

Lonmin Group



# Karee Mine

## Environmental Management Programme Report

November 2005

Volume 1

**PROJECT NAME: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT –  
KAREE MINE**

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## 6 ENVIRONMENTAL MANAGEMENT PROGRAMME

### 6.1 Lonmin Vision

"We are Lonmin, a primary producer of Platinum Group Metals. We create value by the discovery, acquisition, development and marketing of minerals and metals. We respect the communities and nations that host our operations and conduct business in a sustainable, socially and environmentally responsible way."

### 6.2 Lonmin Charter

"Our Mission: -

- To grow and build our portfolio of high quality business;
- To deliver the requirements of the South African broad based socio-economic Mining Charter and we welcome the opportunity to transform our business;
- To build a value-based culture, which is founded on safe work, continuous improvement, common standards and procedures, community involvement and one that rewards employees for high performance."

"We are successful when: -

- Our employees live and work safely and experience the personal satisfaction that comes with high performance and recognition;
- Our shareholders are realising a superior total return on their investment and support our corporate sustainability values;
- The communities in which we operate value our relationships;
- We are meeting our commitments to all business partners and our suppliers, contractors, partners and customers support our Charter."

"Our values: -

- Zero Harm – We are committed to zero harm to people and the environment;
- Integrity, Honesty and Trust – We are committed ethical people who do what we say we will do;
- Transparency – Open, honest communication and free sharing of information;
- Respect for Each Other – Embracing our diversity enriched by openness, sharing, trust, teamwork and involvement;
- High Performance – Stretching our individual and team capabilities to achieve innovative and superior outcomes;
- Employee Self-worth – To enhance the quality of life for our employees and their families and promote self esteem."



### 6.3 Lonmin Commitments

"In order to meet this vision and our value of Zero Harm, Lonmin is committed to: -

- Implementing and maintaining effective safety, health and environmental management systems that drive continual improvement;
- The identification, assessment and management of risks to employees, contractors, the environment and communities in which we operate;
- Ensuring employee knowledge of the safety, health and environmental risks by effective assessment and training;
- The reduction, re-use and recycling of waste to minimise final disposal and promote the efficient use of natural resources;
- Preventing and reducing all forms of pollution by employing effective technologies;
- Making adequate financial provision during the expected life of our operations to ensure sustainable life when operations cease;
- Meeting and where applicable exceeding legal requirements;
- Maintaining transparent, consultative relationships with all stakeholders through effective communication channels;
- Supporting the fundamental human rights of employees, contractors and the communities in which we operate;
- Respecting the traditional rights of indigenous peoples; and
- Contributing to the long-term social, economic and institutional development of our employees and the communities within which our operations are located."

### 6.4 Environmental Objectives, Targets and Mitigating Measures

The environmental objectives, commitments and mitigatory measures for each of the environmental impacts, socio-economic conditions and historical and cultural aspects identified, for each phase of the mining operation, have been detailed in the sections below. Objectives, commitments or mitigatory measures that are applicable to more than one aspect have not been repeated for each aspect but rather a reference made to the applicable section, for example, dust control will impact on surface water quality, air quality and socio-economic conditions and yet has only been mentioned in the section on air quality. Aspects relating to Occupational Health and Safety have not been included in the EMPR, the Lonmin OHS Report is however available from the mine upon request. The Lonmin ISO 14 001 procedures will be adhered to, to ensure minimal environmental impact.

Accountability for all commitments will reside with the Mine Manager of the business unit, although responsibility of fulfilling commitments can be delegated to line management. The Group Manager Environment is responsible for monitoring compliance with EMPR commitments as stipulated in the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

6.4.1 Geology

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Removal of bedrock and ore body.	General	Overall Management Objectives <ul style="list-style-type: none"> <li>To ensure that optimal use is made of the available mineral resource.</li> <li>To reduce the risk of failure of structures, especially where there is a risk of injury to humans and animals.</li> </ul>	Mine Manager Mine Manager	Annual review Ongoing
	Construction	Objective	Mine Manager	Construction phase
	Opencast - Operation	Opencast - Mitigatory Measures	Opencast Mine Manager	Operational phase
			To ensure that construction does not limit the potential to exploit deeper resources.	
		The temporary overburden stockpiles for Opencast mining will be returned back into the void.		

