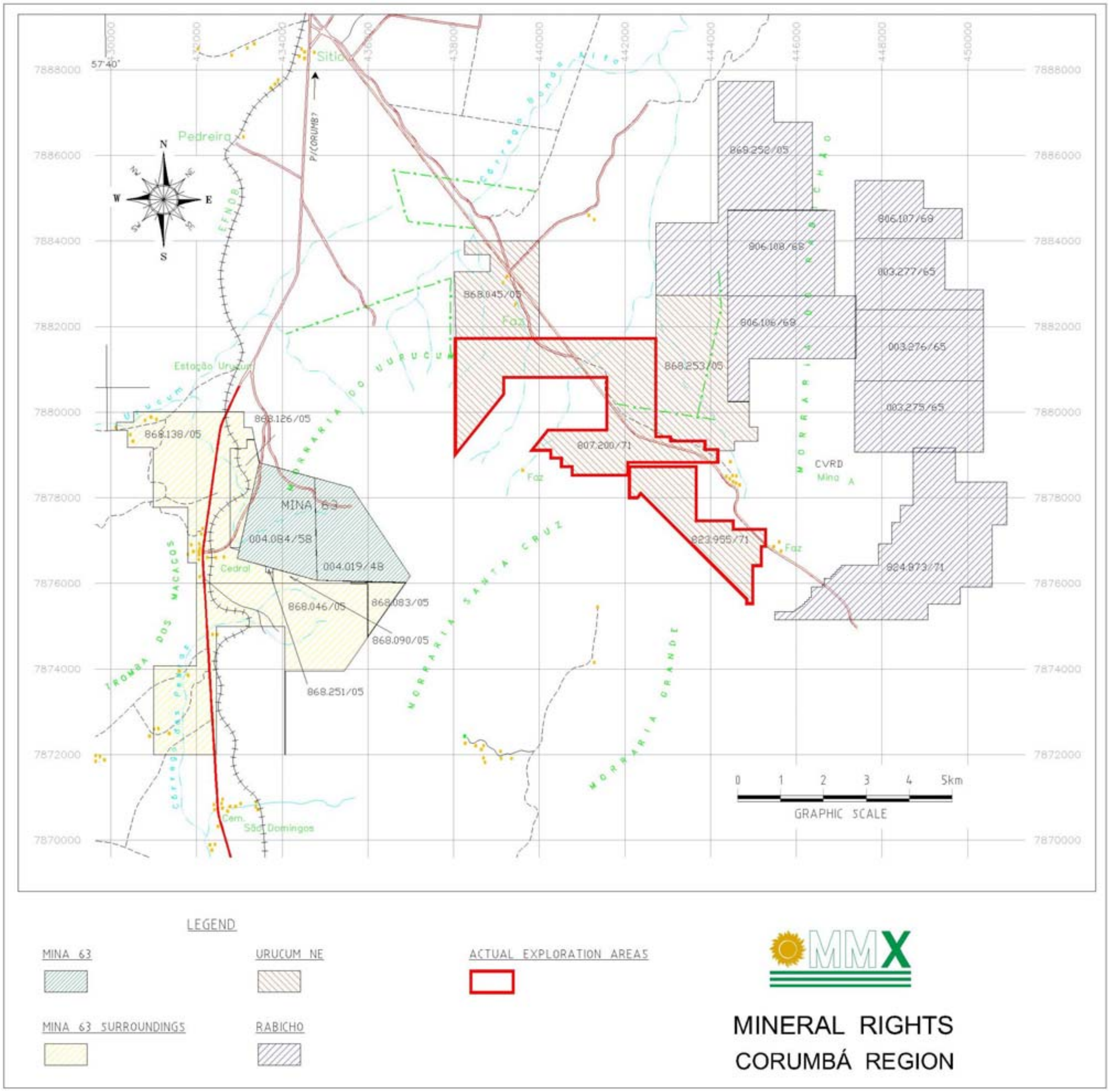
Corumbá Project, Brazil

Source: Mineração & Metálicos S.A.

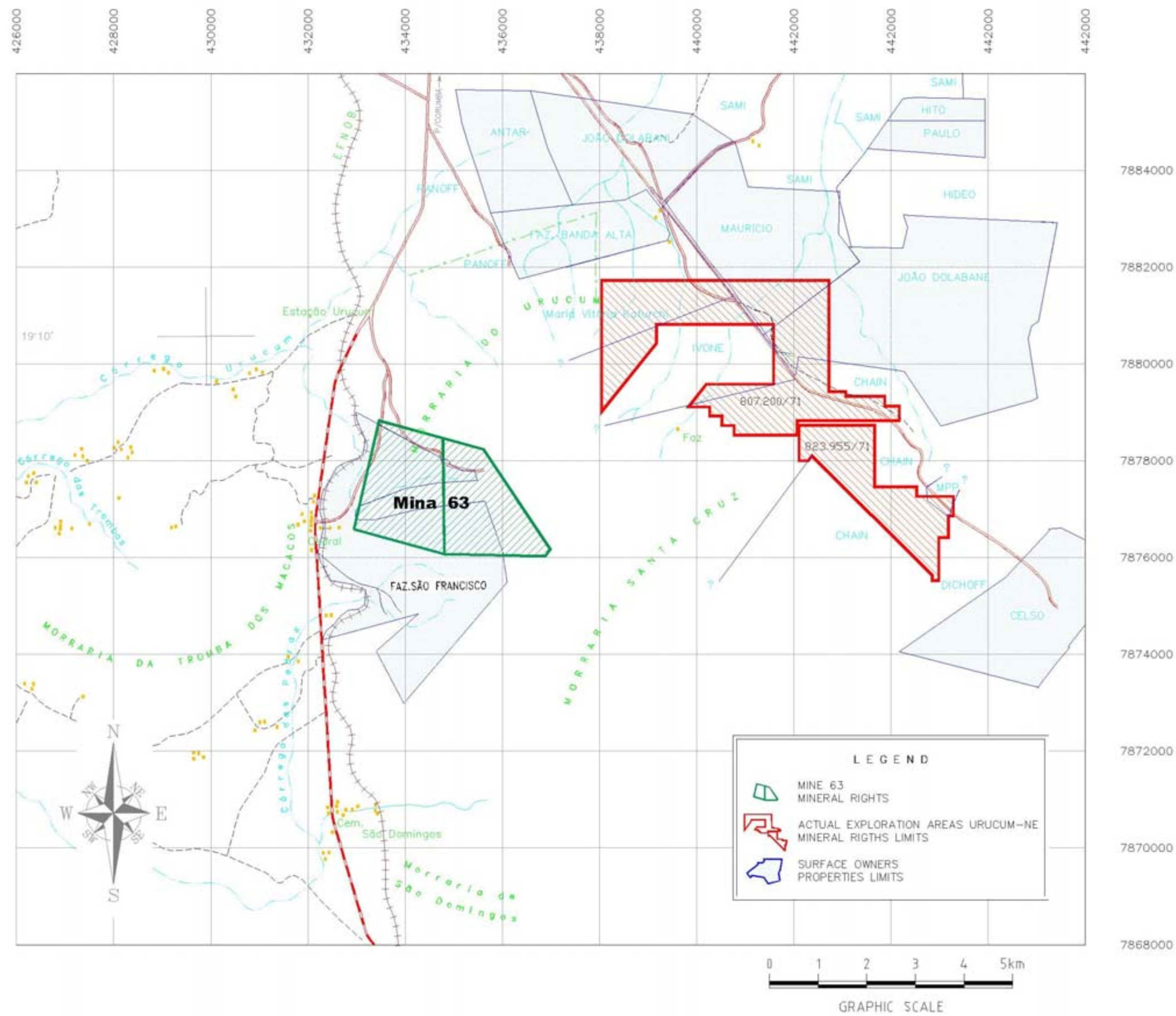
Figure 2-1

Location Map of the Corumbá Project

Date: 02-27-08	Approved: LM	**Figure: 2-1**



SRK Consulting Engineers and Scientists	**Corumbá Project, Brazil**	**Figure 2-2** **Mineral Rights Map - MMX Corumbá Project**
SRK Job No.: 162703.03		
File Name: Figure 2-2.doc	**Source: Mineração & Metálicos S.A.**	Date: 02-27-08 · Approved: LM · Figure: 2-2



SRK Consulting Engineers and Scientists	**Corumbá Project, Brazil**	**Figure 2-3** **Surface Owners of Urucum NE and Mine 63 Areas**
SRK Job No.: 162703.03		
File Name: Figure 2-3.doc	**Source: Mineração & Metálicos S.A.**	Date: 02-27-08 / Approved: LM / Figure: 2-3

3 Accessibility, Climate, Local Resources, Infrastructure and Physiography (Item 7)

3.1 Access

The Corumbá Project is located approximately 19.5km by road from the city of Corumbá, Mato Grosso do Sul, Brazil. Access is by paved highway BR-262 for 16km and then by unpaved roads owned by Vale (Figure 3-1). Urucum Ne is located about 5km east of Mine 63. Access is by paved highway BR-262 for 10km from the city of Corumbá and by unpaved road for an additional 10km.

3.2 Climate

The climate in the project area is determined by factors related to geography and elevation, which ranges from less than 100m in the lowland depression near the city of Corumbá in Brazil and Puerto Suarez/Puerto Quijarro in Bolivia, to more than a 1,000m in the iron-rich mountains close to the Bolivian border.

The climate is tropical with marked rainy and dry seasons. The weather is controlled by the Amazon Basin to the north, the Brazilian plateau to the east, and the Andes Mountains to the west. The dry period lasts for four to five months, from approximately May to September. The rainy season occurs from December to February. Annual average rainfall is 1,500mm at the higher elevations and 1,000mm in the lowlands.

Average temperatures range from 23° to 25°C with lower temperatures in the plateaus and higher temperatures in the Mato Grosso do Sul and Bolivian lowlands. The maximum temperature can exceed 40°C in the lowlands. Rarely, minimum temperatures may reach 0°C, mainly in the Bolivian Chaco region.

3.3 Physiography

Three geomorphologic units are present in the study area: the Mato Grosso Plains and Mato Grosso Lowlands, the Paraguay River Depression, and the Urucum-Amolar Residual Plateaus. The elevation above mean sea level ranges from approximately 60 to 80m in the Paraguay River Depression to over 1,000m in the Residual Plateaus, which include Morraria do Urucum and Serra do Rabicho. Elevations in the study area range from 500 to 1,000m.

3.4 Vegetation

The Mato Grosso lowlands (Pantanal) are part of the upper Paraguay basin and are the largest continuous flooded plains in South America. The vegetation found in the Pantanal is a mosaic of habitats with differing flora defined by the large ecosystems of this area. The northern boundary is dominated by vegetation of the Amazon Basin, while to the east is cerrado (savannah) type vegetation related to the Central Plateau. To the south lies the southern rainforests, and to the west the lowland deciduous forests of the Chaco found in Bolivia and Paraguay.

Mine 63 and Urucum NE lie in an area originally covered by cerrado type vegetation and deciduous forests. The Brazilian cerrado biome is typically comprised of grasses, shrubs and small trees. In the upper parts of the iron-rich mountain ranges close to the city of Corumbá, the soil supporting this vegetation tends to be acidic.

The deciduous and semi-deciduous forests in the project area are restricted to the remains of gallery forests and pockets of forests found in environmental conservation areas and on the slopes of the mountain ranges. The forests have a distinct biotic characteristic, growing with a deficit of water in the dry season and an excess of water in the wet season.

3.5 Local Resources and Infrastructure

The city of Corumbá has excellent transportation and infrastructure, and can be accessed by road, air or river (Figure 3-1). By road, Corumbá is accessed from the capital of the state, Campo Grande, via paved Federal Highway BR-262. The area is also accessed by the Northwest Brazil Railway (Estrada de Ferro Noroeste do Brasil), which connects Corumbá and Campo Grande to São Paulo and the Port of Santos. The Paraguay River allows transportation by barge to ports in Bolivia, Paraguay, Uruguay and Argentina, providing excellent logistic options for the shipment of goods and products. Corumbá has a population sufficient to provide the work force for the mine.

3.5.1 Water Supply and Water Management

The water for the project comes from wells inside the project area. One well has been drilled and more will be drilled if required.

The following three types of water will be used for the project:

- Untreated water – water pumped directly from the wells into the water storage tank;
- Drinking water – water from the wells that has been treated in the project treatment plant; and
- Process water – water recovered from the sedimentation ponds and pumped to the process water recovery tank.

The water from the wells will be used for the following: drinking water, service water, process make-up water, and firefighting water.

Water distribution from the water storage tank is by gravity or pumping, according to its use, in individual lines for each circuit.

After passing through the treatment plant, the treated water is stored in a nearby dedicated tank. From here, the treated water is pumped to consumption points. Treatment consists of filtration, flocculation and chlorination.

Process water is recovered from the sedimentation ponds, and used as re-pulping water in the trommels, as washing water in the screens and for the maintenance of the required levels in pump boxes. Occasionally it is used to control dust in industrial areas.

3.5.2 Electrical Power Supply

Empresa Energética do Mato Grosso do Sul SA (ENERSUL) supplies electricity to the project area by a 34.5kV transmission line. There is a 2km conventional line from the distribution point close to BR-262 to the project's sub-station. The first step-down to 13.8kV is performed at the sub-station before distribution to the load points. The main load is the processing plant sub-station where tension is further reduced to 440, 220, and 120V, to supply electricity to the electrical motors, lighting circuits, process control equipment, auxiliary equipment and other electrical devices.

Total power required is estimated 2.3MW, as negotiated with ENERSUL.

3.5.3 Buildings and Ancillary Facilities

The buildings for Mine 63 include:

- Central administrative office in the city of Corumbá;
- Maintenance shop for the plant facility;
- Kitchen and dining room for 200 employees;
- Change room;
- Laboratory;
- Warehouse; and
- Small administrative office at Mine 63.

3.5.4 Fuel Storage Area

Petrobrás provides a mobile fuel station at Mine 63 with a capacity of 15,000L. Petrobrás maintains the fuel station according to governmental requirements.

3.5.5 Sewage and Waste Disposal

Sewage is treated through:

- Septic tank; and
- Anaerobic filter.

3.5.6 Laboratory

The laboratory at Mine 63 began operations May 15, 2007. The laboratory provides sample preparation and analytical assays to support exploration and mining operations for MMX Corumbá, and quality control for the pig iron plant owned by MMX Metálicos.

The laboratory has 30 employees, 23 in sample preparation, six in the assay laboratory and one supervisor. The laboratory capacity per day is 240 sample preparations and 320 analyses. The actual production rate is about 950 samples per month with a planned increase to about 2,000 samples per month in 2008.

The laboratory procedures include:

- Sample preparation;
- Size screening;
- Iron analysis;
    - Decrepitation index, and
    - Tumble and abrasion index.
- Loss on ignition (LOI);
- X-ray fluorescence (XRF) analysis;
- Pig iron analysis;

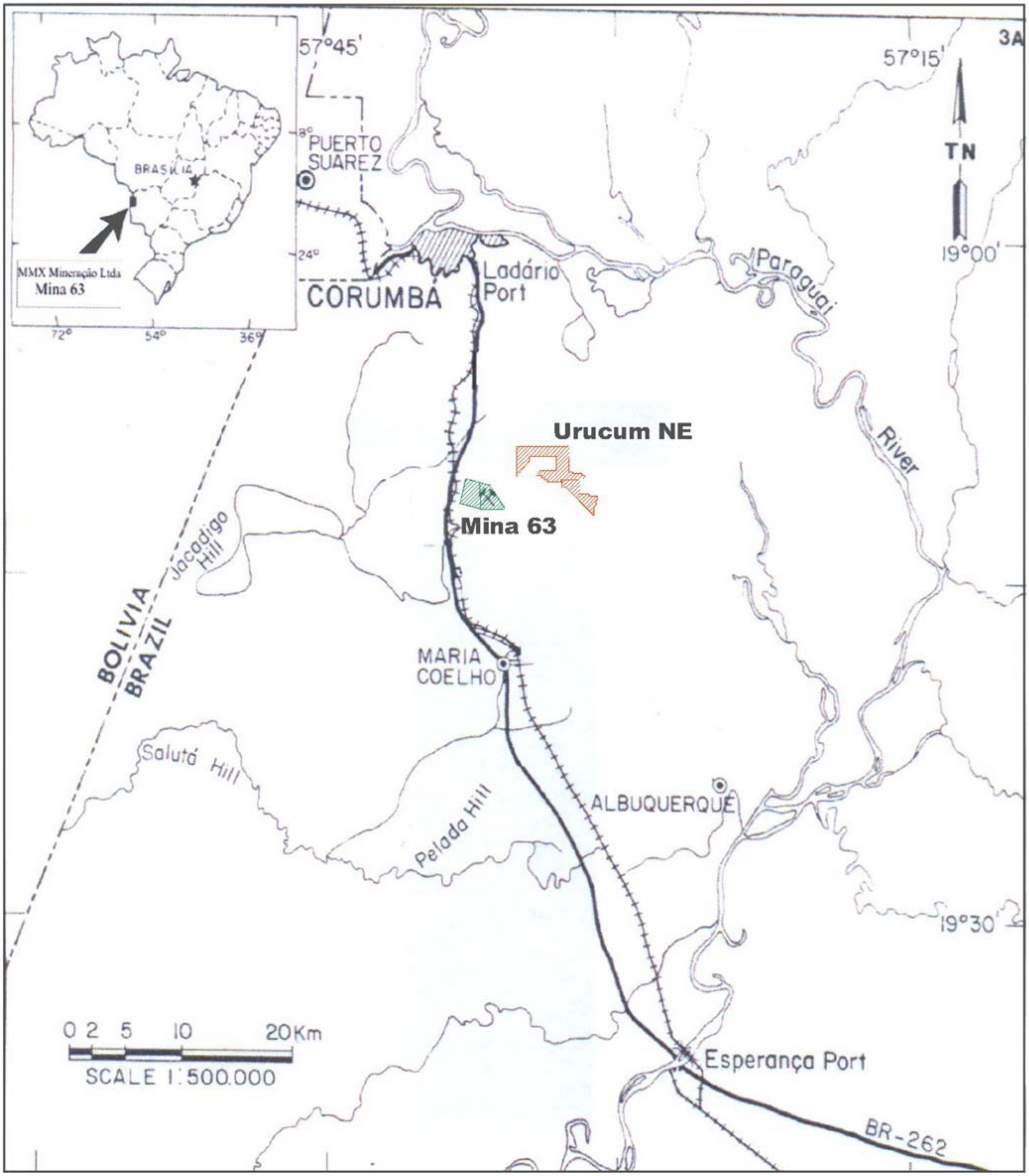
- Carbon and sulfur LECO analyses.

3.5.7 Communications

The office in Corumbá has complete access to telephone and internet. The communication in the area of Mine 63 is by radio or mobile phone.

3.5.8 Security

Security is provided by a contracted company, Maxima Segurança e Vigilância Patrimonial Ltda, with headquarters in Corumbá. The main access to the mine has a gate which is manned by the security company.



SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 3-1 Location Map of MMX Corumbá Project
SRK Job No.: 162703.03		
File Name: Figure 3-1.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08 | Approved: LM | Figure: 3-1

4 History (Item 8)

The Corumbá Project area is located in the Corumbá municipality, Mato Grosso do Sul State, Brazil. The main economic activity of the region is mining of iron ore, manganese ore, limestone, and sand. The iron and manganese deposits have been known since the end of the nineteenth century. All manganese ore is extracted using underground mining methods while the iron ore is mined from open pits. The principal mining companies active in the region are MMX Corumbá, Mineração Urucum (Vale), Minerações Corumbaenses Reunidas (RTZ) and Fábrica de Cimento Itaú (Cement Factory -Votorantin Group).

Mining has gone on in the region for some time, but the first mining decree was issued in 1881, for the area of Morraria do Urucum (Urucum Hill Ridge). This area has a long mining history related to the Laiz and Ema Mines, which are located in the MMX mining concessions. In 1958, the mining company Sociedade Brasileira de Imoveis (SBI) started mining in the Laiz Mine area, with the extraction of colluvial iron ore. The RoM was dry beneficiated, producing 80,000t of Lump ore. The ore was transported by conventional trucks to a pig iron plant belonging to the same group, located near the SBI Port, on the road connecting Ladario to Corumbá.

In 1973, due to the low price of pig iron, work at the pig iron plant, the mine, and the ore beneficiation plant were suspended. After 1974, SBI constructed a processing plant to beneficiate the iron and manganese ore, in place of the old steel plant. This plant had the capacity to beneficiate 140,000tpy of iron ore and 30,000tpy of manganese ore. During this time, the Laiz and Ema Mines were opened. Both mines were designed to produce iron ore by open pit and manganese ore by underground methods. From 1974 to 1986, SBI produced 425,000t of Lump ore and 420,500t of manganese ore.

Between 1986 and 1993, the mining activities were restricted to underground manganese mining while the operations were leased to the Companhia Paulista de Ferro Ligas. From 1993 to 2000, SBI leased the underground manganese mine and open pit mine to Minefer LTDA.

After 2000, the mining activities were restricted to mining and beneficiation of iron ore at the Laiz Mine. SBI sold the iron ore as RoM to the Sidersul/Vetorial Group, who processed the ore using the Laiz Mine’s mobile plant. In August 2005, EBX Corumbaense, presently MMX Corumbá, acquired the mineral rights for these mines, as well as the existing beneficiation plant.

After refurbishing the existing mobile crushing plant (the AZTECA plant) MMX started iron ore mining and processing operations at Mine 63 in January 2006. In July 2006, MMX started operating the main plant, and the first batch of Lump ore was shipped through Ladario Port later that month.

There has been no production at Urucum NE.

Figure 4-1 shows a schematic view of the Mine 63 project area and Urucum NE.

4.1 Ownership

Mine 63

SBI is the registered owner of mining concessions 004.019/48 and 004.084/58. MMX Corumbá is the present owner of 004.084/58 through a purchase agreement and is awaiting the change of ownership in the DNPM. MMX Corumbá controls 004.019/48 through a lease agreement with SBI.

The applications for exploration permits 868.046/05, 868.090/05, 868.126/05 and 868.138/05 were originally made by Eike Batista, the principal shareholder of MMX. The assignment of the permits to MMX was requested from DNPM on June 23, 2006.

The exploration permit 868.083/05 was purchased from Albertina Maria Brazoli, and assignment of the permit to MMX was requested from DNPM on November 22, 2006.

Urucum NE

The transfer of ownership for the mining and exploration permits at Urucum NE is in progress, pending the approval of the Conselho de Defesa Nacional (National Defense Council) (CDN). The CDN is a federal bureau charged with verifying compliance with Law 6.634, which deals with the border zone and controls the procedures and requirements that are followed by businesses located in this region. Although MMX holds a previously issued permit (assentimento prévio) allowing MMX to operate in the border zone, new documents must be submitted to the CDN for each new mine acquisition. During the review process by the CDN, the mining and exploration permits in the DNPM remain in the name of former owner. Ownership will be transferred to MMX upon approval by the CDN after the completion of their review.

4.2 Project Expenditures

There are no records of investments by the former owner in this area. MMX has invested about US$28M, on mineral rights acquisition, exploration, beneficiation plant, environmental work and other studies at Mine 63. MMX has spent about US$306,000 in exploration and $1.0M in acquisition of mineral rights at Urucum NE. An additional $13M must be paid once all mineral rights are transferred.

4.3 Historic Exploration

The exploration methods of the previous owners of Mine 63 are unknown. However, it is the understanding of the MMX geologists that there was no exploration as such and that mining proceeded based on the surface expression of the iron-bearing rock.

Exploration activities in the Urucum NE area were initiated in the mid 1900's by Nicolas Haralyi, a mining engineer, and continued by his son Nicolau, a mining engineer and geologist. Exploration by the Haralyi's consisted of hand-excavated shafts on a 200m grid. MMX became interested in the area for the potential to produce Lump ore. In February 2007, MMX initiated an exploration campaign in this area, also digging had excavated shafts on 400m, 200m and 100m grids.

4.4 Historic Mineral Resource Estimates

There were no published mineral resource or reserve statements for Mine 63 prior to MMX's involvement. MMX presented the first mineral resource estimates to the Bolsa de Valores de São Paulo (BOVESPA) in July 2006 during the Initial Public Offering of MMX common shares. The total geological resources of the Mine 63 were reported to be 65.0Mt of Measured and Indicated Resources and 23.7Mt of Inferred Resources at an average grade of 58% Fe. These resource numbers conform to the Brazilian Mining Code Definitions of Resources/Reserves Classification and are not compliant with NI 43-101 guidelines. MMX produced a NI 43-101 Technical Report on Resources and Reserves as of December 2006 in May 2007 in conjunction with listing on the Toronto Stock Exchange (TSX). The resources and reserves listed in that report are contained in Tables 4.4.1 and 4.4.2 respectively.

Table 4.4.1: Mineral Resources* – Mine 63- Corumbá Project as at December 2006

Classification	Tonnes (Mt)	Fe (%)	S_iO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
Measured	6.5	61.1	8.08	2.59	0.08	0.04	0.14	1.70
Indicated	40.7	52.1	16.75	2.67	0.06	0.05	0.14	1.51
Measured and Indicated	47.2	53.2	15.56	2.66	0.06	0.05	0.14	1.54
Inferred	14.2	53.4	15.96	2.82	0.06	0.55	0.15	1.66

* Tonnes are reported on a wet basis
Fe CoG is 30%

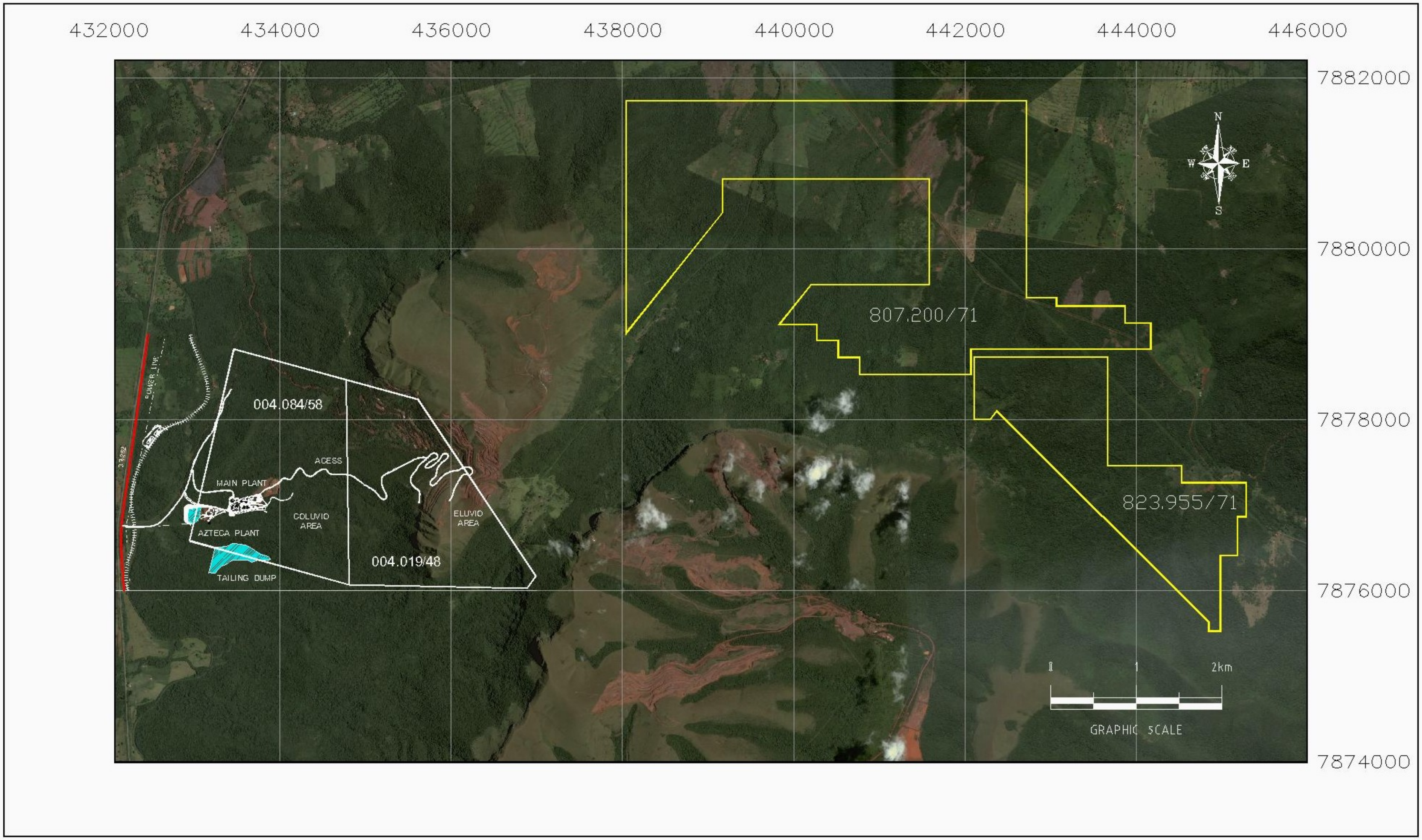
Table 4.4.2: Ore Reserves* – Mine 63 Corumbá Project as at December 2006

Classification	Tonnes (Mt)	Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	LOI (%)	TiO_2 (%)
Proven	5.7	61.1	8.07	2.56	0.08	0.03	1.68	0.14
Probable	25.3	54.8	14.92	2.49	0.06	0.43	1.45	0.14
Total	**31.0**	**56.0**	**13.7**	**2.50**	**0.06**	**0.37**	**1.49**	**0.14**

*Tonnes are reported on a wet basis
Fe CoG Eluvium is 48.0% and in Colluvium is 56.1%
Average Fe price used in reserve is US$32.02

The Haralyi family estimated resources at Urucum NE at 34.4Mt at 60% Fe and submitted those numbers to the DNPM in their Exploration Final Report. The iron content was estimated through a correlation with density data. The volume of the area was based on surface mapping and the average thickness of the mineralized intervals in the exploration shafts. The Haralyi resource is not compliant with NI 43-101 guidelines and should not be relied upon.

This report presents the mineral resources and ore reserves of Mine 63 updated by depletion through September 2007 and mineral resources at Urucum NE according to CIM standards and NI 43-101 guidelines.



SRK Consulting — Engineers and Scientists	Corumbá Project, Brazil	Figure 4-1 — Schematic View of Mine 63 Project and Urucum NE Exploration Targets
SRK Job No.: 162703.03		
File Name: Figure 4-1.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08 / Approved: LM / Figure: 4-1

5 Geological Setting (Item 9)

5.1 Regional Geology

The Corumbá Project lies within the Urucum iron-manganese district which is located along the Brazilian-Bolivian border and extends into the eastern areas of both Paraguay and Bolivia, and includes an area of 200km^2. The Urucum deposits are associated with banded iron formations (BIF), locally known as jaspelites. The iron and manganese deposits are found in the plateaus which rise from the plains of the Paraguay River and near Mutum Mountain.

The iron ore deposits of Corumbá have been known since the end of the 19th century and the region has been the object of numerous publications.

The regional stratigraphy of the area is based on the 1:1,000,000 scale Geological Map of Brazil compiled in 2004 by Companhia de Pesquisa e Recursos Minerais (Brazilian Geological Survey) (CPRM). The regional geology consists of Proterozoic-age igneous and metamorphic rocks, granite intrusions, and acid intrusives. The rocks are in faulted and unconformable contact and are overlain by Quaternary sedimentary deposits which account for approximately 60% of the cover in the area. Figure 5-1 shows the stratigraphic column for the project area based on work by CPRM and the Geological Map of the Corumbá Region.

5.1.1 Lithology and Stratigraphy

Basement Rocks

The basement rocks are a part of the southern Amazon Craton and are composed of the Lower to Middle Proterozoic Rio Apa Complex of metamorphic rocks. These rocks include gneiss, granite gneiss, biotite gneiss, granite, diorite, and schist as well as quartz diorite and quartz gabbro dikes. The rocks have a complex evolutionary history including a period of ductile deformation and simultaneous recrystalization during the Transamazonic thermo-tectonic event. Toward the end of this period, the rocks underwent potassic alteration. The complex has been dated at 1.7Ga.

The regional stratigraphic sequence also includes the following, which are not observed in the Corumbá Project area:

- Pontes e Lacerda Group – metavolcanic sediments of Middle Proterozoic age;
- Santa Helena Intrusive Rocks – syenogranites and monzogranites with late aplite and pegmatite phases;
- Aguapei Group – metasedimentary rocks; and
- Cuiabá Group – metasedimentary rocks.

In the Corumbá Project area, the rio Apa Comples is overlain by the following rock groups.

Jacadigo Group

The rocks of the Jacadigo Group of Upper Proterozoic age, host the iron and manganese deposits. These rocks form plateaus rising up to 950m over the Pantanal plains, distributed in an area of 500km^2. On the Brazil-Bolivia border, the Mountains of Santa Cruz, São Domingos, Grande, Rabichão, Urucum, Tromba dos Macacos and Jacadigo/Mutum are composed of the Jacadigo Group. In the Yacuses area, in Bolivia, about 50km west of Mutum, small hills are found, which are also composed of magnetic non-leached jaspelites. The presence of jaspelites in this area of Bolivia indicates that the deposition basin of the iron sequence was large and not restricted to the Corumbá region.

Dorr (1945) divided this group into three formations, from base to top: Urucum, Córrego das Pedras and Banda Alta. This division is used by the other mining companies in the area and at Mine 63 with some adaptations as described in Section 5.3 on Local Geology.

The Urucum Formation, at the base of the Group, is composed of arkose and conglomerate with limy cement and has a maximum thickness of 400m. Toward the top, the cement is predominantly iron-manganese, characterizing the transition to a more ferruginous depositional environment. The overlying Córrego das Pedras Formation is a package of ferruginous clastic rocks with iron-manganese cement, about 100m thick, composed of ferruginous arkose, quartz sandstone, and some intercalations of jaspelite. Near the top, the ferruginous arkose grades to sandstone and to ferruginous jaspelite with intercalations of manganese (criptomelane). The Banda Alta Formation is a package of ferruginous sediments with manganese intercalations at the. Locally, there are layers of jasper, some centimeters thick with irregular shapes due to fragmentation and deformation with subordinate dropstones of granite.

The Banda Alta Formation has a maximum thickness of 320m and is characterized by the alternating layers of jaspelites and clastic ferruginous sediments. The jaspelite has an average Fe content of 55% in the area of Mineração Corumbaense Reunida S/A - MCR, and is considered to be one of the highest primary contents among the deposits in the world. In the Mutum area the average content found in the jaspelites is in the order of 46% Fe.

Almeida in 1945 (cited by Del'Arco et al., 1982) proposed the division of the Jacadigo Series into two groups: the lower, Urucum, composed of arkose, conglomerate, and limy and pyritiferous siltstones; and the upper, Santa Cruz, composed of jaspelite, arkose sandstone, with manganese oxide lenses, layers of jasper and a package of alternating jasper and hematite laminae, constituting a banded iron ore formation.

The two above mentioned studies, performed by Dorr II (1945) and Almeida in 1945 (cited by Del'Arco et al., 1982), form the basis of subsequent studies. In recent studies, the Jacadigo Group has been subdivided into the Urucum Formation and Santa Cruz Formation. This nomenclature is used in more recent work, including the geological map of Brasil – CPRM (2004), which is the base for the regional geological map of the Corumbá region presented herein.

Puga Formation

The Puga Formation, which is not found in the Corumbá Project area, contains paraconglomerates and diamictites with boulders of granite, quartzite, schist, limestone and quartz with silty or sandy cement. To some authors, this formation is at the base of the Corumbá Group.

Corumbá Group

The stratigraphic relation between the Jacadigo Group and the Corumbá Group has been the subject of interest of various authors, but as of yet there is no consensus. Almeida in 1945 and in 1965 (cited by Del'Arco et al., 1982), suggested an interdigitation between the Jacadigo Group and the Corumbá Group. Other authors suggested joining the two groups into a single unit. The Corumbá Group, of Upper Proterozoic age, contains three formations: Cerradinho, Bocaina and

Tamengo Formations. The Cerradinho Formation, which does not outcrop in the Corumbá Project area., is composed of sandstones, siltstones, shales, marls, limestones, dolomites and thin chert beds, with arkose and conglomerate at the base. The Bocaina Formation contains dolomite, dolomitic limestones with oolites and stromatolitic structures, and marls. This package of carbonate rocks is up to 300m in thickness. The Tamengo Formation is characterized by dark grey limestone alternating with red and grey shales and siltstone and thin layers of micaceous and limy sandstone and oolites. This package, about 120m thick, presents parallel and cross stratification, ripple marks and intraformational breccia. Sedimentary deposits of the Quaternary cover Tamengo Formation.

The following units are part of the regional stratigraphy, but are not present in the Corumbá Project area:

- The Upper Proterozoic Alto Paraguai Group - contains marls, limestone, dolomite sandstone, shale and conglomerate;
- São Vicente Intrusive Rocks – granitic rocks that intrude the metasediments of the Cuiabá Group and are related to Vulcanicas Mimoso, a group of volcanic rocks. The rocks have been dated at 506Ma;
- Coimbra Formation – Silurian age sandstone and conglomerate with silty-ferruginous cement;
- Paleozoic sedimentary rocks related to the Paraná sedimentary basin;
- Ponta do Morro Intrusives – granite and riebeckite dated at 84Ma; and
- Tertiary sediments – lateritic deposits, with local ferruginous concretions.

Quaternary Sediments

These sediments cover most of the lowlands and plains related to the lowlands of the Paraguay River. They include the Pantanal Formation, of Pleistocene age, and the Pantanal deposits, the Xaraiés Formation and the Alluvial Deposits of Holocene age.

Pantanal Formation

The Pantanal Formation consists of colluvium, eluvium and alluvium found in the lowlands and plains. Three facies can be distinguished: the Colluvial Deposits, the Alluvial Terraces and the Alluvial Deposits.

The Colluvial Deposits consist of detrital sediments, partially laterized, of conglomerate, sand, silt and clay. The distribution of the deposits is irregular. They occur at the northwestern edge of the Paraná Basin and at the foot of the slopes of the Urucum, Santa Cruz, Grande and Rabichão Mountains.

The colluvial deposits at the foot of the slopes of the Urucum Mountains contain detrital sediments, and boulders of jaspelite and banded hematite, which originated mainly from the Santa Cruz Formation. These rudaceous fragments, together with a ferruginous cement in the clay-sandy matrix, constitute a limonitic hardpan. The silica in the fragments has been leached thereby increasing the Fe grade. These deposits host the highest-grade material in the Corumbá Project area.

The alluvium terraces are formed by semi-consolidated clay-sandy sediments, partially laterized, and with an irregular distribution around the mountains.

The alluvium deposits are formed by clay, silt and sand sediments with a continuous distribution in the flood plain areas that are a part of the hydrographic basin of the Paraguay River.

Lowland Deposits

The lowland deposits are related to the areas of seasonal floods and contain sand and clay sediments, rich in organic material.

Xaraiés Formation

The Xaraiés Formation is characterized by limestone tuff with fossil plants, travertine with gastropods, and conglomerates with limy cement. This formation occurs in the regions located between the Jacadigo Mountains and Morrinhos Stream, to the west of Lagoa Negra and to the south of Zanetti Mountains, overlaying rocks of the Corumbá and Jacadigo Group.

Alluvial Deposits

The Alluvial Deposits are formed by unconsolidated material, such as sand, gravel, silt and clay related to the deposits of the flooded plain areas belonging to the hydrographic basin of the Paraguay River.

5.2 Structural Geology

The Proterozoic units exhibit folds and faults related to the compressive and extensional events in the area. There is a direct correlation between the structures and the lithology. The rocks of the Rio Apa Complex are sheared and show cataclastic features related to different tectonic phases. Almeida in 1965, 1966 and 1967 (cited in Marini et al., 1984) and Almeida in 1968 suggested that the sediments of the Cuiabá, Jacadigo, Corumbá and Alto Paraguai Groups are related to the Paraguay-Araguaia Geosyncline and each one of these groups present distinct structural behavior. The Cuiabá Group located in the inner portion of the geosycline, represents the earliest sedimentation and is highly folded and metamorphized to greenschist facies. The other groups are younger than the Cuiabá Group and are located in the outer portion of the orogenic arch, near the Amazon craton. The Jacadigo and Corumbá Groups contain folds with axes striking NNW-SSE and normal faults.

The dominant regional structures are northeast-trending faults between the Mountains of Mutum and Jacadigo, Urucum and Tromba dos Macacos, and Urucum and Santa Cruz. One of the most important structures is the Urucum Fault System, a set of northeast striking normal faults. Figure 5-2, taken from the geological map of the RADAM Project (1982), illustrates the structural trends.

Locally, the Urucum Mountains are cut by a set of normal faults that strike northeast. The fault separating the Urucum and Santa Cruz Mountains trends N50°E with a maximum offset of 300m, with the Urucum block down-dropped relative to the Santa Cruz block. Almeida in 1945 (cited in Del’Arco et al., 1982), considered that the Urucum Fault System underwent reactivation through time with the last movement in the Tertiary period during the Andean Orogenesis.

The rocks of the Jacadigo Group form a regional anticlinal structural cut by northeast-striking faults, sub-parallel to the anticlinal axis resulting in horst and graben structures. The faults and associated fractures in the jaspelite bodies provided the ground preparation that favored the enrichment of the iron ore in the region.

