

New Largo Colliery Draft Environmental Management Programme

A	EMP Number	C	D										E					F					G					H					I					J					K					L					M					N					O					P					Q					R					S					V				
			Scheduling					Construction (includes pre-construction)					Operation					Decommissioning and Closure					Post Closure					All activities					Earthworks, Soil Management, Mining Activities					Coal Processing & Discard Management					Materials Handling and Transport					Supporting Infrastructure					Water Management					Waste Management (Non-Mineralogical)					Rehabilitation					R545 Road Deviation					Training					Monitor/Auditing					Procedure, Plan or Report									
	1		APPOINTMENTS, ROLES AND RESPONSIBILITIES																																																																																									
	1.1		New Largo Coal (Pty) Ltd. as owner of New Largo Colliery																																																																																									
			Environmental Aspect / Impact Source:																																																																																									
			Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.																																																																																									
			Goals and Objectives:																																																																																									
			Define organisational and administrative arrangements for EMP implementation.																																																																																									
			Adequate management and mitigation of environmental impacts.																																																																																									
			Mitigation Measures:																																																																																									
	1.1.1		New Largo Coal (Pty.) Ltd. is the owner of the New Largo Colliery and associated infrastructure and as such will be the holder of environmental approvals (mining right and associated EMP approval, environmental authorisation, water use license and waste management license).																																																																																									
	1.1.2		New Largo Coal (Pty.) Ltd. to notify the competent authorities as soon as any of the contact details of the holder of these authorisations change, including the name of the responsible person, the physical or postal address and / or telephonic details.																																																																																									
	1.1.3		New Largo Coal (Pty.) Ltd. is ultimately responsible for the implementation of the EMP during construction, operation, rehabilitation, decommissioning and closure, and post closure phases of the project until a closure certificate has been issued.																																																																																									
	1.1.4		New Largo Coal (Pty.) Ltd. to appoint a capable and suitably qualified and responsible Environmental Control Officer (ECO) to oversee implementation of the EMP during construction, operation, rehabilitation, decommissioning and closure phases of the project. The ECO to be appointed prior to the start of construction. The competent authorities to be notified of the details and contact numbers of the appointee in writing for record and communication purposes. Authorities to be notified about staff changes or when responsibilities are delegated to an alternative person (i.e. during post closure).																																																																																									
	1.1.5		New Largo Coal (Pty.) Ltd. to use a capable and suitably qualified Environmental Auditor (EA), to audit compliance with the EMP at the required intervals. The EA to be external to New Largo Colliery. The details of the appointment to be submitted to the competent authorities on request.																																																																																									
	1.1.6		New Largo Coal (Pty.) Ltd. to appoint a Project Manager (PM) to oversee the construction of the project.																																																																																									
	1.1.7		New Largo Coal (Pty.) Ltd. to appoint a General Manager to oversee the operation, rehabilitation, decommissioning and closure and post closure phases of the project until a closure certificate has been issued. Authorities to be notified when responsibilities are delegated to an alternative member of the New Largo Coal (Pty.) Ltd. management team (i.e. during post closure).																																																																																									
	1.1.8		New Largo Coal (Pty.) Ltd. to ensure that all appointed Contractors are bound to implement the EMP as it applies to the Contractors' line of work.																																																																																									
	1.1.9		Should any activity be planned on the site that requires an environmental authorisation, permit or license approval, which is not covered by existing authorisations or approvals, appropriate applications for authorisations and approvals must be lodged with the competent authorities. These includes listed activities in terms of the MPRDA, NEMA, NEMWA, and NWA as well other environmental acts and regulations.																																																																																									
	1.1.10		Should the ownership of the New Largo Colliery or any of the associated infrastructure be transferred from New Largo Coal (Pty.) Ltd. to any other juristic person, it must be formally recorded in writing and submitted to the competent authorities. The future holder of the authorisation will be required to take ownership of the implementation of the conditions of the EMP and the conditions of all approvals upon transfer of ownership.																																																																																									

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EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report	
			Project Phase				Applicable Project Activities											Action		
1.2	Environmental Control Officer (ECO)																			
	Environmental Aspect / Impact Source:																			
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.																			
	Goals and Objectives:																			
	Define organisational and administrative arrangements for EMP implementation.																			
	Adequate management and mitigation of environmental impacts.																			
	Mitigation Measures:																			
1.2.1	The ECO to oversee the implementation of the EMP on a day to day basis, verifying that the EMP mitigation measures and conditions of all authorisations and approvals are adhered to at all times, and to act as guide and advisor to Contractors, the SHE officer and New Largo Coal (Pty.) Ltd. personnel on matters related to EMP implementation.	Ongoing	Y	Y	Y		Y													
1.2.2	Where necessary, the ECO to develop and oversee implementation of EMP procedures, including emergency procedures, to give effect to the commitments of the EMP. EMP procedures are live documents and the ECO may amend them from time to time to bring them in line with environmental conditions and issues pertaining to New Largo Colliery and surroundings.	As required	Y	Y	Y		Y													Y
1.2.3	Where necessary, the ECO to issue EMP instructions to Contractors, New Largo Coal (Pty.) Ltd. personnel or any party present on site to address and correct non-compliances with the EMP and specific environmental issues pertaining to the mining right area and surroundings.	As required	Y	Y	Y		Y													Y
1.2.4	The ECO to provide a copy of the EMP (and all updates / amendments) to Contractors appointed by New Largo Coal (Pty.) Ltd.. Records to be kept of documents issued, including details and signature of Contractors' responsible person to whom the documents were issued.	As required	Y	Y	Y		Y													Y
1.2.5	The ECO to provide copies of EMP procedures (and all revisions) to Contractors appointed by New Largo Coal (Pty.) Ltd., if the procedures apply to the nature of their activities and contract with New Largo Coal (Pty.) Ltd.. The ECO to keep proof that documentation has been provided to the Contractor.	As required	Y	Y	Y		Y													Y
1.2.6	The ECO to provide copies of EMP instructions to Contractors appointed by New Largo Coal (Pty.) Ltd., if the instructions apply to the nature of their activities and contract with New Largo Coal (Pty.) Ltd.. The ECO to obtain proof that documentation has been provided.	As required	Y	Y	Y		Y													Y
1.2.7	The ECO to be responsible for regular internal inspections of the mining right area and surroundings to monitor and verify that the EMP is implemented and that environmental impacts are kept to a minimum during construction and operation. Records of findings to be kept and submitted to New Largo Coal (Pty.) Ltd. management.	Weekly inspections during construction. Monthly inspections during operation. EMP verification every two months.	Y	Y	Y		Y													Y
1.2.8	The ECO to arrange, facilitate, attend and minute regular meetings to discuss environmental performance and EMP implementation with the Contractors' SHE officers.	Monthly during construction, Quarterly during operation	Y	Y	Y		Y													Y
1.2.9	The ECO to keep records of all matters concerning compliance monitoring, environmental performance and EMP implementation in the incident reporting system and to make it available for inspection to a relevant and competent authority in respect of this project.	Ongoing, as required	Y	Y	Y		Y											Y		Y
1.2.10	The ECO to keep a legal register, listing legislation applicable to the project and a summary of how the legislation applies to the project.	Ongoing, to be updated every two years	Y	Y	Y		Y													Y
1.2.11	The ECO to keep copies of the approved EMP and IWMMP and all authorisation / approval letters on site. The authorisations / approvals to be produced to authorised officials of a relevant or competent government department who requests to see it and to be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the site.	Ongoing	Y	Y	Y		Y													Y
1.2.12	In addition to EMP compliance, the ECO is to monitor overall environmental compliance with relevant legislation.	Annually	Y	Y	Y		Y													Y
1.2.13	The ECO shall maintain copies of all reports submitted to the competent authorities.	Ongoing	Y	Y	Y		Y													Y
1.2.14	The ECO shall maintain copies of all correspondence to and from competent authorities.	Ongoing	Y	Y	Y		Y													Y