Refer to Topography for mitigatory measures related to surface subsidence.

6.4.2 Topography

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
A change in topography due to infrastructure, residue deposits, and the mine workings	General	Overall Management Objectives	Engineering Manager	Ongoing
	<b>Opencast - Prior to Construction</b>	<b>Opencast - Mitigatory Measures</b>	<b>Opencast Mine Manager</b>	Prior to construction
	<b>Opencast - Construction, Operation, Decommissioning and Closure</b>	<b>Opencast - Mitigatory Measures</b>	<b>Opencast Mine Manager and Survey Department</b>	During rehabilitation of the opencast voids

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
	<p><b>Underground Mining - Construction and Operation</b></p>	<p><b>Underground Mining - Mitigatory Measures</b></p>	<p>Mitigatory measures for minimising surface subsidence:</p> <ul style="list-style-type: none"> <li>• All underground mine workings are restricted to a minimum depth of 30m from surface.</li> <li>• Underground support pillars are left insitu.</li> <li>• An active surface subsidence monitoring programme, in accordance with the specifications of the DME's Directive of Mine Surveyors, is in place at <b>KM</b>.</li> <li>• <b>KM</b> will investigate formal claims that subsidence has been induced by its mining activities. Where it is clear <b>KM</b> has caused the subsidence, <b>KM</b> will implement appropriate mitigation measures timeously. These mitigation measures may include repair of damaged infrastructure, landscaping and rehabilitation.</li> </ul>	<p>Mine Manager                      Mine Manager                      Chief Surveyor                      Mine Manager</p> <p>When applicable</p>
	<p><b>Decommissioning &amp; Closure</b></p>	<p><b>General Mitigatory Measures</b></p>	<p>To return the area, as far as possible, to a topography as agreed upon in consultation with stakeholders.                      The decommissioned shafts and surface excavations at <b>KM</b> will be closed as required in terms of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002).</p>	<p>Mine Manager                      Closure</p>

6.4.3 Soil

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Soil degradation	General	Overall Management Objectives	Engineering Manager	Ongoing
Loss of topsoil	Construction and Operation	Mitigatory Measures	Engineering Manager Engineering Manager Engineering Manager Engineering Manager Engineering Manager Engineering Manager Engineering Manager	Prior to construction During construction Ongoing Ongoing Ongoing When required Ongoing

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Impacts on soil due to erosion, pollution, removal and compaction	Construction and Operation	<p><b>General:</b></p> <ul style="list-style-type: none"> <li>• Footprint areas for construction activities will be kept to a minimum.</li> <li>• The number of tracks and access roads on site will be kept to a minimum, and where possible existing tracks and roads should be used.</li> <li>• All residue deposits will be managed according to <b>KM's</b> Code of Practices.</li> </ul> <p><b>Soil Erosion:</b></p> <ul style="list-style-type: none"> <li>• <b>KM</b> shall take measures (e.g. installation of temporary and permanent drainage works, construction of berms, contouring of land, establishment of vegetation etc) to ensure that there is no undue soil erosion due to mining related activities.</li> <li>• All forms of erosion will be mitigated within 6 months.</li> <li>• The following infrastructure will be inspected and eroded areas will be repaired when and if necessary: -                             <ul style="list-style-type: none"> <li>- Linear infrastructure (roads – particularly untarred roads, railway lines and pipelines);</li> <li>- All surface water management infrastructures (canals and bunds).</li> </ul> </li> </ul> <p>Mitigatory Measures</p>	Engineering Manager	Ongoing
Impacts on	Decommissioning	<p><b>Soil Pollution:</b></p> <ul style="list-style-type: none"> <li>• All hazardous material spillages will be managed according to the Lonmin ISO 14 001 procedure to ensure minimal environmental impact.</li> </ul> <p><b>Soil mining (removal of soil):</b></p> <ul style="list-style-type: none"> <li>• <b>Opencast</b> - The opencast voids will be backfilled after mining with the weathered bedrock and sub-soils. Following backfilling, topsoil will be replaced to approximately 300 mm.</li> </ul> <p>Commitments</p>	Engineering Manager  Mine Manager	Ongoing
Impacts on	Decommissioning	<p>• To ensure that dust and erosion is oppressed through</p>	Engineering Manager	Decommissioning