In the Corumbá region the limestones of the Corumbá Group also exhibit faults parallel to the Urucum Fault System. The Lajinha synclinal structure located northeastern of the Urucum Mountain is triangular in shape with the axis striking N55°E. This fold is bound by faults to the northeast and south. The southern limb is in fault contact with the gneiss-granites of the Rio Apa Complex.

5.3 Local Geology

Mine 63 and Urucum NE are located on the western and eastern flanks, respectively, of Urucum Mountain which is composed of rocks of the Jacadigo Group overlying the basement granite and gneisses. MMX Corumbá uses Almeida's (1945, cited by Del'Arco et al., 1982) description of the Jacadigo Group in which it is composed of the Urucum and Santa Cruz Formations with the latter consisting of two members, the Córrego das Pedras and the Banda Alta. Table 5.3.1 summarizes the local stratigraphy in the immediate area of Mine 63 and Figures 5-3 and 5-4 show the geology in the immediate vicinity of Mine 63 and Urucum NE, respectively.

Table 5.3.1: Local Stratigraphy – Mine 63 Area

Group	Formation	Member	Facies	Heading	Deposit Type	Lithology Description
	Pantanal				Colluvium	Partially laterized conglomerates and sediments
Jacadigo	Santa Cruz	Banda Alta	Murucu	Morro Grande		Banded Chert
				Água Verde	Eluvium	Jaspelite/Eluvium
						Banded Mn/Nodular Mn and
		Córrego das Pedras	Urucum	Rabicho		Arkose/Conglomerate with hematitic cement.

5.3.1 Santa Cruz Formation - Córrego das Pedras Member

The Córrego das Pedras Member of the Santa Cruz Formation outcrops near Highway BR-292 and underlies the colluvium deposits that surround the nearby Urucum Mountain. These rocks consist of ferruginous arkose, arkosic sandstone and conglomerate. The arkose is generally massive, dark gray, fine- to coarse-grained and has a quartz-feldspar composition. Cross and parallel stratifications are commonly exhibited. The sandstones are predominantly gray, with some red units, fine-grained to conglomeratic and occur as intercalated beds with the arkose. Some intercalations of siltstones are also found in the sequence.

The colluvium deposits rest unconformably on the sandstones, arkoses and conglomeratic sandstones. Where exposed to surface weathering, this unit develops a yellowish clay-sandy soil.

5.3.2 Santa Cruz Formation - Banda Alta Member

The Banda Alta Member of the Santa Cruz Formation is characterized by jaspelites with millimeter scale bandings and subordinate layers of quartz-feldspar sediments. The basal portion of the sequence contains clastic and ferruginous sediments, with up to four manganese layers varying from 0.5m to 4m thick.

5.3.3 Mine 63 Geology

Colluvial Domain

The Colluvial Domain is characterized by the detrital deposits around Urucum Mountain, with fan or elongate shapes distributed on the flanks of the Mountain and the plains area. They comprise packages of sediments, with thickness varying from 0.5 to 32m, with an average of 13m. These deposits are composed of ferruginous sediments from the Banda Alta Formation that were deposited on the Córrego das Pedras Formation.

The angular fragments vary from pebble to boulder size and are constituted mainly of banded hematite, ferruginous jaspelite and by rare ferruginous arkose. The fragments are randomly distributed, although the size tends to decrease in proportion to the distance from the base of the Mountain.

A sedimentary breccia occurs in the central west portion of Mine 63 area. It is contemporary to the colluvial deposits and it consists of fine to medium sized clasts of hematite jaspelite, partially to totally leached, and by coarse clasts of ferruginous sandstone and of hematite jaspelite partially leached with limonitic cement. The breccia trends east-west and is about 2,500m long, 50 to 200m wide, and averages about 10m thick, with a maximum thickness of 16m.

The colluvial deposits are classified as proximal, medial or distal deposits according to their distance from the source area. The higher Fe contents are related to the deposits near the source area while the laterite deposits are far from the source area.

Eluvial Domain

The Eluvial Domain was generated by in situ weathering action through total and/or partial hydrolyzation, in a process of silica leaching and subsequent enrichment of iron in the hematite jaspelites of the Banda Alta Formation.

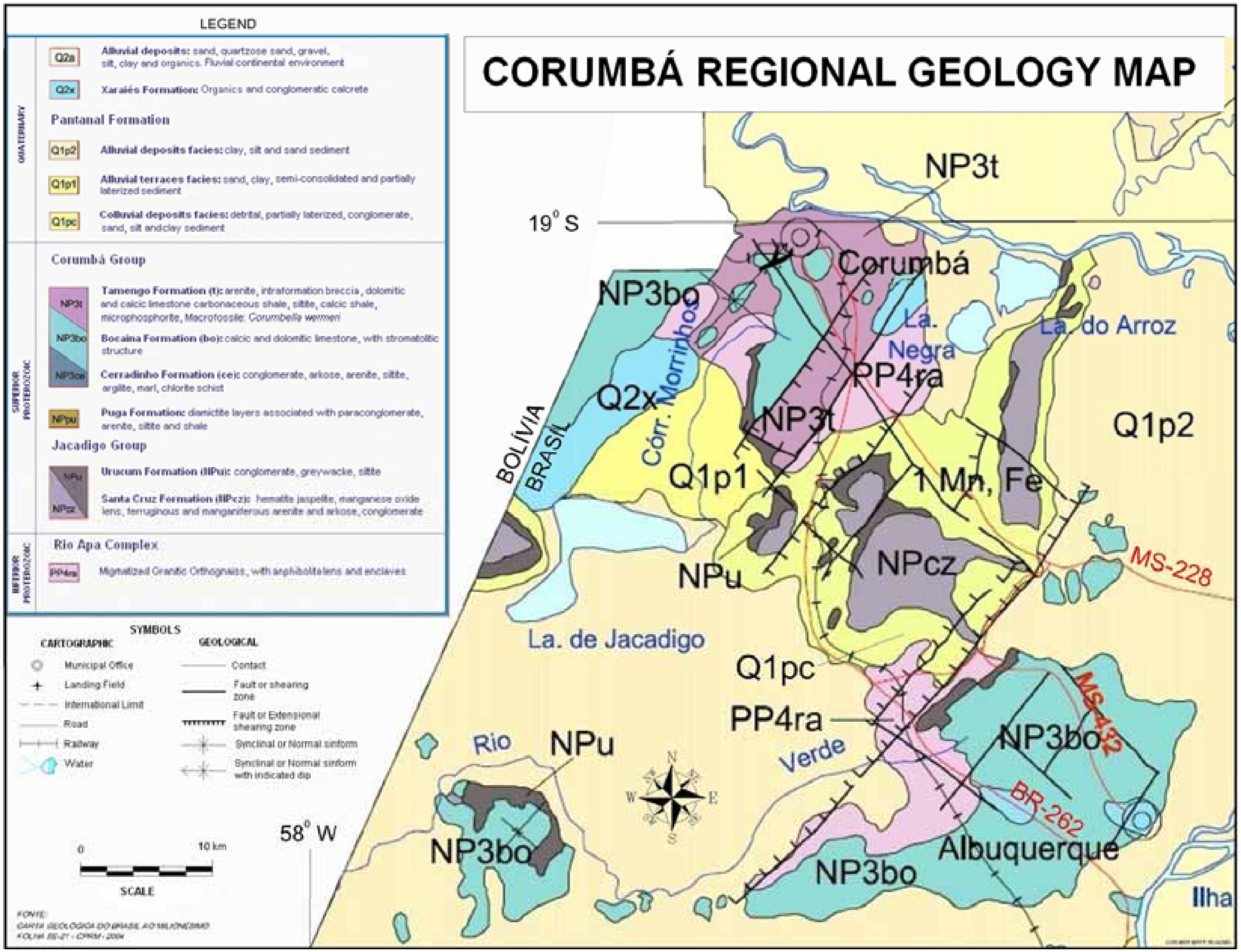
In the area of Mine 63, the eluvium is located on the top and upper slope of the Urucum Mountain, and has an average thickness of 15m. The effects of leaching decrease from the top toward the base of the sequence, followed by an increase in the SiO_2 concentration and a decrease of Fe. In general, the silica leaching increases with the increased frequency of the fractures.

5.3.4 Urucum NE Geology

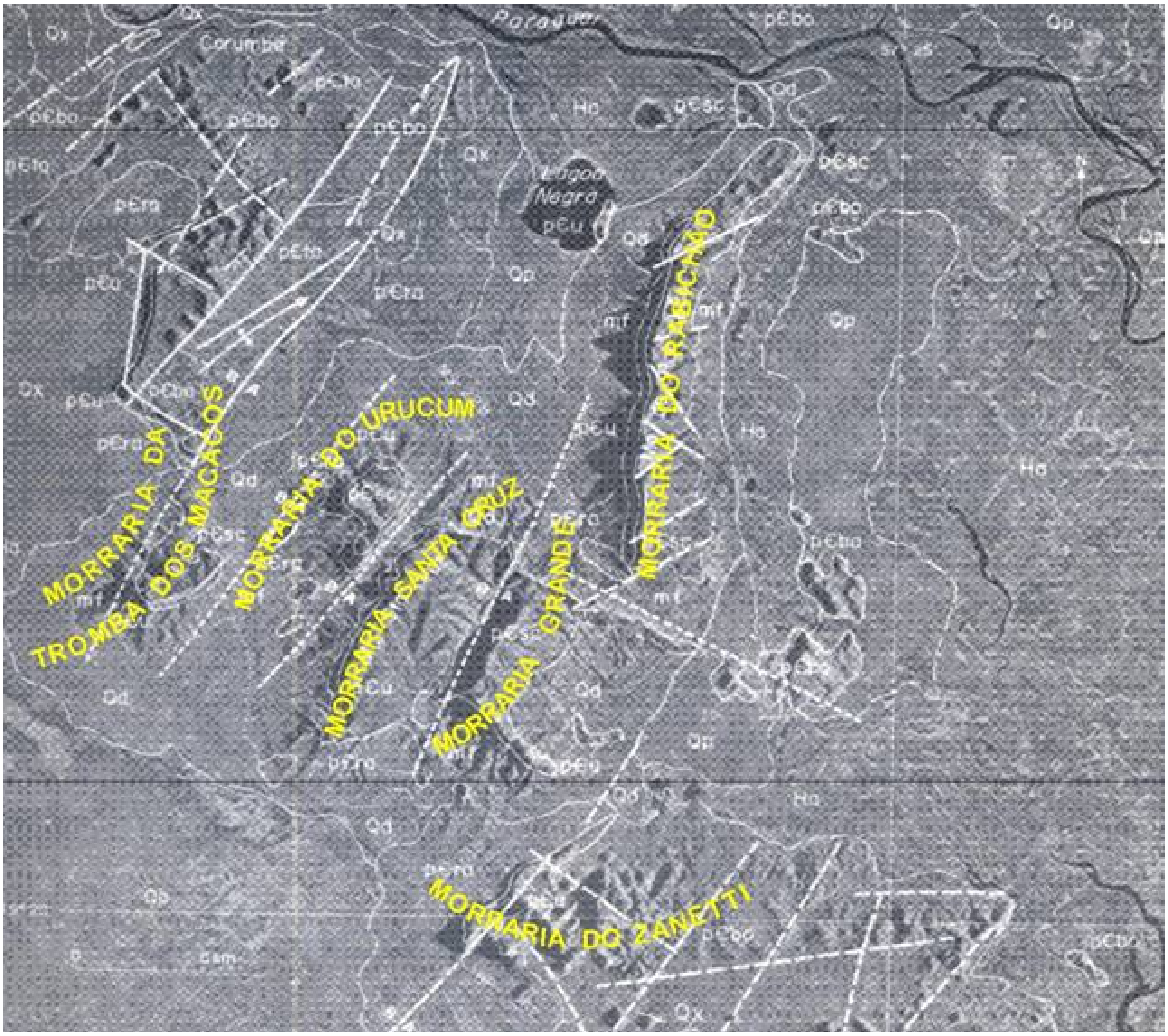
Colluvial Domain

The geology of the Urucum Project area is related to the colluvial deposits of the northeast region of the Santa Cruz Mountain. These colluvial deposits are composed of clastic hematite-jaspelite, arkoses, ferriferous sandstone, as well as erratic milky quartz and granitoid fragments. The bedrock consists of a saprolitic sequence formed from the arkose and, in some cases, the granitoid basement.

In the southern portion of the deposit, a morphologic depression is observed at the top of the colluvial deposit. A colluvial channel was detected through a geophysical survey which may be related to fault zones that increase the erosive processes on the hillside.



SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 5-1 Stratigraphic Column and Regional Map
SRK Job No.: 162703.03		
File Name: Figure 5-1.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08 / Approved: LM / Figure: 5-1



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SRK Job No.: 162703.03

File Name: Figure 5-2.doc

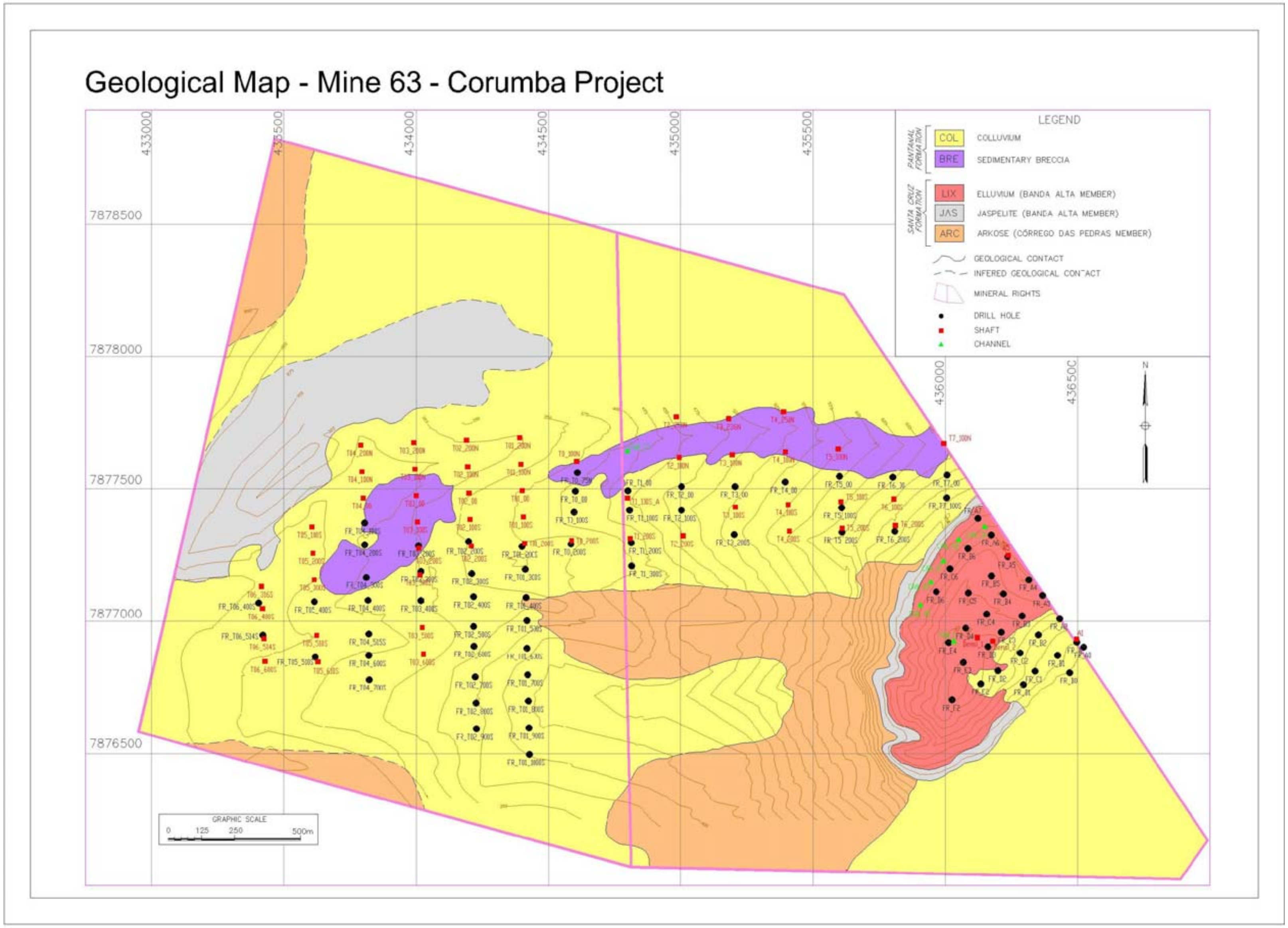
Corumbá Project, Brazil

Source: RADAM Geological Map (1982)

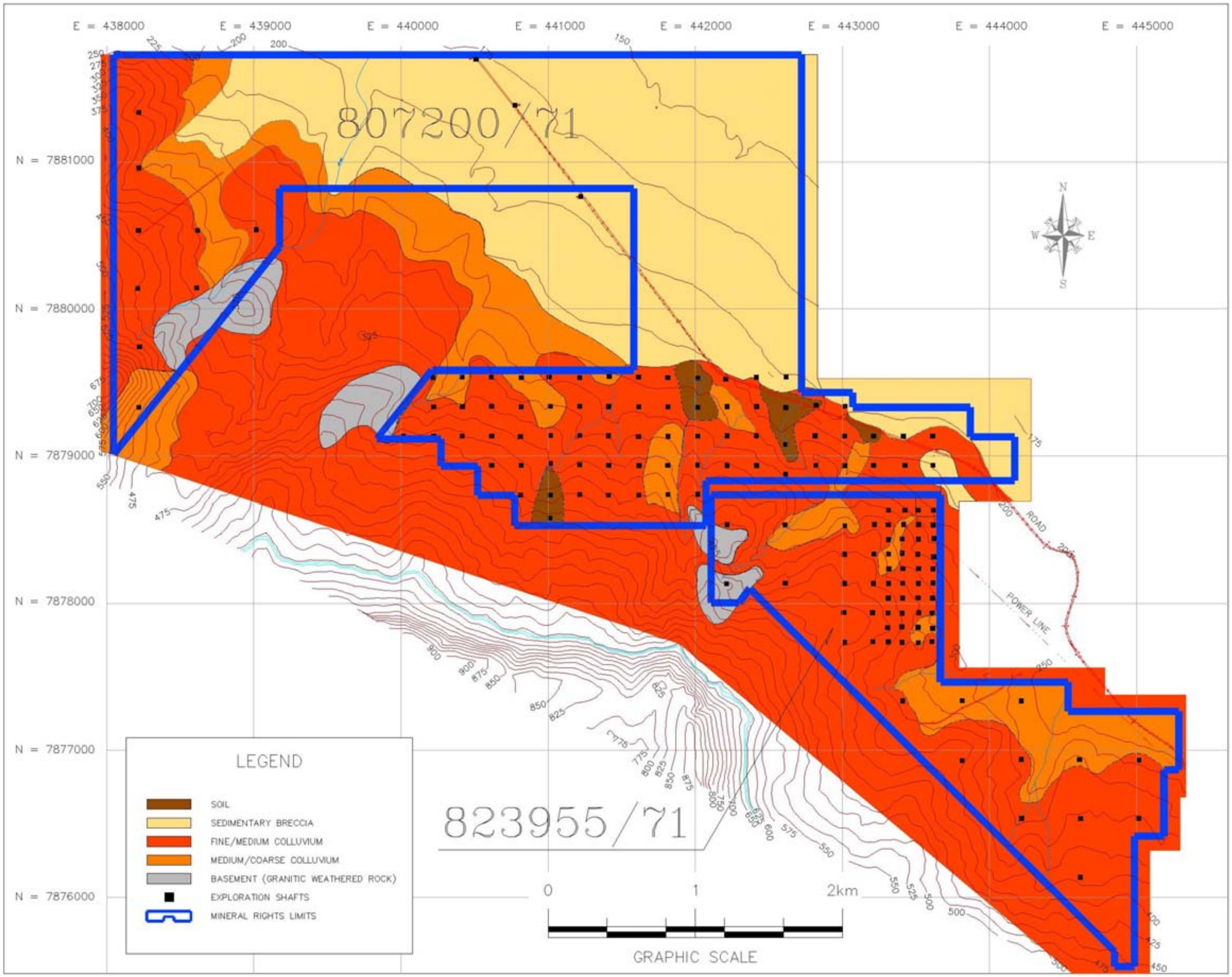
Figure 5-2

Regional Structural Map Corumbá Project

Date: 02-27-08	Approved: LM	Figure: 5-2



SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 5-3 Geologic Map of the Mine 63 Area
SRK Job No.: 162703.03		
File Name: Figure 5-3.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08 · Approved: LM · Figure: 5-3



SRK Consulting Engineers and Scientists	**Corumbá Project, Brazil**	**Figure 5-4** **Geologic Map of Urucum NE**
SRK Job No.: 162703.03		
File Name: Figure 5-4.doc	**Source: Mineração & Metálicos S.A.**	Date: 02-27-08 · Approved: LM · Figure: 5-4

6 Deposit Types (Item 10)

According to Haralyi and Walde (1986), the iron ore of the Jacadigo Group is described as jaspelite, banded hematite or Banded Iron Formation (BIF). In the central part of the basin, there is an interlayering of hematite laminae and ferruginous jasper. At the margin of the basin, there is no banded character, passing to a chemical sedimentation with major clastic contribution. There is a polymictic conglomerate with ferruginous cement in the marginal parts of the basin and on top of the iron sequence.

Haralyi and Barbour (1974), studying the Banda Alta Member at the Urucum Mountain, noted a progressive increase of the average grade of silica in the depositional sequence corresponding to a diminishing of the relative thickness of hematite compared to jaspelite. The variation in layers is related to a gradual diminishment of the Fe++ element in the water of the basin, culminating with the deposition of only silica extracts. Laterally, the diminishing of the average thickness of laminae of hematite and in the increase of jasper laminae can also be noted.

In the area of the Urucum Mountain, the central part of the basin, the average Fe content in the banded hematite ranges from 55% to 60.5%. At the margins of the basin, the Fe contents range from 35% to 50%.

The origin of the iron in this thick jaspelite sequence with high primary Fe content is quite controversial. The jaspelite package in the project area and surrounding areas is characterized by alternating layers of extremely fine hematite and jasper, without magnetite. Some jaspelites exhibit small lenses of jasper eyes. No carbonates are observed, although some textures resemble carbonate substitution by silica. There are two explanations for the absence of carbonate in the jaspelites: a) the carbonate was replaced by silica in the diagenetic process; b) the carbonate was totally destroyed by the climatic conditions, caused by the intense percolation of the meteoric waters, facilitated by the high degree of fracturing of the jaspelite package. The presence of carbonates in the Mutum area is outstanding, in the form of siderite, calcite and, dolomite, in percentages varying from 10 to 15%. The presence of magnetite in the jaspelites of Mutum and north of Rabicho is probably an indication of deeper more reducing waters, or could also be a result of the slightly higher metamorphic degree in Mutum area.

The resource and reserves at Mine 63 and Urucum NE are contained within elluvial and colluvial deposits related to the weathering of the jaspelites and BIF.

7 Mineralization (Item 11)

7.1 Eluvial Deposits

The eluvium originates in the primary jaspelite which has been fractured and undergone weathering and leaching of silica. The Fe content of the eluvium is directly related to the content of the original primary rock. At the marginal parts of the basin, there is lateral variation and even a banding in the Fe contents of the eluvial ore, indicating primary variations in the content of the iron.

The iron enrichment in the eluvium resulted from in situ silica leaching of the primary jaspelite and therefore forms a nearly continuous zone over the bedrock of the jaspelite. At Mine 63, it is located on the top and slopes of Urucum Mountain and has a thickness that varies from less than 1m to over 30m, with an average of about 15m. There is no eluvium at the Urucum NE deposit.

The enrichment factor of the eluvial material, in relation to the primary rock, depends on the grain size and the dimension of the fragments. At the marginal parts of the basin, where sedimentation was mainly clastic, the enrichment of the eluvial material is directly proportional to the iron content in the jaspelite from which it originated. The same is not true in the central part of the basin, where sedimentation is mainly chemical.

7.2 Colluvial Deposits

The colluvium is the material deposited at the base of Urucum Mountain where the Banda Alta member outcrops. The main source rock is the jaspelite, with a secondary contribution from the arkose of the Urucum Formation. The colluvium is formed by recent clastic deposition composed mainly of angular fragments of leached hematite jaspelites and arkose. The colluvial deposits which are richer in hematite fragments and jaspelite, leached or not, concentrate near the rock source, that is, near the mountain. The total iron content is directly proportional to the distance from the source and has been enriched by the leaching of silica. The breccia area has undergone cementation and has a more consolidated nature than the colluvium.

The colluvium, including the breccia, at Mine 63 has an elongate shape, about 3km long and 1.25km wide, and varies from less than 1m to over 30m in thickness, with the thickest sections closest to the source rock and average thickness of 22m. The colluvium at Urucum NE is more than 6km in length and 2km in width.

8 Exploration (Item 12)

8.1 Exploration of Mine 63

The exploration methods of the previous owners of the Corumbá Project are unknown. However, it is the understanding of the MMX geologists that there was no exploration as such and that mining proceeded based on the surface expression of the iron-bearing rock.

The first exploration work by MMX in the region of Mine 63 was the excavation of a series of hand dug exploration pits. The pits, excavated with pick and shovel, are 1.5m^2 in plan view and have vertical walls which are 6m deep in the colluvium and 10m deep in the eluvium. Because of the shape of the pits, they are referred to as shafts. The shafts were excavated on a grid of 100m x 100m in the eluvium area and on a grid of 200m x 100m in the colluvium, and were excavated through the mineralized zone and into the bedrock.

Following this first stage of exploration, a core drilling program was implemented using a Brazilian contractor, Geosol – Geologia e Sondagens Ltda (Geosol). The drilling extended the grid in the colluvium to the north and also twinned some of the exploration shafts.

Additional exploration consisted of channel samples collected during the pre-stripping phase of the mine, where vertical samples were taken in the face of the mountain and surface mapping at a scale of 1:5000.

The drilling and sampling procedures used by MMX are further described in the following sections.

The exploration identified a large area of mineralization associated with the colluvium and eluvium. SRK considers the methods used by MMX to be appropriate for this type of deposit.

8.2 Exploration of Urucum NE

The exploration method employed by the former owners of Urucum NE consisted of the excavation of more than one hundred exploration shafts on a 200m x 200m grid. The exploration methods were not rigorous and the shaft grades and size fractions were inferred using a correlation formula between density and iron grade.

In February 2007, MMX Corumbá started an exploration campaign in which shafts were manually excavated to bedrock or to a maximum depth of 5.0m. The shafts were centered on 100m, 200m and 400m grids).

Exploration lines with spacing at 400m, 200m and 100m, were surveyed by BXF Topographia Ltda (BXF), a topographic survey company with headquarters in Ladário, MS, with supervision by the MMX exploration staff. The surveying was done with a total station Topcon, model GPT3000LW and a total station Pentax, model PCS1S. The methodology was by open polygonal, linked to the mark 1,065 IBGE (Brazilian Official Mark on Santa Cruz Hill) with the UTM coordinates N-7,876,829.21 and E-437,739.16, elevation of 1,065.44 m, DATUM SAD 69. The topographic surface was generated using points on the exploration lines, and a laser survey (ALTM - Airborne Laser Terrain Mappper) performed by GEOID Company, between the lines. The surface was generated using Autodesk software AutoCAD 2006.

The locations of the shafts were surveyed by BXF with supervision of MMX team, using a total station Topcon. The exploration campaign was completed with 159 shafts.

8.2.1 Geophysics

Geophysical surveys in the Urucum NE project were conducted by HGeo – Tecnologia e Informação em Geociência Ltda (HGeo), a contracted company. They used IP method (Induced Polarization), an electrical geophysical method, in lines L27 (2,020m), L28 (2,480m), L29 (2,480m) and L34 (1,400m). The main goal was to determine the contact between the colluvial cover and the arkose basement and, in some cases, the contact with granitic-gneissic basement.

The results were presented in electroresistivity sections, where the scale of colors varies from red (more resistive) to blue (more conductive). The colluvial cover is more resistive than the basement. The transition between the conductive and resistive regions of the sections can be interpreted as the contact between two units.

The preliminary results show an error of about 10% in the maximum depth in the more level areas and about 15% in the regions with irregular relief. This means the interpreted contact in the resistivity sections in the exploration area could show an error up to 6m, depending on the relief.

MMX will continue with this type of geophysical survey, developing more tests on the areas with drilling information at Mine 63, to better calibrate the basal contact delineation. MMX hopes to use this methodology to complement drilling information and support inferred resources estimation.

9 Drilling (Item 13)

9.1 Mine 63

The first drilling at Mine 63 was initiated in November 2005 by MMX. All drilling was conducted by Geosol, a Brazilian company with experience in iron ore drilling. The holes were drilled to an average depth of 16m, with a maximum depth of 40m, with core size of 6.4cm (HQ). All drillholes were vertical and no downhole surveys were taken because of the short length of the holes. The mineralization forms a shallow zone, from less than 1m to about 40m over the bedrock, and is best drilled with vertical holes; the lack of downhole surveys is not a concern in these short holes.

Drilling in the colluvium area is on a north-south grid with sections 200m apart and the holes spaced at 100m on section. The drillholes in the eluvium area are on a 100m x 100m grid oriented N50^{o}E. The holes in both areas were drilled into the bedrock before being halted, and thus penetrate the entire mineralized length.

The drill core was placed in wooden boxes approximately 1m long with 3 sections to contain the core. The drill intervals were marked with wooden plates and the recovery was measured by the drill contractor with supervision by MMX personnel. The core was photographed, logged, split, and sampled by MMX personnel in a core facility at Mine 63.

The drillhole collars are marked with a small concrete slab with the hole number inscribed on an aluminum tag. The drill hole collars were surveyed by BXF.

The shafts were excavated by pick and shovel to a maximum depth of 16m and were 1.5m x 1.5m in plan view. The shafts were sampled in vertical channels by MMX personnel. Channel samples were taken during the pre-stripping phase of mining.

The resource database consists of drillholes, channel samples, and shafts and will be referred to as drilling in this report. A summary of the drilling is given in Table 9.1.1 and the locations are shown in Figure 9-1.

Table 9.1.1: Drilling in Mine 63, Corumbá Project

Sample Type	Number	Total (m)	Average Depth (m)	Minimum Depth (m)	Maximum Depth (m)
Channel Samples	18	210.2	11.7	4.4	20.6
Shafts	102	640.3	6.3	0.1	13.6
Drill Holes	81	1312.0	16.2	4.1	41.0
Total	**201**	**2,162.5**			

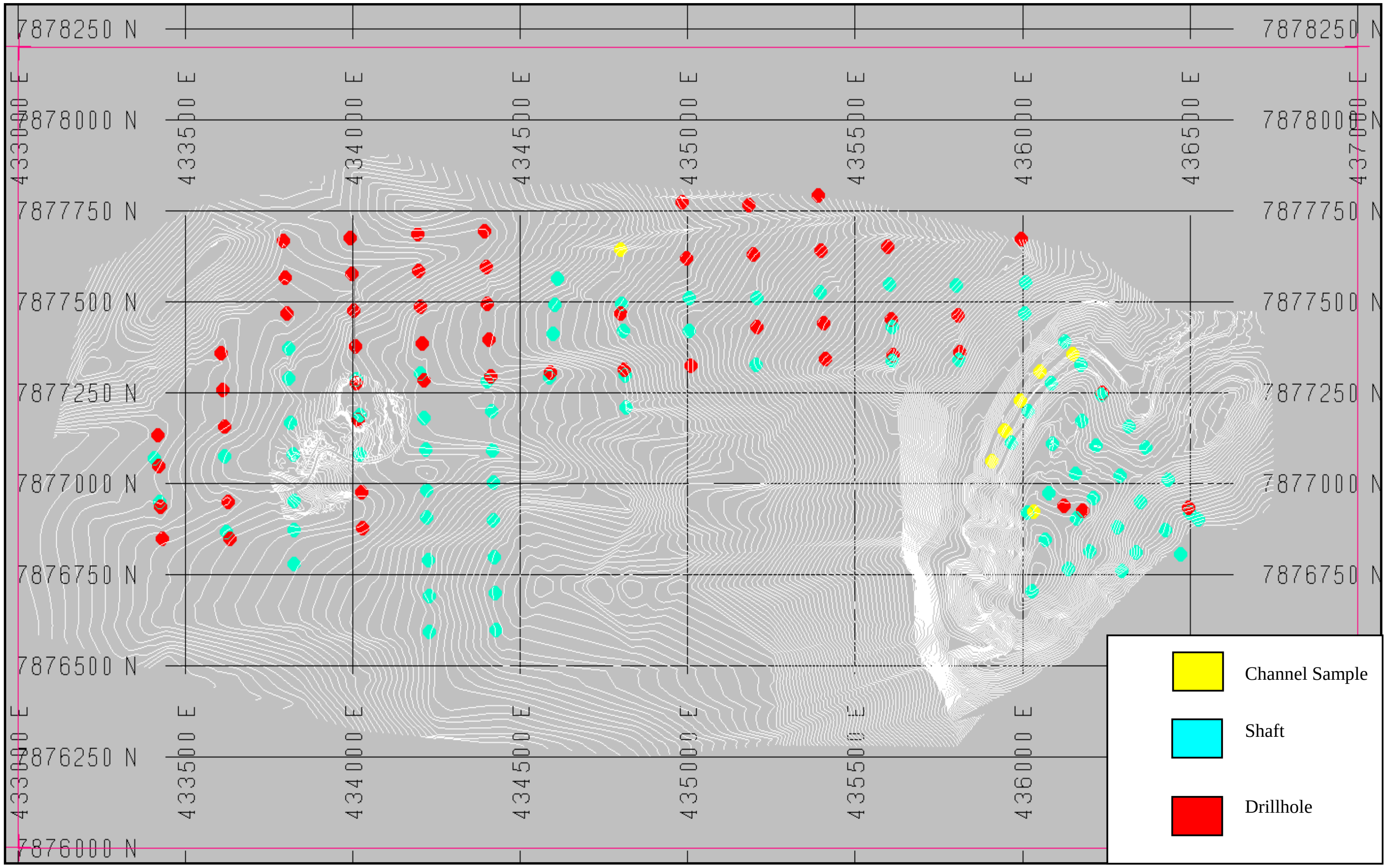
9.2 Urucum NE

The excavation of exploration shafts in the Urucum NE area began in February 2007. The exploration shafts were excavated manually with pickaxes and shovels to a maximum depth of 5m and with plan dimensions of 1.5m x 1.5m. Material from the shafts was placed in separate piles for each 1m of depth; this material was used for metallurgical tests. Geological samples were collected in vertical channel samples located in the center of one wall of the shaft. The channel was 0.2m wide and 0.3m deep, and the length of the sample was determined by lithology. Shafts where the colluvium was less than 1.5m were not sampled.

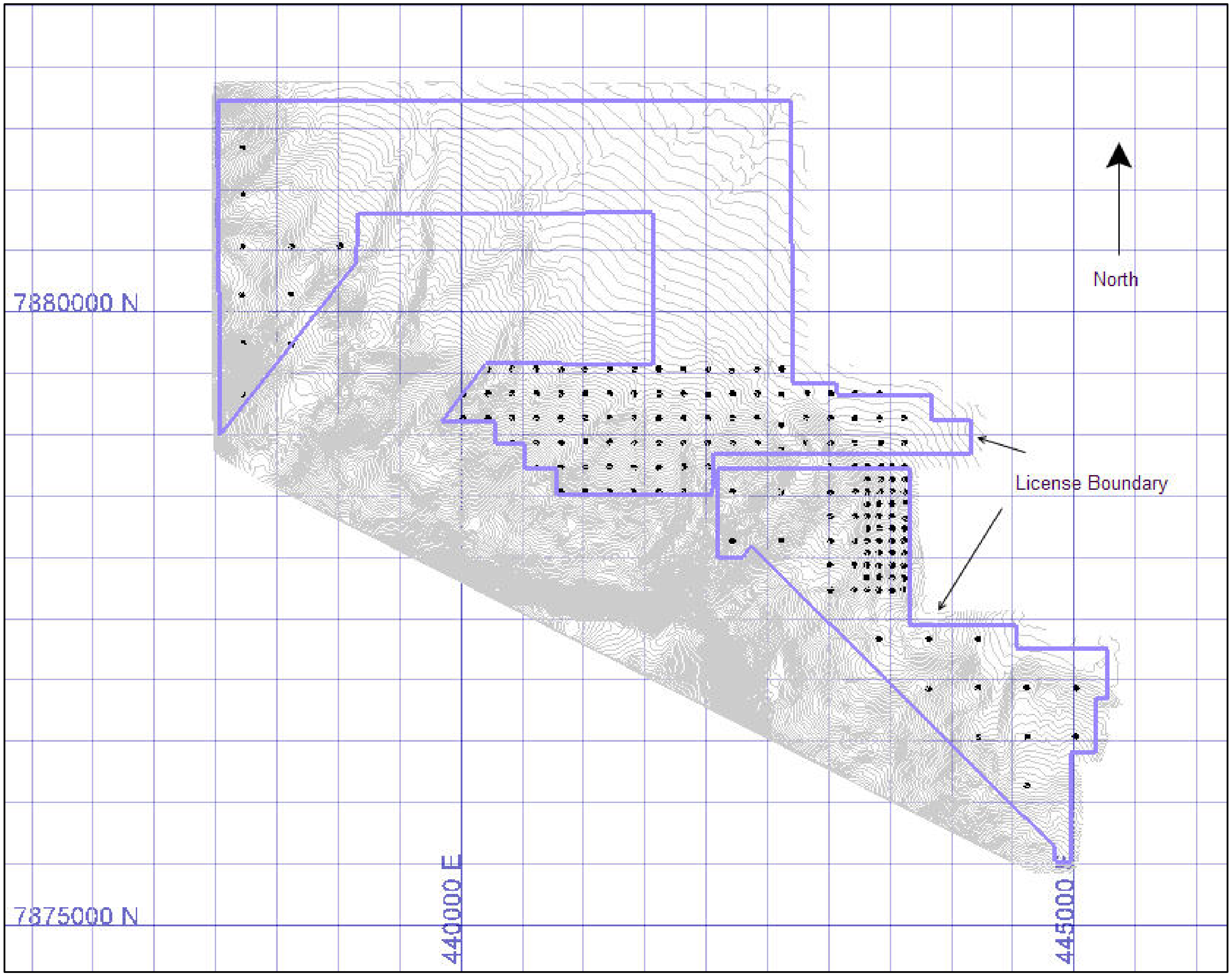
The shafts were located on three different grids: 400m x 400m, 200m x 200m and 100 x 100m The 400 x 400 m spacing is the initial exploration grid. MMX later infilled the grid spacing to 200 x 200m and 100 x 100m. A summary of the exploration shafts is given in Table 9.2.1 and the locations are shown in Figure 9-2.

Table 9.2.1: Shafts at Urucum NE, Corumbá Project

Sample Type	Number	Total (m)	Average Depth (m)	Minimum Depth (m)	Maximum Depth (m)
Shaft	159	703.42	4.4	0.09	5.0



SRK Consulting Engineers and Scientists	**Corumbá Project, Brazil**	**Figure 9-1** **Drillhole and Sample Locations, Mine 63 Corumbá Project**
SRK Job No.: 162703.03		
File Name: Figure 9-1.doc	**Source: Mineração & Metálicos S.A.**	Date: 02-27-08 / Approved: LM / Figure: 9-1



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SRK Job No.: 162703.03

File Name: Figure 9-2.doc

Corumbá Project, Brazil

Source: Mineração & Metálicos S.A.

Figure 9-2

Shaft Locations Urucum NE

Date: 02-27-08	Approved: LM	Figure: 9-2

10 Sampling Method and Approach (Item 14)

The sampling of the core followed the customary procedures for iron ore in Brazil. The core was split lengthwise with breaks at lithologic contacts, and one-half of the core was bagged and the remainder was stored in wooden boxes. Intervals that were considered to be internal waste were not sampled and intervals within the bedrock were not sampled. The samples were numbered consecutively using a blind numbering sequence. Sample tags were placed in the sample bag and the bag was marked with the sample number as well.

Samples from the shafts were collected from vertical channels in one wall of the shaft. The channel was 10cm wide and 15cm deep and was sampled over the entire length of the mineralized zone in the shaft. The channel was made using a hammer and chisel and the sample was collected in a wooden box. The sample was then transferred to plastic bags. The samples were also numbered consecutively with blind numbers as with the drill samples. The four walls of the shafts are photographed meter by meter. The samples from Urucum NE were sent directly to SGS in Belo Horizonte for preparation and analysis.

The channel samples are vertical and were collected from outcrops and benches, using the same methodology as in the shaft samples.

At Urucum NE, a sample of 200kg is collected to provide enough material for a global sample, size fraction samples and for an archive with enough weight for duplicate tests if necessary. The colluvium with total thickness less than 2.0m was not sampled as 2m is considered to be a minimum mining thickness and because their metallogenic potential is considered lower. The sedimentary breccia domain is not considered as resources in this estimation, because it is very hard and massive making manual excavation difficult.

The samples are identified by shaft number and depth and sent to the MMX preparation laboratory. The pulps are bagged and are transported by a dispatching company to the SGS Lab in Belo Horizonte, Minas Gerais State for analysis.