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	1.2.15	The ECO to produce regular environmental reports for submission to the EA and New Largo Coal (Pty.) Ltd. management, covering EMP compliance, general environmental performance, incidents, complaints, EMP procedures and instructions issued, and results of meetings and inspections during the reporting period.	Quarterly during construction. Annually thereafter	Y	Y	Y														Y	
	1.2.16	The ECO to arrange, attend and record the proceedings of regular open meetings with neighbours and I&APs to discuss environmental issues, results of environmental monitoring, amendments to the EMP, feedback from the environmental monitoring committee meetings, results of studies undertaken, closure planning, rehabilitation, incidents and public complaints and the necessary corrective action required to minimise environmental impacts.	Quarterly during construction. Annually thereafter	Y	Y	Y														Y	
	1.2.17	The ECO is to submit compliance reports to the EA and New Largo Coal (Pty.) Ltd. Management / General Manager / PM.	Quarterly during construction. Annually thereafter	Y	Y	Y															Y
	1.2.18	The ECO to report environmental incidents and major EMP non-compliances (that could result in significant environmental damage or pollution) to the New Largo Coal (Pty.) Ltd. Management / General Manager who will then be responsible to report to competent authorities.	As soon as possible, but at least within 24 hours	Y	Y	Y															Y
	1.2.19	The ECO is to manage environmental incidents in accordance with a formal incident response and reporting procedure.	Ongoing, as required	Y	Y	Y		Y													Y
	1.2.20	The ECO to oversee environmental awareness induction training to all contractor staff.	Prior to individuals starting work on site	Y	Y	Y		Y										Y			
	1.2.21	The ECO to ensure that the necessary environmental induction training takes place and that records of attendance are maintained and up to date.	Ongoing	Y	Y	Y		Y										Y			
	1.2.22	The ECO to put in place an incident reporting procedure and to keep this up to date at all times.	At start of construction phase, Ongoing thereafter	Y	Y	Y															Y
	1.2.23	The Public / Community Liaison Officer to be the contact person for public liaison and to be managing their complaints and grievances in accordance with a formal complaints procedure, and documenting complaints in a complaints register.	Ongoing, as required	Y	Y	Y															Y
	1.2.24	Other duties as listed as being the ECO's responsibility under various EMP headings.	Ongoing	Y	Y	Y															
	1.2.25	The ECO to manage the process of submitting any proposed changes/amendments to the EMP to the competent authorities for approval before such changes can be implemented.	Every six months, or as required	Y	Y	Y															Y
	1.2.26	ECO to arrange regular submission of monitoring and compliance reports (performance assessments and other audits) to competent authorities as required by the various authorisations issued.	Quarterly during construction, Every two years during operation (or as required by approval / licence authorisation / license conditions)																		Y
	1.3	Environmental Auditor (EA)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	.	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	.	Goals and Objectives:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	.	Define organisational and administrative arrangements for EMP implementation.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	.	Adequate management and mitigation of environmental impacts.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	1.3.1	The EA (or an independent environmental consultant) to attend the environmental monitoring committee meetings.	Quarterly during construction. Annually during operation	Y	Y	Y															

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																			Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Action
1.3.2		The EA (or an independent environmental consultant / mediator) to act as independent party during disputes.	Y	Y	Y														
1.3.3		The EA to compile environmental compliance audit reports (i.e. performance assessment reports in terms of the MPRDA) to New Largo Coal (Pty.) Ltd. for submission to competent authorities (DMR, MDEDET, DWS, NDEA).	Y	Y	Y												Y	Y	Y
1.4		Environmental Monitoring Committee
		Environmental Aspect / Impact Source:
		Lack of an established working environmental monitoring committee to function as a platform for communication of the implementation of all commitments contained within this EMP and associated permitting documents.
		Goals and Objectives:
		Establish a working environmental monitoring committee which will help to ensure the effective implementation of all commitments contained within this EMP and associated permitting documents.
		Mitigation Measures:
1.4.1		An EMC will be established before construction commences.	Y	Y	Y														
1.4.2		The EMC could include the following stakeholders / I&APs:	Y	Y	Y														
1.4.2.1		Project Manager of New Largo Colliery;	Y	Y	Y														
1.4.2.2		Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET);	Y	Y	Y														
1.4.2.3		Mpumalanga Department of Water Affairs (DWS);	Y	Y	Y														
1.4.2.4		Mpumalanga Department of Mineral Resources (DMR);	Y	Y	Y														
1.4.2.5		Mpumalanga Department of Agriculture, Forestry and Fisheries;	Y	Y	Y														
1.4.2.6		Nkangala District Municipality;	Y	Y	Y														
1.4.2.7		Victor Khanye Local Municipality and Emalahleni Local Municipality;	Y	Y	Y														
1.4.2.8		South African National Biodiversity Institute (SANBI);	Y	Y	Y														
1.4.2.9		Mpumalanga Tourism and Parks Agency (MTPA);	Y	Y	Y														
1.4.2.10		Olifants River Forum;	Y	Y	Y														
1.4.2.11		Catchment Management Agency;	Y	Y	Y														
1.4.2.12		Non-government organisations (NGOs);	Y	Y	Y														
1.4.2.13		Eskom representative;	Y	Y	Y														
1.4.2.18		Community representative; and	Y	Y	Y														
1.4.2.19		Representatives of the media.	Y	Y	Y														
1.4.3		The EMC will meet to discuss progress with and guide the implementation of all commitments contained within this EMP and associated permitting documents.	Y	Y	Y														
1.4.4		The EMC meetings will be chaired by a neutral independent facilitator.	Y	Y	Y														
1.4.5		At the end of the operational phase, a post-closure EMC is to be established.	Y	Y	Y														
1.5		Contractors
		Environmental Aspect / Impact Source:
		Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.
		Goals and Objectives:

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
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			Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
.	Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.
.	Mitigation Measures: Contractors to familiarise themselves with the EMP and to ensure that contract prices allow for environmental legal compliance and costs associated with EMP implementation.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.5.1	Contractors to comply with the EMP where it applies to the nature of their activities and contract with New Largo Coal (Pty.) Ltd..	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.5.2	Contractors to implement EMP amendments, EMP procedures and written EMP instructions issued to them by the ECO, within the timeframe specified by the ECO in the EMP procedure or instruction.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.5.3	Contractors not to deviate from the EMP or procedures and instructions issued by the ECO without written approval by the ECO.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.5.4	Contractors to ensure that their workforce, sub-contractors and suppliers comply with the EMP.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.5.5	Contractors to be responsible for rectifying and rehabilitating, at their own expense, any environmental damage caused by their activities on New Largo Colliery and surroundings. Measures to repair damage and rehabilitate the affected area to be approved and signed off by the ECO.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.5.6	Contractors shall nominate a capable and suitably qualified staff member as SHE officer to supervise implementation of the EMP as it applies to the nature of the contract with New Largo Coal (Pty.) Ltd.. For the purposes of the EMP, a SHE officer shall mean a staff member that has attended an environmental management system or environmental audit course or has a proven track record of managing site environmental matters.	At start of construction phase	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6	Contractor SHE Officer	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source: Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities. Personnel not trained to manage EMP implementation.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Goals and Objectives: Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures: Each SHE officer to identify all EMP sections (as may be amended from time to time) that apply to the Contractor's activities and contract with New Largo Coal (Pty.) Ltd. and to ensure implementation of these sections.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6.1	Each SHE officer to identify EMP sections (as may be amended from time to time) that apply to the Contractor's activities and contract with New Largo Coal (Pty.) Ltd. and to ensure implementation of these sections.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6.2	Each SHE officer to identify EMP procedures issued by the ECO that apply to the nature of their activities and contract with New Largo Coal (Pty.) Ltd. and to ensure that these EMP procedures are implemented within the timeframe specified in the EMP procedure.	Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6.3	Each SHE officer to ensure that EMP instructions issued to them, are implemented within the timeframe specified in the EMP instructions.	As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6.4	Each SHE officer to inspect areas in which the Contractor operates to verify EMP compliance.	Daily	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6.5	Each SHE officer to attend meetings with the ECO and to bring environmental issues and problems with implementation of the EMP to the attention of the ECO.	Monthly, or as required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6.6	Each SHE officer to report environmental incidents, complaints, and major EMP non-compliances (that could result in notable environmental damage or pollution) to the ECO.	As soon as possible, but at least within 24 hours	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.6.7	Each SHE officer to submit regular environmental inspection reports to the ECO, covering EMP compliance and progress with the implementation of EMP procedures and EMP instructions applicable to the reporting period.	Monthly	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
1.7	New Largo Coal (Pty.) Ltd. Project Manager (PM)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source: Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Goals and Objectives: Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	