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
soil due to erosion, pollution, and compaction	and Closure	<p>Mitigatory Measures</p> <ul style="list-style-type: none"> <li>• <b>Opencast</b> – Where the land use is returned to agriculture, low-level berms are to be provided to inhibit erosion where required.</li> <li>• Remove and/or treat all soils that are a source of pollution.</li> <li>• Sediments must be removed from the shaft sludge ponds when these structures are decommissioned.</li> </ul>		& closure

6.4.4 Land Capability and Land Use

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
The potential loss of agricultural and wilderness land due to land transformation and/or soil degradation	General	General Management Objectives	Mine Manager	Ongoing
	Construction and Operation	Mitigatory Measures	Mine Manager	Construction
	Decommissioning and Closure	Mitigatory Measures	Mine Manager	Decommissioning

Refer to Soils for mitigatory measures related to soil degradation (loss of topsoil, erosion, pollution, removal and compaction).

6.4.5 Biodiversity

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Habitat fragmentation, destruction and species loss	General	Overall Management Objectives	Mine Manager Lonmin Environmental Centre	Ongoing
		Overall Management Commitments	Engineering Manager Mine Manager Mine Manager / Training Personnel	Ongoing
Habitat fragmentation and destruction	Construction and Operation	Mitigatory Measures	Engineering Manager	Ongoing
		Mitigatory Measures	Engineering Manager	Ongoing
Reduction in species diversity	Construction and Operation	Mitigatory Measures	Engineering Manager	Ongoing
		Mitigatory Measures	Engineering Manager	Ongoing

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Habitat fragmentation, destruction and species loss	Decommissioning and Closure	<p>action.</p> <p>Re-vegetation shall take place through natural re-seeding. Should natural re-seeding not be successful indigenous vegetation will be used for re-vegetation.</p>	Engineering Manager	Ongoing

*Refer to Soils for mitigatory measures related to soil erosion*

*Refer to Air Quality for mitigatory measures related to dust control*

6.4.6 Water Resources

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Potential adverse impacts on surface and groundwater resources, in terms of quality and quantity.	General	<p>Corporate Objectives</p> <p>Zero surface discharge to the environment.</p> <p>100 % legal compliance in terms of Regulation 704 of the National Water Act, 1998 (Act 36 of 1998) and Lonmin permit conditions. (refer to mitigatory measures below for the requirements of R704).</p> <p>Reduce Lonmin's aggregate fresh water consumption by 10% per unit of production (2007).</p> <ul style="list-style-type: none"> <li>• Ongoing water monitoring of the receiving water environment, stormwater effluent discharge points and bio-monitoring sites. Both the quality and quantity of discharge must be monitored according to the conditions of the Water Use Licence.</li> <li>• Continue calibrating the groundwater flow and mass transport models.</li> <li>• Education of mine staff on the potential impacts on the receiving environment including prevention of these impacts.</li> <li>• Where practical, all future water management facilities, residue deposits and associated infrastructure are to be designed, located, constructed and maintained to minimise water resource pollution, damage to riparian or in stream habitat through erosion, sedimentation, disturbance of vegetation or the alteration of flow characteristics.</li> <li>• Ensure that all residue deposits are designed that the waste or water therein will not impair the structures stability or cause its failure.</li> <li>• Where practically possible, ensure that surface water does not artificially recharge ground water.</li> <li>• Recycle process water as far as practically possible.</li> <li>• Ensure all water systems are free of obstructions.</li> <li>• All domestic waste and wash water to be disposed of as per permit requirements.</li> </ul>	<p>Mine Manager</p> <p>Mine Manager</p> <p>Mine Manager</p>	<p>September 2006</p> <p>September 2006</p> <p>2007</p>
	Construction and Operation	<p>Corporate targets</p> <p>Mitigatory Measures – General prevention of water pollution and the protection of water resources</p>	<p>Mine Manager</p>	<p>Ongoing</p>