Table 10.1 lists the statistics for the number and type of samples at Mine 63 and Urucum NE

Table 10.1: Sample Interval Statistics for Mine 63 and Urucum NE

	Intervals			
Sample Type	**Number**	**Average (m)**	**Minimum (m)**	**Maximum (m)**
Mine 63				
Channel Sample	27	6.70	3.0	15.4
Shaft	122	5.16	0.5	10.0
Drill Hole	452	2.36	0.5	5.9
Total Mine 63	**595**			
Urucum NE				
Shaft	150	4.04	1.5	5.0

The unsampled intervals are considered waste and assigned a value of zero for the compositing routine. The channel samples and shaft samples tend to be long intervals over the entire mineralized section of the unit. The drillhole samples are nominal 2m intervals with breaks at changes in lithology. The resulting database contains samples with highly variable sample intervals, many of which are longer than the compositing length. SRK recommends the sample length be uniform at 5m (with breaks for lithology) and that the internal waste intervals also be assayed to eliminate ambiguity in the assignment of a value to that material.

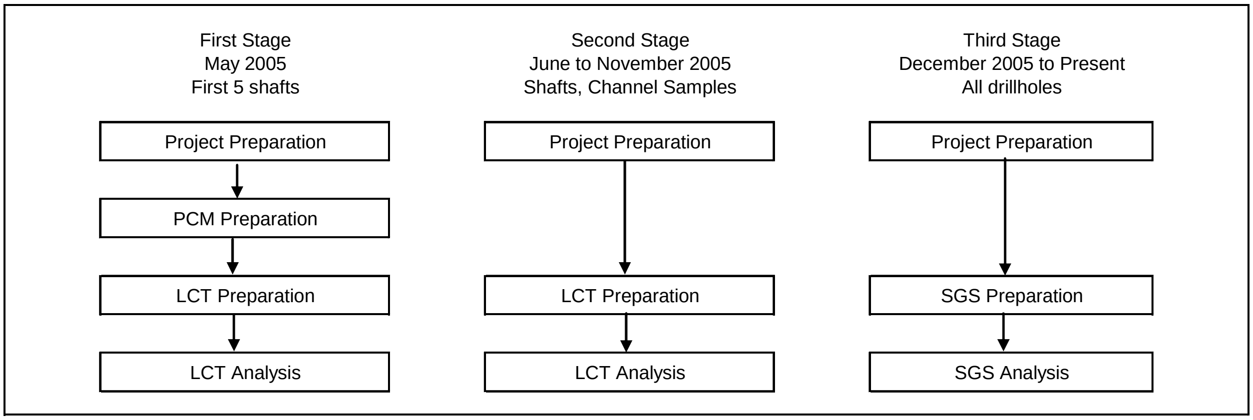
All the drillholes, shafts, and channels shown in Figures 9-1 and 9-2 were sampled. The area sampled is more than 3km in length east-west and about 1.25km north-south at Mine 63 and about 7km in length and 1.5km in width at Urucum NE.

SRK considers the samples to be representative of the mineralized zones and sections. The colluvial and eluvial material was sampled over the entire length of the mineralization, with the exception of the internal waste zones as mentioned above. The core recovery and the size of the shaft and channel samples are sufficient to provide a reliable database for resource estimation.

11 Sample Preparation, Analyses and Security (Item 15)

11.1 Sample Preparation, Analysis and Security for Mine 63

The sample preparation and analysis procedures have evolved during the project history as shown below:



MMX originally used the Technological Characterization Laboratory (LCT) of the Polytechnic School at the University of São Paulo for analysis of the shaft and channel samples; the lab is not internationally certified. The drill samples were analyzed at SGS Geosol Laboratorios Limitada (SGS); SGS has ISO 9001(2000) and ISO 14001(2001) certification. At the suggestion of MMX's Quality Control/Quality Assurance (QA/QC) consultant, 5% of the total samples were sent to the Ultra Trace Analytical Laboratories Pty Ltd (UT) in western Australia for check assays. UT has ISO 17025 and National Association of Testing Authorities, Australia Certifications. At the suggestion of SRK, MMX decided to reassay all available pulps which were initially analyzed by LCT at SGS and to use that laboratory for future work. Only 14 samples remain in the database with only the LCT analysis. Current laboratory QA/QC consists of using SGS internal controls, the use of a standard reference sample, and check assays of 5% of the samples at UT. The following sections describe the sample preparation and analysis procedures used for Corumbá samples. The final section reviews the QA/QC program.

11.1.1 Sample Preparation

The initial sample preparation is done by MMX at the Mine 63 facility. The reduced sample is then shipped to the commercial laboratory for further preparation and analysis.

MMX

The current sample preparation consists of:

- Drying the sample in the sun for 4 to 12 hours;
- Jaw crushing to 2.5cm; and
- Homogenization and splitting with a Jones splitter to a 2kg sample.

Initially a 10kg sample was sent to the laboratory Processamento e Caracterização Mineral Ltda (PCM) and later a 2kg sample was sent to LCT Laboratory. PCM does not have international certification.

PCM

PCM Laboratory was used for sample preparation for the first five shafts to dry, crush and reduce the sample to 2kg before sending to LCT for analysis.

LCT

The sample preparation at LCT consisted of:

- Drying in an oven at a temperature between 80 and 100^{o}C;
- Jaw crushing;
- Disc or roller mill;
- Samples greater than 35g were split to 30g with a Jones splitter;
- Drying in oven for two hours; and
- Pulverization with Herzog mill to grain size less than 0.05mm.

SGS

The sample preparation at SGS consist of:

- Drying in oven at 100$\pm$10^{o}C;
- Crush to 90% less than 2mm;
- Homogenization and splitting with Jones splitter to 250 to 300g;
- Pulverization to 95% less than 150 mesh; and
- Splitting to 125g.

11.1.2 Sample Analysis

LCT

Between 7 to 10g of sample is combined with Hoescht resin (10% of the sample weight) and the resulting mixture is then weighed. The sample and resin are homogenized and then pressed in a Herzog press to form a disk.

The samples are analyzed with an X-ray Fluorescence Spectroscopy (XRF) spectrometer. LOI is analyzed by placing 1.000g $\pm$ 0.0001g of sample in a porcelain crucible, heating in a furnace for one hour at 1050^{o}C and cooling with a dryer. The sample is reweighed and the LOI calculated.

SGS

The sample is dried at 100$\pm$10^{o}C and then a 0.50g sample is combined with a lithium tetraborate solvent which is fused and poured into a mold to form a disk. The samples are analyzed by XRF, LOI is analyzed by heating the sample at 110^{o}C for one hour, placing 1.5 to 2g of the sample in a crucible, heating at 1000$\pm$50^{o}C for one hour, cooling, and weighing the sample and crucible again. The LOI is calculated with a detection limit of 0.01%.

The data are transferred directly from the equipment and stored in the Laboratory Management and Information System (LIMS).

UT

The sample is fused in a Bradway electric rocking furnace and cast into 40mm diameter beads using 12.22 flux containing 5% sodium nitrate. The beads are analyzed with XRF. LOI is analyzed by heating a pre-dried portion of the sample in an electric furnace set to the client's requested temperature.

11.1.3 Laboratory Quality Control and Quality Assurance

Internal SGS QA/QC

SGS internal QA/QC procedures consist of:

- LIMS software is used during the acquisition of data in the laboratory to eliminate errors in the manual entry of data. The software is also used in statistical treatment of the Quality controls;
- Calibration of all critical equipment every six months;
- Daily verification of scales and spectrometers;
- 5% of the samples are weighed after each step of sample preparation, with 3% as an acceptable loss in sample weight;
- 5% of the samples are measured for sample size during preparation with 95% passing the mesh size being the acceptable value;
- The batch size is 40 samples. Duplicate samples are prepared for each 20 samples; standard reference samples are inserted in the sample stream at a rate of 1 in 20 samples and one blank sample is inserted in each batch; and
- Samples with anomalous results are repeated. If the repeat does not duplicate the original, then a new sample is prepared from the reject.

MMX QA/QC

Analytical Solutions Ltd reviewed the QA/QC data and this section is taken from her report. As mentioned in the introduction to this section, LCT analyzed the shaft and channel samples and SGS analyzed the drillhole samples. Five percent of the samples were sent to the UT Laboratory in Australia for check analysis, including 17 pulps originally analyzed by LCT. In general, there was poor correspondence between the UT and LCT data (Figure 11-1). As suggested by other MMX consultants, the LCT data was not considered reliable for resource estimation and MMX decided to have all the pulps reanalyzed by SGS for use in the resource estimation.

For check analysis purposes, a total of 82 pulps analyzed by SGS in 2006 were reanalyzed by UT. Both SGS and UT used fused disk (glass bead) XRF for determination of the major oxides. In general, there is good agreement between the two sets of data. Figure 11-1 summarizes the percentage difference between SGS and UT assays relative to the SGS determination (with no implication that SGS or UT provided the preferred data). One sample is excluded for LOI where values of 0.01 and 0.59% were reported which results in a large percentage difference and may be due to data handling issues. Table 11.1.3.1 documents the percent difference between SGS and UT samples.

Table 11.1.3.1 documents the percentage of samples within ± 5%, 10%, 20%, etc.

Table 11.1.3.1: Summary of Percent Difference Between SGS and UT Samples

Element	N	5%	10%	20%	25%	50%	> +50%
Fe	82	82 100%					
MnO	82	59 72%	61 74%	70 85%	74 90%	81 99%	1 1%
SiO_2	82	76 93%	80 98%	82 100%			
Al_2O_3	82	49 60%	72 88%	78 95%	80 98%	82 100%	
P	82	59 72%	77 94%	82 100%			
TiO_2	82	41 50%	65 79%	77 94%	78 95%	82 100%	
LOI	82	38 46%	57 70%	71 87%	75 91%	79 96%	3 4%

The key observations are:

- Eleven Fe values agree within 5%;
- 93% of SiO_2 values agree within 5%;
- Al_2O_3 values show good correspondence above 1% and 88% of all the samples agree within $\pm$10%;
- The majority of P values are less than 0.1% and close to detection limits for the XRF method; there is a bias equal to approximately 3% of the P concentration with higher values reported by SGS than UT (similar to the observation for Minas-Rio);
- The majority of values of TiO_2 are less than 0.2%. TiO_2 show good correspondence and 79% of the agree within +10%. The majority of results which do not agree within $\pm$10% are almost within 10 times detection limit and precision is expected to be in the order of $\pm$100%;
- 74% of the Mn values agree within ±10%; values less than 0.1% do not agree within ±10% but are within ten times detection limits and precision is expected to be poor; and
- 65% of the LOI values reported by SGS are higher than those reported by UT. UT refers to the analyses as done by a robotic Thermogravimetric Analyser (TGA) with the furnaces set 100^o and 1000ºC. The temperature used for LOI at SGS should be determined and the two analytical methods compared. The majority of the LOI values are less than 2% and the variance between the laboratories is in the order of 5% of the reported values.

In general, there is good correspondence between SGS and UT major oxide determinations. Some elements (MnO, P and TiO_2) are found in concentrations within ten times the detection limit of the XRF method. If these determinations are required more accurately, it is recommended that a lithium metaborate fusion – ICP method, with detection limits in the range of 1 to 10ppm, be used.

SRK considers the sample preparation, analysis and security to follow industry standards and that the assays are reliable for resource estimation.

11.2 Sample, Preparation and Analysis for Urucum NE

11.2.1 Sample Preparation Procedures

Sample preparation takes place at the MMX Corumbá Laboratory. SGS Laboratory, in Belo Horizonte, did all the chemical analysis and ALS Chemex Laboratory, in Australia, was used for check assaying as the second lab.

The 200kg-sample is crushed in a closed circuit with a 38mm screen until all material is less than 38mm. The crushed material is then fed into a rotary splitter. Half the sample is filed as an archive and the other half is fed into rotary splitting again. The second splitting generates two portions, one is used for the global analysis and the other for the size fraction test. The sample is screened at 25mm, 19mm, 12mm, 6.35mm and 4mm. A small portion is taken from the 25mm to 19mm fraction for a crepitation test. The remainder of that fraction is mixed with the 19mm to 12mm fraction. The <4mm fraction is wet screened to generate three more fractions: 4mm to 1mm, 1mm to 0.15mm and <0.15 mm. The resulting size fractions are:

- 25mm to 12mm;
- 12mm to 6.35mm;
- 6.35mm to 4mm;
- 4mm to 1mm;
- 1mm to 0.15mm, and
- <0.15mm.

All six size fractions and the global samples are sent to chemical analysis preparation. This process consists of successive crushing and splitting until the last stage when a pulp is taken for chemical analysis. The first stage is crushing to 8mm. All crushed material is fed into rotary splitting until one 3kg portion is obtained. This portion is crushed again to 2mm and dried at 105°C. Then the dried sample is fed into the rotary splitter until a 200g portion is obtained. This portion is pulverized and split again. One-half is sent for chemical analysis and the other half is stored as an archive.

The global sample and the fractions 25mm to 19mm, 19mm to 12mm and 12mm to 6.35mm pass through the chemical analysis preparation process from the beginning starting with the 8mm-crushing. The fraction 6.35mm to 4mm starts the process in the next stage, where the 3kg portion is obtained. The fractions 4mm to 1mm and 1mm to 0.15mm are sent directly to the drying stage and the fraction <0.15mm is filtered before also being sent to the drying stage.

All chemical analyses are done by XRF for the elements Fe, SiO_2, Al_2O_3, P, MnO, CaO, MgO, K_2O, Na_2O, TiO_2 and gravimetric analysis for LOI (Loss on Ignition).

11.2.2 Chemical Analysis Procedures

SGS Procedures

SGS receives the pulverized samples and dries them at a temperature of 100 ± 10ºC. A portion of 0.50g is taken from the dried samples and a solvent with a lithium tetraborate base is added in a quantity sufficient for the total fusion of the sample. The mixture of the sample and solvent is then homogenized and fused in a platinum crucible, using an automatic fusion machine for between 15 and 20 minutes. The fused material is poured into a platinum mold, forming a disk with a flat surface.

The SGS internal laboratory QA/QC procedures consist of inserting a duplicate sample or a replicate sample, alternately, for each ten samples in a batch. At least one reference sample is inserted into each batch. The samples are stored individually in plastic bags and maintained in a dryer until the spectrometer reading. The samples are analyzed by XRF.

The data are transferred directly from the equipment and stored in the LIMS.

Table 11.2.2.1: Limits Detection of SGS Iron Ore Analysis

Element	Detection Limit (%)	Upper Limit (%)
Al_2O_3	0.10	90
Fe_2O_3	0.01	100
K_2O	0.01	15
MgO	0.10	45
MnO	0.01	70
Na_2O	0.10	15
P_2O_5	0.01	45
SiO_2	0.10	100
TiO_2	0.01	100

Loss on Ignition is performed by a gravimetric method. The sample is heated to approximately 110ºC for a minimum of one hour. A clean, dry crucible is weighed and the weight is recorded (CV). 1.5 to 2g of the heated sample is added to the crucible, which is then weighed again (C+A). The crucible with the sample is placed in an oven which is heated to a temperature of 1000 ± 50ºC. The sample is left to cremate for a period of more than one hour. The crucible is removed from the furnace and placed on a refractory plate until it loses its incandescence. It is then placed in a dryer until the crucible and sample are cooled and then it is weighed again (final weight).

The calculation of results is:

$$\%\,\text{F.W.} = \frac{(\text{C} + \text{A}) - (\text{Final Weightl})}{(\text{C} + \text{A}) - (\text{CV})} \text{ x } 100$$

The detection limit is 0.01% and the data are recorded in the LIMS.

ALS Chemex Procedures

ALS Chemex uses the lithium metaborate fusion method and XRF for its analysis of iron ore samples. A prepared sample (0.5g) is fused with a lithium metaborate flux at about 1000°C which is then analyzed by RXR spectrometry.

The samples were analyzed with ALS Chemex 19 element package. The elements determined by XRF are listed below in Table 11.2.2.2.

The analysis includes a LOI determination at 1000°C, undertaken with a TGA. This allows for an addition of the oxides, generated at the ignition temperature and the LOI, to arrive at a total (oxides plus LOI). The LOI is due to the loss of water from hydrated minerals (goethite, gibbsite and kaolinite), decomposition of carbonates (calcite, siderite and dolomite) and the volatilization of organic compounds.

Table 11.2.2.2: Detection Limits in ALS Chemex Iron Ore Analysis

Element	Symbol	Units	Lower Limit	Upper Limit
Aluminum	Al_2O_3	%	0.01	30
Arsenic	As	%	0.001	0.6
Barium	Ba	%	0.005	0.3
Calcium	CaO	%	0.01	10
Cobalt	Co	%	0.005	2
Chromium	Cr	%	0.005	5
Copper	Cu	%	0.005	3
Iron	Fe	%	0.01	75
Potassium	K_2O	%	0.001	5
Magnesium	MgO	%	0.01	10
Manganese	MnO	%	0.001	75
Sodium	Na_2O	%	0.01	5
Nickel	Ni	%	0.005	3
Phosphorus	P	%	0.001	5
Sulphur	S	%	0.001	5
Silicon	SiO_2	%	0.01	70
Vanadium	V	%	0.005	1
Zinc	Zn	%	0.005	5

11.2.3 Quality Control Procedures (QA/QC)

SGS Quality Control

- SGS uses software developed by LIMS used by geochemical laboratories in various countries (such as Brazil, Chile, Canada and Germany) for on-line acquisition of data, eliminating errors in the manual entry of information. Information relative to quality control (blanks, duplicates and standards) is also retrieved with this software;
- Calibration of all critical equipment related to the process every six months;
- Daily verification of scales and spectrometers through standard weights or control samples;
- Control of mass in 5% of samples prepared in the steps of crushing and pulverization, through weighing samples before and after each step, a maximum loss of 3% of material being acceptable for each step;
- Control of screening in 5% of samples prepared in the steps of crushing and pulverization through the screening analysis of samples after each step, a minimum percentage of 95% below the mesh reference being acceptable;

- With each 20 samples prepared, a sample is divided into two parts after the process of crushing and the final preparation is made of each of these parts (preparation of duplicates);
- The analyses are done in batches of up to 40 samples;
- Samples of internal reference and certified material are inserted in each 20 samples;
- Inclusion of blanks of reagents in each batch analyzed; and
- Anomalous results are repeated and when the result obtained does not confirm the first assay, the analysis of a new sample is prepared using the waste of the material received.

ALS Chemex Quality Control

ALS Chemex uses a web-based LIMS control system which is used by geochemical laboratories in various countries with on-line acquisition of data from equipment used in the laboratory, eliminating errors in the manual entry of information. The system provides additional assurance of the quality of data by providing on-line access to complete audit trails and important QC data and control charts.

Standard specifications for sample preparation are clearly defined and monitored. ALS Chemex standard operating procedures require that at least one sample per day be taken from each sample preparation station.

The ALS Chemex LIMS inserts quality control samples (reference materials, blanks and duplicates) in each analytical run, based on the rack sizes associated with the method. The rack size is the number of samples, including QC samples, included in a batch. The blank is inserted at the beginning, standards are inserted at random intervals, and duplicates are analyzed at the end of the batch. Quality control samples are inserted based on rack sizes specific to the method. XRF methods use two standards, one duplicate and one blank, with rack size of 39 samples.

Quality Control Limits for reference materials and duplicate analyses are established according to the precision and accuracy requirements of the particular method.

MMX Quality Control

MMX initialized a QA/QC program at the beginning of the Urucum NE exploration. The program consists of introducing one iron ore standard, OREAS40, one blank, and one pulp duplicate per batch. Additionally 117 samples were sent to ALS Chemex in Australia for check assaying.

Agoratek International (Agoratek) reviewed the following laboratory QA/QC data for MMX:

- SGS internal QA/QC data;
- SGS vs ALS Chemex pairs of check assays;
- SGS assays of MMX standard OREAS40; and
- A few assays of OREAS40 and APHP standards at ALS Chemex.

Agoratek made the following observations:

- Standard IPT123, the SGS internal commercial standard, is ill-certified and can be used only as a measure of accuracy and cannot be used to assess SGS's general performance;
- Standard OREAS40 has good certification and has been validated by Agoratek in the past. SGS performs well on this standard for Fe and SiO2, but may show bias with Al_2O_3 and P;
- A comparison of the SGS and ALS Chemex check assays indicates that there may be a high bias on P by SGS and a low bias on Al_2O_3; and
- The samples submitted as blanks actually were not blank and therefore the results are not usable.

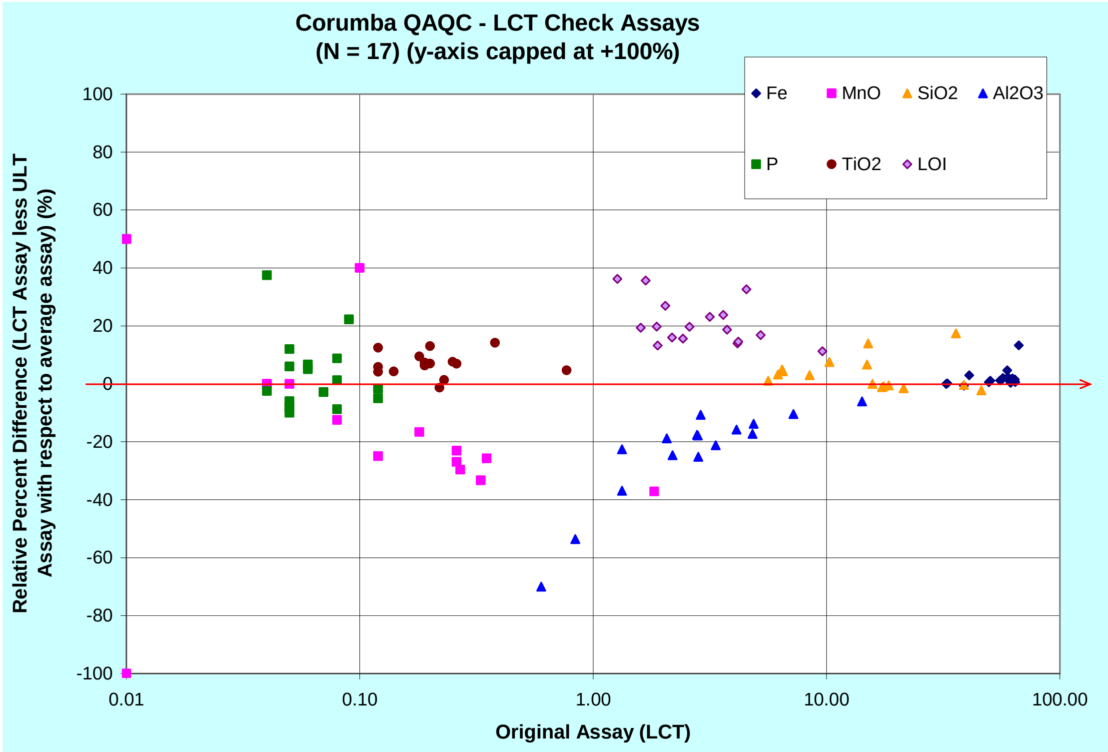
11.2.4 Sample Security

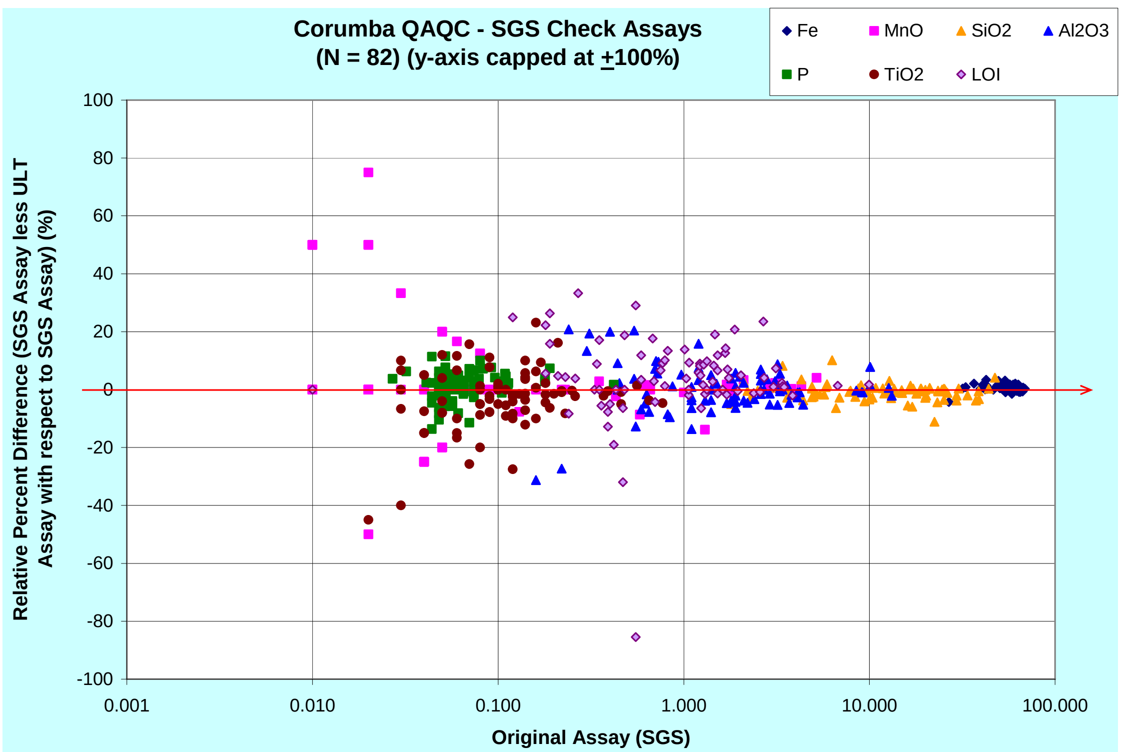
MMX has maintained control of samples from collection to the production of individual samples in sealed shipping packets at the MMX project site. These packets are delivered from the Mine site to the SGS Lab in Belo Horizonte by a transport company.

MMX retains the pulps and coarse rejects from their samples at their secure office at Mine 63.

11.2.5 ISO 9000 Certification

SGS has ISO 9001(2000) and ISO 14001(2001) Certification.





SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	**Figure 11-1** **LCT and SGS vs. UT Analyses for Corumbá Samples**
SRK Job No.: 162703.03		
File Name: Figure 11-1.doc	**Source: Mineração & Metálicos S.A.**	Date: 02-27-08 · Approved: LM · Figure: 11-1

12 Data Verification (Item 16)

The data is received from the laboratory as electronic files and as hard copies of the assay certificates. The data is entered into Excel spreadsheets with four sheets for collar coordinates, assays, downhole surveys, and lithologic information. The laboratory certificates are received as hard copies.

During SRK's verification process for Mine 63 data in the previous Technical Report, some problems were noticed with the values of the MnO variable where in some cases the values appeared to be for Mn and in others the values were for MnO. SRK rebuilt the entire database using the original spreadsheets from SGS. After the database was rebuilt, SRK performed checks on 10% of the data against the assay certificates. SRK also checked the drillhole collars against the database and also reviewed selected lithologic intervals against the core photos and drill logs.

SRK has verified 10% of the Urucum NE database against assay certificates and found no significant errors.

SRK did not independently collect samples for assay because the rock shows obvious mineralization and the database samples have undergone extensive assaying and check assaying.

13 Adjacent Properties (Item 17)

Vale operates the Urucum Mine immediately northeast of Mine 63 and RTZ operates the Corumbaense Reunidas Mine in the nearby Santa Cruz Mountains. MMX did not utilize any information from these mines in the preparation of this report.

14 Mineral Processing and Metallurgical Testing (Item 18)

14.1 Mineral Processing and Metallurgical Testing for Mine 63

14.1.1 Technological Parameters of the Process

This section describes the procedures and results of metallurgical tests to define the parameters used in the development of the process flowsheet and product recoveries and includes:

- Description and location of samples used in bench tests;
- Description of bench tests;
- Study of the correlation between RoM and Lump for the Eluvium and Colluvium ore types, with a view to obtaining the relation of enrichment and establish cut-offs; and
- Study of mass recovery, with the definition of factors of product yield of Lump and Sinter Feed.

Bench Tests and Chemical Analyses

The bench test samples were composed of coarse rejects from 35 shaft samples. Figure 14-1 shows the location of the samples for the bench tests and the pit outline. The eluvial area is well represented by the bench test samples. The samples in the colluvial area were taken in areas close to the source material and also at points at some distance from the source. The overall representativeness of the samples appears to be good. The procedures followed the standard NBR ISO 3082, which deals with the principles of iron ore sampling and preparation of samples.

The samples were prepared by PCM Laboratory with the following procedure:

- An initial sample was taken from the coarse reject for the RoM sample;
- Homogenization of the remainder of each sample;
- The sample was dried and weighed to verify the initial volume of the sample;
- The sample was crushed to less than 25.4mm;
- The sample was combined with an alkaline dispersant, sodium silicate (ph~10), to about 50% solids;
- Scrubbing was conducted in a mixer with visual control of desegregation;
- Wet screening was accomplished with a Manupen type screen into the following sample bands 25.4 – 19.6 – 12.5 – 9.6 – 6.35 – 4.0 – 2.0 – 1.0 – 0.5 – 0.25 and 0.15mm; and
- The range for Lump was considered to be 25.4 to 6.35mm and Sinter Feed was 6.35 to 1.00mm.

Samples of RoM and Lump were sent to the Technological Characterization Laboratory – (LCT) of the Polytechnic School at the University of São Paulo for chemical analysis. The results are shown in Tables 14.1.1.1 and 14.1.1.2.

Table 14.1.1.1: Colluvial Ore –Chemical Analysis: RoM and Lump

Coordinates			RoM													Lump								
X	Y	Z	Hole Id	Laboratory Name	From	To	Fe	SiO_2	AI_2O_3	P	MnO	CaO	MgO	TiO_2	LOI	NºLCT	Hole Id	Fe	SiO_2	$A1_2O_3$	P	Mn	TiO_2	LOI
435800.8	7877646	618.03	Can_T6	EBX075	0.00	7.70	65.230	4.19	1.89	0.05	<0.10	na	na	0.16	2.51	7084/05	CAN T6	67.498	2.12	1.01	0.054	<0.10	0.13	1
434600.1	7877503	403.06	T0_00	EBX118	0.00	10.00	58.309	13.36	1.87	0.05	<0.10	na	na	0.15	1.42	7552/05	T0/00	65.135	5.8	0.61	0.053	<0.10	<0.10	0.58
434405	7877393	378.22	T01_100S	EBX069	0.00	6.00	56.005	12.80	2.00	0.06	2.01	na	na	0.17	2.48	7066/05	T01/100S	64.8	6.10	0.79	0.06	0.64	<0.10	1.20
434199.6	7877484	344.96	T02_00	EBX149	0.00	5.60	56.991	15.76	1.33	0.05	0.35	na	na	0.12	1.60	7606/05	T02/00	62.578	9.030	0.62	0.054	0.115	<0.10	0.53
434204.3	7877384	357.41	T02_100S	EBX090	0.00	6.00	54.001	15.03	3.31	0.07	0.70	na	na	0.20	3.11	7129/05	T02/100S	63.062	8.28	0.48	0.056	0.342	<0.10	1.7
434209	7877284	352.99	T02_200S	EBX079	0.00	6.00	52.563	16.83	1.59	0.07	2.14	na	na	0.14	2.78	7096/05	T02/200S	62.954	7.8	0.46	0.051	0.831	<0.10	0.82
434004.5	7877375	330.5	T03_100S	EBX089	0.00	5.05	61.320	7.90	2.46	0.08	0.42	na	na	0.18	2.42	7126/05	T03/100S	65.442	3.49	1.32	0.062	<0.10	0.1	1.74
434982.3	7877772	458.93	T2_250N	EBX086	0.00	2.47	63.803	4.90	2.49	0.08	<0.10	na	na	0.16	2.68	7117/05	T2/250N	65.111	3.13	2.22	0.05	<0.10	0.12	2.37
435194.6	7877629	493.82	T3_100N	EBX066	0.00	5.00	60.954	8.21	2.11	0.06	0.20	na	na	0.18	2.59	7057/05	T3/100N	67.413	2.83	0.7	0.063	<0.10	<0.10	1.28
435181.8	7877765	491.54	T3_236N	EBX057	0.00	2.90	65.523	3.66	1.40	0.06	0.15	na	na	0.12	1.91	6668/05	T3/236N	67.9	2.16	1.19	0.06	<0.10	<0.10	0.99
435400.5	7877541	557.73	T4_00	EBX058	0.00	8.15	61.193	7.42	2.64	0.05	<0.10	na	na	0.21	2.68	6671/05	T4/00	68.7	2.33	0.72	0.06	<0.10	0.09	0.84
435395.4	7877640	531.56	T4_100N	EBX073	0.00	5.40	61.662	7.94	2.24	0.06	0.10	na	na	0.18	2.11	7078/05	T4/100S	68.154	3.01	0.53	0.05	<0.10	<0.10	0.8
435410.7	7877341	596.65	T4_200S	EBX059	0.00	6.00	59.334	8.48	4.12	0.06	<0.10	na	na	0.25	3.75	6674/05	T4/200S	68.8	1.82	0.37	0.06	<0.10	<0.10	0.63
435387.6	7877791	527.78	T4_250N	EBX061	0.00	2.60	59.009	7.98	2.96	0.09	0.51	na	na	0.19	3.49	6680/05	T4/250N	65.2	4.97	1.05	0.08	<0.10	<0.10	1.39
435600.1	7877551	595.54	T5_00	EBX078	0.00	8.70	59.430	9.15	3.82	0.08	<0.10	na	na	0.20	2.93	7093/05	T5/00	67.155	3.16	0.82	0.056	<0.10	<0.10	0.86
435605.3	7877451	619.66	T5_100S	EBX062	0.00	6.00	60.292	7.17	3.50	0.05	<0.10	na	na	0.26	3.18	6683/05	T5/100S	68.5	1.73	0.75	0.05	<0.10	<0.10	0.89
435610.4	7877351	635.34	T5_200S	EBX065	0.00	6.00	62.793	6.87	1.70	0.05	<0.10	na	na	0.16	2.28	7054/05	T5/200S	67.697	3.14	0.3	0.052	<0.10	<0.10	0.73
435799.9	7877561	641.54	T_00	EBX083	0.00	9.80	63.685	7.60	0.89	0.06	<0.10	na	na	0.10	2.11	7108/05	T6/00	67.865	1.8	0.34	0.055	<0.10	<0.10	1.43
435805	7877461	672.88	T6_100S	EBX068	0.00	6.00	63.109	5.17	2.61	0.05	<0.10	na	na	0.21	2.59	7063/05	T6/100S	66.738	2.03	0.82	0.065	1.102	<0.10	1.01
435810.1	7877361	704.98	T6_200S	EBX072	0.00	6.00	64.767	4.21	1.81	0.05	0.25	na	na	0.16	2.14	7075/05	T6/200S	66.471	2.15	1.06	0.053	0.771	<0.10	2.45
435999.6	7877571	689.83	T7_00	EBX080	0.00	8.00	63.697	5.72	1.90	0.07	<0.10	na	na	0.16	2.39	7099/05	T7/00	68.4	2.65	0.66	0.07	<0.10	<0.10	0.87
435994.4	7877671	672.51	T7_100N	EBX088	0.00	6.00	64.355	4.62	2.03	0.06	<0.10	na	na	0.17	2.14	7153/05	T7100N	68.55	1.61	0.4	0.052	<0.10	<0.10	1.39
436004.7	7877471	736.43	T7_100S	EBX074	0.00	6.00	62.158	6.42	2.83	0.05	0.31	na	na	0.25	3.02	7081/05	T7/100S	63.284	7.15	0.75	0.069	1.154	0.1	1.15

Table 14.1.1.2: Eluvial Ore –Chemical Analysis: RoM and Lump

Coordinates			RoM													Lump								
X	Y	Z	Hole Id	Laboratory Name	From	To	Fe	SiO_2	AI_2O_3	P	MnO	CaO	MgO	TiO_2	LOI	NºLCT	Hole Id	Fe	SiO_2	$A1_2O_3$	P	Mn	TiO_2	LOI
436368.1	7877088.2	890.33	A3	EBX3	0.00	10.00	59.900	6.12	4.22	0.09	0.04	na	na	0.22	5.39		A3	65.1	3.39	2.48	0.08			3.28
436306.0	7877164.5	863.04	A4	EBX4	0.00	10.00	64.200	6.20	1.33	0.07	0.04	na	na	0.12	1.87		A4	67.32	3.42	0.35	0.06			1.2
436122.0	7877380.2	827.40	A7_CAN4A	EBX 107	0.00	4.20	64.587	4.390	2.320	0.040	<0.10	na	na	0.190	2.020	7177/05	A7 (0-4.2m)	68.9	1.48	0.18	0.05	<0.10	<0.10	1.07
436149.1	7877355.7	849.51	CAN_3A (0-6m)	EBX104	0.00	6.00	66.370	4.96	0.97	0.04	<0.10	na	na	0.11	1.08	7168/05	CAN_3A (0-6m)	67.5	2.68	0.32	0.04	<0.10	<0.10	1.70
436149.1	7877355.7	849.51	CAN_3A (6-10.20m)	EBX105	6.00	10.20	61.098	12.3	0.40	0.05	<0.10	na	na	<0.10	0.97	7171/05	CAN_3A (6-10.20m)	63.6	7.61	0.10	0.04	0.14	<0.10	1.99
436075.8	7877285.9	857.79	CAN_3B	EBX84	0.00	15.40	62.217	7.12	2.68	0.09	<0.10	na	na	0.19	2.67	7111/05	CAN 3B	65.0	6.72	0.18	0.04	<0.10	<0.10	1.37
436015.4	7877208.4	861.71	CAN_3C	EBX87	0.00	11.30	64.072	6.78	0.95	0.05	<0.10	na	na	0.11	2.00	7120/05	CAN 3C	65.7	4.55	0.58	0.04	<0.10	<0.10	1.62
435949.3	7877141.8	846.56	CAN 3D (0.0 a 5.0m)	EBX97	0.00	5.00	62.079	9.85	0.58	0.05	<0.10	na	na	<0.10	1.79	7147/05	CAN 3D (0.0 a 5.0m)	64.7	6.99	0.22	0.04	<0.10	<0.10	1.09
435949.3	7877141.8	846.56	CAN 3D (5-11.65m)	EBX98	5.00	11.65	66.536	3.25	1.06	0.05	<0.10	na	na	0.10	1.63	7150/05	CAN 3D (5-11.65m)	67.5	2.16	0.67	0.05	<0.10	<0.10	1.70
436049.8	7877306.6	833.66	CAN 4B (0-6.90m)	EBX101	0.00	6.90	64.796	4.16	1.92	0.05	<0.10	na	na	0.16	2.39	7159/05	CAN 4B (0-6.90m)	65.6	1.41	1.25	0.12	<0.10	0.10	1.34
436049.8	7877306.6	833.66	CAN 4B(6.90-11.80m)	EBX102	6.90	11.90	64.375	5.63	0.84	0.05	<0.10	na	na	0.12	1.68	7162/05	CAN 4B(6.90-11.80m)	66.7	3.81	0.47	0.05	<0.10	0.10	1.13
435945.2	7877145.8	844.36	CAN 4D (0.0 a 7.20m)	EBX95	0.00	7.20	64.517	4.04	2.34	0.04	<0.10	na	na	0.16	2.50	7141/05	CAN 4D 0.94(0.0 a 7.20m)	67.4	1.27	1.12	0.04	<0.10	<0.10	2.14
435905.8	7877058.9	841.53	CAN 4E (0 a 6.20m)	EBX125	0.00	6.20	60.571	9.31	2.01	0.05	<0.10	na	na	0.17	2.15	7567/05	CAN 4E (0 a 6.20m)	66.3	3.31	0.94	0.04	<0.10	<0.10	0.98
435905.8	7877058.9	841.53	CAN-4E (10.05 a 13.05)	EBX125	10.05	13.05	64.628	7.80	0.43	0.05	<0.10	na	na	<0.10	1.30	7579/05	CAN-4E (10.05 a 13.05)	66.3	3.94	0.12	0.04	<0.10	<0.10	0.60
436263.6	7876744.1	860.15	D1	EBX54	0.00	10.00	45.565	30.0	1.78	0.10	<0.10	na	na	0.19	2.21	6659/05	D1	49.9	27.3	0.46	0.06	<0.10	<0.10	0.78
436065.8	7876839.6	973.16	E3	EBX 1	0.00	10.00	63.500	4.07	2.91	0.10	0.02	na	na	0.17	2.87	6665/05	E3	69.8	1.38	0.37	0.09	<0.10	<0.10	0.74
435999.8	7876916.8	851.24	E4	EBX67	0.00	10.00	61.982	9.30	1.03	0.06	<0.10	na	na	0.11	1.89	7060/05	E4	66.3	4.57	0.45	0.05	<0.10	0.10	0.63

Correlation RoM x Lump

The iron grade of RoM and Lump for each sample was plotted on separate graphs for colluvium and eluvium. The equations that relate the grade of Fe in RoM with the grade of Fe in the Lump was obtained by linear regression. The results for the two kinds of ore present in the area, eluvial and colluvial are discussed below.

The first graph presented in Figure 14-2, shows the correlation curve for the grade of Fe of the eluvial type ore. A good correlation is shown between the tests. For the eluvial graph for Fe, the following linear equation is observed: Lump = 0.85 x RoM + 12.454. Therefore, substituting the iron grade in RoM, the value of the iron grade in Lump is obtained. Considering that the grade of iron expected in the product at Mine 63 is 64.2%, the average grade of feed for RoM shall be 60.9% Fe.

The second graph presented in Figure 14-2 shows the correlation curve for the grade of colluvial type ore. In this case, the low correlation between the grades can be noted. This result can be explained by the characteristics of this type of ore that presents high variability in the distribution of iron grades because of the clastic nature of the material.