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			Project Phase			Applicable Project Activities										Action				
	Mitigation Measures:																			
1.7.1	The Project Manager (PM) is to act on New Largo Coal (Pty.) Ltd.'s behalf during the construction of the project.	Ongoing	Y	Y	Y	Y														
1.7.2	The PM is to report environmental incidents, complaints, and major EMP non-compliances (that could result in notable environmental damage or pollution) to the ECO.	As soon as possible, but at least within 24 hours	Y	Y	Y	Y														Y
1.7.3	The PM to approve the Contractors' nominations of SHE officers.	Ongoing	Y	Y	Y	Y														
1.8	Third-Party Infrastructure Owners																			
	Environmental Aspect / Impact Source:																			
	Lack of delegation of responsibilities where third parties own infrastructure within the mining right area. Eskom is the owner of existing and new powerlines and substations within the mining right area. Some of this infrastructure will be constructed by New Largo Coal (Pty.) Ltd. on behalf of Eskom.																			
	Dept of Public Works, Roads and Transport (DPWRT) is the owner of the existing R545, including the section to be deviated around the opencast mine footprint. New Largo Coal (Pty.) Ltd. will construct the R545 deviation on behalf of the DPWRT. The DPWRT will resume responsibility for the entire R545 once construction has been completed.																			
	There are existing linear infrastructure such as water and petroleum pipelines and public roads running through the mining right area.																			
	Goals and Objectives:																			
	Ensure adequate management and mitigation of environmental impacts of infrastructure owned by third parties.																			
	Mitigation Measures:																			
1.8.1	New Largo Coal (Pty.) Ltd. to hand over responsibility of the operational environmental management and maintenance of the R545 deviation to the DPWRT.	At end of construction of the R545 deviation		Y	Y	Y										Y				
1.8.2	New Largo Coal (Pty.) Ltd. to hand over responsibility for environmental management as it applies to infrastructure owned by Eskom.	From end of construction of Eskom owned infrastructure		Y	Y	Y					Y									
1.8.3	Owners of other linear infrastructure to remain responsible for environmental management as it applies to infrastructure owned by them (i.e. Telkom and Transnet).	Ongoing	Y	Y	Y	Y					Y									
1.9	Public / Community Liaison Officer																			
	Environmental Aspect / Impact Source:																			
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.																			
	Goals and Objectives:																			
	Define organisational and administrative arrangements for EMP implementation.																			
	Adequate management and mitigation of environmental impacts.																			
	Mitigation Measures:																			
1.9.1	The Public / Community Liaison Officer to coordinate interaction with local communities, farm workers, farm dwellers, landowners.	Prior to construction / ongoing	Y	Y	Y	Y														
1.9.2	The Public / Community Liaison Officer to develop a stakeholder engagement plan.	Prior to construction / update as required by stakeholder engagement plan	Y	Y	Y	Y														Y
1.9.3	The Public / Community Liaison Officer to ensure all key stakeholders and Interested and Affected parties (IAP's) are identified early.	As required	Y	Y	Y	Y														
1.9.4	The Public / Community Liaison Officer to ensure all key stakeholders and Interested and Affected parties (IAP's) are engaged in a proactive manner and on an on-going basis.	As required	Y	Y	Y	Y														
1.9.5	The Public / Community Liaison Officer to ensure all the main issues and interests are identified.	As required	Y	Y	Y	Y														
1.9.6	The Public / Community Liaison Officer to ensure that risks are identified early and managed appropriately.	As required	Y	Y	Y	Y														

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1.9.7		The Public / Community Liaison Officer to formally record stakeholder (IAP) issues and questions identified and to ensure arising actions are noted and followed up. This information will be transferred on a monthly basis to the New Largo database by the Public Liaison Officer within 24 hours.	As required	Y	Y	Y	Y														Y		
2		TRAINING, AWARENESS AND COMPETENCE																					
		Environmental Aspect / Impact Source: Insufficient duty of care amongst workers, suppliers and service providers due to a lack of an understanding regarding key environmental risks associated with their day to day activities in the workplace, and the potential impacts and repercussions of non-compliance with the EMP.																					
		Insufficient duty of care amongst New Largo Colliery management regarding environmental performance, and environmental impacts resulting in a lack of timeous planning, intervention and corrective action to deal with EMP non-compliance and key environmental issues.																					
		Environmental Impacts: Unnecessary exposure of the workforce and neighbouring communities and habitats to impacts that could have been avoided with diligent implementation of the EMP.																					
		Goals and Objectives: Ensure adequate knowledge and understanding of the EMP. Create an understanding of the interface between the work environment and environmental protection. Reduce the occurrence of environmental incidents through awareness and appropriate training. Timeous planning, intervention and corrective action to deal with EMP non-compliance and key environmental issues. Increase awareness of environmental and public / social health issues. Reduce, prevent, and respond to, the occurrence of environmental incidents through awareness and appropriate training.																					
		Mitigation Measures: New Largo Colliery management personnel to attend a planning session focussing on pertinent EMP implementation and environmental performance issues to identify areas for intervention, corrective action and continuous improvement. Minutes of the planning session and list of attendance to be kept.	Annually for first five years, thereafter every two years.	Y	Y	Y	Y		Y														
2.2		All workers, suppliers and service providers entering the New Largo Colliery to attend induction training covering key environmental risks, protection of the natural environment, prohibited activities and areas, key environmental rules and the potential dangers and repercussions of not complying with these rules. Records of all individuals attending an induction session to be kept, including their names, ID, contact details, designation and signature.	Upon appointment and before entering New Largo Colliery, repeated annually	Y	Y	Y	Y		Y												Y		Y
2.3		Individuals dealing with potential hazardous situations and risks that could lead to hazardous spills, pollution incidents, excessive dust or other forms of environmental damage to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation. Records of all job-specific training sessions to be kept. Records to include the type of training, training material used, and the names, ID, contact details, designation, and signature of the trainer and attendees.	Upon appointment. Repeated annually.	Y	Y	Y	Y		Y												Y		Y
2.4		Implement an ongoing environmental awareness program. The program to involve regular communication of environmental management and protection measures by means of newsletters, posters, meetings and/or other suitable means. Records to be kept of activities undertaken, including copies of the material and evidence of where and when these were displayed / distributed.	Ongoing, at least monthly	Y	Y	Y	Y		Y														Y
2.5		Other training activities highlighted under other sections of the EMP.	As required	Y	Y	Y	Y		Y												Y		
3		INCIDENT REPORTING AND MANAGEMENT																					
		Environmental Aspect / Impact Source: Hazardous spills, pollution occurrences, excessive dust or other forms of environmental damage. Recurring environmental incidents due to EMP non-compliances.																					
		Goals and Objectives: Adequately assess root cause of incidents in order to develop and implement appropriate corrective actions and prevent incidents from recurring. Put an incident reporting procedure in place.																					
		Mitigation Measures:																					

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																			Management Measures	Scheduling	Project Phase				Applicable Project Activities								Action
EMP Number			Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
3,1	An incident reporting procedure to be put in place and kept up to date at all times and the incident reporting procedure must include the reporting of incidents to the relevant authorities.	At start of construction phase, Ongoing thereafter	Y	Y	Y	Y	Y												Y
3,2	Environmental incidents (including complaints by third parties) to be captured as per the incident reporting procedure.	As soon as possible, but at least within 48 hours	Y	Y	Y	Y	Y												Y
3,3	Emergency incidents to be reported as soon as possible and in person or telephonically to the ECO, and thereafter in writing as per the incident reporting procedure.	As soon as possible, but at least within 12 hours, and in writing within 48 hours	Y	Y	Y	Y	Y												Y
3,4	The ECO to register environmental incidents, and ensure investigation, follow-up and close out of all incidents. All incidents to be reported to New Largo Coal (Pty.) Ltd. management.	As required	Y	Y	Y	Y	Y												Y
3,5	All incidents to be investigated and appropriate corrective actions to be implemented, including measures to prevent recurring incidents.	As required	Y	Y	Y	Y	Y												
3,6	Should any accidental damage to third party service infrastructure take place during construction and mining activities, immediate action to be taken to restore such disrupted service in the shortest time possible.	As required	Y	Y	Y	Y	Y												
3,7	New Largo Coal (Pty.) Ltd. senior management to report major environmental incidents and major EMP non-compliances (that could result in notable environmental damage or pollution) to the competent authorities as per applicable legislation and regulatory requirements.	As required	Y	Y	Y	Y	Y												Y
3,8	Upon completion of construction, an operational phase incidents reporting register and procedure to be put in place and kept up to date at all times.	At end of construction phase, to be ready for operations and every two years thereafter		Y															Y
3,9	At the end of the life of the mine, a decommissioning and closure phase incidents reporting register and procedure to be put in place and kept up to date at all times.	At end of operation phase, every two years thereafter		Y															Y
4	EMP REVIEW AND UPDATE		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Environmental Aspect / Impact Source:		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Changing conditions at the New Largo Coal Project may require different environmental management practices to be implemented than outlined in the approved EMP. The EMP is to be a live document that is to be updated and amended to ensure legal compliance and continued improvement of environmental management practices over time. Environmental degradation due to outdated or inappropriate environmental management and procedures and an outdated EMP.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Goals and Objectives:		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Ensure that the EMP is up to date and relevant and that it outlines appropriate environmental management measures and procedures for the New Largo Coal Project over the life of the project.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Mitigation Measures:		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4,1	The ECO to update the EMP based on the recommendations of the EA or external audit / performance assessment findings.	Every two years, or as required	Y	Y	Y	Y	Y											Y	Y
4,2	All EMP updates to be submitted and presented to the competent authorities.	Every two years, or as required	Y	Y	Y	Y	Y												Y
4,3	All EMP amendments will only be given effect once approval of the EMP amendment by relevant authorities is given.	Ongoing	Y	Y	Y	Y	Y												Y