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
	Construction and Operation	Mitigatory Measures – Restrictions on locality of activities and structures	Mine Manager	Ongoing
	Construction and Operation	Mitigatory Measures – Restrictions on use of materials	Mine Manager	Ongoing
	Construction and Operation	Mitigatory Measures – Capacity requirements of clean and dirty water systems	Mine Manager	Ongoing
	Construction and Operation	Mitigatory Measures – Access control and security (R704)		

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
		<p>Ensure the following control measures are in place to prevent oil, grease, fuel or chemicals from reaching a water resource:</p> <ul style="list-style-type: none"> <li>- The fuel supplier shall provide and maintain bund walls around his fuel storage areas within the site. Such walls shall be of a sufficient height to contain 110% of the entire contents of his fuel storage facilities. This shall apply to storage above ground.</li> <li>- Soil contaminated by oil, fuel or chemical leakage shall either be removed and placed in disposal areas as directed by the Lonmin Environmental Center or shall be rehabilitated in situ;</li> <li>- All relevant employees are to be trained on waste management and petro-chemical spill ISO14001 procedures according to the training matrix;</li> <li>- Waste runoff water from the vehicle wash bay, workshop and diesel / fuel tank area shall be collected in a series of covered conservancy tanks/oil traps to firstly settle silt and secondly to remove oil. The oil sludge collected shall be disposed of at an approved hazardous waste disposal site or collected by a recycling company. Water from conservancy tanks shall be discharged into the sewage or mine dirty water system.</li> <li>- All spillage of oil onto concrete surfaces shall be controlled by the use of an approved absorbent material.</li> <li>- All old oils shall be retained for re-use/recycling by the supplier/recycling company.</li> <li>- Concrete shall be mixed only in areas, which have been specially demarcated for this purpose. All concrete that is spilled outside these areas, shall be promptly removed and taken to an approved landfill site. After all concrete mixing is complete, all waste concrete shall be removed from the batching area and disposed of at an approved landfill site. Stormwater shall not be allowed to flow through the batching area.</li> </ul>	Engineering Manager	Ongoing
		<p>Mitigatory Measures- Winning sand and alluvial minerals from a watercourse</p>		

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
	Decommissioning and Closure	Mitigatory measures	Engineering Manager	During decommissioning & closure
		<ul style="list-style-type: none"> <li>• All pollution control mechanisms are to be in accordance with R704.</li> <li>• Ensure that all necessary pollution control mechanisms are protected and repaired or established when stockpiles or residue deposits are reclaimed, removed or rehabilitated so that water pollution is avoided and abated.</li> <li>• Ongoing water monitoring of the receiving water environment and bio-monitoring sites in accordance with the conditions of the Water Use Licence.</li> </ul>		