For the graph of Fe in Colluvium, the following linear equation is observed: Lump = 0.3657 *x* RoM + 44.144. Therefore, substituting the x for the grade of Fe in RoM, the value will be obtained of Fe in Lump. Considering that the grade of iron expected in the product of Mine 63 is 64.2%, the average grade of feed for RoM should be 54.8% Fe. Because of the high variability obtained in the colluvium samples, additional tests are planned, using a larger number of samples. In addition, the particle size will be considered as well as the global chemistry.

14.1.2 Mineralogical Analysis

The mineralogical contents for seven samples with three product sizes each are presented in Table 14.1.2.1. The major contents of the samples are iron oxides and hydroxides in aggregate or in mixed particles. The principal mineral is hematite. Goethite/limonite is very porous and is found free or interspersed among other iron oxide crystals and may show coloform texture, bordering hematite aggregates. Martitic hematite is extremely rare and occurs as very porous crystals, with shapes varying from anhedric to subhedric and grain sizes ranging from cryptocrystalline to very fine. Specular hematite is also rare, and occurs as elongate, oriented crystals, which are rarely acicular. Quartz is anhedric and free of inclusions. Occasionally, quartz occurs within aggregates and shows a reddish coloration due to a fine goethite/limonite cover. Kaolinite occurs freely, associated with goethite/limonite and sometimes overlain by it. Cryptocrystalline and lamellar manganese oxides occur freely associated to goethite/limonite and, rarely containing inclusions of hematite and quartz. Free leucoxene, probably a product of an alteration process of rutile, is present with goethite/limonite aggregates. Phosphorous is present in the samples as apatite, which occurs in anhedric and subhedric crystals included in hematite or as an aggregate of cryptocrystalline crystals included or associated with goethite/limonite.

Yellow and red or brown agglomerates formed by an association of goethite/limonite, argillaceous minerals, hematite, quartz and manganese oxides are present in almost all the fines samples, except AM 0053 and AM 058.

Table 14.1.2.1: Mineralogical Analyses of Samples from Mine 63

Sample		Hematite		Goethite		Goethite/Aggregate		Free Quartz		Quartz/Aggregate		Manganese		Kaolin		Gibbsite	
		VOL (%)	Weight (%)	VOL (%)	Weight (%)	VOL (%)	Weight (%)	VOL (%)	Weight (%)	VOL (%)	Weight (%)	VOL (%)	Weight (%)	VOL (%)	Weight (%)	VOL (%)	Weight (%)
AM - 11	Lump	96.80	97.70	0.00	0.00	3.10	2.20	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sinter Feed	76.20	81.30	7.90	7.00	13.30	10.00	11.30	0.60	0.00	0.00	0.00	0.00	1.70	0.90	0.20	0.20
	Pellet Feed	46.10	57.10	1.30	1.30	33.80	30.10	0.00	7.00	0.00	0.00	0.00	0.00	7.50	4.50	0.00	0.00
AM - 13	Lump	58.10	66.00	14.80	13.00	23.00	18.70	0.80	0.00	0.00	0.00	0.00	0.00	4.10	2.30	0.00	0.00
	Sinter Feed	45.60	55.80	4.80	4.80	38.20	33.30	3.60	0.50	0.00	0.00	0.00	0.00	10.60	6.30	0.00	0.00
	Pellet Feed	3.50	5.50	5.10	6.80	42.30	48.60	0.40	2.90	0.00	0.00	0.60	0.70	44.10	34.70	0.80	0.80
AM - 20	Lump	90.50	93.10	0.30	0.30	8.00	6.00	10.30	0.20	0.30	0.10	0.20	0.20	0.30	0.10	0.00	0.00
	Sinter Feed	56.00	65.90	0.00	0.00	31.30	26.60	19.30	6.10	1.30	0.80	0.00	0.00	1.10	0.60	0.00	0.00
	Pellet Feed	24.40	35.10	0.00	0.00	32.90	34.20	25.10	14.00	0.00	0.00	0.20	0.20	23.20	16.50	0.00	0.00
AM - 47	Lump	36.70	47.50	16.00	17.30	15.60	14.60	21.40	16.40	1.50	1.00	0.00	0.00	5.10	3.30	0.00	0.00
	Sinter Feed	37.50	49.80	7.30	8.10	18.60	17.80	29.50	14.30	3.30	2.20	0.00	0.00	11.90	7.80	0.00	0.00
	Pellet Feed	35.60	47.90	6.80	7.60	17.90	17.40	32.70	20.00	0.00	0.00	1.10	1.00	9.10	6.00	0.00	0.00
AM - 48	Lump	59.40	74.00	0.00	0.00	1.70	1.60	19.20	20.50	2.60	1.60	0.00	0.00	3.60	2.20	0.00	0.00
	Sinter Feed	62.00	73.90	0.00	0.00	12.50	10.80	33.70	11.50	2.60	1.60	0.50	0.40	3.10	1.80	0.00	0.00
	Pellet Feed	32.50	44.40	6.40	7.20	21.30	21.00	5.10	23.20	0.00	0.00	0.10	0.10	6.00	4.10	0.00	0.00
AM - 53	Lump	39.90	45.90	47.20	45.10	5.80	4.80	15.60	2.90	1.00	0.60	0.40	0.30	0.70	0.40	0.00	0.00
	Sinter Feed	22.70	30.60	38.10	42.70	0.00	0.00	0.00	10.60	14.90	10.10	0.70	0.60	8.10	5.40	0.00	0.00
	Pellet Feed	19.10	28.90	14.70	18.50	6.60	7.20	51.50	39.20	0.70	0.60	0.30	0.30	7.10	5.30	0.00	0.00
AM - 58	Lump	98.30	98.90	0.40	0.30	0.50	0.40	0.50	0.20	0.20	0.10	0.00	0.00	0.10	0.10	0.00	0.00
	Sinter Feed	67.50	77.30	0.00	0.00	15.50	12.80	16.60	9.60	0.00	0.00	0.10	0.10	0.20	0.10	0.00	0.00
	Pellet Feed	18.10	28.40	3.40	4.50	15.50	17.60	53.40	42.20	1.70	1.40	0.00	0.00	7.80	6.00	0.00	0.00

14.1.3 Calculation of Mass Balance

The mass balance is used to quantitatively establish the efficiency, yield and the dimensioning of the process plant.

For this study several size fractions characteristic of Lump and Sinter Feed were considered, in order to determine the mass recovery (product yield) of these materials. A total of 110 samples were analyzed; the results are summarized in Table 14.1.3.1 below and the sample locations are shown in Figure 14-3. The samples used in the mass balance calculation cover the entire mine area and are therefore quite representative of the material to feed the beneficiation plant.

Table 14.1.3.1: Average Results of Mass Recovery – Lump and Sinter Feed

	Lump Fractions				Lump	Sinter Feed Fractions				Sinter Feed
	<25.40mm >19.00mm Weight%	<19.00mm >12.50mm Weight%	<12.50mm >9.50mm Weight%	<9.50mm >6.35mm Weight%	<25.40mm >6.35mm Weight%	<6.35mm >4.75mm Weight%	<4.75mm >3.35mm Weight%	<3.35mm >2.00mm Weight%	<2.00mm >1.00mm Weight%	<6.35mm >1mm Weight%
MEAN	12.63	30.41	15.46	10.23	68.73	5.48	5.62	4.01	2.17	17.27
STD.DEV.	6.15	4.27	2.85	2.05	5.68	1.51	1.41	1.08	0.69	3.93
MIN	1.80	20.89	9.51	6.77	55.45	2.48	3.45	1.90	0.91	9.57
MAX	27.95	42.29	22.60	16.23	83.57	10.01	10.92	7.46	4.28	31.83

The size fractions for Lump are between 25.4 and 6.35mm and for Sinter Feed between 6.35 and 1.00mm. In Lump, the average weight percent is 68.7%, with minimum and maximum values of 55.5% and 83.6% respectively. The decision was to adopt 55%, the lowest value, as the project premise. The average weight percent in Sinter Feed is 17.3% with a minimum of 9.6% and maximum of 31.8%. A mass recovery of 11% of Sinter Feed was adopted as the premise for the project.

14.2 Mineral Processing and Metallurgical Testing - Urucum NE

MMX Corumbá performed bench scale tests of partition and gravimetric concentration in order to evaluate the potential of the resources in Urucum NE area for the production of Lump and Sinter Feed.

These tests were designed to evaluate the concentration properties of the resource considering mass and metallurgical recovery. The optimal methods obtained for concentration of the ore were based on gravity concentration processes.

14.2.1 Location and Preparation of Metallurgical Samples

Twenty-five samples were collected in the Urucum NE area from the same exploration shafts used in the geologic model. The sample locations are shown in Figure 14-4 and the principal chemical characteristics of these samples are presented in Table 14.2.1.1.

Table 14.2.1.1: Characteristics of Samples Analyzed in Heavy Medium Concentration

Sample ID	Fe	Al_2O_3	SiO_2	P	Mn	TiO_2	LOI	K_2O
L14_2400S	46.00	5.50	24.70	0.054	0.66	0.26	3.30	0.34
L14_2600S	57.20	2.30	13.50	0.053	0.09	0.16	1.53	0.11
L15_2400S A	59.60	2.30	10.10	0.055	0.15	0.15	1.28	0.11
L15_2600S	60.20	2.30	8.50	0.055	0.37	0.16	1.55	0.13
L15_2800S A	52.50	3.50	17.30	0.049	0.42	0.16	1.95	0.19
L15_2800S B	60.10	2.80	7.60	0.051	0.37	0.16	1.65	0.13
L16_2400S	49.60	2.70	21.30	0.055	1.50	0.18	1.74	0.28
L16_2600S	53.70	2.50	15.60	0.055	1.10	0.17	1.55	0.23
L17_2200S	52.50	2.70	17.00	0.053	1.01	0.18	1.68	0.26
L17_2400S	59.90	2.10	8.40	0.059	0.85	0.17	1.41	0.16
L17_3000S A	59.60	3.00	7.00	0.066	0.02	0.18	1.92	0.11
L17_3000S B	60.00	3.00	9.50	0.059	0.02	0.20	1.60	0.15
L17_3200S A	60.30	2.80	6.90	0.059	0.05	0.18	1.70	0.10
L17_3200S B	59.30	2.40	8.40	0.059	0.02	0.16	1.46	0.14
L18_2200S	52.20	2.30	17.40	0.054	1.32	0.16	1.47	0.25
L18_2400S	53.80	2.10	16.50	0.055	0.46	0.15	1.96	0.22
L18_3000S	62.40	2.10	7.50	0.053	0.02	0.14	1.11	0.08
L18_3200S	58.30	1.90	13.40	0.056	0.02	0.13	1.33	0.08
L19_2200S	55.00	4.70	13.40	0.066	0.27	0.24	2.49	0.14
L19_2400S	60.30	2.70	8.70	0.052	0.12	0.15	1.45	0.06
L19_2800S	55.20	2.00	15.80	0.051	0.08	0.13	1.52	0.11
L19_3000S A	62.70	2.40	7.90	0.059	0.05	0.18	1.57	0.13
L19_3200S	59.00	1.80	11.90	0.054	0.02	0.12	1.12	0.11
L20_2600S	59.30	2.70	11.00	0.052	0.07	0.16	1.50	0.08
L20_3000S	54.20	2.60	16.90	0.067	0.36	0.14	1.76	0.16
Average	**56.92**	**2.69**	**12.65**	**0.056**	**0.38**	**0.17**	**1.66**	**0.15**

14.2.2 Methodology

All samples were prepared according to flowchart in Figure 14-5 before the gravimetric concentration tests were carried out.

The sample preparation resulted in three size fractions to be used in the gravimetric tests and one sample considered waste, as described below:

- Fraction <38 mm > 6.35 mm –concentration test - Lump 1;
- Fraction <25 mm >9.52mm –concentration test - Lump 3;
- Fraction < 6.35mm > 1.00mm –concentration test - Sinter Feed; and
- Fraction < 1.00 mm – considered tailings.

The heavy medium used in the assays was a suspension of atomized Ferrosilicon with a density of approximately 7.00g/cm³. A suspension with 83.3% solids was prepared to obtain a stable pulp with a density of 3.50g/cm³.

14.2.3 Results

The samples, after preparation, presented size fraction mass yield and chemical analysis described in Tables 14.2.3.1 and 14.2.3.2.

Table 14.2.3.1: Mass Yield of Different Products After Processing

Shaft ID	< 38.0 mm >6.3 mm (%)	< 6.35 mm >1.00 mm (%)	<1.00 mm (%)
L14_2400S	53.92	21.18	24.90
L14_2600S	76.15	16.99	6.86
L15_2400S A	75.18	15.95	8.87
L15_2600S	72.01	19.40	8.59
L15_2800S A	70.23	20.39	9.38
L15_2800S B	65.39	17.77	16.84
L16_2400S	70.44	18.41	11.15
L16_2600S	70.26	20.11	9.63
L17_2200S	70.24	18.53	11.23
L17_2400S	72.77	19.25	7.98
L17_3000S A	70.06	21.14	8.80
L17_3000S B	69.45	20.20	10.35
L17_3200S A	68.33	23.66	8.01
L17_3200S B	68.22	22.82	8.96
L18_2200S	71.28	18.89	9.83
L18_2400S	68.31	19.77	11.92
L18_3000S	67.69	18.81	13.50
L18_3200S	76.97	16.39	6.64
L19_2200S	72.54	19.11	8.35
L19_2400S	75.23	18.78	5.99
L19_2800S	71.97	21.33	6.70
L19_3000S A	69.15	25.27	5.58
L19_3200S	74.03	18.12	7.85
L20_2600S	73.47	19.99	6.54
L20_3000S	73.86	16.24	9.90
Average	**70.69**	**19.54**	**9.77**

Table 14.2.3.2: Average Chemical Analysis Before Gravimetric Concentration

Fraction	Fe	Al_2O_3	SiO_2	P	P.F.	K_2O	MnO	TiO_2
Lump1	62.88	1.08	7.85	0.060	0.76	0.11	0.47	0.09
Lump3	62.44	0.87	9.19	0.060	0.70	0.11	0.55	0.10
Sinter Feed	55.38	2.23	15.12	0.070	1.80	0.18	0.67	0.18

The results of the gravity concentration tests in Sinter Feed, Lump 1 and Lump 3 are presented in Tables 14.2.3.3, 14.2.3.4 and 14.2.3.5, respectively. The average grades obtained in the tests with Lump 1 were 65.02% Fe and 4.86% SiO2 and with Lump 3, 64.76% Fe and 5.76% SiO2. When the results of the concentration of the two types of products (Lump 1 and Lump 3) are compared, it is noted that there is not a significant difference in grade, indicating that the reduction of top size of the Lump to 25mm does not bring a gain in its quality. The mass and metallurgical recoveries of the concentration tests were on average of 83% and 86% for LUMP 1 and of 88% and 91% for LUMP 3.

Table 14.2.3.3: Average Chemical Quality of Sinter Feed

	Fe	Al_2O_3	SiO_2	P	P.F.	K_2O	MnO	TiO_2
Sinter feed concentrate	64.30	1.64	4.78	0.05	1.05	0.06	0.15	0.11

Table 14.2.3.4: Results of Heavy Medium Tests for the Fraction <38.00> - LUMP1

SAMPLE	FLOW	Fe	Al203	Si02	P	MnO	Mass Recovery	Met. Recovery
I.14-2400S-1.1	FEED	56.70	1.40	14.70	0.050	1.10		
	CONCENTRATE	63.41	1.03	6.39	0.054	0.63	57%	64%
	TAILING	47.71	2.76	24.20	0.060	2.28		
I.14-2600S-1.1	FEED	62.50	0.90	9.50	0.070	0.06		
	CONCENTRATE	63.62	1.08	6.54	0.053	0.11	89%	90%
	TAILING	53.65	1.73	19.63	0.070	0.43		
I.15-2400SA-1.1	FEED	64.40	0.98	6.10	0.060	0.07		
	CONCENTRATE	65.06	1.04	4.92	0.049	0.07	91%	92%
	TAILING	57.62	2.07	12.51	0.060	0.61		
I.15-2600S-1.1	FEED	65.30	0.98	4.50	0.070	0.53		
	CONCENTRATE	65.97	0.85	3.52	0.047	0.11	85%	86%
	TAILING	61.43	1.83	6.58	0.060	1.65		
I.15-2800SA-1.1	FEED	65.20	1.20	2.90	0.070	0.32		
	CONCENTRATE	66.78	1.16	2.02	0.052	0.14	86%	88%
	TAILING	55.48	2.33	9.15	0.060	4.81		
I.15-2800SB-1.1	FEED	63.60	0.84	7.20	0.070	0.42		
	CONCENTRATE	65.92	0.70	3.99	0.046	0.03	82%	85%
	TAILING	53.26	2.27	13.46	0.080	1.91		
I-16.2400S-1.1	FEED	54.90	1.40	16.20	0.060	1.70		
	CONCENTRATE	64.06	0.81	6.25	0.049	0.86	52%	61%
	TAILING	45.00	2.37	27.87	0.060	4.03		
I-16.2600S-1.1	FEED	60.30	1.10	11.30	0.050	1.30		
	CONCENTRATE	63.87	0.93	5.97	0.051	0.50	77%	82%
	TAILING	48.30	2.34	24.34	0.060	3.42		
I-17.2200S-1.1	FEED	59.70	1.10	12.30	0.050	1.00		
	CONCENTRATE	64.38	0.89	5.91	0.048	0.13	61%	66%
	TAILING	52.38	2.14	17.31	0.060	4.04		
I-17.2400S-1.1	FEED	64.70	1.20	3.70	0.080	1.10		
	CONCENTRATE	66.26	0.98	2.54	0.050	0.34	83%	85%
	TAILING	57,25	2.37	8.53	0.070	3.04		
I-17.3000SA-1.1	FEED	66.00	1.40	2.70	0.070	0.04		
	CONCENTRATE	66.78	1.19	2.08	0.051	0.02	82%	83%
	TAILING	62.50	3.03	4.42	0.070	0.06		
I-17.3000SB-1.1	FEED	64.80	1.20	4.20	0.070	0.04		
	CONCENTRATE	65.95	1.10	2.96	0.052	0.02	68%	70%
	TAILING	62.32	2.13	5.73	0.070	0.04		
I-18.2200S-1.1	FEED	58.10	1.10	13.70	0.050	1.60		
	CONCENTRATE	64.16	1.07	5.48	0.053	0.23	68%	75%
	TAILING	45.06	2.35	28.30	0.060	6.20		
I-18.2400S-1.1	FEED	61.60	1.00	11.20	0.050	0.29		
	CONCENTRATE	64.14	0.83	6.17	0.049	0.22	82%	86%
	TAILING	49.68	1.90	24.35	0.050	1.35		
I-18.3200S-1.1	FEED	62.00	0.80	9.10	0.060	0.05		
	CONCENTRATE	63.79	0.72	7.18	0.046	0.01	77%	79%
	TAILING	55.93	1.52	17.77	0.060	0.06		
I-19.2200S-1.1	FEED	63.10	1.20	7.30	0.070	0.45		
	CONCENTRATE	65.55	1.01	4.08	0.050	0.06	89%	93%
	TAILING	43.00	4.49	21.70	0.090	3.19		
I-19.2400S-1.1	FEED	64.90	1.20	5.00	0.070	0.41		
	CONCENTRATE	65.48	1.08	4.19	0.049	0.03	89%	90%
	TAILING	60.25	2.32	8.18	0.070	0.27		
I-19.2800S-1.1	FEED	60.60	0.90	13.20	0.050	0.04		
	CONCENTRATE	63.36	0.81	8.10	0.047	0.03	78%	81%
	TAILING	50.93	1.87	25.94	0.070	0.81		
I-19.3000S-1.1	FEED	66.10	1.10	3.90	0.050	0.06		
	CONCENTRATE	66.58	0.96	3.01	0.048	0.02	82%	83%
	TAILING	63.84	1.71	4.84	0.060	0.14		
I-19.3200S-1.1	FEED	64.10	0.73	7.50	0.040	0.04		
	CONCENTRATE	64.29	0.74	6.86	0.048	0.02	95%	96%
	TAILING	60.31	1.38	11.22	0.060	0.05		
I-20.2600S-1.1	FEED	63.70	1.10	8.10	0.060	0.06		
	CONCENTRATE	65.42	0.92	4.98	0.048	0.03	67%	68%
	TAILING	60.27	1.61	10.54	0.060	0.42		
I-20.3000S-1.1	FEED	60.20	0.83	11.20	0.060	0.87		
	CONCENTRATE	62.39	0.85	8.79	0.056	0.58	89%	93%
	TAILING	42.00	1.64	32.23	0.070	4.61		

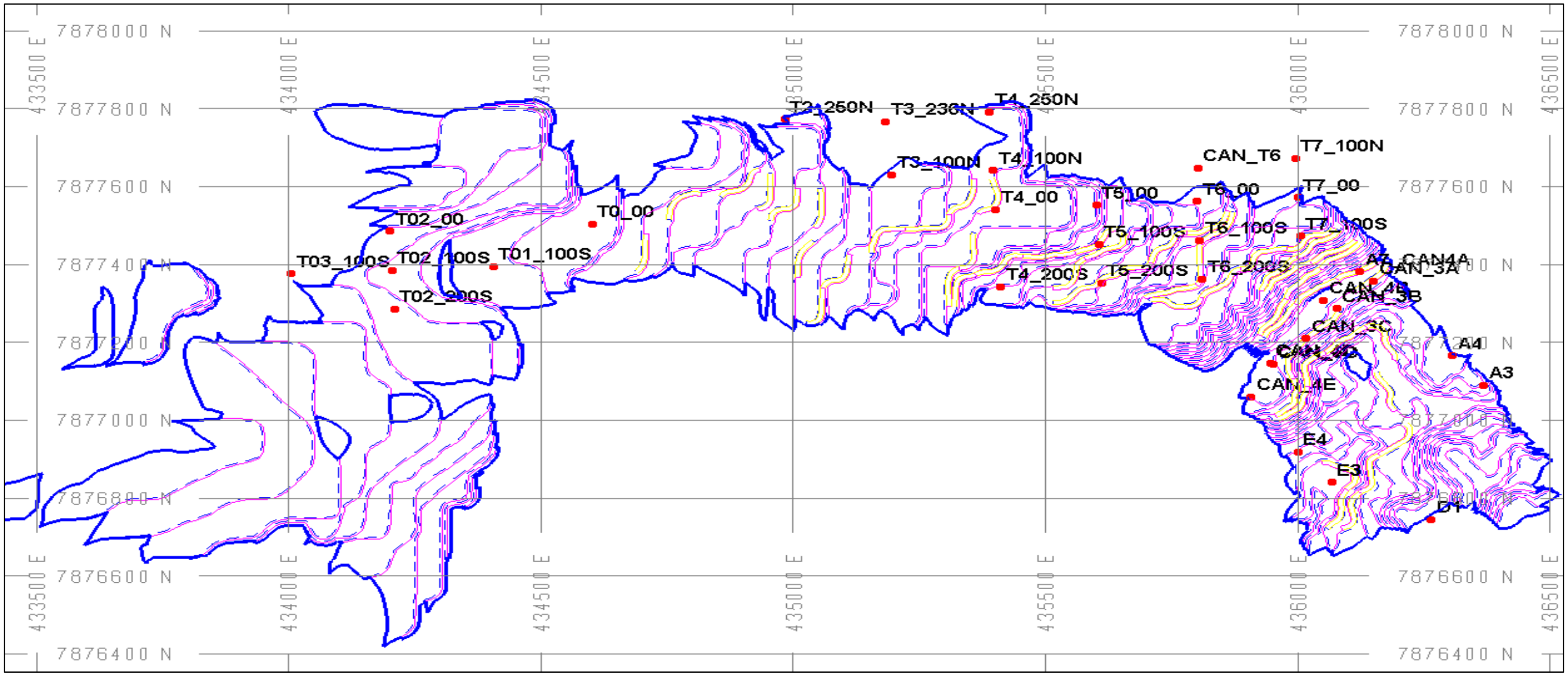
Table 14.2.3.5: Results of Heavy Medium Tests for the Fraction < 25.00 >9.52 – LUMP3

SAMPLE	FLOW	Fe	Al203	Si02	P	MnO	Mass Recovery	Met. Recovery
I.14-2400S-1.1	FEED	58.20	1.20	14.40	0.050	0.80		
	CONCENTRATE	63.43	0.92	6.53	0.049	0.37	71%	78%
	TAILING	45.12	2.55	30.26	0.050	1.86		
I.14-2600S-1.1	FEED	62.20	0.76	10.90	0.070	0.12		
	CONCENTRATE	63.77	0.96	6.62	0.050	0.02	86%	89%
	TAILING	52.22	1.88	21.81	0.080	0.87		
I.15-2400SA-1.1	FEED	54.60	0.64	22.00	0.050	0.09		
	CONCENTRATE	60.49	0.77	12.13	0.047	0.03	64%	71%
	TAILING	44.01	1.70	41.93	0.050	0.32		
I.15-2600S-1.1	FEED	65.80	0.83	4.20	0.060	0.41		
	CONCENTRATE	66.00	0.95	3.42	0.050	0.57	97%	98%
	TAILING	58.16	1.97	7.83	0.070	3.98		
I.15-2800SA-1.1	FEED	67.20	0.93	2.60	0.060	0.58		
	CONCENTRATE	66.96	1.15	2.13	0.053	0.09	102%	102%
	TAILING	56.27	2.19	8.38	0.080	5.17		
I.15-2800SB-1.1	FEED	62.50	0.87	8.90	0.060	0.48		
	CONCENTRATE	65.97	0.71	4.44	0.048	0.03	78%	82%
	TAILING	50.42	2.53	16.41	0.080	2.10		
I-16.2400S-1.1	FEED	54.70	1.20	18.00	0.060	1.90		
	CONCENTRATE	63.43	0.84	7.59	0.048	0.23	68%	79%
	TAILING	36.00	2.57	40.05	0.060	5.04		
I-16.2600S-1.1	FEED	59.30	0.99	12.10	0.060	1.40		
	CONCENTRATE	63.09	0.90	7.66	0.052	0.42	76%	81%
	TAILING	47.38	2.50	24.55	0.070	4.23		
I-17.2200S-1.1	FEED	60.20	0.98	11.50	0.050	1.20		
	CONCENTRATE	64.51	0.84	5.91	0.047	0.28	82%	88%
	TAILING	41.00	2.15	32.11	0.050	3.76		
I-17.2400S-1.1	FEED	65.30	0.94	4.00	0.070	1.00		
	CONCENTRATE	66.60	0.94	2.50	0.051	0.29	88%	90%
	TAILING	55.83	2.61	9.30	0.070	4.36		
I-17.3000SA-1.1	FEED	58.10	0.99	13.10	0.050	1.80		
	CONCENTRATE	66.18	0.89	4.96	0.050	0.35	73%	82%
	TAILING	39.00	2.47	34.09	0.050	5.45		
I-17.3000SB-1.1	FEED	60.50	0.88	11.70	0.040	0.35		
	CONCENTRATE	64.34	0.78	6.31	0.049	0.14	77%	82%
	TAILING	47.59	2.01	28.79	0.060	0.91		
I-18.2200S-1.1	FEED	56.50	0.79	18.20	0.050	0.34		
	CONCENTRATE	60.39	0.81	12.23	0.049	0.06	81%	86%
	TAILING	40.00	1.51	42.85	0.050	0.82		
I-18.2400S-1.1	FEED	63.00	0.59	10.30	0.070	0.03		
	CONCENTRATE	64.22	0.82	6.79	0.051	0.02	87%	88%
	TAILING	55.17	1.73	18.50	0.070	0.07		
I-18.3200S-1.1	FEED	63.10	1.20	7.30	0.070	0.45		
	CONCENTRATE	63.39	0.78	8.02	0.049	0.21	98%	99%
	TAILING	48.35	2.30	28.92	0.050	0.37		
I-19.2200S-1.1	FEED	60.00	0.62	13.70	0.060	0.07		
	CONCENTRATE	63.94	0.69	7.84	0.046	0.03	61%	65%
	TAILING	53.82	1.34	23.25	0.060	0.10		
I-19.2400S-1.1	FEED	64.20	0.68	7.70	0.060	0.10		
	CONCENTRATE	64.72	0.84	5.93	0.049	0.13	92%	93%
	TAILING	58.21	1.49	14.98	0.060	0.33		
I-19.2800S-1.1	FEED	60.80	0.70	12.40	0.060	0.68		
	CONCENTRATE	63.25	0.78	8.13	0.055	0.56	88%	91%
	TAILING	43.00	1.38	33.13	0.070	2.22		
I-19.3000S-1.1	FEED	66.10	1.10	3.90	0.050	0.06		
	CONCENTRATE	66.58	0.96	3.01	0.048	0.02	82%	83%
	TAILING	63.84	1.71	4.84	0.060	0.14		
I-19.3200S-1.1	FEED	64.10	0.73	7.50	0.040	0.04		
	CONCENTRATE	64.29	0.74	6.86	0.048	0.02	95%	96%
	TAILING	60.31	1.38	11.22	0.060	0.05		
I-20.2600S-1.1	FEED	63.70	1.10	8.10	0.060	0.06		
	CONCENTRATE	65.42	0.92	4.98	0.048	0.03	67%	68%
	TAILING	60.27	1.61	10.54	0.060	0.42		
I-20.3000S-1.1	FEED	60.20	0.83	11.20	0.060	0.87		
	CONCENTRATE	62.39	0.85	8.79	0.056	0.58	89%	93%
	TAILING	42.00	1.64	32.23	0.070	4.61		

14.2.4 Conclusion

The first indicative tests with samples from Urucum NE showed good results for the production of iron ore products adequate for the current market. According to the technological characterization of the samples, approximately 57% of the mass of RoM can be transformed into Lump with average grades of 65% Fe and 5% SiO_2 using dense media concentration (DMS). As with the Lump, the Sinter Feed also presented good indicative results.

Partition and concentration tests are in progress with other samples from Urucum NE to increase the representativity both in the number of samples and in spatial and quality distribution.



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File Name: Figure 14-1.doc

Corumbá Project, Brazil

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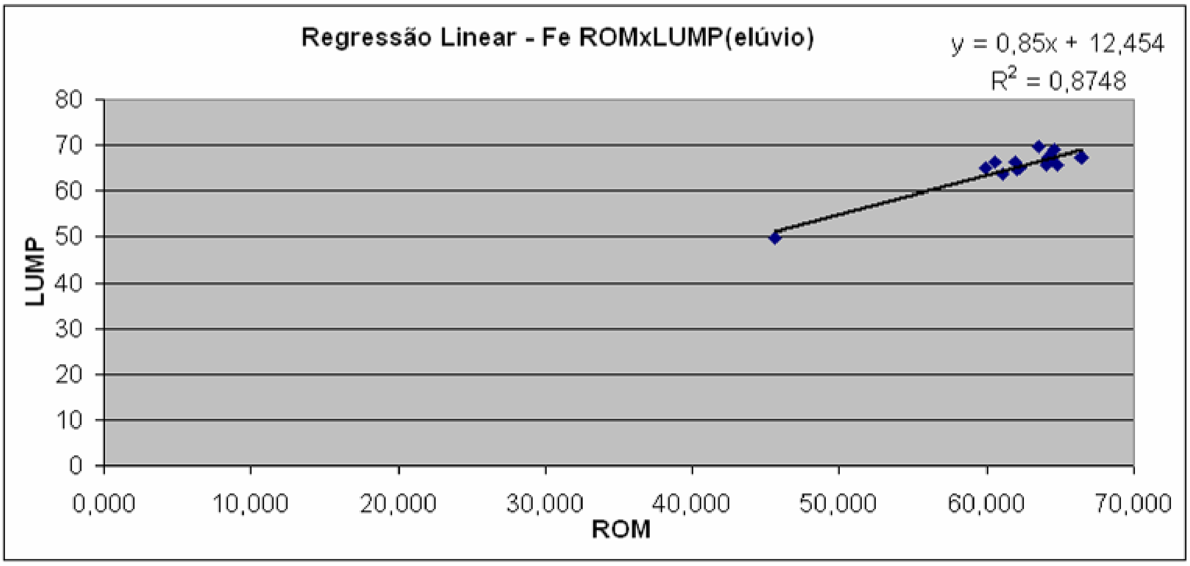
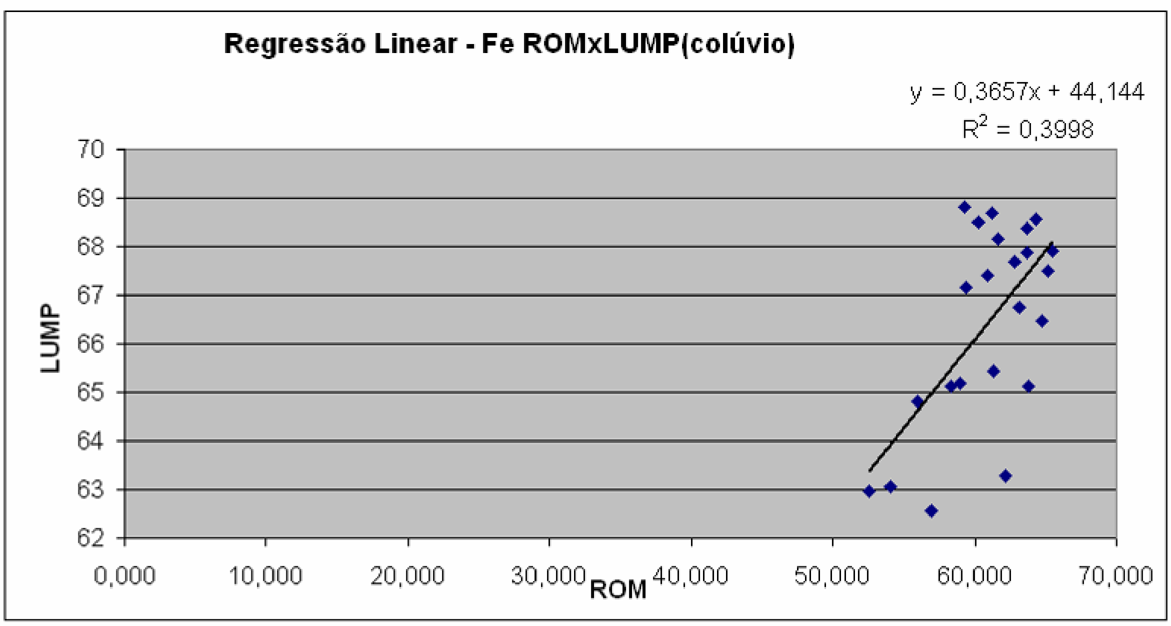
Figure 14-1

Location of Metallurgical Samples, Mine 63

Date: 02-27-08 | Approved: LM | Figure: 14-1

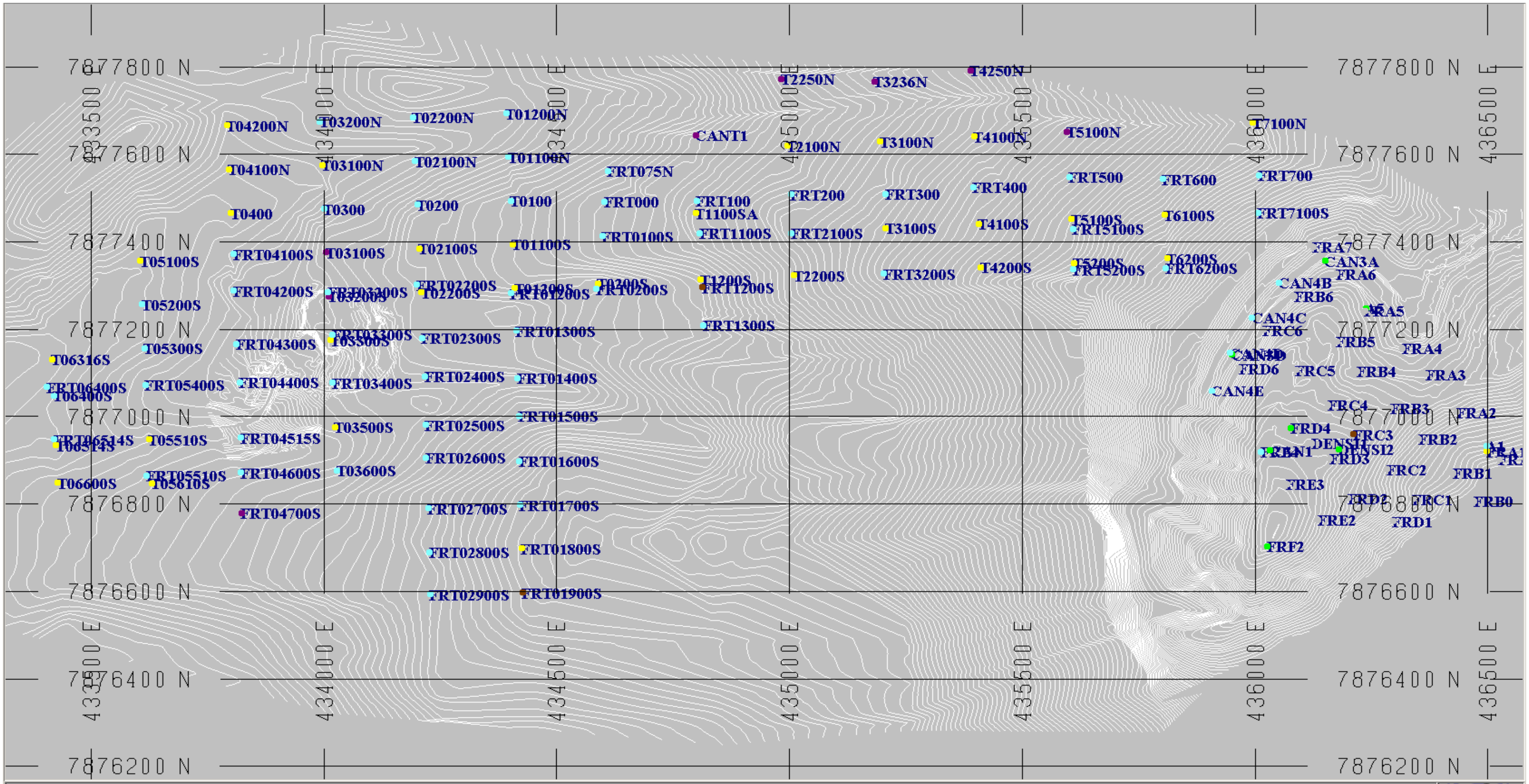


Eluvium Area



Colluvium Area

SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 14-2 Iron Percentage RoM vs. Lump, Mine 63
SRK Job No.: 162703.03		
File Name: Figure 14-2.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08 / Approved: LM / Figure: 14-2



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File Name: Figure 14-3.doc

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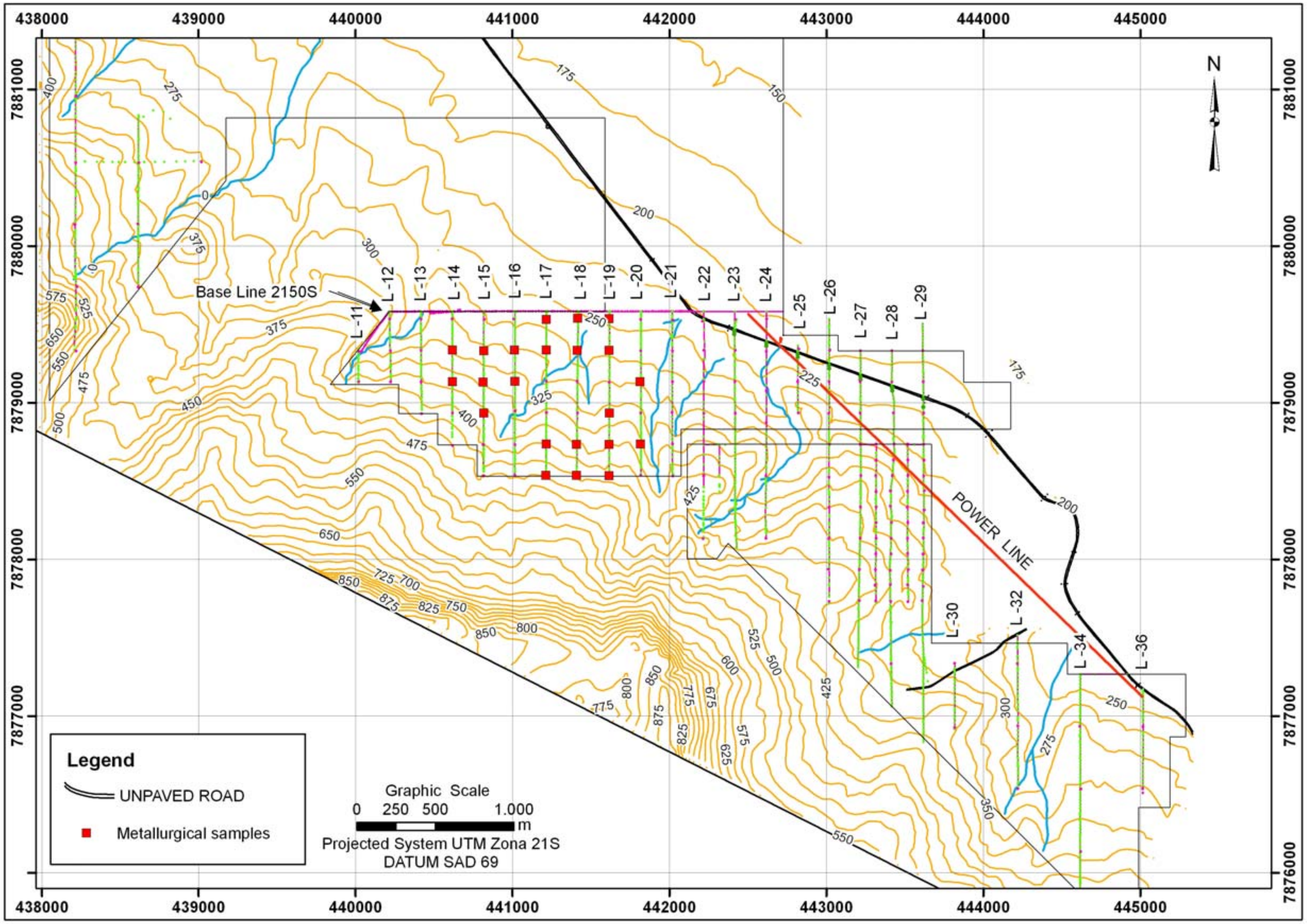
Figure 14-3

Mass Balance Samples, Mine 63

Date: 02-27-08 | Approved: LM | Figure: 14-3



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File Name: Figure 14-4.doc

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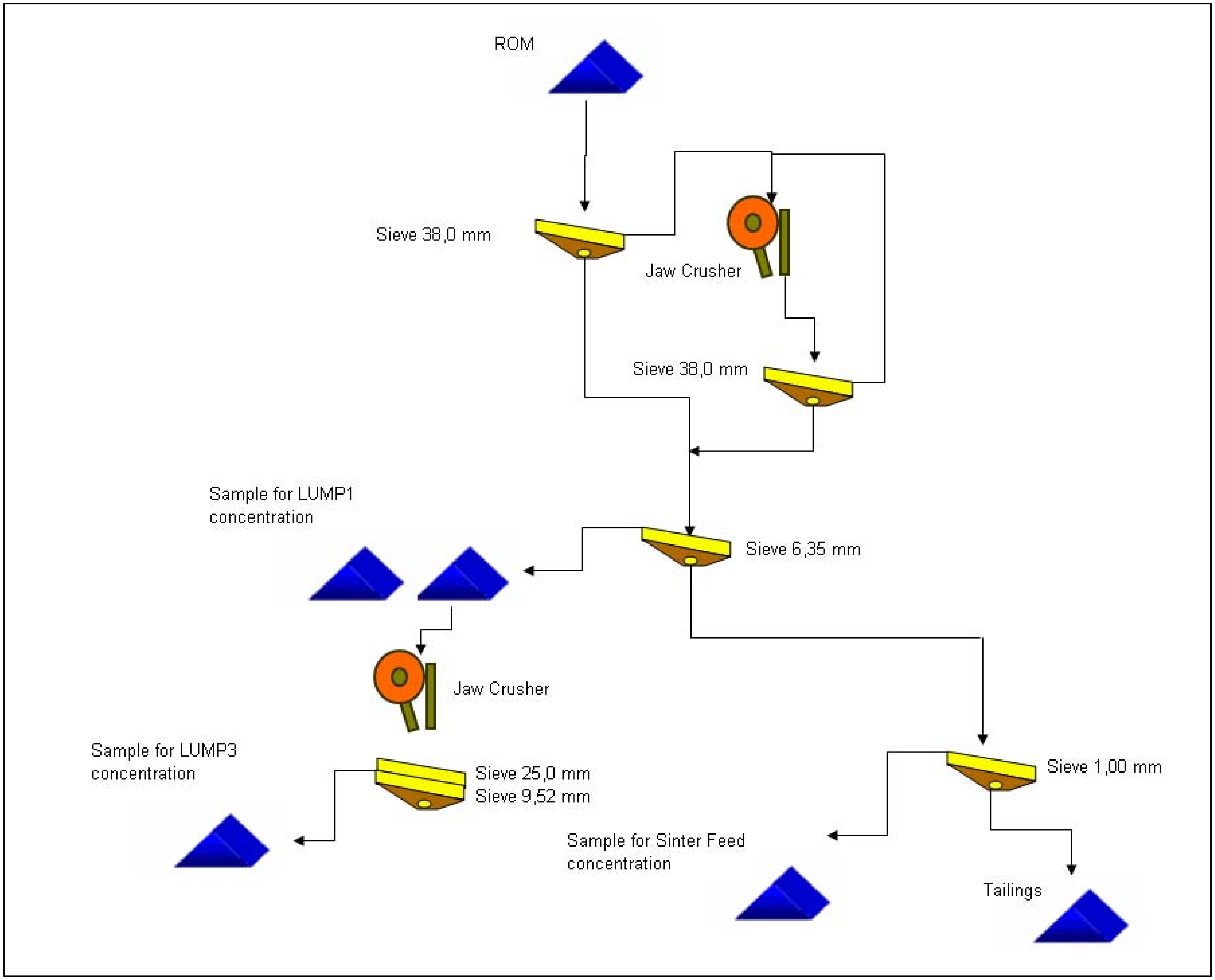
Figure 14-4

Location Map of Metallurgical Samples, Urucum NE

Date: 02-27-08	Approved: LM	Figure: 14-4



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File Name: Figure 14-5.doc

Corumbá Project, Brazil

Source: Mineração & Metálicos S.A.