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EMP Number	Management Measures	Scheduling	Project Phase				Applicable Project Activities										Action			
5	PUBLIC AND SOCIAL HEALTH		Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report	
	Environmental Aspect / Impact Source: Spread of communicable diseases, including HIV/AIDS, other Sexual Transmitted Infections (STIs) and tuberculosis due to the influx of people and the presences of construction and operation workforce, negatively affecting public and social wellbeing. Intrusion impacts such as air quality, dust and noise, which may lead to health issues, including respiratory and related diseases.																			
	Goals and Objectives: Create awareness about communicable diseases, including HIV/AIDS, other SDIs and tuberculosis amongst workforce and local communities. Equip people with the necessary knowledge to change attitudes and behaviour and empower them to prevent the spread of infections. Provide support for employees who are already infected. Promote the expansion of current wellness programmes and facilities to accommodate the needs of New Largo Colliery.																			
	Mitigation Measures: The Public / Community Liaison Officer to develop and implement an awareness campaign on communicable diseases such as COVID-19, HIV/AIDS and other STIs, and tuberculosis. The Public / Community Liaison Officer may liaise with an NGO that specialise in this field - The Public / Community Liaison Officer must see that such a programme is implemented. The awareness campaign must be implemented through: 5.1.1 Posters and pamphlets. 5.1.2 Focus group discussions for workforce and the resident community in mining right area and within the project's direct zone of influence.	At the start of construction, reviewed as required	Y	Y	Y															
	5.1.3 Provision of comprehensive information packages on COVID-19, HIV/AIDS and other STIs, and tuberculosis.	As required	Y	Y	Y															
	5.1.4 Provide opportunities for voluntary testing, counselling support and care services to the construction workforce, New Largo Coal (Pty.) Ltd. employees and contract workers.	As required	Y	Y	Y															
	5.1.5 Provide support for employees who are already infected.	As required	Y	Y	Y															
	5.2 Any medical tests should be done without infringing the rights to privacy and preferably before employment and before the termination of contract.	As required	Y	Y	Y															
	5.3 The ongoing health and safety management program implemented for New Largo Colliery to include workforce wellbeing and awareness about public / social health issues. Topics to be covered include, but are not limited to, communicable diseases such as COVID 19, AIDS and tuberculosis, hygiene, fatigue management, social health, safety at home, healthy eating, exercise, and prevention of drug and alcohol abuse.	As per the health and safety management programme timeframes	Y	Y	Y															
	5.4 Public and social health awareness in communities exposed to the New Largo Colliery workforce. Details of campaigns to be kept on file.	Annually, or as required.																		
	5.6 Continuous air quality and dust monitoring must be undertaken, and the results shared with the appropriate community structures and adjacent landowners and occupants. Air quality management and dust avoidance and suppression activities must be implemented diligently, and the results communicated to the affected stakeholders using the existing communication structures.	As required	Y	Y	Y															
	6 PUBLIC SAFETY AND SECURITY																			
	Environmental Aspect / Impact Source: Injury of people and livestock due to unauthorised access onto construction and mining areas. Injury of people and livestock due to unauthorised access into the mining area during construction and operation. Compromised security conditions. Increased traffic load due to haulage of coal by road																			

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V			
EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Action		
	Goals and Objectives:																				
	Implementation of adequate access control in order to prevent harm during construction and operation of the project.																				
	Provide security during construction and operation.																				
	Minimise impacts on third party landowners.																				
	Minimise disruptions to and impacts on New Largo Coal (Pty.) Ltd.'s tenants on land earmarked for mining and ensure that they have been appropriately notified in advance to New Largo Coal (Pty.) Ltd. preparing the land for mining.																				
	Minimise disruptions to and impacts on occupiers of land within the mining and infrastructure footprints until they have relocated.																				
	Manage safety in accordance with applicable safety legislation.																				
	Mitigation Measures:																				
6.1	Potentially dangerous areas to be fenced and access controlled.	Ongoing	Y	Y	Y	Y	Y														
6.2	Appropriate signage and communication material used and in place at access points, entrances and along the fence line.	Ongoing	Y	Y	Y	Y	Y														
6.3	Access to the mining area and associated infrastructure areas to be controlled and only authorised vehicles and persons to be allowed onto the mining area.	Ongoing	Y	Y	Y	Y	Y														
6.4	Active mining and supporting infrastructure areas to be fenced to prevent unauthorised people and animals accessing the area.	Ongoing	Y	Y	Y	Y	Y														
6.5	Movement of vehicles, equipment and personnel to be restricted to the fenced active mining and supporting infrastructure areas unless for specific construction or operational purposes.	Ongoing	Y	Y			Y														
6.6	Fences and gates to be monitored and maintained, and all damage to fences and gates to be properly fixed and repaired as soon as required.	Ongoing	Y	Y	Y	Y	Y														
6.7	No fences may be flattened or deviated for the purpose of construction or mining without consent from the landowner and advance warning to tenant and occupiers of the land.	Ongoing	Y	Y			Y														
6.8	Develop an access control protocol to control access onto the mining right area, fenced areas, private land, land occupied by third parties and land leased to third parties. The protocol will address:	Prior to construction	Y				Y														Y
6.8.1	Access control to the New Largo Colliery, particularly the fenced active mining and infrastructure areas.	Ongoing	Y	Y			Y														
6.8.2	Measures to restrict trespassing from New Largo Colliery onto private land, including fencing and access control.	Ongoing	Y	Y	Y	Y	Y														
6.8.3	Marking of New Largo Coal (Pty.) Ltd. and Contractor vehicles.	Ongoing	Y	Y	Y	Y	Y														
6.8.4	Photo-identity tags with photographs for New Largo Coal (Pty.) Ltd. and Contractor personnel.	Ongoing	Y	Y	Y	Y	Y														
6.8.5	Restrictions on people residing on the project site or adjacent third-party land unless a written agreement with the affected landowner is obtained.	Ongoing	Y	Y	Y	Y	Y														
6.8.6	Safety of landowners and occupiers of land around the New Largo Colliery. Measures to be implemented to be defined in consultation with affected parties (neighbours of the mine).	Ongoing	Y	Y	Y	Y	Y														
6.8.7	Patrolling of New Largo Colliery fenced in area.	Ongoing	Y	Y	Y	Y	Y														
6.8.8	Communication with landowners, occupiers of land, and tenants needed before entering affected land, addressing property / site specific access requirements and arrangements.	Ongoing	Y	Y	Y	Y	Y														
6.9	Care should be taken that communities are informed of the grievance mechanism and how to access it, so that traffic infringements can be reported and addressed.	Ongoing	Y	Y	Y	Y	Y				Y										

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
EMP Number	Management Measures	Scheduling	Project Phase				Applicable Project Activities											Action		
			Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report	
7	LABOUR RECRUITMENT AND RELATIONS																			
	Environmental Aspect / Impact Source:																			
	Community discontentment and unrest due to perceived unfair recruitment procedures.																			
	Recruitment of labour.																			
	Loss in agriculture employment.																			
	Project located in an area with high unemployment rates.																			
	Loss in employment during decommissioning phase.																			
	Increased job opportunities for construction of road.																			
	Procurement of goods and services.																			
	Employment from construction of mine.																			
	Loss of livelihoods, including loss of agricultural land and subsistence farming activities.																			
	Goals and Objectives:																			
	Put in place a fair and transparent process with regards to recruitment and management of labour in partnership with Department of Labour and the local labour centre.																			
	Promote local workforce.																			
	Promote local business.																			
	Mitigate loss in local employment (i.e. agricultural jobs on land that will be occupied by mining and associated infrastructure).																			
	Promote procurement of local goods and services.																			
	Partnership with nearby sister mines in terms of supply chain and community funding.																			
	Mitigation Measures:																			
7.1	Without compromising job-specific skills requirements, safety, quality and meeting of construction timeframes, define a recruitment strategy based on the following principles:	Ongoing	Y	Y																Y
7.2	Transparent employment policies and skills requirements for specific positions.	Ongoing	Y	Y																
7.3	A fair and accessible process of advertising employment opportunities.	Ongoing	Y	Y																
7.4	The local workforce to be employed as far possible.	Ongoing	Y	Y																
7.5	Involvement of women.	Ongoing	Y	Y																
7.6	Equal opportunity to all people.	Prior to construction	Y																	
7.7	Skills development and training opportunities.	Ongoing	Y	Y																
7.8	Creation of opportunities for local entrepreneurs.	Ongoing	Y	Y																
7.9	Establishment of an off-site recruitment and labour office and a single point of call (telephone, fax and email number) for enquiries about employment opportunities and submission of applications.	Ongoing	Y	Y																
7.10	The recruitment strategy to be presented to local ward committees, Local and District Municipal structures and the Department of Labour.	Ongoing	Y																	
7.11	The use and development of local SMME businesses are a New Largo focus area. A focus on black economic empowerment is essential. The use and development of local SMMEs must focus on local empowerment but should include a regional focus. Entrepreneurial support could be considered. This aspect will be addressed further in the Social and Labour Plan that is currently in development. Specific targets to be set and communicated to the I&APs.	Ongoing	Y	Y																

