

## 8. ENGINEERING INFRASTRUCTURE AND CAPITAL PROJECTS

### 8.1 Introduction

This section includes discussion and comment on the infrastructure-related aspects necessary for the execution of the LoM Plans associated with the Material Properties. Specifically, real capital requirements at 1 January 2006 are provided based on estimation, adequacy of design and project development schedules. A general discussion on power generation and distribution, water sourcing, reticulation and planned maintenance programmes is included in Section 8.2. Specific discussion on capital expenditure requirements is included in Section 8.4.

### 8.2 Engineering infrastructure of the Material Properties

Engineering infrastructure at the Material Properties includes a wide range of operating technologies. The level of supporting infrastructure and services is dependent on the location of the operation in relation to industrial centres and major access routes.

Underground mining operations comprise access infrastructure to convey personnel, materials and equipment to and from the working areas and associated services to support mining operations. Surface access infrastructure primarily includes declines. Horizontal access infrastructure includes crosscut haulages, footwall haulage levels, declines/inclines and cross-cuts. Associated underground infrastructure includes ore passes, conveyor belts, crushing stations, ore bins, loading stations, water dams, pump stations, secondary ventilation plants, workshops, and power and water reticulation systems. Associated surface infrastructure includes primary ventilation fans, office blocks and training centres, workshops and stores, lamp rooms, change houses and accommodation. At the Material Properties there are also a number of service and supply centres. These include compressed air supply stations, and major workshops for repair of major plant and equipment.

Surface mining operations are typified by their high degree of mechanisation and relatively high productivity in comparison with their underground counterparts. Access and service infrastructure at Exxaro's open-pit operations reflect their scales of operation and location to primary access routes. In all instances however, these are based on the typical requirements for open-pits utilising conventional earthmoving equipment and include primary crushing facilities, RoM and product stockpiling facilities, waste dumps, consumable storage facilities, power generation and reticulation, water storage, workshops, mine offices and accommodation, airstrips and auxiliary infrastructure buildings.

Notwithstanding the age of the general infrastructure, SRK consider that all surface and underground infrastructure is reasonably maintained and equipped. In conjunction with planned maintenance programmes, including specific remedial action and expenditure of projected ongoing capital allowances, the current infrastructure is considered by SRK to be adequate to satisfy the requirements of the LoM Plans.

Further, the power generation and distribution systems, water sourcing and reticulation systems are appropriate for operations as envisaged in the individual LoM Plans. Where this is not the case SRK has allocated appropriate capital costs, which have been included in the TEPs presented in Section 13.

### 8.3 LoM Capital Expenditure Programmes

The following section gives, where appropriate specific comments on the status of the underground and surface infrastructure, in addition to a breakdown of the total capital requirements of the current LoM Plans. Distinction is made between project capital and on-going capital, whereby project capital encompasses all major items identified for the LoM period. On-going capital is considered to be a provision, based on a historical percentage of operating costs incorporating appropriate modifications for the last two years of operations, thus recognising that as the operation approaches closure capital expenditure will decline.

Table 8.1 and Table 8.2 provide the latest project and on-going capital requirements for the Material Properties and regional infrastructure requirements excluding off-mine exploration costs. In preparing the tables the following apply:

- Where appropriate SRK have included additional infrastructure as identified in Sections 5 through to Section 7;
- All capital amounts are exclusive of financing charges and separation costs and unless otherwise stated are considered by SRK to be adequate to meet the requirements of the current LoM Plan;
- The statistical estimate class currently reflects a typical accuracy level of a Class I at –15% to +25%.
- A contingency amount is applied only to the project capital component; and
- Unless otherwise stated all amounts are not attributable and reflect 100% contributions.

## 8.4 Material Properties

Capital expenditure requirements for the Material Properties are principally aimed at, development projects, expansion projects, mobile fleet replacement, metallurgical plant modifications, installation of tailings dam facilities and infrastructure rehabilitation programmes and other ongoing capital. The total estimated capital expenditure for the Material Properties is provided in Table 8.1. The principal components of the current project capital include the following:

- Iron Ore
  - At Sishen Mine the capital expenditure required for the SEP includes crushing, screening, beneficiation utilising jig technology, product handling and load out utilising the existing facility;
  - The Sishen South Project requires capital for crushing, screening, beneficiation utilising jig technology, product handling and load out utilising a new facility;
- Coal
  - Capital expenditure requirements for the all the operating Coal assets are aimed at ongoing capital and new projects;
- Heavy Minerals
- At the Hillendale mine strategic development capital expenditure and replacement capital expenditure for the PWP and the MSP;
- The development of the Fairbreeze Project C and Fairbreeze Project C Extension deposits including the erection of a PWP at the Fairbreeze Project area and the establishment of a slimes dam storage facility to service the Fairbreeze Project area;
- The development of the Block P deposit and the establishment of general infrastructure at the Block P mining area, infrastructure to pump mined heavy mineral sands from Block P mining area to the PWP at Hillendale Mine;
- At the CPC smelter site sustaining capital expenditure and reline capital expenditure;
- At the CPC smelter site capital expenditure for support services;
- At Tiwest JV expansion and sustaining capital;
- Base Metals
  - At Rosh Pinah there are no major capital projects other than completion of the various plant modifications as currently underway, mobile fleet equipment replacement and ongoing capital provisions; and
  - At Zincor the major short-term capital project is the building of a new waste disposal facility as mentioned in Section 7; and
- Industrial Minerals
  - At Glen Douglas Mine there are no major capital projects.