Figure 14-5

Flowchart of Preparation of Samples for Dense Medium Tests, Urucum NE

Date: 02-27-08 | Approved: LM | Figure: 14-5

15 Mineral Resource and Reserve Estimates (Item 19)

The resource was estimated by Prominas, an independent geologic and engineering consultant company based in Belo Horizonte, under the supervision of MMX personnel. SRK reviewed the resource estimation procedures and results and performed separate validation procedures. MineSight software was used by Prominas and Vulcan software by SRK. SRK received the database as a Microsoft Excel file with four sheets containing the collar coordinates, downhole surveys, assays, and lithologic information. The MineSight surfaces and 3D solids were exported as Vulcan surfaces and solids by Prominas and given to SRK.

15.1 Mineral Resource and Reserve Estimation for Mine 63

The resource estimate uses all data through December 2006 and is depleted for production through September 2007. The resource estimation procedure was first described in a NI43-101 Technical Report by SRK in May 2007.

15.1.1 Database

The assays are received from the laboratory as electronic files and as hard copies of the assay certificates. The assays ares entered into an Acquire database where it is checked for errors in duplication of fields, sample intervals, and total depth. Channel samples, shafts, and drillholes are all used in the resource database. Figure 15-1 is location map of all channel samples, shafts, and drillholes in the database.

15.1.2 Geological Model

For the purposes of the resource and reserve evaluation, the area of Mine 63 was divided into two separate models: Eluvium Model and the Colluvium Model. Two types of material were modeled in the Colluvium area, colluvium (COL) and breccia (BRE); and two types were modeled in the Eluvial area, COL and Eluvium (LIX).

Two sets of vertical cross sections were generated and interpreted for each model. In the eluvium area, sections are oriented NE-SW and NW-SE and in the colluvium area, the sections are N-S and E-W. The geological contacts were justified between the two sets of sections for each area, and digitized. 3D solids were created for the COL, BRE, and LIX. Figure 15-2, 15-3 and 15-4 illustrate the 3D solids of Mine 63.

15.1.3 Resource Database

Fifty-four shaft and channel samples were excluded from the database for the resource estimation procedure. Two different criteria were used to exclude samples: samples with length of more than 6m or less than 1m and samples within 10.0m of drillholes. SRK has reviewed the excluded samples and notes that the average grade is 57.9% Fe which is somewhat higher than the average grade of the samples which were retained. The revised database with 142 drillholes was obtained after the application of the criteria cited above. The sample locations in the resource database are shown in Figure 15-5 and are summarized in Table 15.1.3.1.

Table 15.1.3.1: Resource Database, Mine 63

Types of Drilling	# Drilling	# Samples	Sampled Meters	% Meters
Channel	7	15	83	7%
Drill Hole	81	384	919	74%
Shaft	54	65	237	19%
Total	**142**	**464**	**1,239**	**100%**

A statistical analysis was performed on the samples in each area, Colluvium and Eluvium, type of material (LIX, COL and BRE) and type of drilling (channel, drill hole and shaft). After the statistical analysis it was decided to use all types of samples in the resource estimate because the statistics showed no bias and the method used for the channel samples and shaft samples are similar to the sampling support of the drill holes.

Unassayed Intervals

Some intervals contained within the COL, BRE, or LIX 3D solids had not undergone laboratory analysis. In the original geologic description, some of these intervals that are internal to the mineralized area were described as arkose and are considered internal waste material. Other intervals were not analyzed because there was no core recovery. It was decided to assign a value of zero to all elements in the intervals considered to be internal waste and to assign a value of -1 to those intervals where core was not recovered. In the compositing procedure, the internal waste would be calculated with a value of zero, and the non-recovered intervals would not be used.

Tables 15.1.3.2 and 15.1.3.3 present summaries of the descriptive statistics for the original samples including the internal waste material.

Table 15.1.3.2: Basic Statistics – Original Assays– Colluvium Area

		Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
COL	Sample	241	241	241	241	241	241	241
	Minimum	-	-	-	-	-	-	-
	Maximum	66.3	51.1	11.2	0.2	4.49	0.46	5.83
	Mean	51.39	17.04	2.85	0.054	0.6	0.15	1.55
	Std. Devn.	13.11	10.59	2.05	0.018	0.9	0.09	1.07
	Variance	171.74	112.19	4.22	0	0.81	0.01	1.15
	Co. of Variation	0.26	0.62	0.72	0.34	1.49	0.57	0.69
BRE	Sample	48	48	48	48	48	48	48
	Minimum	-	-	-	-	-	-	-
	Maximum	64.2	47.8	6	0.3	2.71	0.28	4.66
	Mean	49.92	20.96	2.27	0.1	0.46	0.12	1.66
	Std. Devn.	10.55	10.08	1.22	0.067	0.5	0.05	1.17
	Variance	111.39	101.56	1.48	0.004	0.25	0	1.37
	Co. of Variation	0.21	0.48	0.54	0.67	1.08	0.44	0.71
All	Sample	289	289	289	289	289	289	289
	Minimum	-	-	-	-	-	-	-
	Maximum	66.3	51.1	11.2	0.3	4.49	0.46	5.83
	Mean	51.13	17.74	2.74	0.062	0.58	0.15	1.57
	Std. Devn.	12.7	10.61	1.95	0.037	0.84	0.08	1.09
	Variance	161.4	112.55	3.78	0.001	0.71	0.01	1.19
	Co. of Variation	0.25	0.6	0.71	0.59	1.46	0.56	0.69

Table 15.1.3.3: Statistics – Original Assays – Eluvium Area

		Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
LIX	Sample	164	164	164	164	164	164	164
	Minimum	-	-	-	-	-	-	-
	Maximum	68.6	33.9	14.6	0.284	0.29	0.62	9.95
	Mean	60.39	8.67	2.51	0.072	0.04	0.14	1.65
	Std. Devn.	6.15	5.78	2.44	0.04	0.04	0.11	1.72
	Variance	37.76	33.43	5.96	0.002	0	0.01	2.97
	Co. of Variation	0.1	0.67	0.97	0.55	1.04	0.78	1.04
COL	Sample	41	41	41	41	41	41	41
	Minimum	37.4	1.3	0.22	0.036	0.01	0.02	0.25
	Maximum	66.7	41.3	8.6	0.44	2.25	0.4	5.77
	Mean	57.84	12.77	2.43	0.078	0.14	0.15	1.71
	Std. Devn.	6.7	9.44	1.92	0.039	0.39	0.09	1.32
	Variance	44.86	89.08	3.67	0.002	0.15	0.01	1.75
	Co. of Variation	0.12	0.74	0.79	0.5	2.84	0.61	0.77
All	Sample	205	205	205	205	205	205	205
	Minimum	-	-	-	-	-	-	-
	Maximum	68.6	41.3	14.6	0.44	2.25	0.62	9.95
	Mean	59.94	9.41	2.49	0.073	0.06	0.14	1.66
	Std. Devn.	6.32	6.77	2.36	0.04	0.17	0.11	1.66
	Variance	39.99	45.88	5.55	0.002	0.03	0.01	2.75
	Co. of Variation	0.11	0.72	0.94	0.54	3.08	0.75	1

15.1.4 Compositing

The original samples were composited into 5m lengths with breaks at the geologic contacts. Intervals less than 2.0m were included in the previous interval if both intervals were inside the same lithologic domain. The compositing procedure resulted in 282 composite samples For grade estimation, only composites with lengths between 3 and 7m were used. Tables 15.1.4.1 and 15.1.4.2 present summary statistics for composites used in resource estimation. The composites excluded from resource estimation because they had lengths outside the accepted range include:

- Colluvium area: 21 composites in the colluvium with a mean grade of 44.8% Fe and seven composites in the breccia with a mean grade of 57.6% Fe; and
- Eluvium area: nine samples in the LIX with a mean grade of 61.1% Fe and five in the colluvium with a mean grade of 59.2% Fe.

SRK notes that the more customary method of limiting the influence of composites with lengths less than the nominal compositing length is to use length weighting in the estimation procedure. However, the validation of the block grade models indicates that this procedure of excluding composites has not created a grade bias in the estimation.

Table 15.1.4.1: Basic Statistics Composite Data Set – Colluvium Area

		Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
All	Sample	148	148	148	148	148	148	148
	Minimum	12.66	3.5	0.15	0.013	0.01	0.01	0.04
	Maximum	66.11	39.45	11.2	0.3	4.03	0.45	4.92
	Mean	50.93	17.88	2.64	0.062	0.59	0.14	1.48
	Std. Devn.	9.98	9.03	1.74	0.033	0.78	0.07	0.96
	Variance	99.6	81.62	3.02	0.001	0.6	0.01	0.92
	Co. of Variation	0.2	0.51	0.66	0.53	1.32	0.51	0.65

Table 15.1.4.2: Basic Statistics Length Composite Data Set – Eluvium Area

		Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
All	Sample	94	94	94	94	94	94	94
	Minimum	38.95	2.1	0.3	0.035	-	0.01	-
	Maximum	68.3	38.2	9.09	0.242	1.36	0.47	7.14
	Mean	59.78	9.6	2.52	0.074	0.06	0.14	1.71
	Std. Devn.	5.1	6.5	2.12	0.037	0.14	0.1	1.5
	Variance	26.03	42.25	4.47	0.001	0.02	0.01	2.26
	Co. of Variation	0.09	0.68	0.84	0.5	2.52	0.67	0.88

Histograms of the iron in the colluvium and eluvium areas show different distributions. The eluvial ore presents a smaller variation of iron content with a minimum iron grade of 45.28%. The variation of the iron content in the colluvial ore is larger, with iron grades between 12 and 66%. The difference is explained by the genesis of each type of mineralization. The eluvial ore deposit is an “in situ” enrichment from the jaspelite. The colluvial ore deposit represents a depositional process. This type of iron ore contains clasts of eluvial ore as well as fragments of jaspelite and arkose within a clay matrix.

15.1.5 Density

Bulk density measurements were made on samples collected from the shafts in the colluvium and eluvium areas of Mine 63. The sampling and analysis were done by Prominas, a Brazilian company with experience in the procedures. The specific gravity (SG) measurements were done on a wet basis.

Methodology

The tests to determine density were carried out in accordance with the established Brazilian Association of Technical Standards (ABNT), listed below:

- NBR 7.185/1986 – Determination of Apparent Specific Mass, in situ, with use of sand flask; and
- NBR 10.838/1988 – Determination of Apparent Specific Mass of undeformed samples, with the use of a hydrostatic scale – displacement of volume in dense medium.

For the eluvium, the test was displacement of volume in dense medium which is the methodology used for compact or hard samples. For colluvium material, the sand flask method was used because this type of material consist of unconsolidated rock.

Eluvium

Sixty-four samples of eluvium material were collected in the walls of exploration shafts, using small pieces of compact material. The data are presented in Table 15.1.4.2. The average density for the eluvium was 3.603g/cm³, standard deviation 0.4397g/cm³ and variance 2.07g/cm³, with maximum and minimum values of 4.67 and 2.60g/cm³ respectively.

Colluvium

The method used for lab tests on colluvium material was the sand flask. Twenty-five samples of Colluvium Ore Type were collected beside or inside the exploration shafts.

The average density was 3.158g/cm³, the standard deviation was 0.3598g/cm³, the variance was 1.52g/cm³ with maximum and minimum values of 3.9 and 2.38g/cm³ respectively.

15.1.6 Topography

The preliminary survey of Mine 63 was carried out by BXF, which used a Topcon DT 209 electronic theodolite, optical plummet with angular accuracy of 20” (twenty seconds) and distances measured by tape; after setting a baseline, a Pentax PCS1S Total Station was used, with angular accuracy of 10” (ten seconds), optical plummet, 5” (five seconds) reading, 800m range with 1 circular prism and 1,100m range, with three prisms, HP 48GX calculator-type external data collector, Pawertopolite system. The calculations and drawings were made with use of topoGRAPH 98 and AutoCAD 2004 software.

The tie-in point (PA) had landmark M_24 on top of the Urucum Hill (observation deck) as a station, and its UTM coordinates (Universal Transverse Mercator System) are N 7877220.20 E 436598.27 Z 935.93.

The topography used in the original resource estimation was current as of December 2006. The topography used in this report is current as of September 2007.

BXF also surveyed the location of the drillhole collars, shafts, and channel samples

15.1.7 Variography

Variographic analysis and modeling were made for both Colluvium and Eluvium areas. The variables studied were Fe, SiO_2, Al_2O_3, P, MnO, TiO_2 and LOI in each of the areas and by individual material types.

After analysis of the directional variograms and taking into account the small number of available samples, it was decided to develop omnidirectional horizontal semi-variograms. Semi-variograms in the vertical direction were made to assess the continuity in the vertical direction and the nugget value.

The spherical model using up to two nested structures. The parameters are:

- C0 = nugget effect;
- C1 = sill 1st structure;
- C2 = sill 2nd Structure;
- A1 = range 1st structure; and
- A2 = range 2nd structure.

Figures 15-6 and 15-7 present the variograms developed for Fe in the Colluvium and Eluvium areas and tables 15.1.7.1 and 15.1.7.2 summarize all variographic models adjusted for the regional variables modeled in Colluvium and Eluvium areas.

Table 15.1.7.1: Variography – Colluvium Area

VR	COD	C0	Horizontal Sill			Vertical Sill			Horizontal Range		Vertical Range	
			C1	C2	Total	C1	C2	Total	A1	A2	A1	A2
FE	COL	24.26	33.09	15.22	**72.57**	10.54	37.78	**72.57**	138.6	500	6.78	14.93
	ALL	34.25	23.34	9.99	**67.58**	33.33	-	**67.58**	173.28	499.2	19.27	-
SiO_2	COL	35.57	44.38	19.84	**99.79**	68.76	-	**104.33**	116.24	467.53	17.11	-
	ALL	39	49.72	9.37	**98.09**	62.03	-	**101.03**	151.7	532.87	20.31	-
Al_2O_3	COL	1.28	1.353	1.356	**3.989**	2.336	-	**3.616**	169.08	500	11.15	-
	ALL	1.6	1.022	0.897	**3.52**	1.758	-	**3.358**	129.42	499.18	11	-
P	COL	0.2993	0.5803	0.2164	**1.096**	0.0795	-	**0.3788**	101.15	367.38	3.77	-
	ALL	0.18	0.6981	0.1925	**1.0706**	0.2934	-	**0.4734**	78.46	344.75	10	-
MnO	COL	0.55	0.276	0.154	**0.981**	0.502	-	**1.052**	152.95	325	15.47	-
	ALL	0.458	0.394	0.041	**0.893**	0.482	-	**0.94**	135.2	318	10.82	-
TiO_2	COL	0.004	0.0005	0.0029	**0.0074**	0.0027	-	**0.0067**	208.3	420.38	11.48	-
	ALL	0.004	0.0012	0.0011	**0.0063**	0.0025	-	**0.0065**	249.87	454.53	12.83	-
LOI	COL	0.403	0.549	0.24	**1.191**	0.791	-	**1.194**	56.2	347.55	10.17	-
	ALL	0.199	0.901	0.091	**1.191**	0.991	-	**1.19**	64.6	306.21	9.9	-

Table 15.1.7.2: Variography – Eluvium Area

VR	COD	C0	Horizontal Sill			Vertical Sill			Horizontal Range		Vertical Range	
			C1	C2	Total	C1	C2	Total	A1	A2	A1	A2
FE	LIX	0.43	0.31	0.29	**1.03**	1.07	-	**1.5**	26.32	398.56	12.1	-
	ALL	13.3	1.89	7.4	**22.59**	8.65	-	**21.95**	118.11	381.5	16.94	-
SiO_2	LIX	17.8	6.08	4.03	**27.9**	5.61	-	**23.41**	84.71	338.82	9.26	-
	ALL	25.5	4.6	7.83	**37.93**	3.28	-	**28.78**	88.08	393.08	10.03	-
Al_2O_3	LIX	0.31	1.785	3.77	**5.865**	4.387	-	**4.697**	81.16	521.83	12.63	-
	ALL	0.25	1.729	3.316	**5.295**	3.001	-	**3.251**	75.87	490.26	11.7	-
P	LIX	0.0001	0.0004	0.0007	**0.0012**	0.0008	-	**0.0009**	76.38	353.47	24.51	-
	ALL	0.0001	0.0005	0.0006	**0.0012**	0.0008	-	**0.0009**	108.56	435.83	17.05	-
MnO	LIX	0.011	0.002	0.001	**0.014**	0.002	0.001	**0.013**	81.69	241.92	4.44	14.04
	ALL	0.01	0.002	0.0013	**0.013**	0.037	-	**0.047**	74.37	210.83	14.68	-
TiO_2	LIX	0.002	0.0031	0.0079	**0.013**	0.008	-	**0.01**	32.68	495	12.88	-
	ALL	0.0018	0.0028	0.0066	**0.0112**	0.0048	-	**0.0066**	64.57	441.79	10.78	-
LOI	LIX	0.013	0.001	-	**0.014**	1.905	-	**1.918**	184.82	-	6.38	-
	ALL	0.042	0.003	0.004	**0.049**	1.129	0.799	**1.97**	83.95	259.1	4.68	10.16

The adjusted models presented geometric anisotropy related to the range in the horizontal plane. In some cases, the models also presented zonal anisotropy. The vertical variograms do not show good structure, because of the small thickness of the layers and the consequent few sample numbers.

To solve the problem of anisotropy, the technique of telescoping was employed. This technique was described by Campos (1989) and developed in the algorithm of decomposition of variograms that deals with complex situations such as nested structures with geometric and zonal anisotropies. This method was adopted by Girodo and colleagues (personal communication, 2007) in the evaluation of iron ore mines in the Iron Ore Quadrangle of Minas Gerais.

The results of the telescoping study are shown in Table 15.1.7.3 and Table 15.1.7.4. The range in the z direction was set to an artificially high number so that the kriging weight would not be limited in the vertical direction.

Table 15.1.7.3: Telescoped Variograms – Colluvium Area

VR/Type	Code	Nugget	Structures			Ranges Structure 1			Ranges Structure 2			Ranges Structure 3		
			Sill 1	Sill 2	Sill 3	X	Y	Z	X	Y	Z	X	Y	Z
Fe	COL	24.26	10.54	22.56	15.22	139	139	7	139	139	15	500	500	15
	ALL	34.25	23.34	9.99	-	173	173	19	499	499	19	-	-	-
SiO_2	COL	35.57	44.38	19.84	4.54	116	116	17	468	468	17	99999	99999	17
	ALL	39.00	49.72	9.37	2.94	152	152	20	533	533	20	99999	99999	20
Al_2O_3	COL	1.28	1.35	0.98	0.37	169	169	11	500	500	11	500	500	99999
	ALL	1.60	1.02	0.74	0.16	129	129	11	499	499	11	499	499	99999
P	COL	0.30	0.08	0.50	0.22	101	101	8	101	101	99999	367	367	99999
	ALL	0.18	0.29	0.40	0.19	78	78	10	78	78	99999	345	345	99999
Mn	COL	0.55	0.28	0.15	0.07	153	153	15	325	325	15	99999	99999	15
	ALL	0.46	0.39	0.04	0.05	135	135	20	318	318	20	99999	99999	20
TiO_2	COL	0.00	0.00	0.00	0.00	208	208	11	420	420	11	420	420	99999
	ALL	0.00	0.00	0.00	0.00	250	250	13	455	455	13	99999	99999	13
LOI	COL	0.40	0.55	0.24	0.00	56	56	10	348	348	10	99999	99999	10
	ALL	0.20	0.90	0.09	0.00	65	65	10	306	306	10	306	306	99999

Table 15.1.7.4: Telescoped Variograms – Eluvium Area

VR/Type	Code	Nugget	Structures			Ranges Structure 1			Ranges Structure 2			Ranges Structure 3		
			Sill 1	Sill 2	Sill 3	X	Y	Z	X	Y	Z	X	Y	Z
Fe	LIX	8.20	5.91	5.54	8.92	26	26	12	399	399	12	99999	99999	12
	ALL	13.30	1.89	6.77	0.64	118	118	17	382	382	17	382	382	99999
SiO_2	LIX	17.80	5.61	0.47	4.03	85	85	9	85	85	99999	339	339	99999
	ALL	25.50	3.28	1.32	7.83	88	88	10	88	88	99999	393	393	99999
Al_2O_3	LIX	0.31	1.79	2.60	1.17	81	81	13	522	522	13	522	522	99999
	ALL	0.25	1.73	1.27	2.04	76	76	12	490	490	12	490	490	99999
P	LIX	0.00	0.00	0.00	0.00	76	76	25	353	353	25	353	353	99999
	ALL	0.00	0.00	0.00	0.00	109	109	17	436	436	17	436	436	99999
Mn	LIX	0.01	0.00	0.00	0.00	82	82	4	82	82	14	242	242	99999
	ALL	0.01	0.00	0.00	0.03	74	74	10	211	211	10	99999	99999	10
TiO_2	LIX	0.00	0.00	0.00	0.00	33	33	13	495	495	13	495	495	99999
	ALL	0.00	0.00	0.00	0.00	65	65	11	442	442	11	442	442	99999
LOI	LIX	0.01	0.00	1.90	-	185	185	6	99999	99999	6	-	-	-
	ALL	0.04	0.00	0.00	1.12	84	84	5	259	259	5	99999	99999	5

15.1.8 Resource Estimation

Block Model

Following the same strategy applied to the geologic model, the area was divided into two separate block models. The Colluvium block model is oriented north-south and the Eluvium block model is rotated with an azimuth of 312°, from the reference point X = 436,150 (East UTM Location) and Y = 7,875,700 (North UTM Location).

The two block models were constructed with different cell sizes related to the sample grid spacing of each domain. The parameters of the two models are described in the Table 151.8.1. The Eluvium block model coordinates are local, the origin of the block model is the reference point cited above.

Table 15.1.8.1: Parameters of Block Model

Model	Direction	Minimum	Maximum	Block Sizes (m)	No. of Blocks
Colluvium	X	433 000	436 250	50	65
	Y	7 875 500	7 878 500	50	60
	Z	200	1 200	5	200
Eluvium	X	0	2 000	25	80
	Y	0	2 000	25	80
	Z	500	1 200	5	140

The blocks were assigned a rock code from the 3D solids using MineSight software; the percentage of the block within the solid was also assigned to the block. Blocks that intersected more than one solid were assigned the majority rock code.

Figure 15-8 illustrates the Mine 63 Block Models.

Estimation

The variables Fe, SiO_2, P, Al_2O_3, Mn and TiO_2 were estimated by ordinary kriging, using the following parameters:

- Composite samples with length between 3.0 and 7.0m;
- The minimum number of samples was two and the maximum number of samples was 27;
- A maximum of three composites per hole were used in the estimation of each block;
- Selection of composite samples by quadrants, with a maximum of seven composites per quadrant;
- The search distance in the horizontal direction was defined by the maximum range of the variogram with no restriction in the vertical search, which is limited by the geologic solid;
- Discretization of the blocks equal to 5m x 5m x 2m in X, Y and Z; and
- Only composite samples of the same geological domain were used in each estimation.

In addition to Fe, SiO_2, P, Al_2O_3, Mn and TiO_2, the following variables were included in the estimation:

- VK – Kriging Variance;
- RS – Regression Slope;
- DISTC = distance from the center of the block to the nearest composite sample used in the block estimation;
- DISTM = average distance from the center of the block to the samples used in the block estimation;
- NA = number of samples used in the block estimation; and
- NF = number of holes used in the estimation.

For the COL (Colluvium area) and LIX (Eluvium area) geologic domains the respective variographic models were used. For the BRE geologic domain in the Colluvium area, the variographic model ALL was used but only samples of the BRE domain were used. For the COL geologic domain in the Eluvium area, the variographic model ALL was used but only samples of the COL domain was used. Tables 15.1.8.2 and 15.1.8.3 present the statistics of the estimated blocks for the Colluvium and Eluvium areas and Figures 15-9 and 15-10 present a plan view and cross-sections of the block model.

Table 15.1.8.2: Statistics of the Colluvium Block Model

		Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
All	# Block	4 281	4 283	4 281	4 243	4 227	4 271	4 241
	Minimum	31.9	4.84	1.02	0.038	0.03	0.07	0.75
	Maximum	62.6	32.18	7.42	0.23	2.52	0.28	4.14
	Mean	51.43	17.53	2.83	0.06	0.62	0.15	1.59
	Std. Devn.	5.39	5.07	0.85	0.022	0.47	0.03	0.48
	Variance	29.08	25.73	0.72	0.001	0.22	0	0.23
	Co. of Variation	0.1	0.29	0.3	0.37	0.76	0.22	0.3

Table 15.1.8.3: Statistics of the Eluvium Block Model

		Fe (%)	SiO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	TiO_2 (%)	LOI (%)
All	# Block	2 913	2 913	2 913	2 913	2 911	2 913	2 913
	Minimum	49.67	5.48	0.47	0.039	0.01	0.05	0.09
	Maximum	65.89	21.9	7.31	0.209	1.03	0.32	6.21
	Mean	60.24	9.66	2.42	0.077	0.05	0.14	1.66
	Std. Devn.	2.58	2.94	1.19	0.024	0.08	0.05	1.12
	Variance	6.65	8.62	1.41	0.001	0.01	0	1.24
	Co. of Variation	0.04	0.3	0.49	0.32	1.69	0.35	0.67

Model Validation

SRK validated the block model by constructing swath plots comparing iron grades of composites and block model grades in the east-west and north-south directions as shown in Figure 15-11. The plots include data from both block models and all composites, regardless of sample length. The plots show good agreement between the composite and block grades. SRK also visually compared the block model to composites by cross-section and by bench.

15.1.9 Resource Classification

The Mineral Resources are classified under the categories of Measured, Indicated and Inferred Mineral resources according to CIM guidelines. Tonnes are reported on a wet basis. The resource classification of the Colluvium and Eluvium areas was based on the kriging variance and/or the regression slope between the kriged-estimated value and the real value.

The mineral resources of the Colluvium area were classified based on the following criterion:

For the COL geologic domain:

- Indicated: Kriging Variance < 43; and
- Inferred: Kriging Variance >= 43.

For the BRE domain:

- Indicated: Kriging Variance < 40; and
- Inferred: Kriging Variance >= 40.

The mineral resources of the Eluvium area were classified based on the following criterion:

For the LIX geologic domain:

- Measured: Kriging Variance < 13 and Regression Slope > 0.9;
- Indicated: Kriging Variance < 13 and Regression Slope <= 0.9; and
- Inferred: Kriging Variance >= 13.

For the COL geologic domain:

- Indicated: Kriging Variance < 9.5; and
- Inferred: Kriging Variance >= 9.5.

Resource Statements

The resources for the Corumbá iron deposit are declared at a 30% Fe cut-off. The resources were depleted for mine production through September 2007. Table 15.1.8.4 lists the total resources, including ore reserves, for Mine 63 of the Corumbá Project as at September 30, 2007.

Table 15.1.8.4: Mineral Resources – Mine 63 Corumbá Project*

Classification	Tonnage (M t)*	Fe(%)	SiO_2 (%)	Al_2O_3 (%)	P(%)	Mn(%)	TiO_2 (%)	LOI (%)
Measured	3.17	55.23	15.2	3.09	0.056	0.12	0.18	1.72
Indicated	34.00	53.03	18.14	2.97	0.055	0.34	0.18	1.8
Measured and Indicated	37.17	53.22	17.89	2.98	0.055	0.32	0.18	1.79
Inferred	32.84	50.95	19.53	3.78	0.054	0.44	0.2	2.19

* Tonnes are reported on a wet basis
Fe Cut-off grade is 30%

15.2 Mineral Resource Estimation – Urucum NE

15.2.1 Database

The database of the Urucum NE Project consists of 162 exploration shafts and represents the available data through September 2007. Three of these shafts were removed from the resource database because they are less than 1m in depth. An additional 22 shafts were not sampled because they did not encounter favorable lithologies. These 22 shafts were used in in the database that defined the geologic model, but are outside the model and therefore not used in the resource estimation. The resource database therefore contains 137 shafts that were used for statistical analysis and grade estimation. Table 15.2.1.1 presents the summary of the Urucum NE shafts.

Table 15.2.1.1: Summary of Exploration Shafts, Urucum NE

	Number	Meters	% Meters
Shafts	159	703.42	100
Sampled	137	605.42	86

The database consists of four Microsoft Excel spreadsheets:

- Header: collar co-ordinates of the shafts with 159 records;
- Survey: shaft surveys with 159 records; all shafts are vertical;
- Geology: final geological description with 421 records; and
- Assay: eight assays tables were generated with the global analysis (GL) and seven analyses corresponding to the granulometric intervals (F1 to F7). Samples with values below the detection limit received a value of half of the detection limit. Unsampled intervals were designated as -1.

These files were imported to the MineSight© software and during the import routines no errors were found in relation to duplicated fields or different length between the tables.

The basic statistics for the global analyses by rock type are shown in Table 15.2.1.2.

Table 15.2.1.2: Basic Statistics – Global Assay Urucum NE Area

		Fe (%)	Al_2O_3(%)	SiO_2(%)	P(%)	Mn(%)	TiO_2(%)	LOI(%)
Entire Samples COFM	Valid	52	52	52	52	52	52	52
	Minimum	19.4	0.8	8.2	0.025	0.02	0.06	0.9
	Maximum	62.4	12.5	52.9	0.18	1.4	0.57	5.92
	Mean	50.085	4.049	20.407	0.0559	0.321	0.219	2.272
	1st Quartile	45.598	2.596	13.607	0.0451	0.03	0.17	1.542
	3rd Quartile	56.305	5.1	25.111	0.062	0.601	0.25	2.601
	Std. Devn.	8.614	2.294	9.422	0.0212	0.4	0.09	1.093
	Variance	74.196	5.263	88.769	0.0004	0.16	0.008	1.194
	Co. of Variation	0.172	0.567	0.462	0.3793	1.244	0.412	0.481
Entire samples COMG	Valid	17	17	17	17	17	17	17
	Minimum	45.5	1.3	8.4	0.038	0.02	0.1	0.82
	Maximum	60	4.5	29.3	0.081	1.6	0.29	2.49
	Mean	51.9	2.491	20.776	0.0574	0.284	0.166	1.469
	1st Quartile	47.521	1.8	19.382	0.052	0.049	0.14	1.07
	3rd Quartile	53.508	3.099	25.203	0.06	0.37	0.17	1.729
	Std. Devn.	4.761	0.893	6.72	0.011	0.411	0.044	0.527
	Variance	22.666	0.798	45.153	0.0001	0.169	0.002	0.278
	Co. of Variation	0.092	0.358	0.323	0.1918	1.447	0.264	0.359
Mixed samples COFM	Valid	50	50	50	50	50	50	50
	Minimum	40.7	1.4	6.7	0.036	0.02	0.12	1.04
	Maximum	63.1	6.13	35	0.077	1.5	0.28	4.27
	Mean	54.79	2.796	15.938	0.0574	0.3	0.174	1.759
	1st Quartile	51.716	1.999	9.819	0.053	0.04	0.15	1.371
	3rd Quartile	59.582	3.005	20.814	0.064	0.391	0.19	1.921
	Std. Devn.	5.273	1.176	6.587	0.009	0.384	0.035	0.663
	Variance	27.809	1.383	43.391	0.0001	0.148	0.001	0.439
	Co. of Variation	0.096	0.421	0.413	0.1567	1.28	0.202	0.377
Mixed samples COMG	Valid	31	31	31	31	31	31	31
	Minimum	28.6	1.5	7.5	0.03	0.02	0.12	0.73
	Maximum	62.7	6.4	48.9	0.073	1.32	0.35	2.93
	Mean	54.519	2.789	16.597	0.0542	0.245	0.171	1.613
	1st Quartile	52.197	2.198	11.02	0.051	0.03	0.15	1.329
	3rd Quartile	59.101	2.9	19.521	0.059	0.36	0.19	1.812
	Std. Devn.	6.471	0.942	7.985	0.0079	0.363	0.042	0.399
	Variance	41.88	0.887	63.754	0.0001	0.132	0.002	0.159
	Co. of Variation	0.119	0.338	0.481	0.1464	1.485	0.245	0.247
All samples	Valid	150	150	150	150	150	150	150
	Minimum	19.4	0.8	6.7	0.025	0.02	0.06	0.73
	Maximum	63.1	12.5	52.9	0.18	1.6	0.57	5.92
	Mean	52.775	3.194	18.172	0.0562	0.294	0.188	1.874
	1st Quartile	49.706	2.186	11.99	0.05	0.03	0.15	1.34
	3rd Quartile	58.184	3.684	23.217	0.062	0.391	0.2	2.17
	Std. Devn.	7.072	1.709	8.188	0.0144	0.386	0.065	0.841
	Variance	50.017	2.919	67.047	0.0002	0.149	0.004	0.708
	Co. of Variation	0.134	0.535	0.451	0.2563	1.311	0.348	0.449

15.2.2 Geologic Model

The geologic model of the Urucum NE area was created in MineSight© software using a Gridded Seam Model (GSM).

Originally, the colluvium of the Urucum NE area was classified by grain size, mineralogy and matrix characteristics, as fine to medium colluvium (COFM) and medium to coarse colluvium (COMG). The geologic model was simplified by combining the two groups into a single colluvium layer, COL, because the density and chemical qualities were not significantly different. In Urucum NE area, the lithologic layers are well defined as soil (SOL), colluvium (COL), breccia (BRE) and basement saprolite (SAP). The colluvium is sub-horizontal following the topographic surface. This allows modeling the geology as a sub-horizontal GSM, with a cell size of 15m x 15m in plan. Data points were created in the database to allow smoother transitions to areas where the saprolite is near to the surface and the colluvium is thin or non-existent. The generation of top and bottom surfaces of the colluvium layer (COL) was made through the an inverse distance (IDW) methodology, interpolating the thickness of this layer with the length of the composite intervals. A 3D solid of the colluvium was created covering the entire map area (Figure 15-12), using the contact surfaces.

To validate the solid model, two sets of vertical cross sections, NS and EW, were created with spacing based on the grid of the shafts and the solid was visually compared to the shafts.

The geologic colluvium solid was modified to obtain the final solid used in resource estimation as follows:

- The geologic solid was cut to a maximum thickness of 5m;
- Isopach curves were created and the solid was cut by the 2m isopach curves as it is considered that 2m is the minimum mining thickness;
- The solid was cut by the limits of the exploration licenses; and
- The solid was cut by the original topography surface.

Figure 15-13 illustrates the final solid.

15.2.3 Gridded Seam Block Model

The block model was generated in the MineSight© GSM module. This results in blocks with set x and y dimensions and variable z dimensions, dependent on the thickness of the layer. The block model limits are described in table 15.2.3.1.

Table 15.2.3.1: Parameters of Block Model

Direction	Minimum	Maximum	Block Sizes (m)	Nº of Blocks
X	437,600	445,600	50	160
Y	7,875,000	7,882,200	50	144
Z	100	950	variable	1

The colluvium solid was used to code the lithology variable and the percentage of the block within the solid.

15.2.4 Density

Density measurements were performed by MMX personnel, who had been trained by a Prominas technician. The methodology followed the procedures described in Section 15.1.5.

The 132 samples of colluvium were collected at the collar, middle and bottom of the exploration shafts. In order to check any variability, samples were taken in the two types of colluvium ore:

98 samples in the fine to medium colluvium and 34 samples in the medium to coarse colluvium. Table 15.2.4.1 presents the statistics of the data obtained from the tests.

The fine to medium colluvium has an average density of 2.87g/cm³ and the medium to coarse colluvium has an average density of 2.84g/cm³. The colluvium as assigned a density of 2.86 based on the density tests.

Table 15.2.4.1: Statistics of Density Tests – Colluvium Ore Type

Wet Density (g/cm^3)			
Parameters	**All**	**Fine to medium**	**Medium to coarse**
Number	132	98	34
Minimum	2.01	2.14	2.01
Maximum	4.05	3.92	4.05
Mean	2.86	2.87	2.84
Median	2.85	2.87	2.79
Standard deviation	0.37	0.35	0.44
Variance	0.14	0.12	0.19
Kurtosis	1.03	0.93	1.12

15.2.5 Topography

Exploration lines with spacing at 400m, 200m and 100m, were surveyed by BXF Topographia Ltda (BXF), a topographic survey company with headquarters in Ladário, MS, with supervision by the MMX exploration staff. The surveying was done with a total station Topcon, model GPT3000LW and a total station Pentax, model PCS1S. The methodology was by open polygonal, linked to the mark 1,065 IBGE (Brazilian Official Mark on Santa Cruz Hill) with the UTM coordinates N-7,876,829.21 and E-437,739.16, elevation of 1,065.44 m, DATUM SAD 69. The topographic surface was generated using points on the exploration lines, and a laser survey (ALTM - Airborne Laser Terrain Mappper) performed by GEOID Company, between the lines. The surface was generated using Autodesk software AutoCAD 2006. BXF also surveyed the location of the exploration shafts.