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
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			Project Phase				Applicable Project Activities												Action		
7.12	Put in place appropriate decommissioning phase labour management plan dealing with employment losses.	Prior to decommissioning phase	.	.	Y	Y		
7.13	Put in place a post-closure labour management plan dealing with remaining labour and water treatment plant.	Prior to post-closure phase	.	.	.	Y	.	.	.	.	.	.	.	.	.	.	.	.	Y	
7.14	A Social Labour Plan including a skills development programme will be implemented. New Largo must bind subcontractors contractually to achieve agreed quotas for local employment. New Largo must ensure a specific focus on the employment of local youth and women. This expectation needs to be carefully managed and planned as part of the Social and Labour Plan's Skill Development Plans. The process needs to start with a skills audit to determine the skills and qualification level of the local people, with a focus on those to be resettled.	Ongoing	Y	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.
7.15	New Largo will develop a RAP when the need arises. As part of the RAP process, a livelihood restoration plan should also be developed. However, adverse livelihood impacts may emerge before the implementation of the RAP process. Care should be taken that adverse livelihood impacts are monitored, and site (or even plot) specific measures be developed to address livelihood and related impact on an ongoing base. The regular interaction by the New Largo Community Specialist with the Community Consultative Form (CCF) is an opportunity to manage and monitor potential livelihood impacts.	Ongoing	Y	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.
7.16	The choice of post-closure land use must consider opportunities to maximise livelihood opportunities. People should gain access to rehabilitated land for livelihood purposes, where feasible. Careful consideration must be taken on how to transform existing infrastructure to	Ongoing	.	.	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8	PUBLIC RELATIONS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Negative public perception of construction and mining activities and new developments and community discontent and mobilisation.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Goals and Objectives:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Maintain transparent communication with project affected community.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Keeping project affected community up to date with developments at the New Largo Colliery.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Maintain community based license to operate.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Be transparent, accessible and understanding to community issues and concerns.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.1	Registered IAPs, the owners or occupants of land adjacent to mining area, tenants living on New Largo Coal (Pty.) Ltd. land, the farming community, people living in Kendal Forest Holdings, Voltargo and representatives from Phola and the local municipality to be provided with the names and contact details of the ECO, the New Largo Coal (Pty.) Ltd. Health and Safety representative, the New Largo Coal (Pty.) Ltd. Public / Community Liaison Officer, and relevant New Largo Coal (Pty.) Ltd. or contractor staff responsible for dealing with emergencies such as fires and dangerous conditions on and around the New Largo Colliery.	Prior to the start of construction, to be updated as required.	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.2	Implement measures to ensure access to homesteads and amenities are provided at all times. Access not to be disrupted / restricted without consent of the landowner and occupier of the land.	Monthly, or as required	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.3	Should any disruption of services be required during construction activities, the affected parties to be informed at least two (2) days in advance.	As required	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.4	The ECO will arrange regular meetings with I&APs, to:	Quarterly during construction. Annual during operation or as required.	Y	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.4.1	Maintain open lines of communication between New Largo Coal (Pty.) Ltd. and environmental monitoring committee members and to provide a forum to air their comments, complaints and concerns about the project.	as above	Y	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.4.2	Inform / remind I&APs about the complaints register and procedures for lodging a complaint, and provide feedback on complaints received since the previous meeting.	as above	Y	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.4.3	Identify unresolved issues and disputes and discuss the need for dispute resolution and inform / remind environmental committee members about their right to contact the EA to discuss unresolved issues and disputes regarding environmental matters.	as above	Y	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8.4.4	Discuss water and other environmental issues affecting the farming community.	as above	Y	Y	Y	.	.	.	.	.	.	.	.	.	.	.	.	.	.

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
8.4.5	Discuss and present a summary of information submitted to authorities as part of quarterly / annual reports (i.e. on air, water, noise, blasting, water monitoring, water releases to streams and rehabilitation).	as above	Y	Y	Y														Y
8.4.6	Results of EMP compliance inspections and auditing activities.	as above	Y	Y	Y														
8.4.7	Discuss security management, safety, firebreaks and general maintenance issues.	as above	Y	Y	Y														
8.4.8	Discuss relevant matters of concern with the attendees.	as above	Y	Y	Y														
8.4.9	Give feedback of concerns and issues discussed at previous meetings and measures that were where taken to address and resolve previously raised concerns and issues.	Quarterly during construction, annually thereafter	Y	Y	Y														
8.5	I&APs may request an independent party to facilitate the meeting if issues raised at the meetings are not being resolved.	Quarterly during construction, annually thereafter	Y	Y	Y														
8.6	New Largo Coal (Pty.) Ltd. to appoint a Public / Community Liaison Officer to assist with management of social impacts and dealing with community issues.	Ongoing	Y	Y	Y														
8.7	Design and implement a public and community communication and liaison strategy.	Prior to the start of construction, to be updated as required.	Y	Y	Y														Y
8.8	Inform communities about employment procedures, and feedback on training and employment of people from the local community.	Ongoing	Y	Y															
8.9	Ensure all local community groups are included and involved and that the strategy is adapted to the special concerns of the different local community interest groups. Conduct regular meetings with these groups, which include:	Quarterly during construction. Annual during operation or as determined based on	Y	Y	Y														
8.9.1	Farm workers and other people living informally within the mining right area.	as above	Y	Y	Y														
8.9.2	People from Kendal Forest Holdings.	as above	Y	Y	Y														
8.9.3	People from Voltargo (Wilige Village).	as above	Y	Y	Y														
8.9.4	Representatives from Phola township.	as above	Y	Y	Y														
8.9.5	Local farming community.	as above	Y	Y	Y														
8.9.6	Directly affected businesses.	as above	Y	Y	Y														
9	SOCIAL DISPLACEMENT AND DIRECT IMPACTS ON NEIGHBOURS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Displacement of people living on and in close proximity to the land to be mined.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Impacts on property values.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Impacts on boreholes.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Relocation of people.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Vibration and blasting, causing houses to crack.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Noise.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Goals and Objectives:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Mitigate displacement of property owners, mostly farmers and farm workers and other landowners that will be directly affected residing in Ogies, Phola Town, Wilige (Voltargo) and Kendal Forest Holdings.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Address the issues around the displacement of farm workers and other people living on the land where mining will take place.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9.1	Engage with affected parties to be relocated and develop and implement a plan for the relocation of people in accordance with best practices and guidelines. (i.e. IFC guidelines on relocation action plans).	Prior to mining of areas where people reside	Y	Y				Y	Y							Y			

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																			Project Phase						Applicable Project Activities						Action
EMP Number	Management Measures	Scheduling	Construction (Includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
9,2	Where land is bought by New Largo Coal (Pty.) Ltd., give previous owner of land first choice to rent. After that give preference to local farmers that to be impacted on by the mine. Keep record of contractual agreements.	As required	Y	Y				Y	Y						Y				
9,3	If there is a case where parties believe that they are negatively affected by the New Largo Colliery (i.e. due to loss of land, land fragmentation, changes in access to businesses and residences, travel distances, impacts on water supply and boreholes, property values and general disruptions due to dust, noise and blasting), New Largo Coal (Pty.) Ltd. will investigate these claims and will discuss and agree mitigation measures (i.e. measures to avoid, reduce, manage and /or compensate for impacts) based on negotiations with the claimants.	As required	Y	Y	Y		Y	Y							Y				
9,4	Where land is owned by New Largo Coal (Pty.) Ltd., the conditions of agreements with tenants and occupiers of the land to be honoured. New Largo Coal (Pty.) Ltd. to provide clear and comprehensive information on the project timeframes and impacts to affected tenants and occupiers of the land to avoid uncertainty and discontentment.	As required	Y	Y				Y	Y							Y			
9,5	New Largo will conduct a crack survey to determine the conditions of the houses before mining and during mining. It is recommended that the results of the crack survey be shared with the households. Such surveys should be updated regularly, as recommended by the blast and vibration specialist, depending on the intensity of the mining and the proximity of the houses.	Prior to construction, as required	Y	Y				Y											
9,6	Stakeholders must be informed of any changes regarding the relocation process. This information needs to be shared as soon as possible. Not sharing may lead to rumours and related social mobilisation. The regular interaction with the Community Consultative Forum (CCF) would be an appropriate mechanism to share this information.	Ongoing	Y	Y			Y	Y											
10	COMPLAINTS REGISTER AND MANAGEMENT																		
	Environmental Aspect / Impact Source:																		
	Complaints by third parties of environmental nuisance.																		
	Goals and Objectives:																		
	Adequately assess root cause of complaints in order to develop and implement appropriate corrective actions and prevent complaints from recurring.																		
	Key Performance Indicators:																		
	Complaints procedure in place and communicated to I&APs.																		
	Record of complaints /grievances investigated and corrective actions taken.																		
	Minutes of meetings.																		
	Mitigation Measures:																		
10.1	The detailed complaints procedure to be developed and kept up to date at all times.	At start of construction phase, Ongoing thereafter	Y	Y	Y														
10.2	The complaints procedure is to be communicated to local residents through a variety of media and placed at accessible locations	At start of construction phase, annually thereafter in areas where mining activities are within 3 km from sensitive receptors (i.e. residences)	Y	Y	Y	Y													
10.3	Suggestions, complaints and grievances to be reported in writing or in person as per the complaints procedure.	As required	Y	Y	Y														
10.4	When a complaint / grievance has been lodged, the ECO (or Public / Community Liaison Officer or alternative New Largo Coal (Pty.) Ltd. management staff member) will inform the party who lodged the complaint / grievance that they are allowed to contact the EA to discuss their complaints. This is to ensure that they have an alternative channel if they feel their complaints are not being resolved through the normal complaints management procedures followed by New Largo Coal (Pty.) Ltd..	As required	Y	Y	Y														
10.5	All complaints / grievances are to be investigated and appropriate corrective actions to be implemented, including measures to prevent recurring complaints.	As required	Y	Y	Y														