*Refer to Soils for mitigatory measures related to soil erosion*

*Refer to Air Quality for mitigatory measures related to dust control*

6.4.7 Air Quality

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
The main pollutants in terms of air quality are particulates	Overall Management Objective	<p>Ensure that the air quality within the main impact zone of KM is maintained at a level complying with ambient air quality guidelines and standards.</p> <ul style="list-style-type: none"> <li>• Monitor and minimise emissions of hazardous chemical compounds.</li> <li>• Monitor and manage airborne particulate emissions and dustfall deposition.</li> <li>• Maintain, and if required expand, the air quality monitoring and management network.</li> <li>• Minimise the health risks due to air contaminants generated within the main impact zone.</li> <li>• Avoid or minimise negative impacts on surrounding flora and fauna due to air contaminants generated by KM.</li> </ul>	Engineering Manager	Ongoing
	General	Overall Management Commitments	Engineering Manager	Ongoing

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
	Construction and Operation	Mitigatory Measures	Engineering Manager	<ul style="list-style-type: none"> <li>When necessary</li> <li>When necessary</li> <li>Ongoing</li> <li>Ongoing</li> <li>Ongoing</li> <li>Ongoing</li> <li>Ongoing</li> <li>Ongoing</li> <li>Ongoing</li> </ul>
		<ul style="list-style-type: none"> <li>• Should dust emission from mining operations prove to be excessive on dust roads and/or in close proximity to communities, dust suppression techniques will be applied.</li> <li>• Where practicable, excessive dust created by drilling, surface blasting, loading and unloading, mobile equipment and dust blows will be suppressed</li> <li>• Smoke emissions will be avoided by ensuring adequate training in fire prevention practices and fire management. Waste and plastics are prohibited from being burnt on the mine.</li> <li>• Continuous monitoring and rationalization of dustfall deposition.</li> <li>• Ongoing PM10 monitoring.</li> <li>• The Codes of Practice for residue deposits will be strictly adhered to.</li> <li>• The sides of active tailings dams are to be vegetated to reduce dust blows.</li> <li>• Re-vegetate dormant tailings dams.</li> <li>• Control and minimise where possible vehicles and machinery on tailings dams.</li> <li>• Access roads should be kept to a minimum, and where possible existing tracks should be used and maintained.</li> <li>• Dust control measures are to be put in place on the gravel roads around the tailings facilities.</li> </ul>		

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IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
	Decommissioning and Closure	Mitigatory Measures	<ul style="list-style-type: none"> <li>• Excessive dust resulting from decommissioning activities will be suppressed using dust suppression techniques.</li> <li>• The waste rock dumps will be reclaimed, used for building aggregate or re-habiltated.</li> <li>• Evaluate and implement effective capping of dormant tailings dams.</li> <li>• Revegetate the slopes and surface of all tailings dams.</li> </ul>	Decommissioning
	Post Closure	Mitigatory Measures	<ul style="list-style-type: none"> <li>• Restrict access on all tailings dams.</li> <li>• Maintain vegetation cover on the slopes and surface of all tailings dams.</li> </ul>	Post closure

6.4.8 Noise, Vibration and Shock

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Increased noise and vibration levels	General	<p>General Management Objectives</p> <ul style="list-style-type: none"> <li>Ensure that noise levels from mining activities do not significantly affect staff at the site or people in the surrounding communities.</li> <li>Design and implement a hearing conservation programme for employees (including contractors).</li> <li>Formal complaints about mining related noise and/or vibrations will be investigated and appropriate mitigatory measures implemented where the complaints are found to be valid.</li> </ul>	Engineering Manager	Ongoing
	Construction and Operation	<p>General Management Commitments</p> <ul style="list-style-type: none"> <li>Conduct base line noise survey on perimeter and monitor noise against base line standards for ambient noise levels.</li> <li>Mobile equipment noise:                             <ul style="list-style-type: none"> <li>- Use designated routes;</li> <li>- Fit efficient silencers and enclose engine compartments;</li> </ul> </li> <li>Damp mechanical vibrations where practicable;</li> <li>Ensure that all machinery and vehicles are well maintained.</li> <li>Fixed plant noise:                             <ul style="list-style-type: none"> <li>- Reduce noise at source by damping through acoustic treatment and applying silencing equipment as far as practicable.</li> <li>- Isolate source by enclosure in acoustic building, room etc.</li> <li>- Erect bank, screen or barrier.</li> <li>- Carefully select fixed plant site.</li> </ul> </li> </ul>	Engineering Manager	Update annually
		Mitigatory Measures - Noise		Engineering Manager