15.2.6 Compositing

The original assay data was composited using the MineSight seam composite procedure whereby a single composite was calculated for the colluvium layer. The minimum length of the composite is 2m, the maximum is 5m, and the average is 4.4m.

The database consists of analyses of seven different elements (Fe, SiO_2, Al_2O_3, P, Mn, TiO_2 and LOI) for each of the eight size fractions shown in Table 15.2.6.1, and the mass recovery for each size fraction. The principal estimation was done using grades for the global fraction. The grades of the individual size fractions and their respective mass recoveries were also estimated for use in future reserve estimates.

Table 15.2.6.1: Size Fractions of Sample Analyses

Variable name	Size Fraction
F1	>3/4in
F2	>1/2" <3/4 in
F3	>1/4" < 1/2 in
F4	>4mm < 1/4 in
F5	>1mm <4mm
F6	>0.15mm < 1mm
F7	<0.15mm
Global	Size undifferentiated

15.2.7 Variography

Variography analysis was conducted with only the global Fe variable in the colluvium. Variograms in different directions were inspected to define the best structure indicative of the spatial continuity, but it was determined that the an omnidirectional horizontal variogram was the best option. The global Fe semivariogram is presented in Figure 15-14.

15.2.8 Resource Estimation

The geology of Urucum NE Area consists of a single layer of colluvium and it was modeled as a single mineralized unit.

The blocks grades were estimated with the Inverse Distance Squared (ID2) algorithm in a 3-pass procedure as presented in Table 15.2.8.1. After the estimation had been concluded, it was observed that some blocks had not been adequately classified and that there were instances of isolated measured or indicated blocks within indicated or inferred areas. These blocks were adjusted manually. The total number of modified blocks was 87. Of these, 22 were reclassified from indicated to inferred resource, 14 from measured to indicated resource and one block from inferred to indicated resource. The distribution of blocks by classification is shown in Figure 15-15.

Table 15.2.8.1: Resources Classification Criteria

	Search Ellipsoid		
Resource Classification	Variographic Parameter	Search Ratio – Horizontal Plane	Min./Max. No. of Samples
Measured	¼ Range	118 m	4/6
Indicated	½ Range	235 m	2/16
Inferred	1 Range	470 m	1/16

Comparison of the basic statistics for the assays, composites, and block model are given in Table 15.2.8.2

Table 15.2.8.2: Basic Statistics for Block Model, Composites and Original Assays

		#	Min.	Max.	Mean	1st Quartile	Median	3rd Quartile	Std.Devn.	Variance
Fe(%)	Block Model	2,782	20.05	62.93	52.25	48.78	52.03	55.09	4.66	21.75
	Composite	137	19.40	63.10	53.06	49.72	53.53	57.22	6.50	42.26
	Assay	150	19.40	63.10	53.06	49.72	53.53	58.22	6.66	44.33
Al_2O_3(%)	Block Model	2,782	1.17	11.67	3.31	2.44	2.89	4.01	1.29	1.67
	Composite	137	1.13	11.90	3.06	2.21	2.71	3.71	1.38	1.90
	Assay	150	0.80	12.50	3.06	2.19	2.71	3.69	1.47	2.17
SiO_2 (%)	Block Model	2,782	7.08	52.13	18.59	15.14	18.93	23.11	5.56	30.93
	Composite	137	6.70	52.90	17.96	12.94	17.34	22.88	7.64	58.40
	Assay	150	6.70	52.90	17.96	12.03	17.26	23.18	7.80	60.78
P(%)	Block Model	2,782	0.026	0.180	0.055	0.049	0.054	0.059	0.009	0.000
	Composite	137	0.025	0.180	0.056	0.050	0.054	0.062	0.012	0.000
	Assay	150	0.025	0.180	0.056	0.050	0.055	0.062	0.012	0.000
Mn(%)	Block Model	2,782	0.02	1.60	0.37	0.07	0.26	0.61	0.37	0.13
	Composite	137	0.02	1.60	0.30	0.03	0.09	0.41	0.39	0.15
	Assay	150	0.02	1.60	0.30	0.03	0.09	0.39	0.40	0.16
TiO_2 (%)	Block Model	2,782	0.10	0.45	0.19	0.16	0.18	0.21	0.05	0.00
	Composite	137	0.10	0.46	0.18	0.15	0.17	0.20	0.05	0.00
	Assay	150	0.06	0.57	0.18	0.15	0.17	0.20	0.06	0.00
LOI(%)	Block Model	2,782	0.86	5.46	1.95	1.50	1.74	2.31	0.69	0.48
	Composite	137	0.73	5.46	1.81	1.40	1.70	2.19	0.69	0.48
	Assay	150	0.73	5.92	1.81	1.34	1.66	2.17	0.74	0.55

SRK validated the resource by creating a conventional 3D block model, compositing the database, and estimating grades with the same search distances and parameters as MMX. The block tonnage and grade were within 5% of MMX's resource, which is a good validation.

15.2.9 Resource Statement

Table 15.2.9.1 below lists the resources of Urucum NE Area.

Table 15.2.9.1: Summary of Resources Urucum NE

Classification	Tonnage (M t)*	Fe(%)	SiO_2 (%)	Al_2O_3 (%)	P(%)	Mn(%)	TiO_2 (%)	LOI (%)
Measured	3.17	55.23	15.2	3.09	0.056	0.12	0.18	1.72
Indicated	34.00	53.03	18.14	2.97	0.055	0.34	0.18	1.8
Measured and Indicated	37.17	53.22	17.89	2.98	0.055	0.32	0.18	1.79
Inferred	32.84	50.95	19.53	3.78	0.054	0.44	0.2	2.19

(*) Tonnes reported in wet basis. Density = 2.86 g/cm³. Cut off = 20% Fe.

15.3 Reserve Estimation Mine 63

The reserve estimation used measured and indicated resources to define the pit limits through a Lerchs-Grossman pit optimization program. Prominas was responsible for the reserve estimation under the supervision of MMX. The pit optimization was conducted at the end of 2007 as reported in the May 2007 NI 43-101 Technical Report.

Based on correlation studies between RoM ore and product specifications, the average grades required for the mined ore were established. Table 15.3.1 summarizes the correlation of RoM and Lump as detailed in Section 14.

Table 15.3.1: Correlations RoM x Lump

	Colluvium	Eluvium
Fe	Y = 0.3657 x + 44.144	Y = 0.85 x + 12.454
SiO2	Y = 0.4999 x – 0.321	Y = 0.954 x + 2.5395
Al_2O_3	Y = 0.294 x + 0.7128	Y = 0.3831 x + 0.0224
P	Y = 0.2208 x + 0.0447	Y = 0.4477 x + 0.0262

The results were 54.4% Fe for the colluvial ore and 60.8% Fe for the eluvial ore. These grades result in an average grade of product equal to 64.03% Fe and 64.13% Fe, respectively.

Figure 15-16 presents the parameterization of measured and indicated resources for the two areas. Based on the curves for the resources, cut-off grades were established at 51.7% Fe for the Colluvium area and 59.0% Fe for the Eluvium area. Based on these result, different cuts were simulated near to the cutoff values to maximize the mineable reserves, maintaining the required average grade for the RoM ore.

The Colluvium and Eluvium block models were optimized separately, using the parameters listed below:

- RM (mass recovery)= 66% (55% Lump and 11% Sinter-feed);
- Average Product Value = US$32.02/t (Lump US$35.50/t and Sinter-Feed US$15.00/t; prices as of December 2006);
- Mine Cost RoM = US$1.38/t;
- Mine Cost Waste = US$1.00/t;
- Plant Cost = US$3.39/t product;
- Sundry Costs (Sundry costs include: planning and quality control, administration and others)= US$0.68/t product;
- Transportation Cost = US$3.12/t product (from Mine 63 to the Ladário Port);
- Colluvium Block Model;
    - Density – 3.16 Colluvium and Breccia; 1.72 Waste,
    - Volume - 12,500m³, and
    - Pit Slope – 47°.
- Eluvium Block Model;

- Density – 3.60 Colluvium and Breccia; 3.87 Waste,
- Volume - 3,125m³, and
- Pit Slope - 48°.

Table 15.3.2 contains ore and waste in the optimized pit which was used as the base for a designed pit and subsequent mine planning. The average product value of US$32.02 is higher than the projected future prices used in the cash flow. As a check on the sensitivity of the pit optimization to the product price, two additional optimizations were run on the Colluvium area only, using US$30.00 and US$20.00. The results, given in Table 15.3.3, indicate that the pit is very robust in regard to product price and that the use of a higher iron price has no effect on the pit optimization results.

Table 15.3.2: Optimized Pit for Mine 63, Corumbá Project End of December 2006

	Colluvium		Eluvium		Total	
Class	Mt	Fe%	Mt	Fe%	Mt	Fe%
Proven and Probable	22.69	54.41	7.85	60.81	**30.53**	**56.05**
Waste					**19.12**	
Total Pit					**49.65**	
Strip Ratio					**0.63**	

Table 15.3.3: Sensitivity of the Optimized Pit to Product Price in Colluvium Area Only

Average Product Price	Mt	Fe%
$32	22.687	54.41
$30	22.669	54.41
$20	22.463	54.41

After the pit was designed with the inclusion of ramps, the average grade of the Colluvium area was slightly above the grade required for the product specifications. The CoG within the designed pit was then lowered from 48.85% to 48.00%, increasing the Mineable Reserve by 1.09Mt. In the Eluvium area, the CoG was adjusted to 56.1% from 55.85% in order to achieve the specified product grade, resulting in a loss of 0.09Mt. The Measured Resources at or above the CoG within the designed pit were converted to Proven Reserves and the Indicated Resources at the CoG were converted to Probable Reserves. Table 15.3.4 presents the Ore Reserves for Mine 63 as of December 2006.

Table 15.3.4: Total Reserves as at December 2006 - Mine 63 Corumbá Project*

Classification	Tonnes (Mt)	Fe (%)	S_iO_2 (%)	Al_2O_3 (%)	P (%)	Mn (%)	LOI (%)	TiO_2 (%)
Proven	5.7	61.1	8.07	2.56	0.08	0.03	1.68	0.14
Probable	25.3	54.8	14.92	2.49	0.06	0.43	1.45	0.14
Total	31.0	56.0	13.66	2.51	0.06	0.35	1.49	0.14
Waste	15.3							
SR	0.49							

* Tonnes are reported on a wet basis. Fe cut-off grade for Eluvium is 48.0% and for Colluvium is 56.1%. Average Fe price used is US$ 32.02.

Mine production from January to September 2007 is shown in Table 15.3.5.

Table 15.3.5: Mine 63 Production, January to September 2007

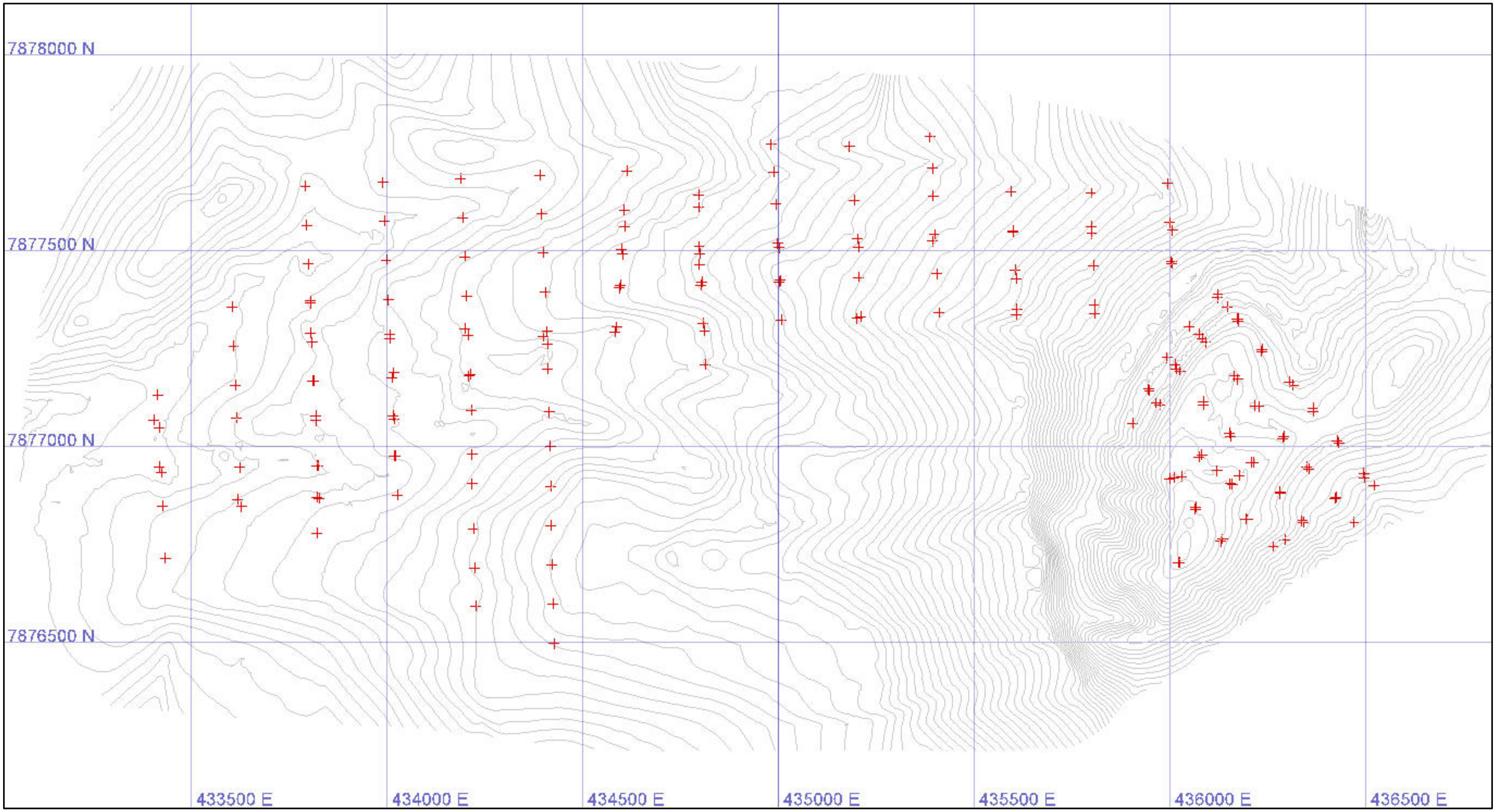
			Product			Mass Recovery		
RoM (t)	Stockpile (t)	Processed (t)	Lump (t)	Sinter (t)	**Total**	Lump	Sinter	**Total**
1,746,334	79,600	1,666,734	844,684	225,897	**1,070,581**	50.68	13.55	**64.23**

Production from January to September 2007 was subtracted from the 2006 year-end reserves to arrive at the reserves as of September 30, 2007. The total reserves, including stockpiles, are listed in Table 15.3.6. Figure 15-17 illustrates the final pit layout of the Mine 63 project.

Table 15.3.6: Total Proven and Probable Reserves at Mine 63 Corumbá Project*, September 30, 2007

Classification	**Mt**	**Fe (%)**	**SiO2 (%)**	**Al2O3 (%)**	**P (%)**	**Mn (%)**	**TiO2 (%)**	**LOI (%)**
Proven	4.3	61.03	8.26	2.55	0.08	0.03	0.14	1.67
Probable	25.0	54.74	14.96	2.51	0.06	0.43	0.14	1.45
Stockpile	0.1	60.40	9.28	2.53	0.08	0.05	0.14	1.69
Total Probable	25.1	54.76	14.94	2.51	0.06	0.43	0.14	1.45
Total	**29.4**	**55.68**	**13.96**	**2.51**	**0.06**	**0.37**	**0.14**	**1.48**

* Tonnes are reported on a wet basis
Fe CoG for Eluvium is 48.0% and Fe CoG for Colluvium is 56.1%
Average Fe price isUS$32.02



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File Name: Figure 15-1.doc

Corumbá Project, Brazil

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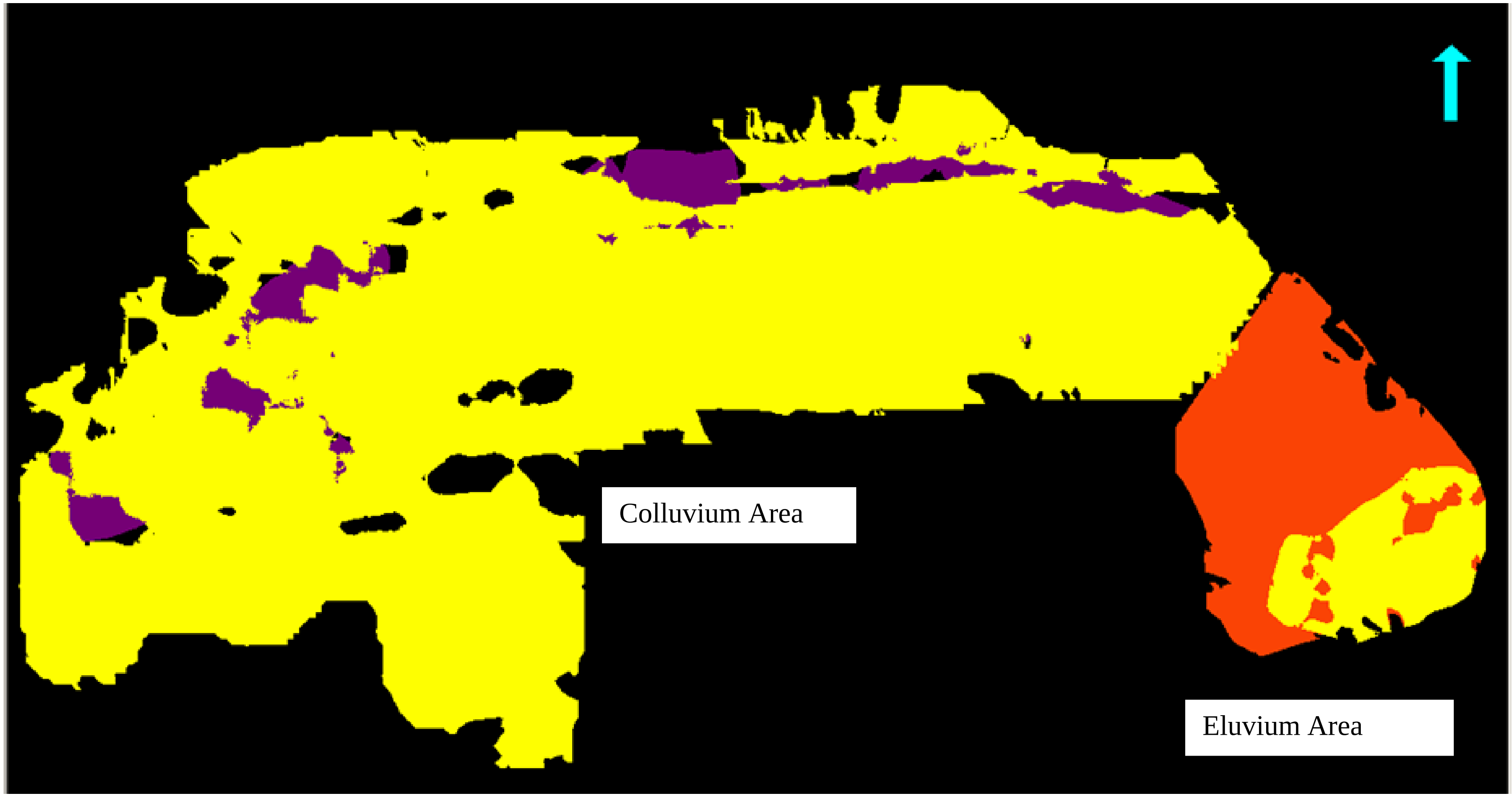
Figure 15-1

All Drillholes, Channel Samples, and Shafts – Mine 63

Date: 02-27-08	Approved: LM	Figure: 15-1



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File Name: Figure 15-2.doc

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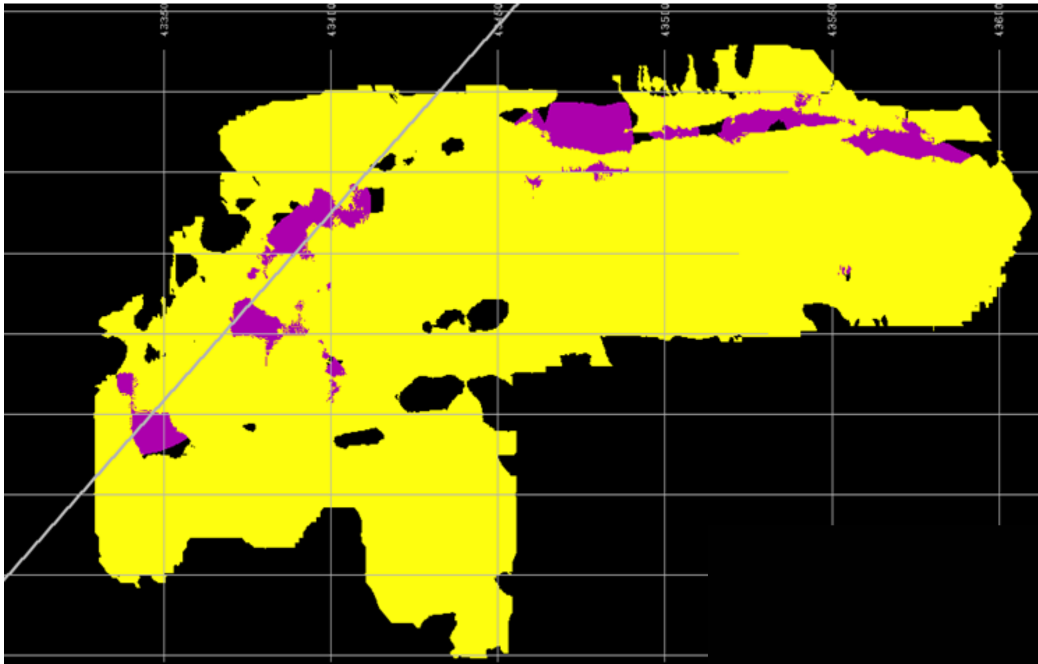
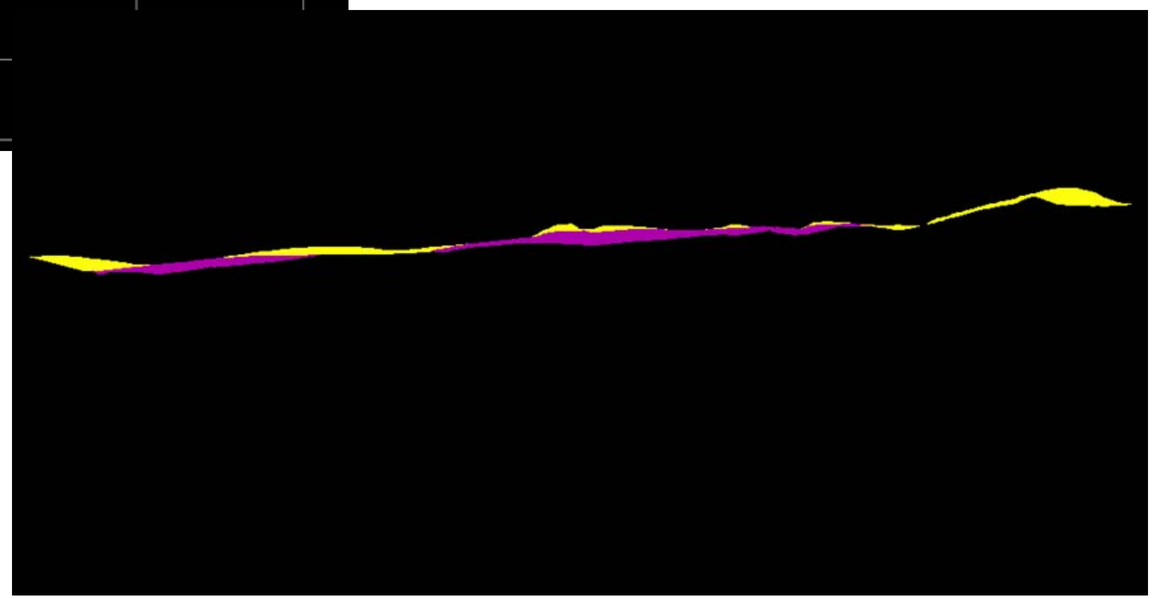
Source: Mineração & Metálicos S.A.

Figure 15-2

Colluvium and Eluvium Areas of Mine 63

Date: 02-27-08	Approved: LM	Figure: 15-2





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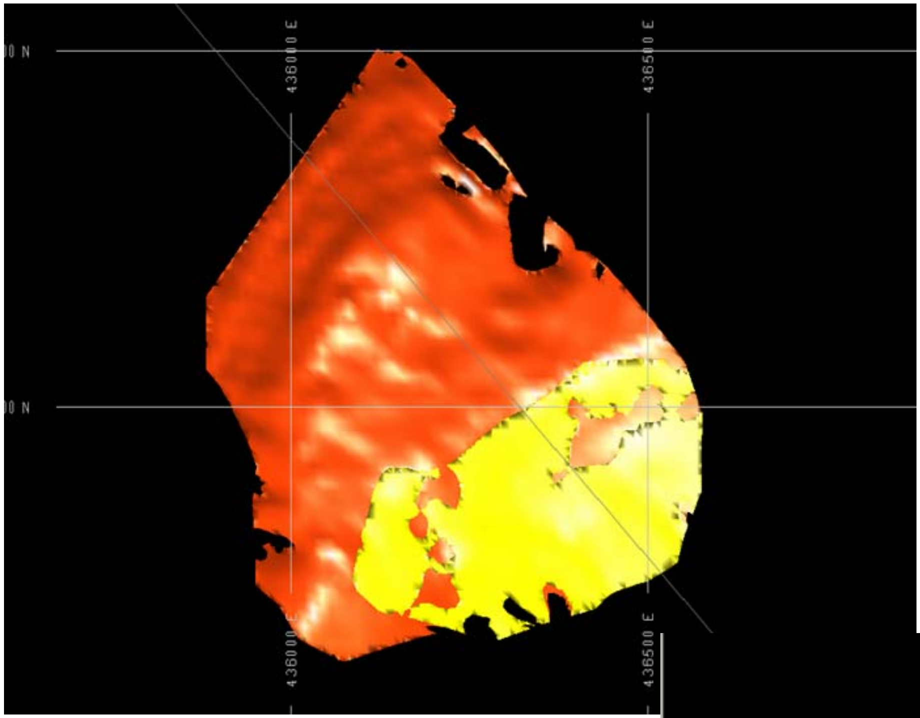
Brazil**

Source: Mineração & Metálicos S.A.

Figure 15-3

Colluvium 3D Solids in Plan and Cross-Section

Date: 02-27-08	Approved: LM	Figure: 15-3



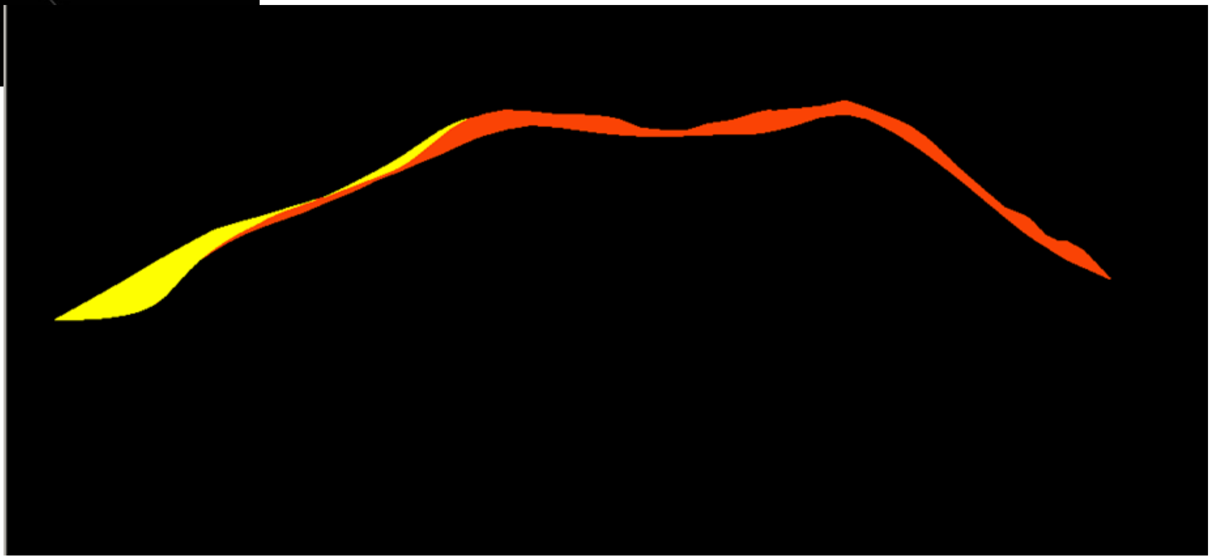


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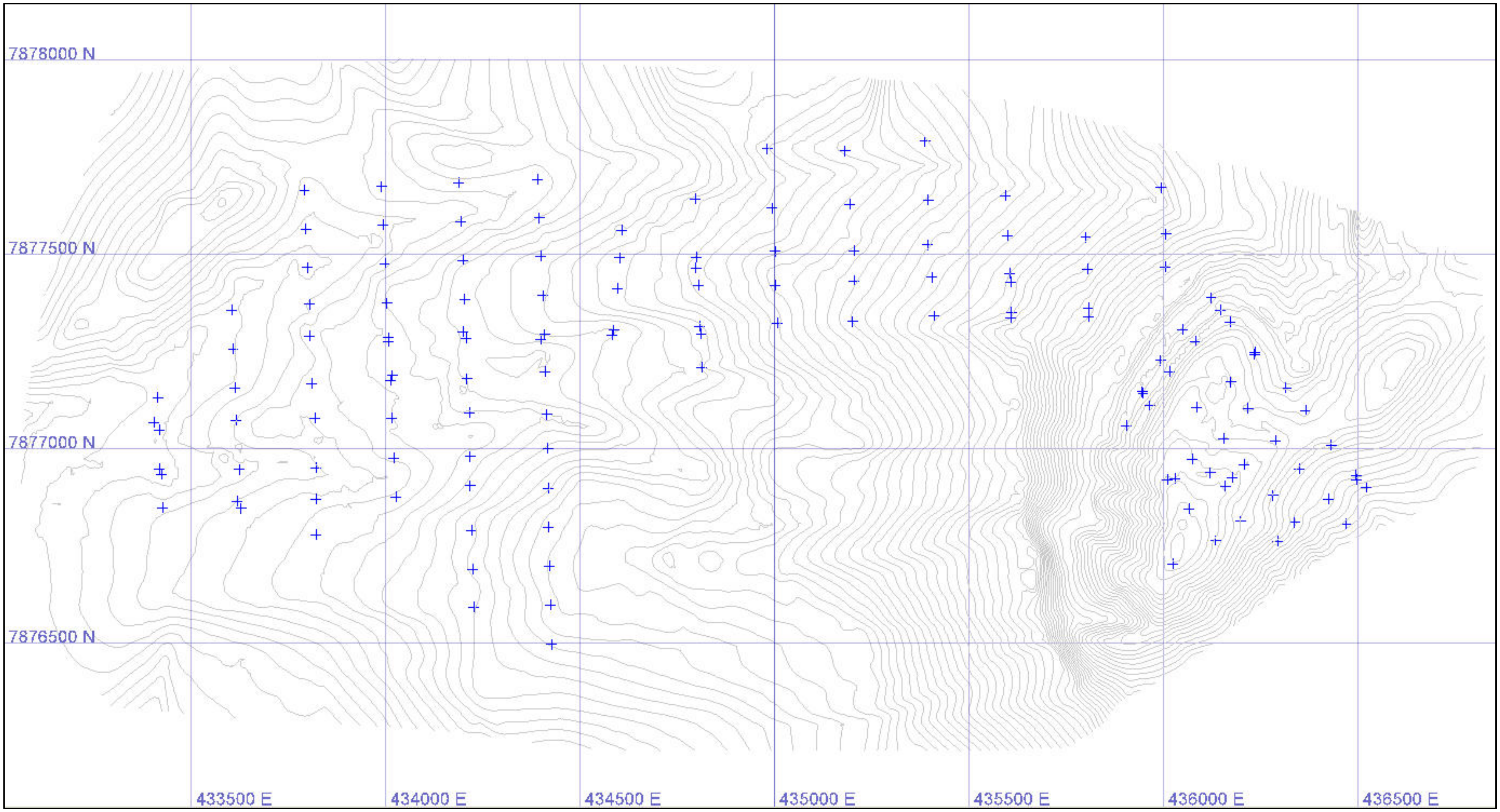
Figure 15-4

Eluvium 3D Solids in Plan and Cross-Section

Date: 02-27-08	Approved: LM	Figure: 15-4



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File Name: Figure 15-5.doc

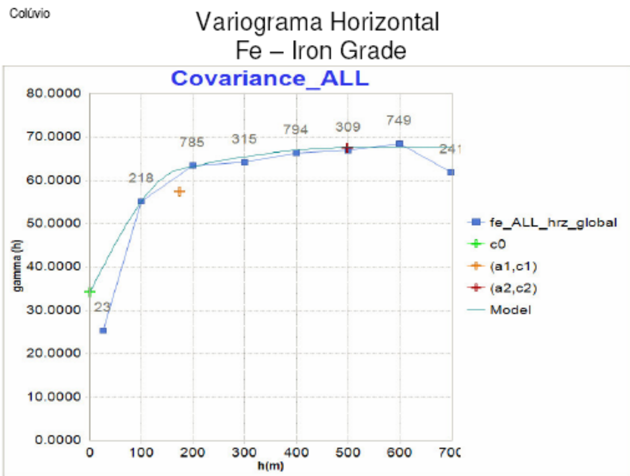
Corumbá Project, Brazil

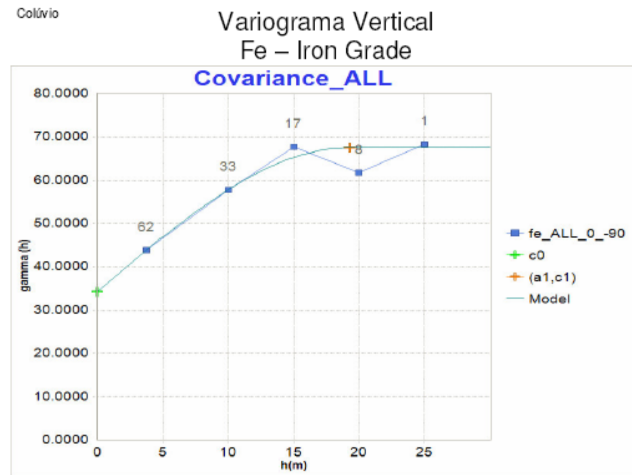
Source: Mineração & Metálicos S.A.

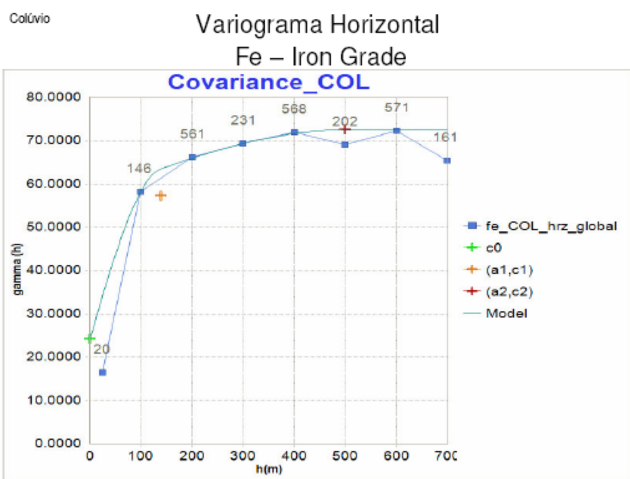
Figure 15-5

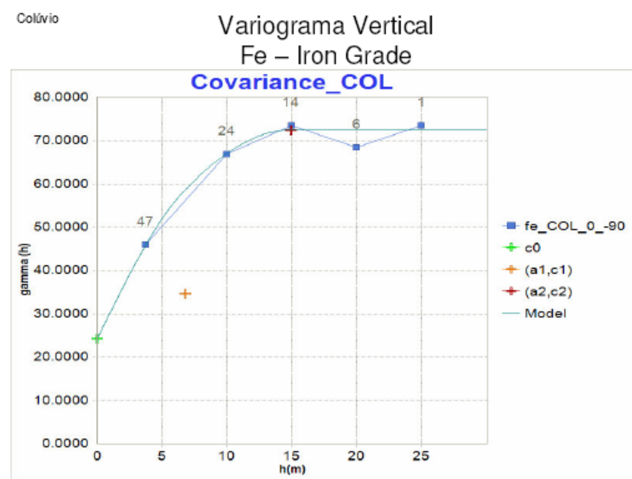
Location of Samples in Resource Database - Mine 63

Date: 02-27-08 | Approved: LM | Figure: 15-5









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SRK Job No.: 162703.03

File Name: Figure 15-6.doc

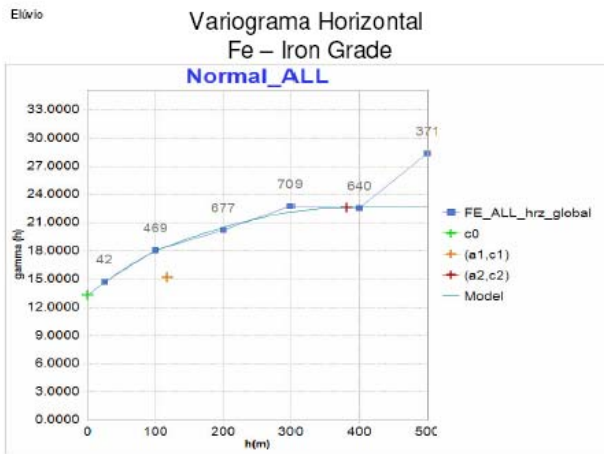
Corumbá Project, Brazil

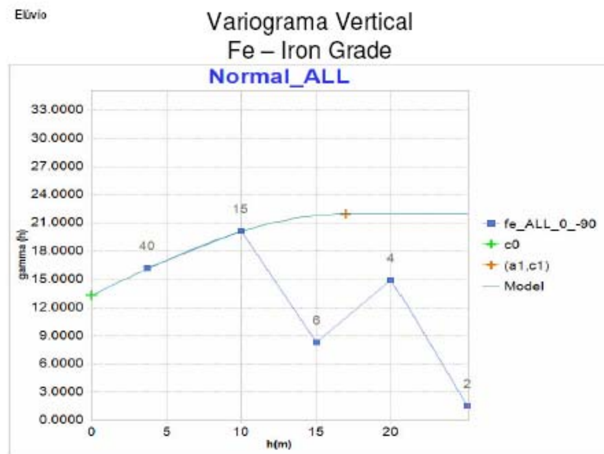
Source: Mineração & Metálicos S.A.