A	EMP Number	C	Scheduling	D	E F G H I J K L M N O P Q R S V				Y														
					Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure		All activities	Earthworks, Soil Management, Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Action		
	10.6		All disputes between New Largo Coal (Pty.) Ltd. and an interested or affected party (cases open for more than sixty (60) calendar days) and recurring environmentally related complaints (complaint / grievance recurring more than three (3) times) to be dealt with in accordance with the stakeholder engagement plan.	As required	Y	Y	Y																
	10.7		A complaints procedure must be developed for post-closure phase.	As required			Y																
	11		STAKEHOLDER ENGAGEMENT PLAN																				
			Environmental Aspect / Impact Source: Interested and affected parties disgruntled about unresolved complaints and environmental issues and impacts associated with the project. Disputes between New Largo Coal (Pty.) Ltd. and an interested or affected party about unresolved complaints or environmental issues and impacts associated with the project. Interested and affected parties concerned that they do not have access to an independent third party that would assist them with unresolved environmental issues, complaints and disputes between them and with New Largo Coal (Pty.) Ltd.																				
			Goals and Objectives: Put in place a stakeholder engagement plan to deal with disputes and unresolved complaints about environmental issues and impacts. Pro-actively identify, analyse and engage all relevant stakeholders, create and maintain relationships with stakeholders that can sustain and allow for mutual benefit; build and maintain stakeholder trust; attend to and address stakeholder issues proactively with a view to reaching as much agreement as possible; facilitate dialogue and manage conflict; meet regulatory/statutory requirements; enable participation by adopting an approach that enables stakeholders to engage willingly and freely and to reach as much agreement as possible; build the capacity of stakeholders to engage in the process; engage in culturally appropriate ways; take diverse approaches that suits the diverse needs of stakeholders; proactively plan engagement of stakeholders to meet specific objectives and seek predetermined outcomes; seek a high level of participation by stakeholders; ensure extensive communication with stakeholders at all stages of the process; establish a proactive and reactive communication strategy; inform stakeholders through regular, useful, general and targeted communications; create well-defined and open channels for two-way communication; address all stakeholder interests and issues through the engagement process; ensure there is the necessary capacity to achieve the purpose of the stakeholder engagement strategy.																				
			Reduce any community concern about crisis preparedness.																				
			Ensure that local communities and emergency services have an adequate understanding of the nature of the facility or site and the risks it presents.																				
			Reduce any adverse impacts of emergencies on the reputation of Thermal Coal and its relationship with stakeholders.																				
			Maximise the effectiveness of emergency response plans.																				
			Mitigation Measures: New Largo Coal (Pty.) Ltd. management in conjunction with community / public liaison officer to develop a stakeholder engagement plan. The procedure to be presented to the environmental monitoring committee.		Y	Y	Y																Y
	11.2		Maintain a record of all stakeholder comments and keep track of the public participation process. Commitments made to stakeholders should be recorded.		Y	Y	Y																
	11.3		Stakeholder engagement in emergency planning should be undertaken in the context of pre-existing emergency plans (OHSAS 18001 and ISO 14001).		Y	Y	Y																
	11.4		New Largo Coal (Pty.) Ltd. management in conjunction with community / public liaison officer to develop a Social Management System to include a complaints and grievance procedure for receiving, managing, investigating and responding to stakeholder complaints in a timely and respectful manner		Y	Y	Y																
	11.5		I&APs that are not satisfied with the structure and application of the stakeholder engagement plan procedures and associated Social Management System or the way unresolved issues and complaints are dealt with by New Largo Coal (Pty.) Ltd. may bring this to the attention of the competent authorities (DWS, MDEDET and DMR).	Ongoing	Y	Y	Y																
	11.6		During construction, affected stakeholders should be involved in monitoring and assessing the project's impacts and the efficacy of the mitigation measures implemented.	Construction	Y																		

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
EMP Number	Management Measures	Scheduling	Project Phase				Applicable Project Activities										Action		
			Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
11.7	Make transport available to meetings for selected stakeholder's (those who generally don't have access to private or safe transport).	Ongoing	Y	Y	Y														
11.8	Develop a stakeholder engagement plan specific for post-closure phase.	Prior to post-closure phase				Y													Y
12	ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS																		
	Environmental Aspect / Impact Source:																		
	Depletion of natural energy resources.																		
	Contribution to climate change.																		
	Electricity use.																		
	Fuel use.																		
	Removal of vegetation (loss of carbon sequestered in vegetation cover).																		
	Goals and Objectives:																		
	Optimisation of natural resource consumption and conservation.																		
	Minimise energy consumption, create awareness and encourage all staff to use energy sparingly.																		
	Reduce carbon emissions.																		
	Minimise vegetation removal.																		
	Maximise carbon sequestration through appropriate rehabilitation practices.																		
	Mitigation Measures:																		
12.1	Pay particular attention to energy and carbon reduction measures as part of project design.	Design	Y	Y															Y
12.2	Develop a carbon reporting system and calculate carbon emissions (consumption of fuel and electricity) in line with corporate reporting requirements on a regular basis, implement improvement actions based on the results.	Put in place prior to operation, report monthly		Y	Y	Y													Y
12.3	Conduct energy audits and implement improvement actions based on the results.	As part of detailed design, annually thereafter	Y	Y	Y	Y													Y
12.4	Optimise carbon sequestration potential of mine pit rehabilitation, as integral part of end land use planning, through careful selection of vegetation for rehabilitation. Audit the long-term success of the initiatives.	Ongoing, initiatives audited annually		Y	Y	Y													Y
12.5	Pursue carbon off-set initiatives (i.e. alternative energy projects and focussing on projects that would benefit the local community). Audit the long-term success of the off-set initiatives.	Ongoing, projects audited annually		Y	Y	Y													Y
13	HERITAGE RESOURCES																		
	Environmental Aspect / Impact Source:																		
	There are a number of known graves located within the area of disturbance (mine pit, Pit F and surface infrastructure footprints; not Pit H, D or Phase 0 footprints), as identified during a heritage survey of the mining area.																		
	In some parts of the mining area, the grass cover is tall and dense, making the detection of sites, features and objects of cultural significance very difficult. There is thus a real possibility that unknown graves exist within the mining and surface infrastructure areas. A grave site was recorded close to the southern boundary of the proposed Pit F development.																		
	The extensive nature and long life of the mine, together with fact that there are still people living on the land increases the risk of unknown graves being present.																		
	The long life of the mine could result in a situation where buildings and structures that were not classified as historical buildings at the time of the heritage survey, will obtain such status during the life of the mine.																		
	Although no fossils have been identified, it is always possible that chance find fossils could be unearthed when construction related activities (e.g. digging, drilling, blasting and excavating of foundations, trenches, channels and footing and removal of overburden) are being undertaken.																		
	Goals and Objectives:																		
	Implement measures to avoid disturbance or loss of important heritage sites and artefacts, including graves and fossils.																		

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report	
			Project Phase			Applicable Project Activities												Action		
	Mitigation Measures:																			
13.1	Graves located in the mine pit and surface infrastructure footprint areas to be relocated by a specialist in the field and according to applicable legislation and best practices, and with the necessary permits and approvals in place. As a general rule, graves located within 50 m from a disturbing activity to be relocated, but each site to be evaluated on a case by case basis.	Prior to disturbance of the area where the graves are located.	Y																	
13.2	Graves that are not relocated shall be demarcated with a proper boundary fence and providing an entrance gate for potential visitors (descendants/family members of the deceased). The site must be sign-posted as a Grave Site and has to be cleaned and each grave marked, numbered and included in a Graves Register. A Graves Management Plan can also be considered and implemented as part of the Development. For the grave site on the southern boundary of Pit F, a 30m buffer zone (from the outside boundary fence of the site) will also have to be adhered to, with no development allowed in this exclusion zone.	Prior to disturbance of the area where the graves are located.	Y	Y	Y		Y													
13.3	Known graves located on the periphery of the area where disturbances will take place (within the area potentially affected by the movement of mining equipment, vehicles and personnel on foot) to be demarcated (i.e. high viz netting / fencing) and protected from damage.	Prior to construction	Y				Y													
13.4	Conduct a follow-up survey to ensure that all noticeable graves and historical buildings and structures (including those that would obtain historical status over the life of the mine) are identified. The survey should be conducted timeously to allow for the necessary approvals for relocation / destruction to be in place prior to disturbance of the land. The survey can be done in sections as the opencast mining activities advance over the life of the mine.	As required based on mine schedule	Y	Y			Y											Y		
13.5	If heritage features (such as an unknown grave or artefact) are unearthed / exposed during excavation, soil stripping or earthworks, reasonable measures are to be implemented to prevent further damage to the grave or artefact. The following will apply:	As required	Y				Y													
13.6	Work around an unearthed grave or artefact to be stopped immediately and the New Largo Coal (Pty.) Ltd. PM / GM to be notified.	As required	Y				Y													
13.7	The New Largo Coal (Pty.) Ltd. PM / GM to demarcate the site and seek advice from a suitably qualified archaeologist/historian/specialist and develop appropriate procedure relating to relocation / removal of heritage artefacts if required.	As required	Y				Y											Y		
13.8	Opportunity to be provided for the examination and identification of the artefact by a suitably qualified specialist.	As required	Y				Y													
13.9	The artefact to not be removed and work at the site to not resume until clearance is given by the specialist for removal or work to continue.	As required	Y				Y													
13.10	The artefact or grave to not be destroyed, disturbed or relocated until the necessary permits have been obtained.	As required	Y				Y													Y
13.11	The New Largo Coal (Pty.) Ltd. PM / GM to inform the South African Heritage Resources Agency (SAHRA) of any new heritage finds and will ensure the necessary permits and approvals are put in place.	As required	Y				Y													
13.12	No graves are to be relocated unless the necessary permits and approvals are in place and applicable legislation has been adhered to.	Ongoing	Y																	
13.13	If fossils are unearthed when construction related activities (e.g. digging, drilling, blasting and excavating of foundations, trenches, channels and footing and removal of overburden) are being undertaken, the following procedure must be implemented: All construction activities must be stopped, and a 30 m no-go barrier constructed; Construction workers must be informed that this is a 30 m fenced no-go area; SAHRA must be notified; and A palaeontologist should be called in to determine proper mitigation measures.	As required	Y				Y													