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
		<ul style="list-style-type: none"> <li>• Eskom is notified prior to blasting in the vicinity of the powerlines.</li> <li>• All persons within a 500m radius of an area where blasting will take place, shall be requested to vacate their dwellings prior to any blasting.</li> <li>• Atmospheric conditions should be considered before charging and blasting</li> <li>• Air blasting vibrations:                             <ul style="list-style-type: none"> <li>- Use low energy detonating fuse or eliminate;</li> <li>- Use drop ball to eliminate secondary blasting.</li> </ul> </li> <li>• Blasting vibrations:                             <ul style="list-style-type: none"> <li>- Optimise shothole geometry;</li> <li>- Alter time and frequency of blasting;</li> <li>- Restrict maximum instantaneous charge detonated;</li> <li>- Consider ripping in softer formations.</li> </ul> </li> </ul>	<p style="text-align: center;">Mine Manager</p>	<p>Prior to blasting</p> <p>Prior to blasting</p> <p>Prior to blasting</p> <p>Ongoing</p> <p>Ongoing</p>
	Construction and Operation	Mitigatory Measures - Vibration		

6.4.9 Traffic

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
An increase in traffic volumes will result in an impact on congestion, road safety, road damage, erosion and dust.	General	<ul style="list-style-type: none"> <li>Manage the increase in traffic in terms of congestion, road surface damage, safety concerns, dust and erosion.</li> </ul>	Engineering Manager	Ongoing
	Construction and Operation	<ul style="list-style-type: none"> <li>All vehicular traffic on site should adhere to mine road safety measures.</li> <li>All mine vehicles should be road worthy.</li> <li>Only designated roads should be used for mining vehicles.</li> <li>Ensure drivers and operators of equipment are familiar with the safety policies and regulations.</li> </ul>	Engineering Manager	Ongoing

Refer to Soils for mitigatory measures related to soil erosion

Refer to Air Quality for mitigatory measures related to dust control

6.4.10 Radiation

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Contamination of machinery by radioactive isotopes and therefore a potential impact on workers and the environment	Operation, Decommissioning & Closure	Overall Management Commitment	Instrumentation Superintendent	Annually
		Commitment	Instrumentation Superintendent	Upon decommissioning
	Decommissioning & Closure	Mitigatory Measure	Instrumentation Superintendent	Upon decommissioning

6.4.11 Heritage Resources

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Impacts include a destruction or disturbance of cultural and natural heritage resources due to construction and mining operations	General	General Management Commitments	Mine Manager	Ongoing
	Construction, Operation and Decommissioning	Mitigatory measures relating to cultural heritage resources	Mine Manager Mine Manager Mine Manager	End of 2005 Ongoing When applicable

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
		<p><b>Archaeological and palaeontological sites:</b></p> <ul style="list-style-type: none"> <li>Existing archaeological and palaeontological sites will be fenced off where necessary and no mining will take place in their immediate vicinity where possible.</li> <li>Under no circumstances shall archaeological or palaeontological objects or material be destroyed, damaged, excavated, altered, defaced or otherwise disturbed without the necessary permits.</li> <li>The mine shall advise its workers of the penalties associated with the unlawful removal of archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act, 1999 (Act 25 of 1999) section 51.</li> </ul> <p><b>Burial grounds and graves:</b></p> <ul style="list-style-type: none"> <li>Existing burial grounds and graves will be fenced off, where necessary, and no mining will take place in their immediate vicinity.</li> <li>Should any grave/s need to be moved in the near future, due to the expansion of mining, permissions to exhume and re-bury the human remains and associated grave dressings and cultural remains will be obtained from:             <ul style="list-style-type: none"> <li>South African Heritage Resources Agency (SAHRA);</li> <li>The South African Police Services at Mooiwooi; and the</li> <li>Department of Home Affairs.</li> </ul> </li> </ul>	<p>Mine Manager</p>	<p>Ongoing</p>