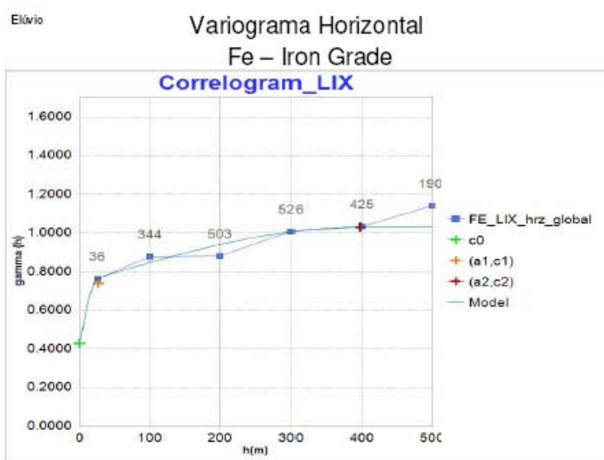
Figure 15-6

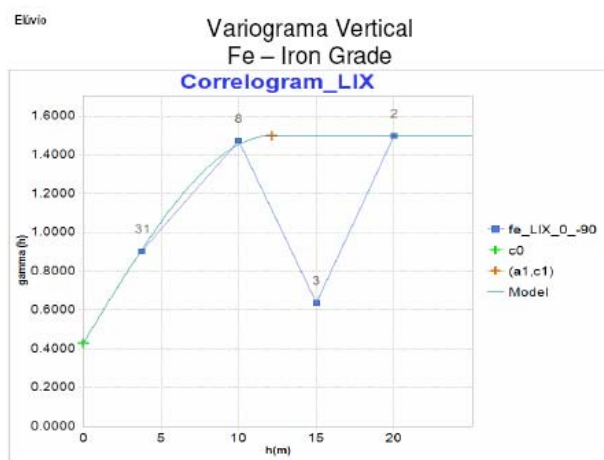
Iron Variograms–Colluvium

Date: 02-27-08	Approved: LM	Figure: 15-6









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SRK Job No.: 162703.03

File Name: Figure 15-7.doc

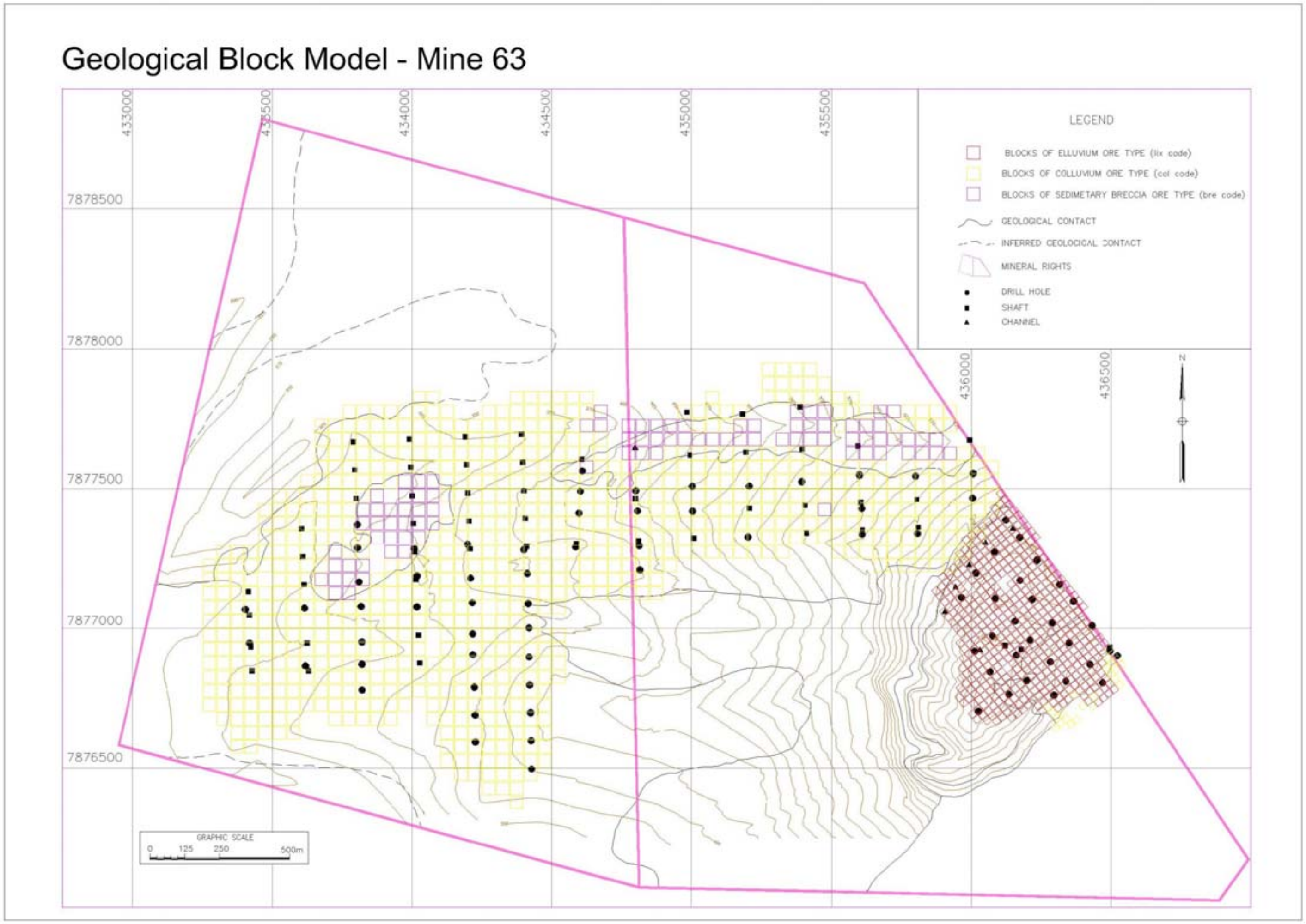
Corumbá Project, Brazil

Source: Mineração & Metálicos S.A.

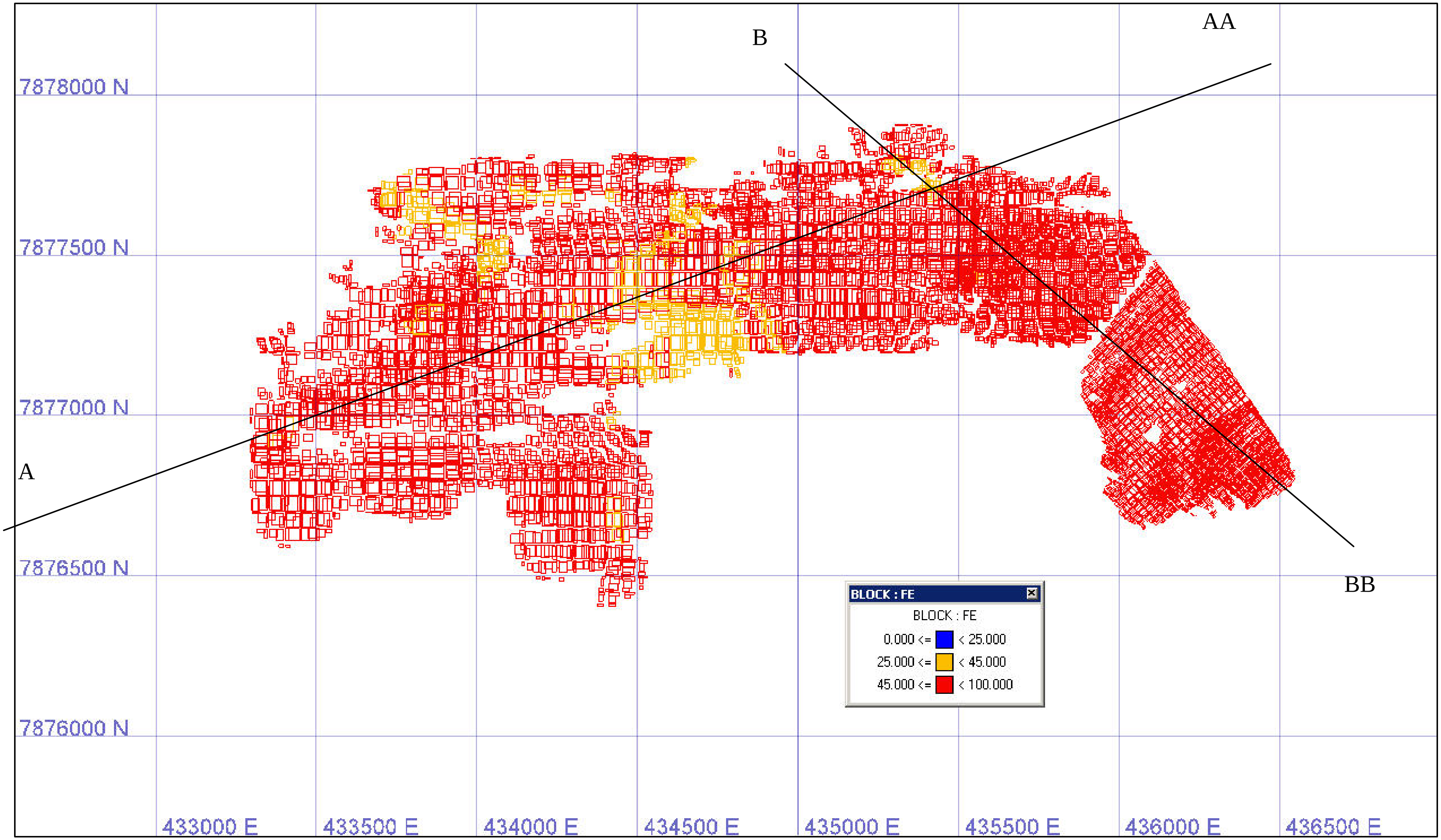
Figure 15-7

Iron Variograms–Eluvium Area

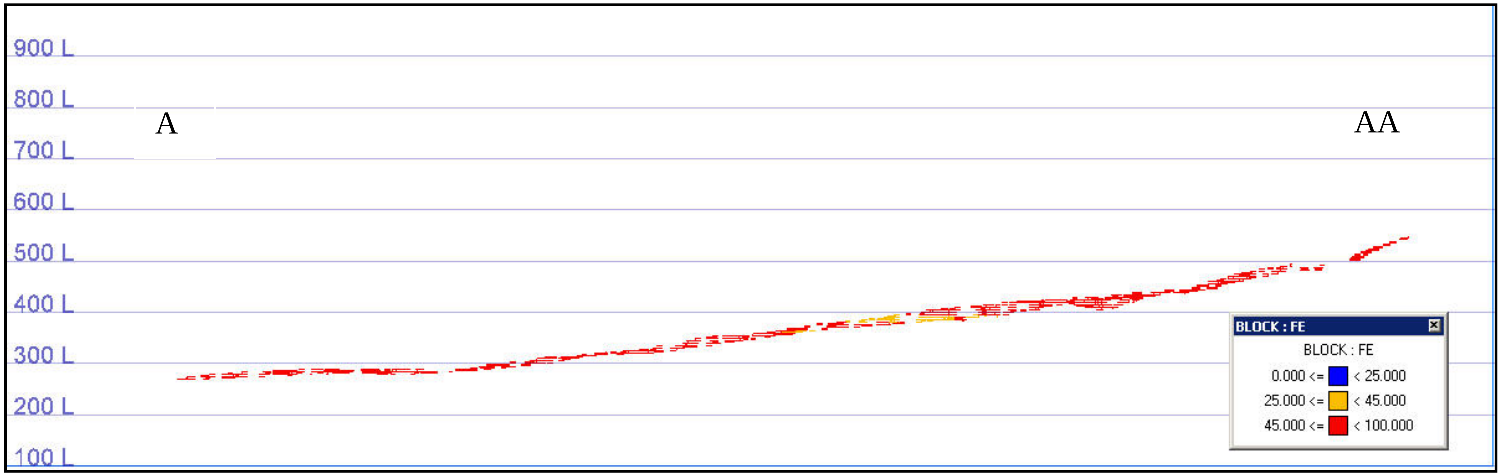
Date: 02-27-08 | Approved: LM | Figure: 15-7

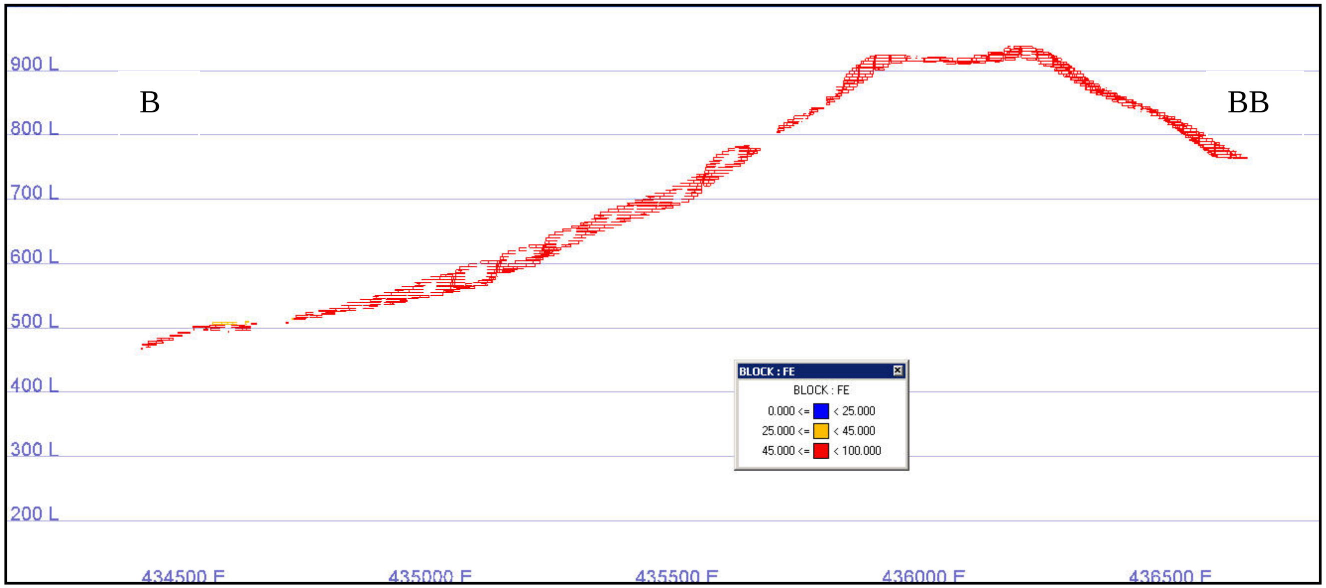


SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 15-8 Colluvium and Eluvium Block Models Mine 63		
SRK Job No.: 162703.03				
File Name: Figure 15-8.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08	Approved: LM	Figure: 15-8

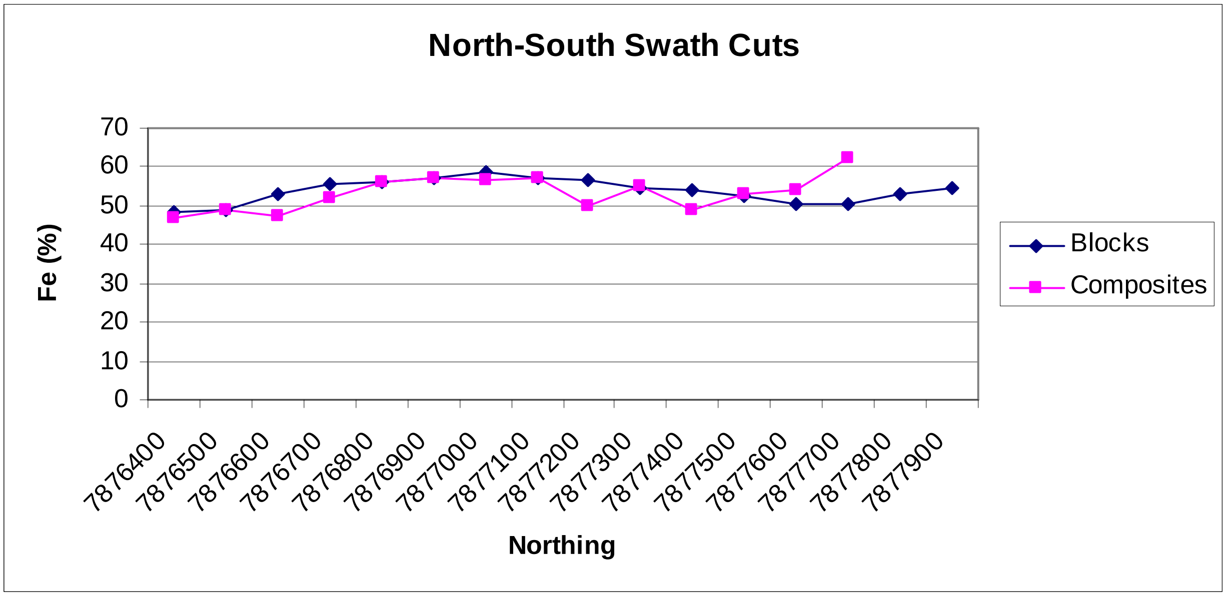


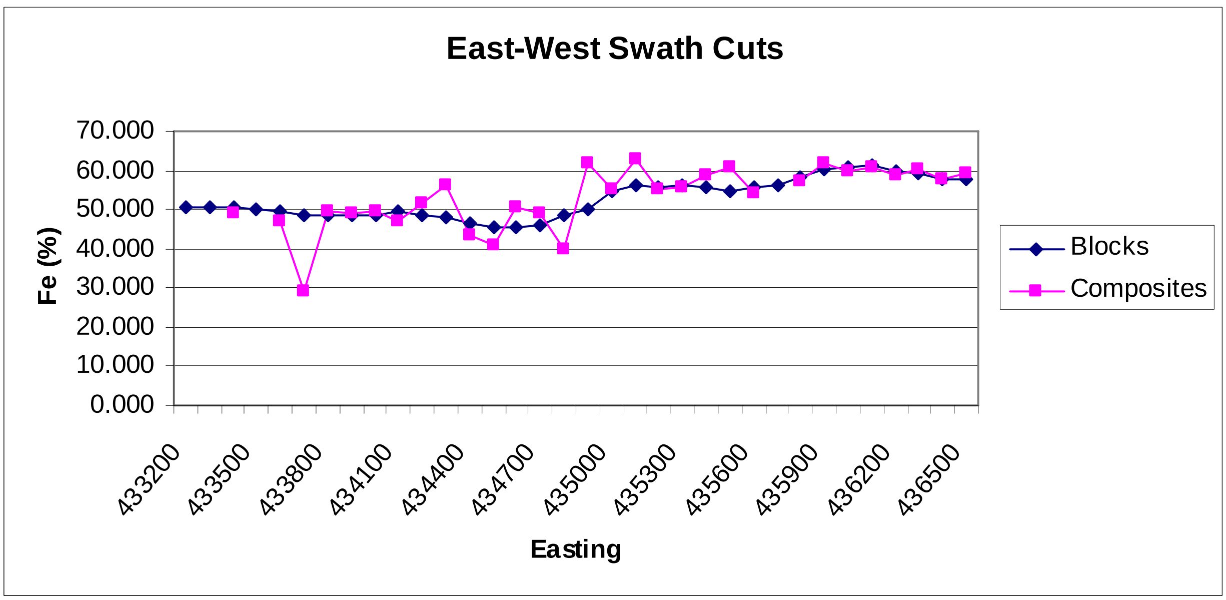
SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 15-9
SRK Job No.: 162703.03		Colluvium and Eluvium Block Grades Plan View
File Name: Figure 15-9.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08 · Approved: LM · Figure: 15-9



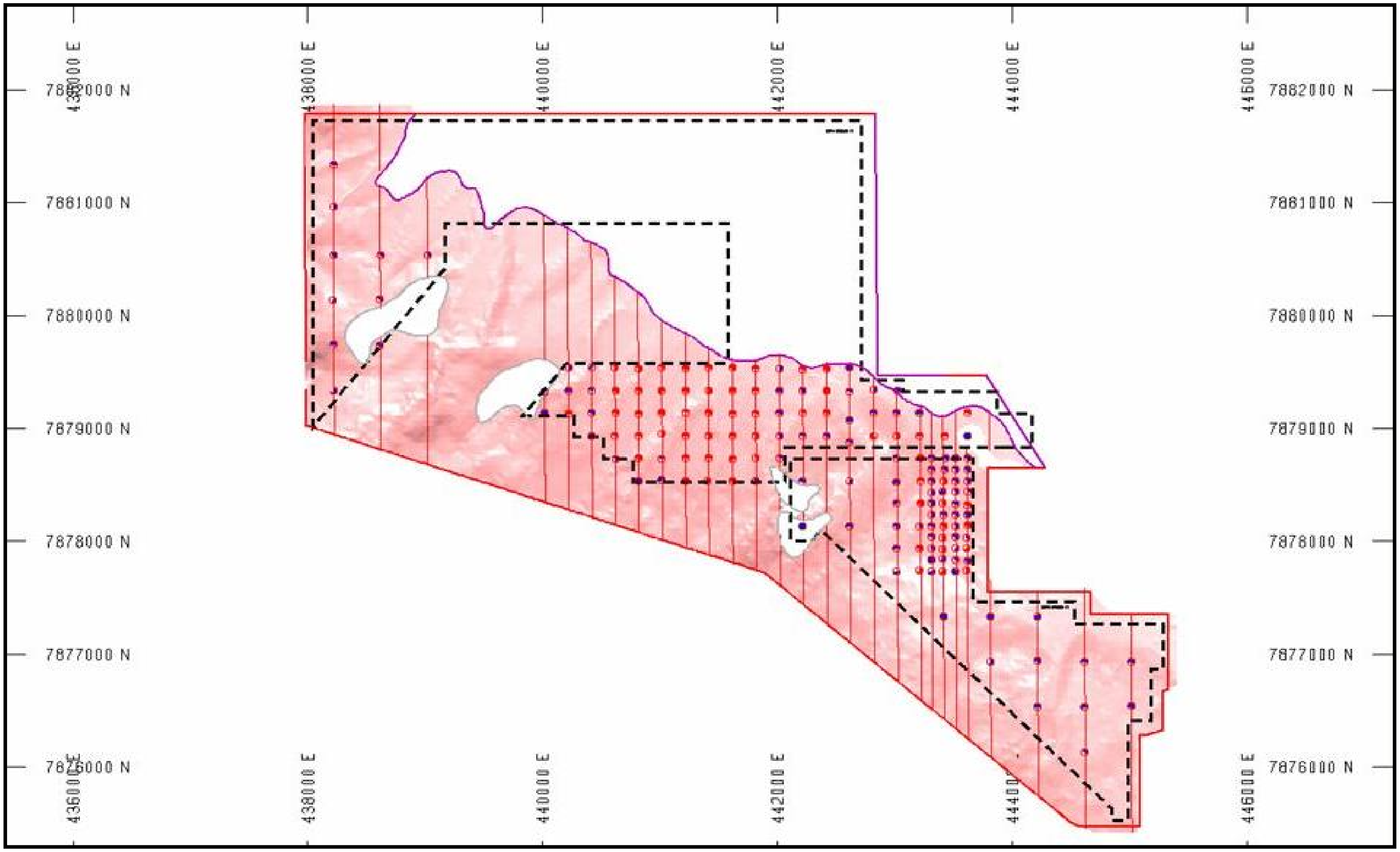


SRK Consulting Engineers and Scientists	**Corumbá Project, Brazil**	**Figure 15-10** **Colluvium and Eluvium Block Model Cross-Section**
SRK Job No.: 162702.03		
File Name: Figure 15-10.doc	**Source: Mineração & Metálicos S.A.**	Date: 2-27-07 / Approved: LM / Figure: 15-10

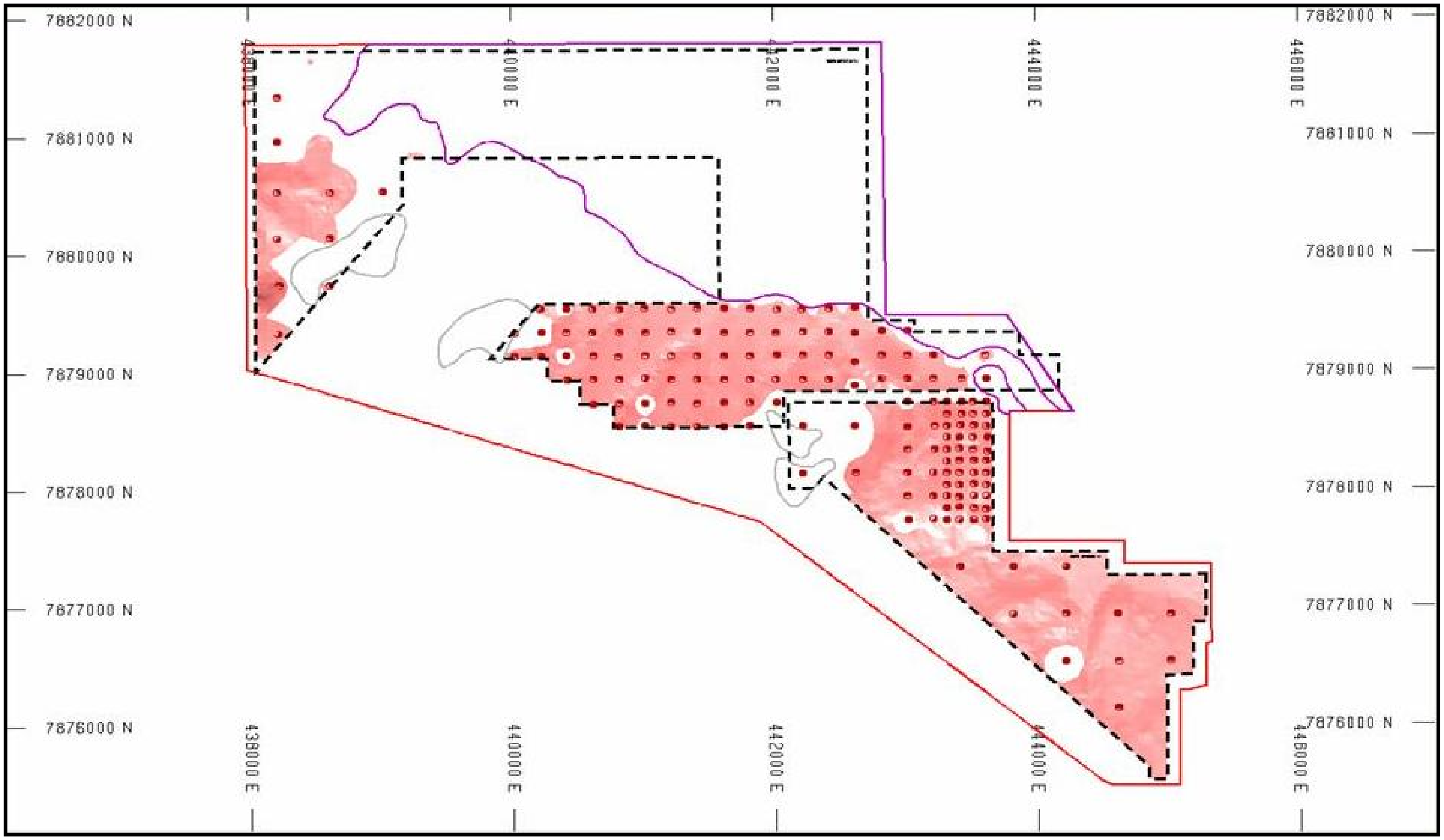




SRK Consulting Engineers and Scientists	**Corumbá Project, Brazil**	**Figure 15-11** **Swath Plots Mine 63**		
SRK Job No.: 162703.03				
File Name: Figure 15-11.doc		Date: 02-27-08	Approved: LM	Figure: 15-11



SRK Consulting Engineers and Scientists	**Corumbá Project, Brazil**	**Figure 15-12**
SRK Job No.: 162702.03		**Colluvium Solid Urucum NE**
File Name: Figure 15-12.doc	**Source: Mineração & Metálicos S.A.**	Date: 2-27-07 · Approved: LM · Figure: 15-12



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SRK Job No.: 162702.03

File Name: Figure 15-13.doc

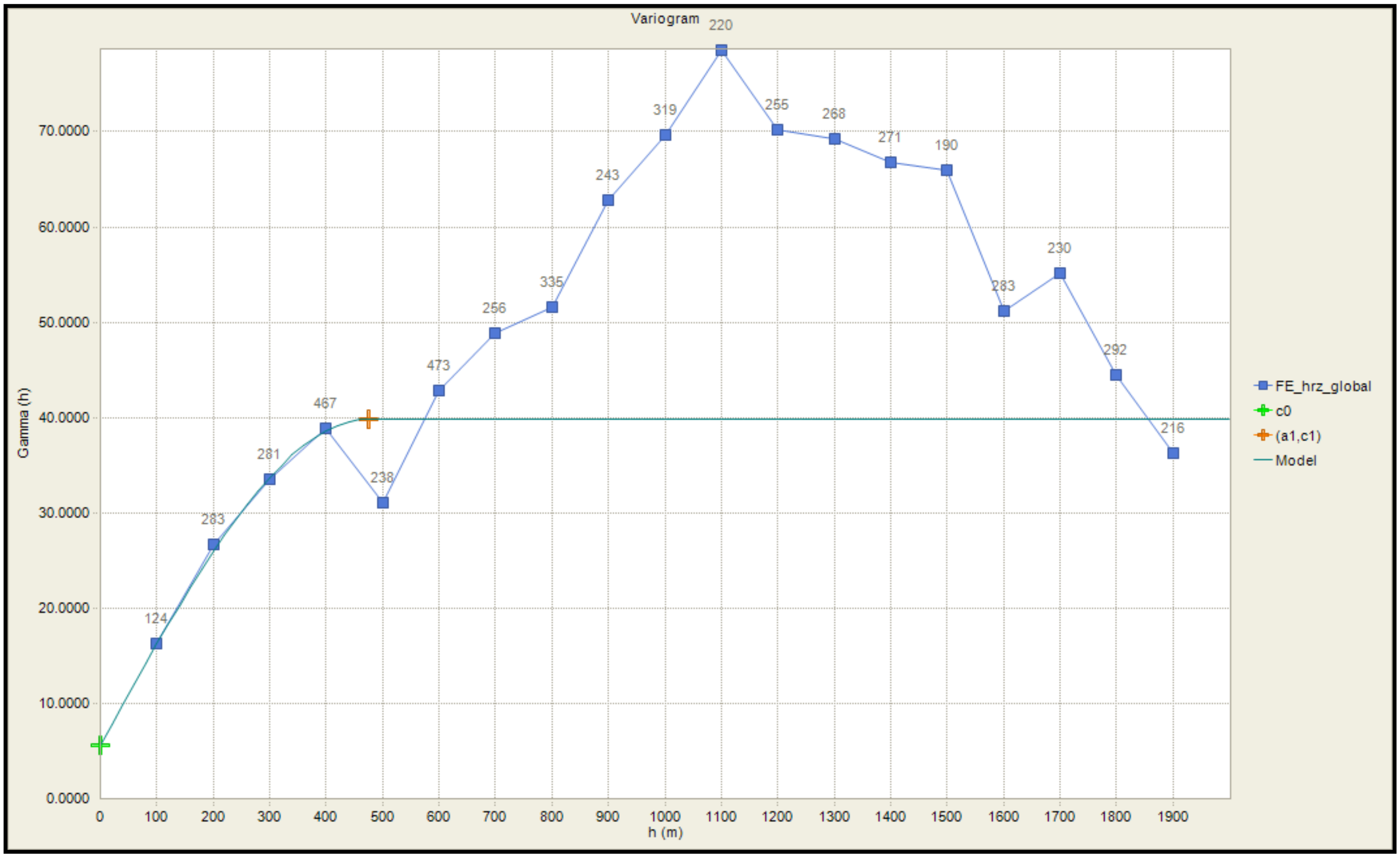
Corumbá Project, Brazil

Source: Mineração & Metálicos S.A.

Figure 15-13

Final Colluvium Solid for Resource Estimation Urucum NE

Date: 2-27-07 | Approved: LM | Figure: 15-13



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SRK Job No.: 162703.03

File Name: Figure 15-14.doc

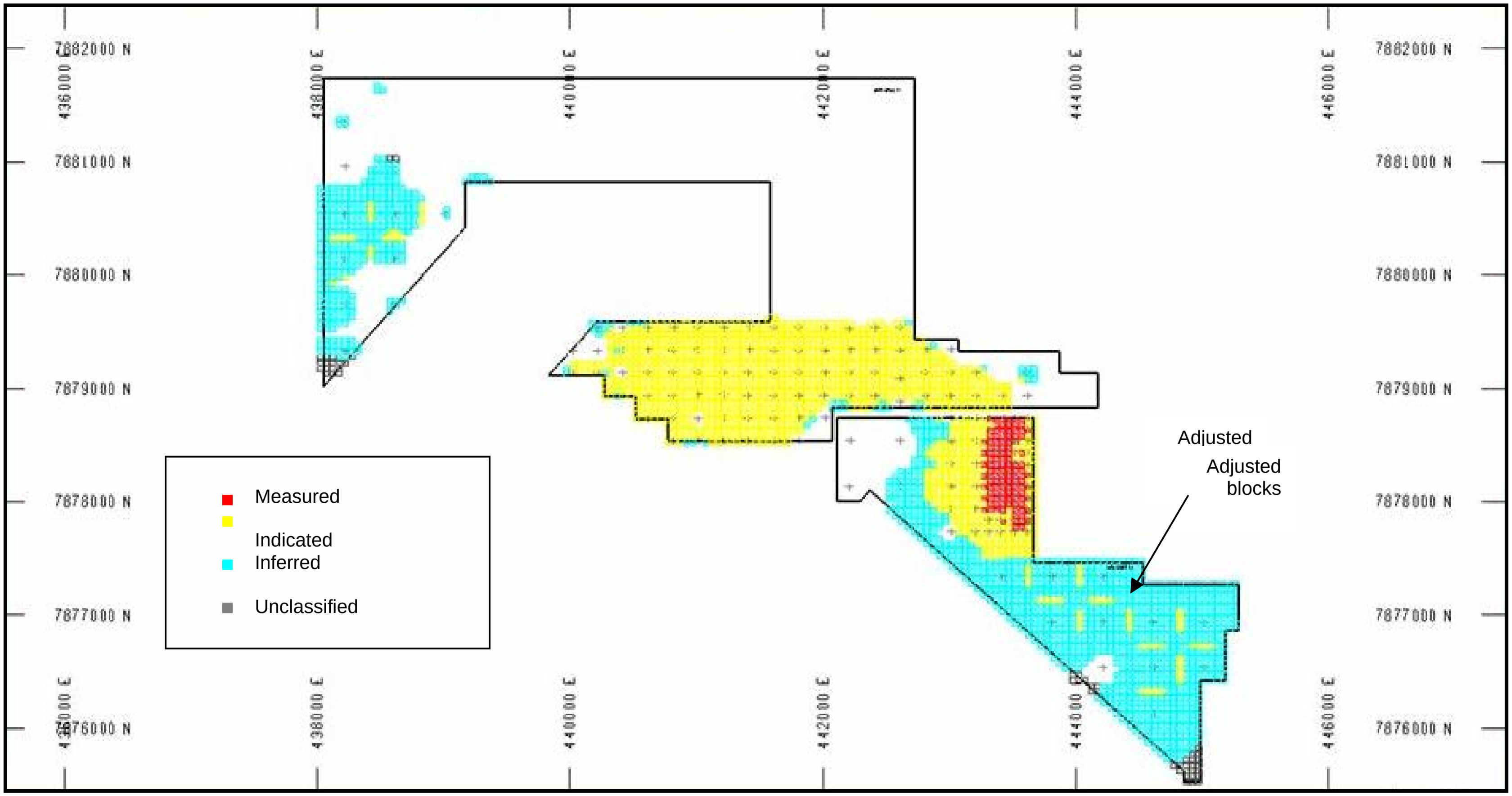
Corumbá Project, Brazil

Source: Mineração & Metálicos S.A.

Figure 15-14

Iron Variogram Urucum NE

Date: 02-27-08 | Approved: LM | Figure: 15-14



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SRK Job No.: 162702.03

File Name: Figure 15-15.doc

Corumbá Project, Brazil

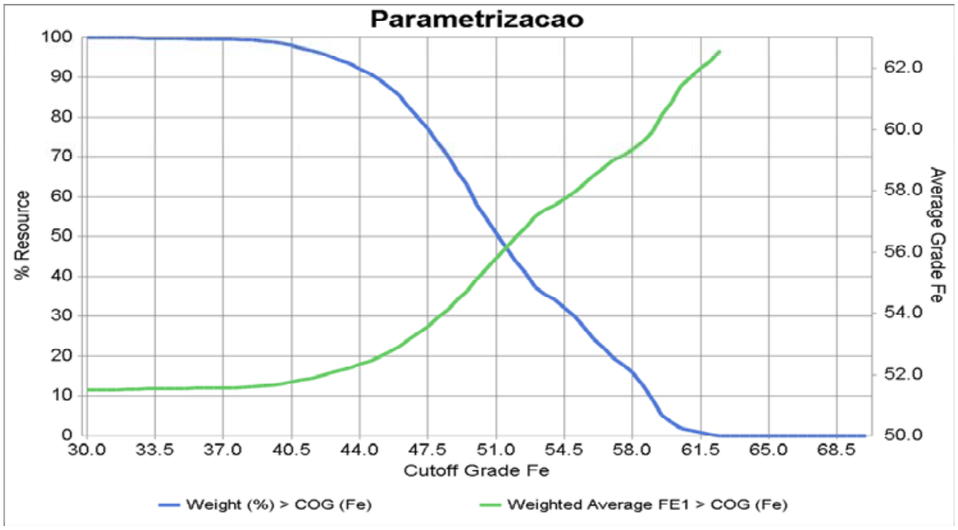
Source: Mineração & Metálicos S.A.

Figure 15-15

Blocks by Classification Urucum NE

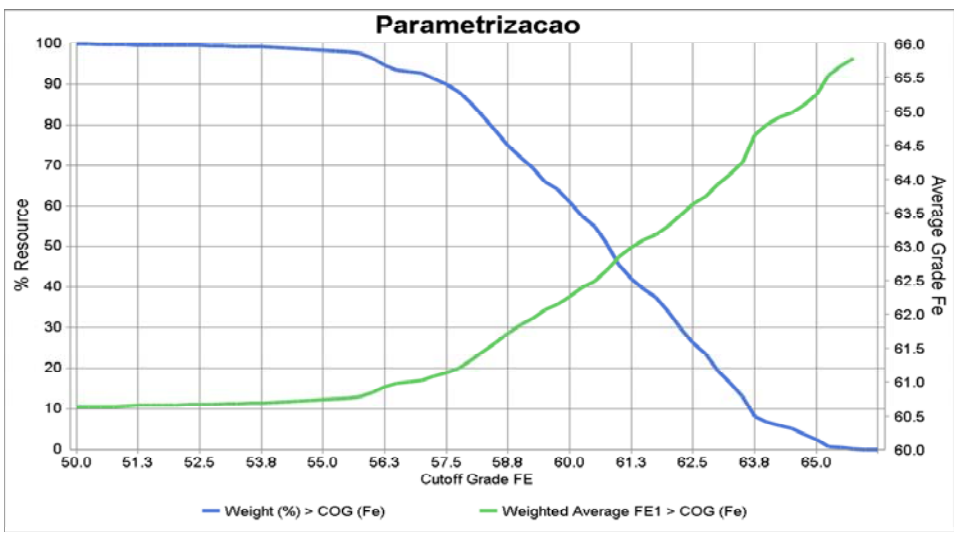
Date: 2-27-07	Approved: LM	Figure: 15-15

Fe COG ≥ 48.85 ⇔ Fe_{avg} = 54.4



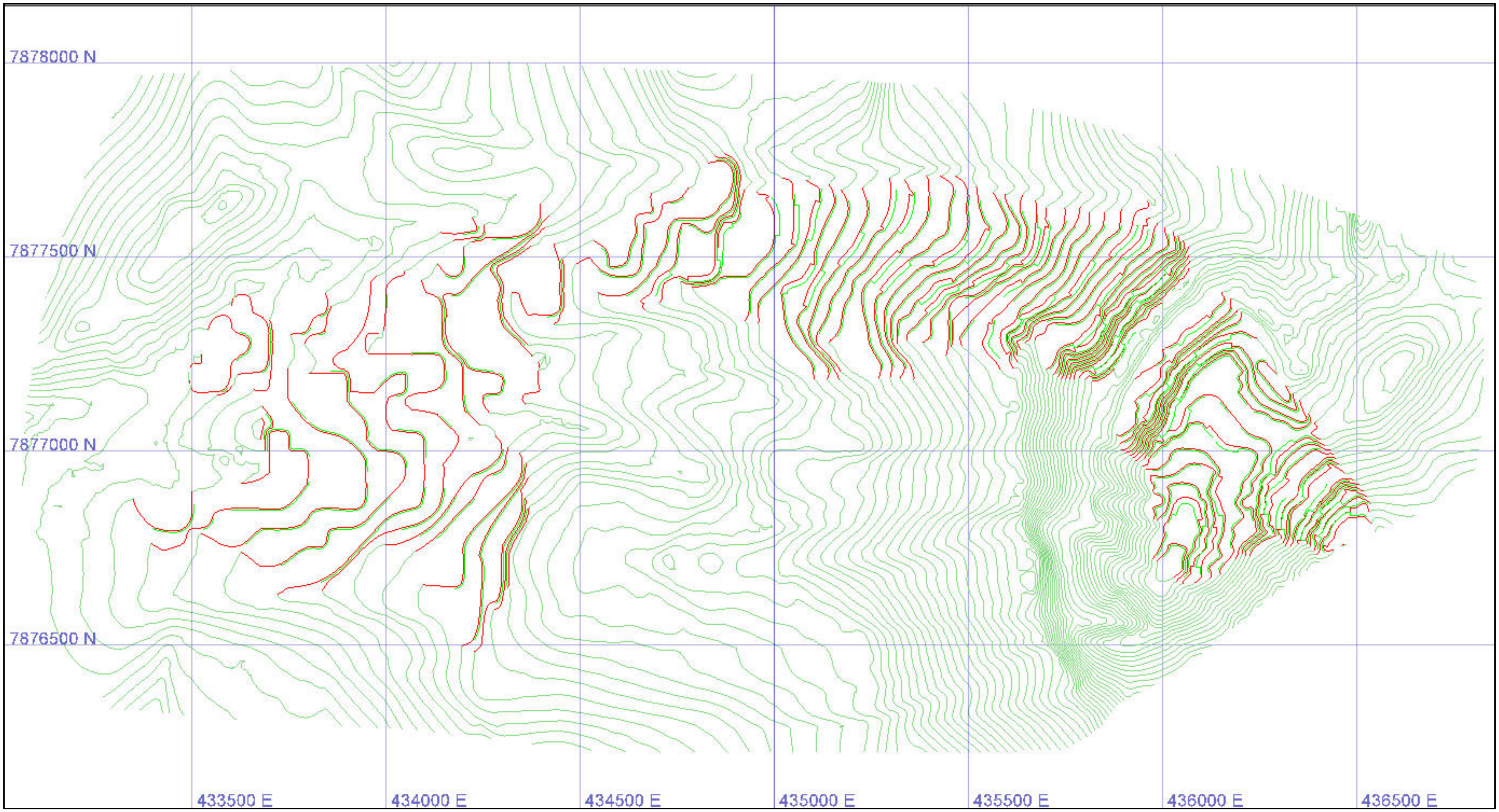
Colluvium Area

Fe COG ≥ 55.85 ⇔ Fe_{avg} = 60.8%



Eluvium Area

SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 15-16 CoG Curve Colluvium and Eluvium
SRK Job No.: 162703.03		
File Name: Figure 15-16.doc	Source: Mineração & Metálicos S.A.	Date: 02-27-08 / Approved: LM / Figure: 15-16



SRK Consulting
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SRK Job No.: 162703.03

File Name: Figure 15-17.doc

Corumbá Project, Brazil

Source: Mineração & Metálicos S.A.