**Table 8.1 Estimated Real Capital Expenditures – Scenario I**

<b>Material Property</b>	<b>Units</b>	<b>Sustaining Capital Real</b>	<b>Project Capital Real</b>	<b>Total Capital Real</b>
<b>Iron Ore</b>				
Sishen Mine <sup>(1)</sup>	(ZARm)	6,968	4,014	10,982
Sishen South Project	(ZARm)	288	860	1,148
Thabazimbi Mine	(ZARm)	69		69
<b>Coal</b>				
Grootegeluk Mine	(ZARm)	3,121		3,121
Leeuwan Mine	(ZARm)	776		776
Tshikondeni Mine	(ZARm)	210		210
Arnot Colliery	(ZARm)	491		491
Matla Colliery	(ZARm)	2,183		2,183
New Clydesdale Colliery	(ZARm)	61	76	137
North Block Complex	(ZARm)	12	20	32
Sintel Char Project	(ZARm)	43	152	195
Inyanda Project	(ZARm)	63	194	257
Mafube JV Phase II Project	(ZARm)	188	2,000	2,188
Belfast Project	(ZARm)	70	118	188
Ingcambu Project	(ZARm)			
<b>Heavy Minerals</b>				
Hillendale Mine and Fairbreeze Project	(ZARm)	1,104	545	1,649
Ticor Smelter	(ZARm)	1,714	347	2,062
Tiwest JV	(AUDm)	681		681
<b>Base Metals</b>				
Rosh Pinah	(NADm)	34		34
Zincor	(ZARm)	1,332		1,332
Chifeng	(RMBm)	410	276	686
<b>Industrial Minerals</b>				
Glen Douglas	(ZARm)	310		310
Kumba Ferroalloys	(ZARm)	48		48

(1) Includes SEP Phase I.

**Table 8.2 Estimated Real Capital Expenditures – Scenario II**

<b>Material Property</b>	<b>Units</b>	<b>Sustaining Capital Real</b>	<b>Project Capital Real</b>	<b>Total Capital Real</b>
<b>Iron Ore</b>				
Sishen Mine <sup>(1)</sup>	(ZARm)	6,968	4,014	10,982
Sishen South Project	(ZARm)	288	860	1,148
Thabazimbi Mine	(ZARm)	69		69
<b>Coal</b>				
Grootegeluk Mine	(ZARm)	5,174		5,174
Leeuwpan Mine	(ZARm)	776		776
Tshikondeni Mine	(ZARm)	210		210
Arnot Colliery	(ZARm)	491		491
Matla Colliery	(ZARm)	2,183		2,183
New Clydesdale Colliery	(ZARm)	61	76	137
North Block Complex	(ZARm)	12	20	32
Sintel Char Project	(ZARm)	43	152	195
Inyanda Project	(ZARm)	63	194	257
Mafube JV Phase II Project	(ZARm)	195	2,000	2,195
Belfast Project	(ZARm)	70	118	188
Ingcambu Project	(ZARm)			
<b>Heavy Minerals</b>				
Hillendale Mine and Fairbreeze Project	(ZARm)	1,104	545	1,649
Ticor Smelter	(ZARm)	1,714	347	2,062
Tiwest JV	(AUDm)	681		681
<b>Base Metals</b>				
Rosh Pinah	(NADm)	34		34
Zincor	(ZARm)	1,332		1,332
Chifeng	(RMBm)	410	276	686
<b>Industrial Minerals</b>				
Glen Douglas	(ZARm)	310		310
Kumba Ferroalloys	(ZARm)	48		48

(1) Includes SEP Phase I.

## 9. MANAGEMENT AND MANPOWER

### 9.1 Introduction

This section includes discussion and comment on the human resources related aspects associated with the Material Properties. Specifically, information as provided by Kumba and Eyesizwe is included on the following: current legislation; the current board, executive and operational management structures; recruitment, training, productivity initiatives and remuneration policies; industrial relations; and terminal benefits liabilities. SRK note that the following section, in certain instances, includes discussion and comment on public domain statements which have been made. Certain aspects of these have been independently audited by various companies, specifically where these relate to compliance with regulatory requirements including the Mining Charter. These items may not be strictly required in respect of compliance with the Listings Requirements or the SAMREC Code. SRK however recognise the increasing importance of these items in respect of the South African Material Properties and specifically in respect security of tenure and have included disclosure relating to these for this reason.

### 9.2 Legislation

Various regulatory authorities, in addition to mining and labour codes, govern labour legislation in the countries in which Exxaro operates. In general these are well-established in conjunction with Exxaro's operating policies and form the cornerstone of human resource management.