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Action	
14	NOISE MANAGEMENT Environmental Aspect / Impact Source: General construction activities in close proximity to residences, including movement of vehicles, materials handling and use of machinery and equipment during construction. Residences located within the significant noise impact zone as defined by the noise specialist study or subsequent noise monitoring. Mining equipment including trucks, shovels, drills, dozers, light vehicles, loaders and graders. Processing and handling equipment such as crushers, coal handling and preparation plant/destoning plant and load out facilities. Noise including, construction noise, operational noise, crusher noise, reverse alarms and truck hooters, haul road noise. Noise-sensitive locations within 1.5 km distance from the operation, or within 250 m from the road edge of product trucking routes. Goals and Objectives: Minimise noise in close proximity to residences. Mitigate noise disturbance at night. Minimize the noise impact of blasting. Reduce crusher noise. Minimise noise associated with reverse alarms and truck hooters. Minimise haul road / destoning plant noise through screening by means of waste rock dumps and berms. Manage noise impacts on noise-sensitive locations that are within 1.5 km distance from the operation, or within 250 m from the road edge of product trucking routes. Mitigation Measures:																			
14.1	Noise pollution to be kept to the minimum possible levels, to be within applicable SANS recommended standards at sensitive receptors.	As required	Y	Y			Y													
14.2	Complaints regarding noise to be registered in the complaints register in accordance with the stakeholder engagement plan and social management system developed by New Largo Coal (Pty.) Ltd. project team / Public / community liaison officer and to be investigated and managed in accordance with the incident reporting procedure.	Ongoing	Y	Y																Y
14.3	During construction, noise levels and other disturbances in close proximity to residences to be kept to a minimum especially outside daylight hours.	Ongoing during construction.	Y				Y													
14.4	If there is a case where parties believe that they are affected by noise from the New Largo Coal Project, New Largo Coal (Pty.) Ltd. will investigate the claims and will discuss and agree noise monitoring to be instituted in the case of credible complaints. Appropriate mitigation measures will be implemented based on the outcome of the monitoring and discussions with the claimants.	As required	Y	Y			Y												Y	
14.5	Where the destoning plant, crusher (or tip) noise affects sensitive receptors, impacts to be mitigated by partial enclosure and selective acoustic screening of units where practically possible. Ideally, berms / waste facilities should be planned to act as screens to reduce noise at nearby sensitive receptors.	Design / Construction / Operation	Y	Y				Y	Y		Y									
14.6	The mine to instruct drivers and fleet owners of trucks to use hooters in a disciplined manner for purposes of safety only, not for signalling or any other purpose. The mine to be very strict in enforcing this rule and to verify compliance.	Construction / Ongoing Operation	Y	Y							Y									
14.7	Use buzzer type alarms (which produce a hissing sound) on vehicles operating on the mine, waste rock dumps in particular. This measure must be implemented on all vehicles and adhered to by contractors and to be strictly enforced.	Construction / Operation	Y	Y				Y	Y		Y									
14.8	If practically possible, erection of temporary berms to reduce the noise impacts at nearby sensitive receptors along the moving mining front.	Design / Pre construction	Y	Y			Y													
14.9	Temporary storage or placement of overburden and waste material on berms or dumps which can act as noise screens. For a berm to be effective as a noise screen, it has to be located close to the source of noise and be at least high and long enough to break the line-of-sight between the source of noise and the noise-sensitive receiver.	Construction / Operation	Y	Y			Y													
14.10	Final decision as to where the noise mitigation be put in place to be based on final results of noise assessment and evaluation of sensitive receptors along the final route alignment, landownership and negotiations between New Largo Coal (Pty.) Ltd. and third-party property owners and tenants.	Design, prior to construction	Y	Y																

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																			Project Phase						Applicable Project Activities						Action
EMP Number	Management Measures	Scheduling	Construction (Includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
14.11	Noise survey to be carried out shortly before commissioning to measure noise levels at reference points in the area most likely to be affected (as per recommendations by noise specialist).	Prior to operation / Design / thereafter annually or as required	Y	Y														Y	
14.12	Follow up noise survey immediately after commissioning to measure noise levels at reference points in the area most likely to be affected (as per recommendations by noise specialist).	Operation		Y														Y	
14.13	Potential noise disturbance at night, should such a problem arise, can be mitigated by limiting construction to daytime hours (i.e. 06:00 to 22:00).	Operation	Y	Y															
15	BLASTING AND VIBRATIONS																		
	Environmental Aspect / Impact Source:																		
	Coal blasting, presplit blasting, blasting of narrow parting layers between coal seams.																		
	Over-charged blast holes.																		
	Blasting near sensitive receptors (fly rock, airblast and vibrations).																		
	Use of blasting chemicals (associated with dissolved explosive salts and nitrous oxides).																		
	Blasting and vibrations causing houses to crack.																		
	Goals and Objectives:																		
	Minimise impacts of blasting (fly rock, vibrations and airblast) in mining areas close to where people live, and damage to third party property.																		
	Avoid damage to mining equipment and machinery (i.e. the dragline).																		
	Ensure safety of humans and animals and those travelling on nearby public roads during blasting operations.																		
	Minimise nitrous oxides escaping during blasting.																		
	Prevent water pollution from occurring due to dissolved explosive salts.																		
	Control vibration and airblast to within acceptable limits.																		
	Control fly rock.																		
	Mitigation Measures:																		
15.1	A 500 meter safety zone around the perimeter of blasting to be maintained and evacuated during blasting, unless approval for relaxation of the 500 m safety zone has been obtained from the relevant authorities.	When mining occurs close to occupied residence / areas where people live.	Y	Y	Y				Y										
15.2	Limit vibration to below 7.0 mm/s at points of concern such as occupied residences / areas where people live.	When mining occurs close to occupied residence / areas where people live.	Y	Y	Y				Y										
15.3	Air blast levels should not exceed 128 dB at points of concern such as occupied residences / areas where people live.	When mining occurs close to occupied residence / areas where people live.	Y	Y					Y										
15.4	Strict control needs to be applied to prevent fly rock where blasting occur 1200 m from any occupied residence and areas where people live.	When mining occurs close to occupied residence / areas where people live.	Y	Y	Y				Y										
15.5	Apply appropriate blasting practices near sensitive mining equipment.	As required	Y	Y					Y										
15.6	Apply appropriate blasting practices near the old underground mining workings to minimise the risks of spontaneous combustion.	As required	Y	Y					Y										
15.7	To prevent water pollution occurring from dissolved explosive salts use water-proof explosives and provide effective bunding to contain spillages of explosives from storage silos and when transferring explosives materials to and from the silos.	As required	Y	Y					Y										