Figure 15-17

Mine 63 Pit Colluvium and Elluvium Areas

Date: 02-27-08 | Approved: LM | Figure: 15-17

16 Other Relevant Data and Information (Item 20)

16.1 Potential Resources

16.1.1 Mine 63

MMX Corumbá plans to upgrade a portion of the inferred material to indicated and a portion of the indicated material to measured and to increase the total amount of resources through an exploration program that includes 1,500m of shafts, geochemical analysis by size fraction, complete implementation of a QA/QC program and maintenance of the data in Acquire database software.

16.1.2 Additional Targets

MMX Corumbá holds additional exploration permits in the Corumbá Region, located in the Rabicho Mountains. The initial exploration work in these new targets suggests a potential for new geologic resources in both colluvium and eluvium iron ore types. Development of these potential resources is part of MMX's long-term strategy for the region

16.2 Process Improvements

A processing route using heavy liquid separation is being studied for the concentration of coarse material at Corumbá, with a view to increasing the iron grade in the Lump product and thus increasing the realized price. The process of separation in a heavy liquid involves removal of contaminants through gravity separation and the subsequent enrichment of the Lump ore. In the colluvium material, the arkose particles may be removed with this process, which will help to lower the cut-off grade and accordingly increase the reserve tonnage.

Tests have been conducted at the EMITANG installations (Empresa de Mineração Tanguá Ltda.) in Tanguá – Rio de Janeiro. Bulk samples of Lump from four different locations were collected at Mine 63, comprising 1,100t of material. The test was divided into four different categories, according to the chemical quality of the samples to be tested. These samples were submitted to the Heavy Medium Drum equipment for size separation. After the conclusion of the tests, the four different samples were submitted to "reprocessing" with the intention of evaluating the influence of the resident time in separation.

The results indicate the applicability of the process of heavy liquid separation as an alternative for the enrichment of Lump at Corumbá. However, the plant used as pilot in this third phase of development has been modified from its original characteristics. Additional tests will be run which will also test the separation with greater densities.

MMX is in the process of dimensioning the industrial plant with heavy medium drums. The commercial proposal, together with a description of the project, is in progress by the Dorr-Oliver EIMCO.

17 Additional Requirements for Operating Properties and Production Properties (Item 25)

Mine 63 is an operating property. Current mine operations produce iron ore by surface methods. Previous mining operations produced both iron ore and manganese ore by surface and underground methods.

17.1 Geotechnical Studies

In the area of Mine 63, the hillsides are steep and sustained by the competence of primary hematite jaspelite which is the protolith of the eluvial ore. The thickness of the eluvium is between 15 and 20m. The material still presents a certain rocky continuity that confers competence, although inferior to the competence of the unleached jaspelite.

The colluvium forms on the hillside below the almost vertical wall of Urucum Mountain. It is composed of reddish clayey soil, with gravel, blocks and small pebbles of jaspelite with dimensions of centimeters to tens of centimeters. The thickness of the colluvium is variable from a few meters at elevations between 550 and 600m, to a maximum of 25 to 30m locally. The average thickness is about 12m and the proportion of blocks of larger dimensions decreases from the base of the cliff toward the toe of the colluvial fan.

There are two water levels: the first at the level of silica leaching of the jaspelite in the higher elevations and the second in the colluvium. The water level varies according to the season and the lines of concentration of the subterranean flow, probably predominating at the base of this formation.

Various simulations have been conducted to achieve the optimal pit angles with the following results:

- For the final slope in colluvium: a bench face angle of 55º and a berm width of 4.7m, results in an average slope angle of 47º; and
- For slopes in eluvium with ultimate heights of 100m, a bench face angle of 75º and a berm width of 6m results in an average slope angle of 48º.

17.2 Mining Operations

MMX started iron ore mining and processing operations at Mine 63 in January 2006. Current mine operations produce iron ore by surface methods. Initial production was processed through the refurbished mobile crushing plant (AZTECA plant) which is no longer in use. In July 2006, MMX started operating the main crushing and washing plant and the first batch of Lump ore was shipped through Ladario Port later that month.

This Technical Report is based on annual ore production of 4.1Mtpy from Mine 63, producing 2.7Mt of Lump and Sinter Feed. To meet the processing rate, the average mining rate for total material movement (ore and waste) varies from 14,000tpd to 17,550tpd. Processing operations are scheduled 24 hours/day, and the mine production is scheduled to directly feed the processing operations.

The mine layout is shown in Figure 17-1.

17.3 Mining Method

MMX uses contract mining at Mine 63. A contract with Julio Simões Transportes e Serviços Ltda was signed on June 1, 2007 and is valid for 36 months form that date. The mine operates 348 days per year, three shifts per day.

The surface operations include:

- Topsoil removal;
- Ripping, drilling and blasting;
- Loading and haulage; and
- General maintenance and services.

Topsoil Removal

Topsoil operations consists of removing the cover in order to expose the ore and waste material The topsoil is stockpiled for future reclamation activities or direct placed during reclamation activities. Mine 63 operations utilize CAT D6 and D8, or similar type of dozer equipment.

Ripping, Drilling and Blasting

Mine 63 scarifies or rips waste and ore material with D8 dozer class equipment. Drilling and blasting, as required, is conducted by drilling and blasting contractors. A hydraulic breaker adapted to a 25t digging machine reduces the size of any remaining large blocks.

Grade control samples are obtained from percussive drilling and channel samples are collected and analyzed.

Loading and Haulage

Ore and waste are separately loaded into haulage trucks. A CAT330 class backhoe with 2.4m^3 capacity is the primary loader. Alternatively, a CAT 980 class front-end loader with a 5m^3 bucket is used as a backup loader.

Ore is transported to the primary crusher pad and waste is transported to the waste dumps with 25-30t rear dump haul trucks. Haul roads are 10m wide, with a maximum 12% grade and 1% drainage cross-slope.

General Maintenance and Services

Ore is hauled continuously to the primary crusher. As required, RoM material will feed the primary crusher. A CAT 980 type class loads the material from the RoM piles.

Haul road construction and maintenance, waste dump operations, sedimentation pond operations and other general maintenance activities utilize the reclamation dozer, Cat 140H class grader, water truck, various maintenance equipment and pickups.

17.4 Mine Planning

The mine is laid out with ten sectors in the Colluvial area and five sectors in the Eluvial area. The Colluvium reserves have an average grade of 54.4% Fe and the Eluvium reserves have an average grade of 60.81% resulting in an average mine reserve grade of 55.96% Fe. Grades in the individual sectors vary from 49.66 to 62.30% Fe. The average RoM ore grade is estimated at 55.7% for the LoM.

Table 17.4.1 below presents the planned RoM, waste and total material mined in the LoM Plan.

Table 17.4.1: Mine Production Schedule – Mine 63

Year	RoM Mtpy	Waste Mtpy	Total Movement Mtpy
2007	0.675	0.283	0.958
2008	3.723	1.604	4.877
2009	4.101	2.009	6.110
2010	4.101	2.009	6.110
2011	4.101	2.009	6.110
2012	4.101	2.009	6.110
2013	4.101	2.009	6.110
2014	4.101	2.009	6.110
2015	0.812	0.398	1.210
Total	**29.366**	**14.333**	**43.705**

The mine production schedule in Table 17.4.1 includes all Proven and Probable Reserves as of September 30, 2007. The quantities are based on cutoff grades of 48.85% for Colluvium and 55.85% for Eluvium. There is no dilution added to the reserves and there are no mining losses deducted from the reserves. MMX considers that internal dilution is adequately represented in the resource estimation and they intend to recover all economic material in the LoM Plan.

Table 17.4.2: Mine Personnel Requirements

Position	Each	Schedule Days/shifts/hrs
Supervisory/Technical Personnel		
Mining General Mgr	1	250,1,8
Maintenance Mgr	1	250,1,8
Operations Mgr	1	250,1,8
Planning, Mine and QC Mgr	1	250,1,8
Supply Coordinator (Sr Eng)	1	250,1,8
Safety Engineer (Sr Eng)	1	250,1,8
Environmental Eng (Jr Eng)	1	250,1,8
Junior Geologist	1	250,1,8
Supervisors	8	348,3,8
Administrative 1	1	250,1,8
Administrative 2	2	250,1,8
Administrative 3	2	250,1,8
Physics/Chem Lab (Jr Tech)	4	348,3,8
Mine Planning (Eng)	1	250,1,8
Jr Admin Adviser (Jr Eng)	1	250,1,8
Physics/Chem Lab (Tech)	1	250,1,8
Surveyor (Sr Tech)	1	250,1,8
Grade Control (Sr Tech)	1	250,1,8
Acctg (Eng)	1	250,1,8
Security/Medic	1	250,1,8
Sub-total Supervisory/Technical Staff	*32*	
Process Operations/Maintenance		
Mechanics	21	348,3,8
Operators	32	348,3,8
Quality Control	4	348,3,8
Sr Operators/Mechanics	14	348,3,8
Operators/Mechanics	15	348,3,8
Jr Operators/Mechanics	9	348,3,8
Sp Tech Operators/Mechanics	1	250,1,8
Laborers	3	250,1,8
Sub-total Operations/Maintenance Staff	*99*	
Total Mine Workforce	**131**	

17.5 Processing

The process plant for Mine 63 ore is a simple crushing and washing plant for the production of Lump and Sinter Feed. The plant has a capacity of 4.1Mtpy. The plant has been designed to perform the following operations as shown in Figure 17-2 and the simplified flowsheet in Figure 17-3:

- Primary crushing with a conventional jaw crusher;
- Secondary and tertiary crushing with cone crushers and classification screens;
- Washing and dewatering of Lump product with trommel and screens;
- Classification and dewatering of Sinter Feed with spiral classifier with double helix and dewatering screens;
- Deposition of slurry with tailings in sedimentation ponds;

- Storage of dry tailings for possible future use, for construction of dams and for reclamation of disturbed areas; and
- Transport and storage of products.

17.6 Infrastructure

The operational infrastructure consists primarily of:

- Power transmission line 2km long and 34.5kV; connected to the main line which supplies the “Vale das Mineradoras” from Corumbá;
- Five sub-stations with a principal step-down sub-station of 1,100kVA (34.5kV/440V) and four of variable potency;
- Roads and access;
- Products stockpile areas before shipping, placed near Highway BR-262, with 80,000t capacity;
- Water well system, water treatment system, reservoirs for recovered water, and storage tanks;
- Industrial and administrative facilities (workshops, stockroom, offices and others.); and
- Two tailings facilities for rejects with storage capacity of 12Mt of solids, the first dam being constructed for the first phase and the second dam constructed after 4 to 5 years of operation.

17.6.1 Tailings

The main plant will produce approximately 300,000t of slurry tailings/yr, with fine particles <0.15mm and a solids content of 6%. According to the environmental permit construction of the tailings site will begin in the last half of 2008. The tailings facility was designed by Dam Projetos de Engenharia Ltda based in Belo Horizonte, Minas Gerais. The total capacity is 1Mm^3 118,000m^3 of water and 882,000m^3 of tailings. The maximum height of the dam is 23m; overflow water will be returned to the beneficiation plant. The facility will also store rainwater which will be collected from the mine site.

For the first years of operation, a series of four sedimentation ponds will be used to decant water from the tailings. The ponds are successively allowed to dry and the dry tailings are removed and trucked to a dry tailings pile. Three ponds are currently in use and a fourth will be constructed in March 2008.

17.7 Contracts

MMX has negotiated a contract with Julio Simões Transportes e Serviços Ltda, signed June 1, 2007 and valid for 36 months from that date for mining ore and waste at Mine 63. MMX also has other small contracts for providing food and cleaning services.

17.8 Markets

The iron ore products from Corumbá are transported either to the pig iron plant operated by MMX Metálicos near Corumbá or to the Ladário Port on the Paraguay River from where they can be transported to domestic markets or to the San Nicholas port in Argentina. The export destinations are Argentina, Europe, and China.

Mine 63 is also very close to a rising pig iron market in the region of Corumbá/Campo Grande.

Currently all sales from Corumbá are negotiated at spot price due to the elevated price of iron ore product. MMX will consider negotiations for long-term contracts as part of its long-term strategy. MMX will also investigate the possibility of strategic partners for the project.

17.8.1 Shipment Logistics

Lump ore is trucked directly to the pig iron plant operated by MMX Metálicos near Corumbá. Products to be sold to domestic or international markets are transported by truck to the port terminal of Granel Química on the Paraguay River in Ladario, a distance of 28km from Mine 63, and 45km from the areas of Urucum NE and Rabicho Sul

For the cash flow analysis, which considers FOB prices at the port terminal, the costs of port terminal movements are included. The port terminal belongs to the Norwegian company Odfjell, is fully authorized for exports and is capable of moving products by the waterway from either road or rail access. The products can be stored in a 15,000m^2 stockyard and then loaded onto the ships.

17.9 Environmental Management

17.9.1 During the Operational Life of the Mine

The plan for rehabilitation of areas impacted by mining includes the following activities during mine operations:

- After the authorization to proceed with the vegetation removal in the mining areas is given, the topsoil is removed and stockpiled during the mining period;
- Training program for the orientation of professionals on operational planning and best practices for environmental administration of mining projects;
- As soon as the mine slopes and areas reach the final geometry, in any point of the mine life, those surfaces receive stabilization treatment, in a way to provide efficient drainage; and
- Once the re-contouring is done, a topsoil layer is applied and it will be revegetated with native seeds.

17.9.2 Mine Closure

The following areas will be recontoured and revegetated after the mine operations are completed:

- Tailings dam;
- Mining areas; and
- Plant and waste dumps.

Every area cited above will be subjected to the following reclamation program:

- Topographic reconstruction;
- Vegetation species selection; and

- Conditioning of berms and pit walls.

After the implementation of the reclamation plan, a monitoring program will be instituted for flora, fauna and human activity.

17.10 Economic Analysis

SRK has reviewed the internal LoM technical and financial model prepared by MMX for Corumbá Mine 63. The Mine has been operating since mid-2006 and the financial projections indicates a positive cash flow throughout the remaining life of the Mine. The economic analysis is presented on a post-tax basis and assumes 100% equity to provide a clear picture of the technical merits of the project.

The LoM plan, technical and economic projections in the LoM model include forward looking statements that are not historical facts and are required in accordance with the reporting requirements. These forward-looking statements are estimates and involve risks and uncertainties that could cause actual results to differ materially.

17.11 Taxes and Royalties

Taxes are included on Gross Revenues as well as the 34% Income Tax on Net Income Before Tax (NIBT). There are four royalties identified by MMX as indicated in Table 17.11.1. The 34% Income Tax/Social Security Tax is calculated on the NIBT.

Table 17.11.1: MMX Royalties

Royalty	Percentage	Comments
PIS	1.65%	Applied to Internal Production Only
COFINS	7.60%	Applied to Internal Production Only
CFEM	2.00%	Applied to Total Production
Land Owner Rights	1.00%	Applied to Total Production

17.12 LoM Plan Economics

The SRK LoM plan and economics are based on the following:

- Reserves of 29.4Mt at an average grade of 55.7% Fe;
- A mine life of eight years, at a designed rate of 4,101ktpy;
- An overall average process recovery rate of 55% for Lump product and 11% for Sinter product over the LoM;
- Operating Costs are shown in Table 17.12.1;
- G&A costs:
    - Sundry costs – include mine planning, quality control, administration - US$1.90/t-product for 2008 and US$1.58/t product for the remaining LoM,
    - Product transport – mine to port - US$1.99/t-product for 2008 and US$1.69/t-product for the remaining LoM,
    - Port terminal cost is included in sales expenses, and

- Corporate costs – miscellaneous - US$2.22/t-product for 2008 and US$1.78/t-product for the remaining LoM.

- A cash operating cost of US$8.55/t-ore or US$12.97/t of total product;
- Total capital costs of US$35.8M have been spent in 2005, 2006, and 2007. The capital costs are amortized/depreciated in accordance with MMX supplied straight-line depreciation methods. However, the capital costs are not included in the financial model; and
- Total sustaining capital costs of US$26.8M LoM are included for years 2008-2015. MMX included mine closure costs in the sustaining capital. There is no provision for salvage value.

The base case economic analysis results, shown in Table 17.12.2, indicate an after-tax net present value of US$76M at a 10% discount rate.

Table 17.12.1: Operating Costs (US$/t of product)

Description	2008	LoM
Mining	3.46	3.30
Process	3.79	2.98
Ore handling	1.74	1.37
Sundry cost	1.90	1.58
Transport cost to port	1.99	1.69
Port terminal cost	0.00	0.00
Corporate cost	2.22	1.78
Total	**15.10**	**12.70**

Table 17.12.2: LoM Economic Results (US$000s)

Description	LoM Value
Ore	
Ore RoM (Mt)	29.4
Grade	
Iron	55.7%
Lump Ore	
Process Recovery	55%
Sinter Ore	
Process Recovery	11%
Gross Revenue	
Lump Product	$430,108
Sinter Product	$77,272
Gross Revenue	**$507,380**
Royalty (Taxes)	
Royalties	($22,662)
Gross Income from Mining	**$484.718**
US$/-ore t	*$16.51*
US$/t-product	*$25.03*
Gross Income from Mining	**$484,718**
Operating Costs	
Mining	($64,259)
Process	($86,798)
G & A	(100,097)
Operating Costs	**($251,154)**
US$/t-ore	*$8.55*
US$/t-product	*$12.97*
Operating Margin	**$233,564**
US$/t-ore	***$7.95***
US$/t-product	***$1206***
Income Tax	
Income Tax	($71,847)
Total Tax	**($71,847)**
US$/t-ore	*$2.45*
US$/t-product	*$3.71*
NIAT	**$161,717**
US$/t-ore	***$5.51***
US$/t-product	***$8.35***
Capital Costs	
Sustaining	$34,866
Equipment – sunk capital – operating mine	$0
Mine Closure/Reclamation – incl in sustaining	$0
Total Capital	**($34,866)**
Cash Flow	**$126,738**
$NPV_{10\%}$	**$76,069**

17.13 Sensitivities

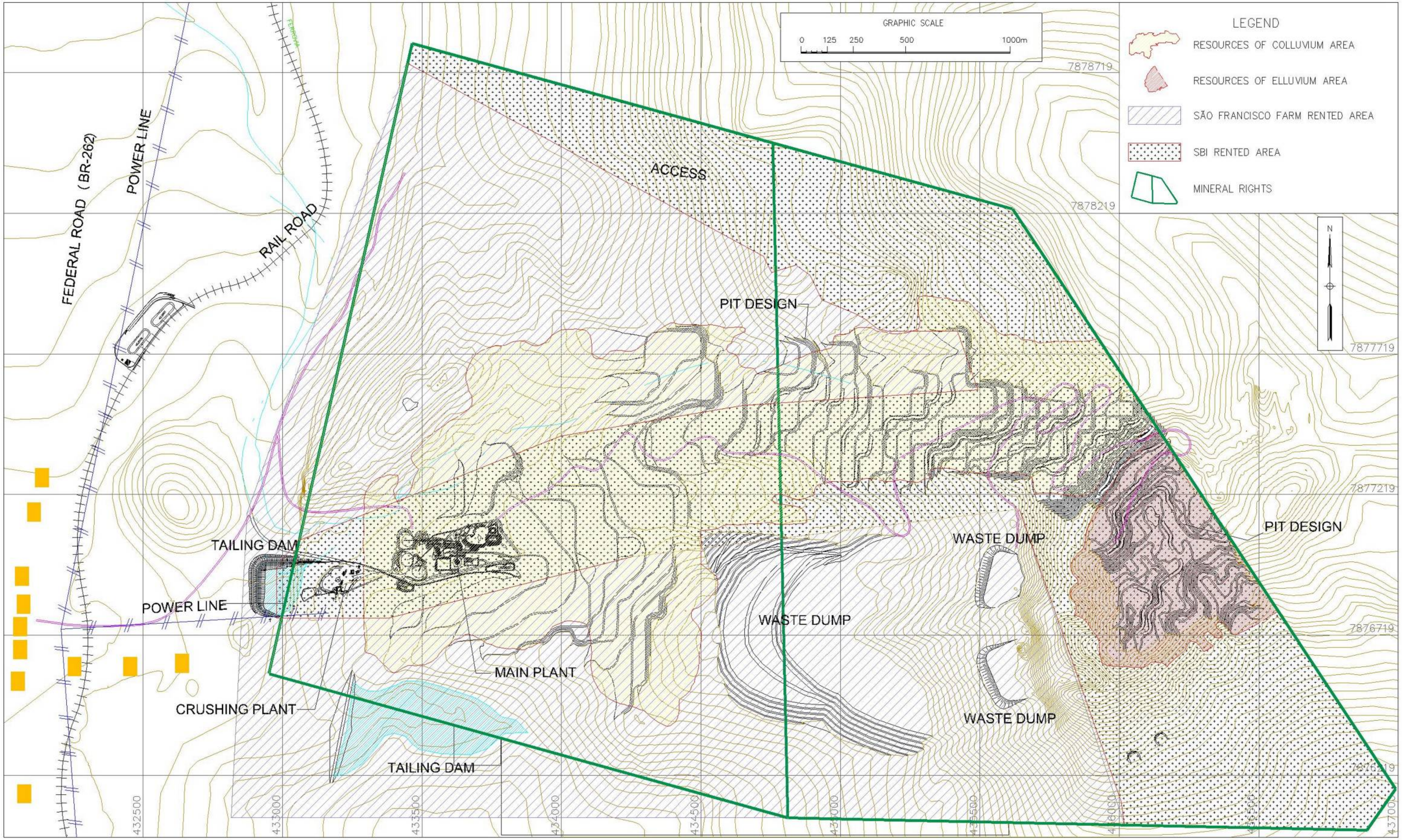
Sensitivity analysis for the key economic parameters are shown in Table 17.13.1. The analysis was carried out varying the base case values by +10%. The analysis suggests that the project is most sensitive to market price. Being a short life operating mine with initial capital already expensed, the project is least sensitive to ongoing capital costs.

Table 17.13.1: Project Sensitivity ($NPV_{10\%}$ US$000's)

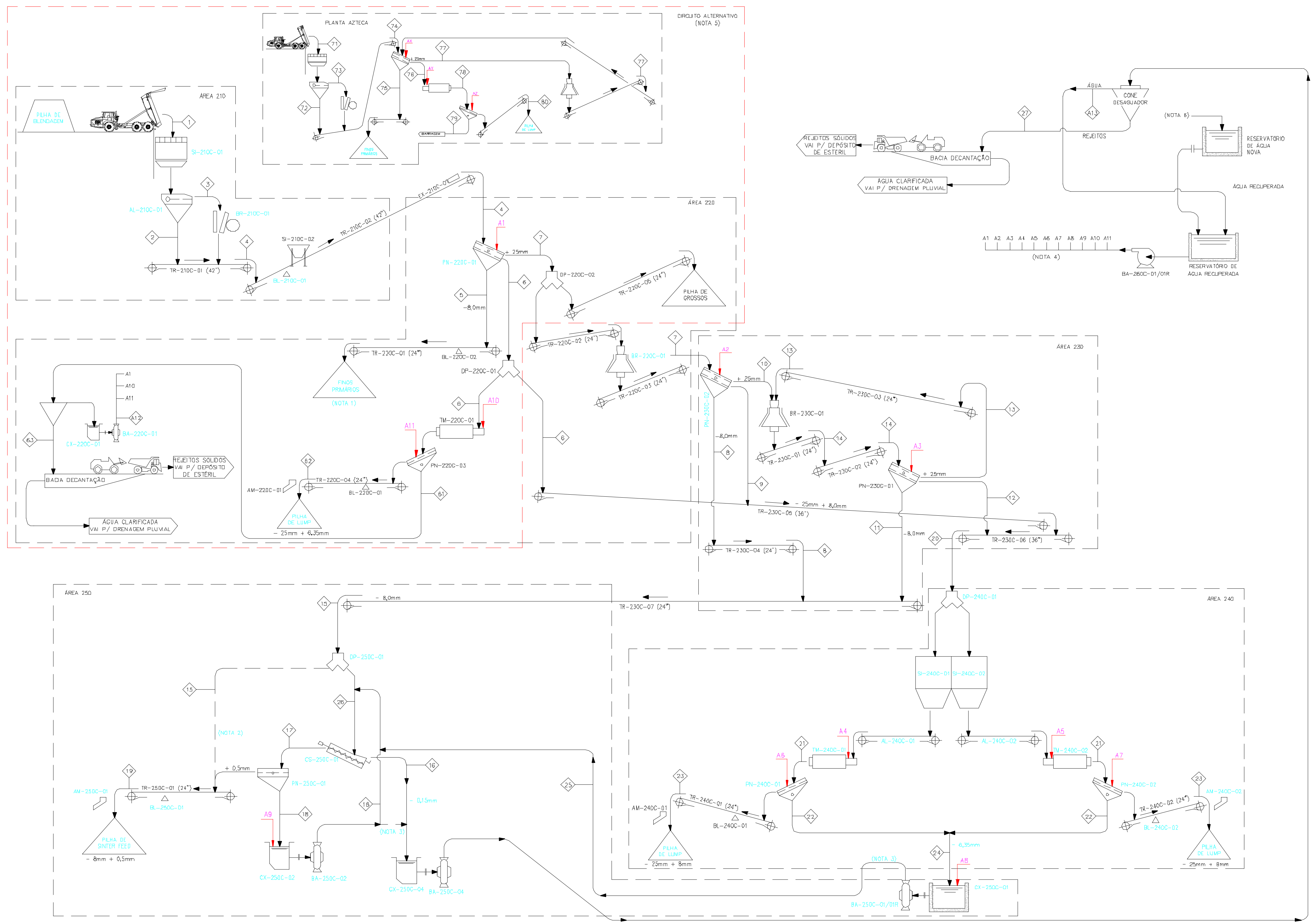
	Discount Rate		Opex		Market Prices		Lump Recovery		Capex	
Factor %	NPV	Variation %	NPV	Variation %	NPV	Variation %	NPV	Variation %	NPV	Variation %
-10	79,812	4.92	86,412	13.60	55,590	-26.92	68,470	-9.99	78,157	2.7
0	76,069	0.00	76,069	0.00	76,069	0.00	76,069	0.00	76,069	0.0
10	72,546	-4.63	65,639	-13.71	96,407	26.74	83,656	9.97	73,945	-2.8

17.14 Mine Life

Mine 63 has a projected life of approximately 8 years. The mine will operate from the last quarter of 2007 through 71 days into 2015.



SRK Consulting Engineers and Scientists	Corumbá Project, Brazil	Figure 17-1 Layout of Mine 63 Corumbá Project
SRK Job No.: 162703.03		
File Name: Figure 17-1.doc	Source: Mineração & Metálicos S.A	Date: 02-27-08 · Approved: LM · Figure: 17-1



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Engineers and Scientists

SRK Job No.: 162703.03

File Name: Figure 17-2.doc

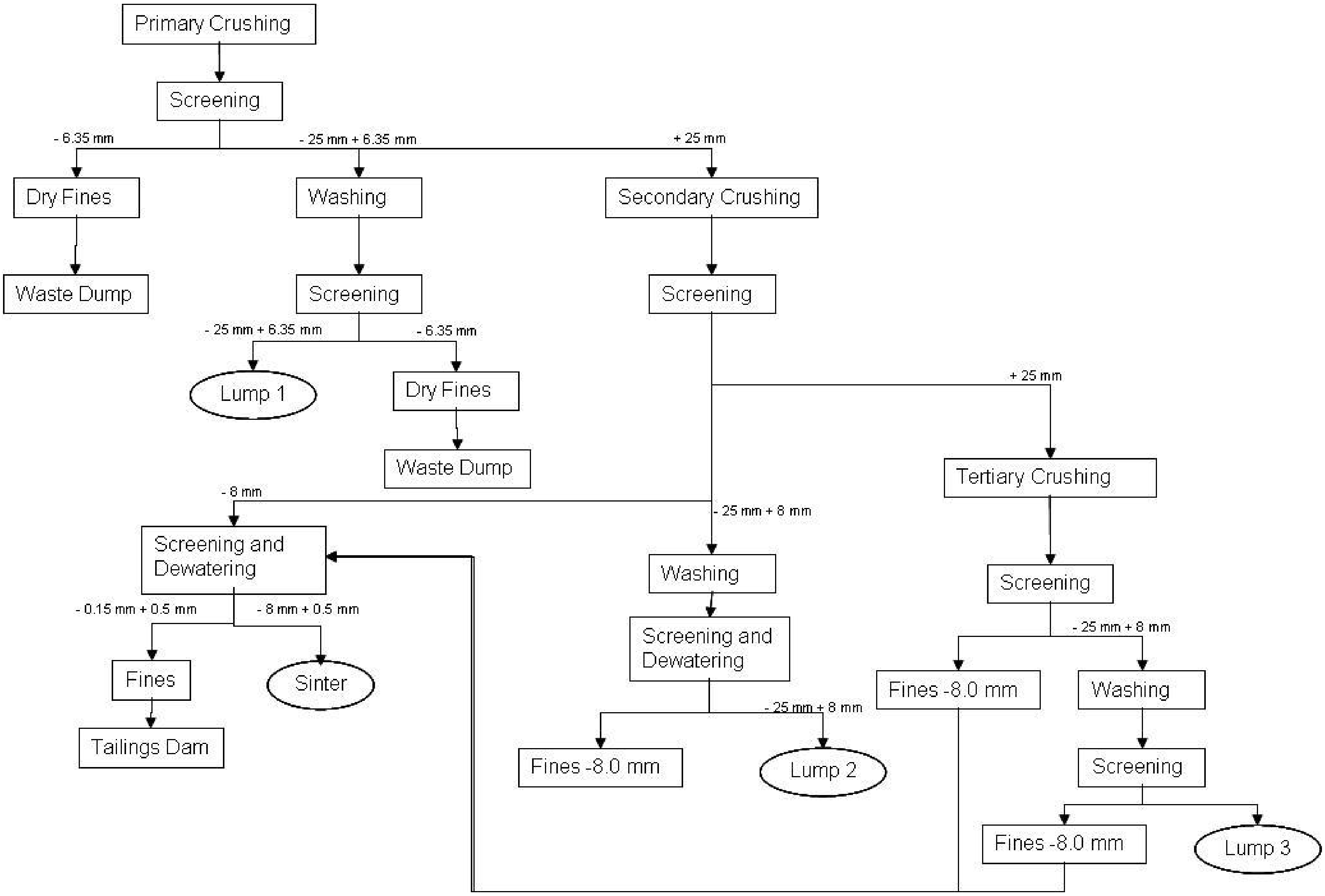
Corumbá Project, Brazil

Source: Mineração & Metálicos S.A

Figure 17-2

Plant Design

Date: 02-27-08	Approved: LM	Figure: 17-2



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SRK Job No.: 162703.03

File Name: Figure 17-3.doc

Corumbá Project, Brazil

Source: Mineração & Metálicos S.A

Figure 17-3

Simplified Process Flowsheet

Date: 02-27-08	Approved: LM	Figure: 17-3

18 Interpretation and Conclusions (Item 21)

The Corumbá Project is an operating mine that has been in production since July 2006. The Resource and Reserve have been estimated by Prominas under the direction of MMX. The Project is well documented with original sources of drill logs, assays, and various reports, as well as an electronic database.

SRK has reviewed and validated the sample database, topography, geologic interpretation, and the resource estimation parameters. The resource block model has been verified through visual examination and by construction of swath plots through the deposit. The resource database and the resource estimate follow industry standards and resource classification is in accordance with CIM guidelines.

The metallurgical testwork has been reviewed by SRK and found to be adequate for the project.

MMX has the necessary mining and environmental permits and surface agreements to operate Mine 63 at the Corumbá Project.

The LoM is relatively short and as such, the project is straightforward with the initial capital expended and does not require complex sensitivity analysis typical with long life projects.

The project economics indicate that:

- The Corumbá Project exhibits robust economics with a $NPV_{10\%}$ of US$76M; and
- SRK considers the Corumbá Project to be a relatively low-risk project given its relatively short mine life, good mining conditions, conventional processing methods, sunk capital, and contracts for sales of its iron products.

19 Recommendations (Item 22)

The resource database could be improved by the following procedures in future programs:

- Sample intervals should be no longer than the bench height of the mine. This procedure would eliminate the problem of sample support where intervals longer than 6m were excluded from the compositing routine; and
- Intervals of internal waste should be analyzed with the same procedures as the surrounding samples. This would eliminate the doubts about the grade and the subsequent assignment of zero to those intervals. MMX has instituted this practice in 2007 at Urucum NE.

The resource estimate procedure should be re-examined following future drilling and sampling programs to see if it could be simplified. The current procedure is technically correct, but may be more complex than required for this deposit.

As mining progresses, a program of mined to model reconciliation should be instituted. This is a standard practice in mine operations and aids in evaluation of the resource model.

The laboratory QA/QC at Urucum NE indicates that there may be a bias in SGS analysis of Al_2O_3 and P. SRK recommends that MMX continue its investigation into the issue.

20 References (Item 23)

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21 Glossary

21.1 Mineral Resources and Reserves

Mineral Resources

The mineral resources and mineral reserves have been classified according to the "CIM Standards on Mineral Resources and Reserves: Definitions and Guidelines" (August 2000). Accordingly, the Resources have been classified as Measured, Indicated or Inferred, the Reserves have been classified as Proven, and Probable based on the Measured and Indicated Resources as defined below.

A Mineral Resource is a concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes.

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough to confirm both geological and grade continuity.

Mineral Reserves

A Mineral Reserve is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

A ‘Probable Mineral Reserve’ is the economically mineable part of an Indicated, and in some circumstances a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

A ‘Proven Mineral Reserve’ is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

21.2 Glossary

Assay:	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure:	All other expenditures not classified as operating costs.
Composite:	Combining more than one sample result to give an average result over a larger distance.
Concentrate:	A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore.
Crushing:	Initial process of reducing ore particle size to render it more amenable for further processing.
Cutoff Grade (CoG):	The grade of mineralized rock, which determines as to whether or not it is economic to recover its gold content by further concentration.
Dilution:	Waste, which is unavoidably mined with ore.
Dip:	Angle of inclination of a geological feature/rock from the horizontal.
Fault:	The surface of a fracture along which movement has occurred.
Grade:	The measure of concentration of gold within mineralized rock.
Haulage:	A horizontal underground excavation which is used to transport mined ore.
Hydrocyclone:	A process whereby material is graded according to size by exploiting centrifugal forces of particulate materials.
Igneous:	Primary crystalline rock formed by the solidification of magma.
Kriging:	An interpolation method of assigning values from samples to blocks that minimizes the estimation error.
Level:	Horizontal tunnel the primary purpose is the transportation of personnel and materials.
Lithological:	Geological description pertaining to different rock types.
LoM Plans:	Life-of-Mine plans.
Material Properties:	Mine properties.

Milling:	A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product.
Mineral/Mining Lease:	A lease area for which mineral rights are held.
Mining Assets:	The Material Properties and Significant Exploration Properties.
Ongoing Capital:	Capital estimates of a routine nature, which is necessary for sustaining operations.
Ore Reserve:	See Mineral Reserve.
RoM:	Run-of-Mine.
Sedimentary:	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Shaft:	An opening cut downwards from the surface for transporting personnel, equipment, supplies, ore and waste. In the case of this report the shafts were used for sampling the colluvial and eluvial deposits.
Stratigraphy:	The study of stratified rocks in terms of time and space.
Strike:	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Tailings:	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening:	The process of concentrating solid particles in suspension.
Total Expenditure:	All expenditures including those of an operating and capital nature.
Variogram:	A statistical representation of physical characteristics (usually grade).

Abbreviations

The metric system has been used throughout this report unless otherwise stated. All currency is in U.S. dollars. Market prices are reported in US$25.75/t fob and US$15.75/t fob of iron ore. Tonnes are metric of 1,000kg, or 2,204.6lbs. The following abbreviations are used in this report.

Abbreviation	Unit or Term
A	ampere
AA	atomic absorption
A/m^2	amperes per square meter
Al_2O_3	Aluminum Oxide
°C	degrees Centigrade
CoG	Cut-off-Grade
cm	centimeter

cm^2	square centimeter
cm^3	cubic centimeter
cfm	cubic feet per minute
°	degree (degrees)
dia.	Diameter
Fe	Iron
Fe++	Ferrous iron
g	gram
Ga	billion years before present
gpt	grams per tonne
ha	hectares
ID2	inverse-distance squared
ID3	inverse-distance cubed
kA	kiloamperes
kg	kilograms
km	kilometer
km^2	square kilometer
kt	thousand tonnes
ktpd	thousand tonnes per day
ktpy	thousand tonnes per year
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
kWh/t	kilowatt-hour per metric tonne
l	liter
lps	liters per second
LOI	Loss On Ignition
LoM	Life-of-Mine
lps	liters per second
m	meter
m^2	square meter
m^3	cubic meter
mg/l	milligrams/liter

mm	millimeter
mm^2	square millimeter
mm^3	cubic millimeter
Mn	Manganese
MnO	Manganese oxide
Mt	million tonnes
Mtpy	million tonnes per year
MW	million watts
NI 43-101	Canadian National Instrument 43-101
OSC	Ontario Securities Commission
%	percent
P	Phosphorous
ppb	parts per billion
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RoM	Run-of-Mine
s	second
SiO2	Silica
SG	specific gravity
t	tonne (metric ton) (2,204.6 pounds)
TiO2	Titanium Oxide
tph	tonnes per hour
tpd	tonnes per day
tpy	tonnes per year
µ	micron or microns
V	volts
W	watt
XRD	x-ray diffraction
yr	year

Appendix A

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I, Neal Rigby, CEng do hereby certify that:

1. I am a Principal of:

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2. I graduated with a BSc degree in Mineral Exploitation with first class honors in 1974 and a PhD in Mining Engineering in 1977 both from the University of Wales, UK.

3. I am a member of the Institute of Materials, Mining and Metallurgy.

4. I have worked as a mining engineer for a total of 33 years since my graduation from university.

5. 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 fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.

6. I am responsible for Section 15.3 and 17, as well as, the content, compilation, and editing of all sections of the technical report, titled, MMX Mineração e Metálicos S.A. NI 43-101 Technical Report, Corumbá Iron Project, and dated March 10, 2008 (the “Technical Report”) relating to the Corumbá Iron Project. I personally visited the Corumbá Iron Project on January 6, 2006.

7. I have had prior involvement with the property that is the subject of the Technical Report. The nature of my prior involvement with the property was as the qualified person for the preparation of Sections 14, 15.9 and 17 and the overall preparation of the Technical Report titled NI 43-101 Technical Report, Mineração & Metálicos S.A. Corumbá Project, Brazil, and dated May 04, 2007.

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

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

10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical has been prepared in compliance with that instrument and form.

Dated March 10, 2008.

N. Rigby.

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Neal Rigby, CEng., MIMMM, PhD (signed)

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I, Leah Mach, CPG do hereby certify that:

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2. I graduated with a Master of Science degree in Geology from the University of Idaho in 1986.

3. I am a member of the American Institute of Professional Geologists.

4. I have worked as a Geologist for a total of 22 years since my graduation in minerals exploration, mine geology, project development and resource estimation.

5. 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 fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the responsible for the overall preparation of the report and specifically for Sections 1 through 13, 15.1 through 15.2, 16 and 18 through 22 of the technical report, titled, MMX Mineração e Metálicos S.A. NI 43-101 Technical Report, Corumbá Iron Project, and dated March 10, 2008 (the "Technical Report") relating to the Corumbá Iron Project. I personally visited the Corumbá Iron Project on September 25 through 27, 2007.

7. I have had prior involvement with the property that is the subject of the Technical Report. The nature of my prior involvement with the property was as the qualified person for the preparation of Sections 2 through 13, and 15.1 through 15.8 of the Technical Report titled NI 43-101 Technical Report, Mineração & Metálicos S.A., Minas-Rio Project, Brazil, and dated May 4, 2007.

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

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

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10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Dated March 10, 2008.

Leah Mach

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Leah Mach, CPG, MSc (signed) **CPG 10940** (sealed)

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2. I graduated with a diploma in Mining and Metallurgy from the Technical High School (University equivalent) of Skellefteå, Sweden in 1964.

3. I am a member of the South African Institute of Mining and Metallurgy.

4. I have worked as a metallurgist for a total of 40 years since my graduation from university.

5. 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 fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the preparation of section on mineral processing and metallurgical testing of the technical report titled MMX Mineração e Metálicos S.A.NI 43-101 Technical Report, Corumba Project and dated March 10, 2008 (the "Technical Report") relating to Mine 63 which is owned and operated by MMX Corumba . I visited the Metallurgical Office in Belo Horisonte and the Pilot Plant in Ouro Preto on September 24, September 29 and October, 2007 for 3 days. A visit to the Corumba mine and the plant took place on October 3 and 4.

7. I have not had prior involvement with the properties that are the subject of the Technical Report.

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

9. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

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

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

Dated this 10th Day of March, 2008.

Sten Erik Einar Johansson

MMX Mineração e Metálicos S.A. NI 43-101 Technical Report, Corumbá Project, Brazil, September 30, 2008.

Dated March 10, 2008

N. Rigby.

Dr. Neal Rigby CEng, MIMMM, PhD (signed)

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