*Refer to Sensitive landscapes for mitigatory measures relating to natural heritage resources*

6.4.12 Sensitive Landscapes

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
Destruction / Loss of Sensitive Landscapes	General	Overall Management Commitment  As far as possible, mining and mining related activities will not impact on sensitive environments.	Mine Manager	Ongoing
	Construction and Operation	Mitigatory Measures  <ul style="list-style-type: none"> <li>• Ensure that any new mining or mining related activities remain outside the 1:50 year floodline unless the necessary authorisations have been obtained.</li> <li>• Limit construction activities to demarcated areas.</li> <li>• Implement training and awareness programmes to all staff/ contractors regarding the importance and protection of sensitive environments.</li> <li>• Undertake a Heritage Resources Management Programme. for the identification of natural heritage resources.</li> </ul>	Engineering Manager	Ongoing

Refer to the following sections for further mitigatory measures relating to sensitive environments: Water Resources, Biodiversity and Heritage Resources

6.4.13 Visual Aspects

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
	General	Overall Management Commitment	Engineering Manager	Ongoing
	Construction and Operation	Mitigatory Measures	Engineering Manager	Ongoing
	Decommissioning and Closure	Mitigatory Measures	Engineering Manager	Ongoing

6.4.14 Socio-economic Aspects

IMPACT	DEVELOPMENT PHASE	COMMITMENTS/OBJECTIVES/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
<p>Mining and mining related activities impact on the socio-economic aspects of the area in the following ways:</p> <ul style="list-style-type: none"> <li>• Employment opportunities</li> <li>• Education and skills development</li> <li>• Corporate social investment</li> <li>• Primary health care</li> <li>• Formal accommodation</li> <li>• Increase in the influx of job seekers to the local and surrounding areas</li> <li>• Increased crime levels</li> <li>• Informal housing settlements</li> <li>• Pollution</li> <li>• Environmental degradation</li> <li>• Potential spread of communicable diseases</li> </ul>	<p>General</p>	<p>Full compliance with the Broad-based Socio-Economic Empowerment Charter for the South African Mining Industry.</p> <p><b>Community based objectives:</b></p> <ul style="list-style-type: none"> <li>• Enhance the community skills base through the building of facilities and the training and development of stakeholders.</li> <li>• Enhance the economic base of the community and to increase employment opportunities.</li> <li>• Promote community projects to enhance the environment and control degradation.</li> <li>• Maximize the relationships between Lonmin Platinum and the community to enhance joint development and cooperation.</li> <li>• Create an environment conducive for opportunities for Small, Medium Micro Enterprises (SMME's).</li> </ul>	<p>Vice President of Human Capital.</p>	<p>Ongoing</p>
	<p>Construction and Operation</p>	<p>Objectives</p>	<p>Vice President of Human Capital.</p>	<p>Ongoing</p>
		<ul style="list-style-type: none"> <li>• Assess the impacts that Lonmin Platinum has had on the region and its local communities.</li> </ul>	<p>Vice President of Human Capital.</p>	<p>End of 2005</p>

IMPACT	DEVELOPMENT PHASE	COMMITMENTS/OBJECTIVES/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
		<p><b>Employee based objectives:</b></p> <ul style="list-style-type: none"> <li>• Teach all employees to be conversant in English and improve the literacy rate and qualifications of all personnel.</li> <li>• Increase study grant opportunities to HDSA and women in order to increase appointments in mining positions.</li> <li>• Align all study grant opportunities to equity targets and formal education requirements.</li> <li>• Delivering access to formal housing for all employees by 2009</li> <li>• Facilitate the successful incorporation of HDSA's into the organisation through the existing mentorship scheme.</li> </ul>	<p>Vice President of Human Capital.</p>	<p>Ongoing</p>
<p>Loss of employment due to closure</p>	<p>Decommissioning and Closure</p>	<p>General Management Commitments</p>	<p>Vice President of Human Capital.</p>	<p>When applicable</p>

6.4.15 Interested & Affected Parties

IMPACT	DEVELOPMENT PHASE	OBJECTIVES/ COMMITMENTS/ MITIGATORY MEASURES	ACCOUNTABILITY	TIMING
<p>Negative: Inadequate public consultation process and potentially dissatisfied I&amp;APs</p>	<p>General</p>	<p>General Management Objectives</p> <ul style="list-style-type: none"> <li>• Manage development in an environmentally sustainable and transparent manner and ensure that all development complies with current legislation.</li> <li>• Maintain open communication channels and transparency between the mine and the I&amp;AP's.</li> <li>• Avoid or minimise potential negative environmental, health, safety, social or economic impacts on I&amp;AP's.</li> </ul>	<p>Mine Manager and Group Manager Communications</p>	<p>Ongoing</p>
<p>Positive: Satisfied and informed I&amp;APs</p>	<p>Prior to Construction</p>	<p>Mitigatory Measures</p>	<p>Mine Manager and the Lonmin Environmental Centre</p>	<p>Prior to construction</p>
	<p>All Phases</p>	<p>Mitigatory Measures</p>	<p>Mine Manager and Group Manager Communications</p>	<p>Ongoing When applicable Ongoing Ongoing</p>

The impact of mining and mining related activities on the environment impacts directly on the I&AP's, therefore refer to all other sections for mitigatory measures relating to the I&AP's

**6.5 Monitoring and Performance Assessment**

The monitoring and reporting period for the various environmental aspects discussed in the EMPR are indicated in **Table 6.5(a)** together with the responsible government department to whom the reports are submitted.

**Table 6.5(a) Monitoring at KM**

IMPACTS	MONITORING PERIOD	REPORTING PERIOD	RESPONSIBLE GOVERNMENT DEPARTMENT
<i>Topography</i>	Ongoing	Adhoc*	DME/DEAT
<i>Soils</i>	Ongoing	Adhoc*	DME/DEAT
<i>Land capability</i>	Ongoing	Adhoc*	DME/DEAT
<i>Natural vegetation</i>	Ongoing	Adhoc*	DME/DEAT
<i>Animal life</i>	Ongoing	Adhoc*	DME/DEAT
<i>Water quality &amp; quantity</i>			
Surface water	Monthly	Annually	DWAF
Ground water	Quarterly	Annually	DWAF
Storm water	Ad hoc	Annually	DWAF
<i>Air quality</i>			
Dust fallout	Continuous	Annually	CAPCO&DACE
<i>Noise</i>			
Within KM (occupational)	Quarterly	Quarterly	DME
Outside KM plant (boundary)	Quarterly	Reported internally	N/A
<i>Visual aspects</i>	Ongoing	Only if significant impact is proposed, in which case an EIA will be completed	DME
<i>Archaeological, historical and cultural sites</i>	Ongoing	Adhoc*	SAHRA & DME (for comment)
<i>Socio-economic</i>	Refer to Social & Labour Plan		
<i>Sensitive landscapes</i>	Ongoing	Only if significant impact is proposed, in which case an EIA will be completed	DME/DEAT
<i>I&amp;AP's</i>			
Maintain a public complaints record	Continuous	Internal	
Open days	Annual	Annual	Minutes sent to all attendees (including government departments)

Karee Mine

IMPACTS	MONITORING PERIOD	REPORTING PERIOD	RESPONSIBLE GOVERNMENT DEPARTMENT
Additional Community Forum Meetings	Adhoc	Adhoc	Minutes sent to all attendees
<b>Safety Risks and Hazards</b>	Ongoing	When required	DME