A	EMP Number	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																				Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Action
		Management Measures																		
15.8		Should any nitrous oxide fumes be observed during a blast, blasting activity to be halted and the cause of the fumes identified and corrected.	As required	Y					Y											
15.9		Suitably qualified blasting specialists to oversee blasting design and practices in sensitive areas.	Ad hoc during construction, ongoing during operations	Y					Y										Y	
15.10		The ECO to register complaints about blasting damage as per the complaints procedure.	As required	Y																Y
15.11		The ECO to register environmental damage caused by blasting as per the incident reporting procedure.	As required	Y																Y
15.12		Implement a routine vibration monitoring programme based on where impacts are predicted (i.e. where sensitive receptors are located within 1200 m from mining and blasting activities).	As required	Y					Y										Y	
15.13		If there is a case where parties believe that they or the environment has been negatively affected due to vibration, fly rock or air blast, New Largo Coal (Pty.) Ltd. will investigate these claims and will discuss and agree on monitoring to be undertaken and will implement mitigation measures based on the monitoring results and discussions with the claimants.	As required	Y																
15.14		Blasting should take place at designated times during the day. Blasting to be limited to daylight hours. Early morning hours should be avoided unless required for safety reasons.	Ongoing	Y																
15.15		People residing in the vicinity of the blast zone to be notified of the blasting schedule.	As required	Y																Y
15.16		Adequate warning to be provided immediately prior to blasting to people within with blast zone.	Ongoing	Y																Y
15.17		Design blasts for vibration amplitudes below 25 mm/s at any part of the Transnet pipeline.	Ongoing	Y																
15.18		Design blasts for vibration amplitudes below 50 mm/s at any part of other pipelines.	Ongoing	Y																
15.19		Design blasts for vibration amplitudes below 50 mm/s at part of the Eskom powerline.	Ongoing	Y																
15.20		Design blasts for vibration amplitudes below 150 mm/s at any part of the road (R545, N4, N12).	Ongoing	Y																
16		AESTHETICS, HOUSEKEEPING AND VISUAL IMPACTS																		
		Environmental Aspect / Impact Source:																		
		Alteration of the visual and landscape character of the immediate surroundings.																		
		Site development, earthworks, lighting.																		
		Proximity of project to the N12 (tourist route) and residences.																		
		Opencast mining activities - Site Development, Earthworks, Screening, Access Roads, Lighting																		
		R545 Road Re-alignment - Site Development, Earthworks, Screening																		
		Trucking of product coal to end users (customers)																		
		Lighting associated with operating activities																		
		Goals and Objectives:																		
		Maintain the visual quality and appeal of New Largo Colliery and surroundings.																		
		Mitigate visual impacts of opencast mining activities																		
		Mitigate visual impacts of the R545 re-alignment																		
		Mitigation Measures:																		
16.1		The appearance of buildings and structures to be as visually pleasing as possible, design considerations to cover: colour, height and lighting design.	Design, and as required thereafter	Y	Y							Y	Y	Y						
16.2		Ensure good housekeeping and litter control and general site cleanliness.	Ongoing	Y	Y															
16.3		Reinstatement of vegetation to be done as per the rehabilitation plan in order to minimise the visual impact of the project.	Ongoing	Y	Y															
16.4		Detailed design of the project to include a landscape design plan to address:	Prior to construction / operation / As required / ongoing	Y	Y															Y
16.4.1		Visual screening (trees, shrubs or berms) in areas where the surface infrastructure and active mining areas visible from third-party owned residences located within 800 m from the mine surface infrastructure or mine pit. Each affected residence (farm homesteads, Kendal Forest Holdings and Voltargo) to be dealt with on a case by case basis and based on discussions with the affected landowners.	Prior to construction / Design / As required	Y	Y			Y												

A EMP Number	C Scheduling	D Construction (includes pre-construction)	E Operation	F Decommissioning and Closure	G Post Closure	H All activities	I Earthworks, Earthwork Management	J Mining Activities	K Coal Processing & Discard Management	L Materials Handling and Transport	M Supporting Infrastructure	N Water Management	O Waste Management (Non-Mineralogical)	P Rehabilitation	Q R545 Road Deviation	R Training	S Monitor/Auditing	V Procedure, Plan or Report	
																			Applicable Project Activities												Action
16.5	The design of and management of soil and overburden stockpiles, particularly when located near public roads and residences to be as such to avoid these stockpiles becoming a visual impact. Design considerations to cover: height, side slope angles, erosion control, alien vegetation control, and re-vegetation to improve the appearance of the stockpiles.		Y				Y		Y										
16.6	Wherever possible, all existing natural vegetation to be retained and incorporated into the site rehabilitation, especially in line of sight from sensitive viewers to mitigate visual impacts, particularly where the sensitive viewers are within 800 m from the mine surface infrastructure or mine pit.	Y	Y			Y								Y					
16.7	Minimise the areas of disturbance. Only the footprint of the proposed surface infrastructure, laydown areas and active mine areas to be exposed. In all other areas the vegetation to be retained to mitigate visual impacts.	Y	Y			Y													
16.8	Rehabilitation of mined out areas to occur as soon as possible according to the rehabilitation plan.		Y	Y				Y						Y					
16.9	Dust suppression to be in place at all times to avoid excessively visible dust plumes from hauling, earthworks, materials handling, crushing and screening, tipping, trucking of coal, etc.	Y	Y				Y	Y	Y	Y	Y	Y	Y						
16.10	Appropriate blasting design to be in place at all times to minimise visible dust plumes associated with blasting.	Y	Y					Y											
16.11	The negative impact of night lighting, glare and spotlight effects to be mitigated by using appropriate lighting design. Including:	Y	Y			Y													
16.11.1	Measures to reduce the overall night-time glare effect of the New Largo Colliery as a whole.	Y	Y			Y													
16.11.2	Avoid high pole top security lighting along the periphery of the site where visible from residences.	Y	Y			Y													
16.11.3	Installation of light fixtures that provide precisely directed illumination to reduce light 'spillage' beyond the immediate surrounds of the sites wherever possible, but particularly near residences.	Y	Y			Y													
16.11.4	Boundary / fence lights to be positioned in such a way that impacts on nearby residences are minimised. Where feasible, use lights that are activated by motion sensors to detect illegal entry to the site.	Y	Y			Y													
16.12	Pay particular attention to the impact of lighting where residences located within 800 m from the site boundary.	Y	Y			Y													
16.13	Implement visual screening, where practically possible, of the R545 road (new deviation) where this new road is located in close proximity (< 200 m) to third party residences, using trees.	Y	Y												Y				
16.14	Conduct visual and lighting audits and implement corrective action based on the lighting audit, giving particular attention to the overall night-time glare effect of the New Largo Colliery as a whole, impact of lighting on residences located within 800 m from the site boundary and impact on public roads.	Y	Y			Y											Y		
17	AIR QUALITY MANAGEMENT																		
	Environmental Aspect / Impact Source:																		
	Elevated baseline dustfall and PM ₁₀ levels in the area.																		
	The number one impact source is vehicle entrained dust from unpaved roads due to the transportation of ROM coal from open pits to processing /destoning plant/power stations and transportation of topsoil and overburden/interburden from open pits to stockpiles or areas where the materials are placed as part of backfilling and rehabilitation of the mine pits.																		
	Other impact sources include materials handling, mining operations, crushing and screening, destoning plant, blasting, stockpiled material (coal, overburden and soil)																		
	Handling of debris during demolition.																		
	Spontaneous combustion due to old underground mine workings and coal stockpiling.																		
	Goals and Objectives:																		
	Install, operate and maintain appropriate air emission abatement technologies as part of project design.	Y	Y																
	Develop and implement appropriate dust control measures according to the risk profile of the project.																		
	Minimise airborne coal dust liberation.																		
	Minimise coal dust impacting on stream and wetland crossings.																		
	Maintain visibility along roads to ensure road safety for employees and people in area.																		
	Install, operate and maintain air emission abatement technologies appropriate to the dust generating activities such as crushers, tips, transfer stations, that could have significant adverse impacts on ambient air quality.	Y	Y																

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	Target dust emission rates for specific operations: Dustfall at sensitive receptors to be <600 mg/m ² /day (residential levels). Dustfall immediately downwind of the stockpiles, haul roads and other sources to be <1200 mg/m ² /day. Absence of visible dust plume at all tipping points, transfer stations, and outside the crushers during operations as indicator of effective control equipment in place. PM10 to comply with national ambient air quality standards. PM2.5 to comply with national ambient air quality standards (draft standards until standards are finalised).																				
	Key Performance Indicators: Air quality monitoring report. Dust monitoring network. No complaints about dust. No complaints about smells or smoke (related to mine fires / spontaneous combustion).	Ongoing	Y	Y	Y																
	Mitigation Measures: Air quality and meteorological monitoring programme to be kept in place and maintained. Monitoring will include: 17.1 A dustfall monitoring network (directional and non-directional dust buckets). 17.2.1 Two PM10 monitoring and a PM2.5 monitoring station. 17.2.2 Meteorological monitoring including relative humidity, rainfall, solar radiation, wind speed, wind direction and ambient temperature. 17.2.3 Chemical dust suppressants on unpaved haul road surfaces to control vehicle entrainment on haul roads to 90% control efficiency. 17.3 Adequate stocks of chemical dust suppressants / wetting agents to be held on the mine and used as necessary. 17.4 Effective water sprays on unpaved road surfaces (including product trucking routes) to control vehicle entrainment on unpaved roads (≥75% control efficiency). 17.5 Effective water sprays on temporary conveyor transfer points to control dust from materials handling operations (≥50% control efficiency). 17.6 Effective water sprays at main tipping points to control dust from materials handling operations (≥50% control efficiency). 17.7 Effective water sprays at crushing and screening activities to control dust from materials handling operations (≥50% control efficiency). 17.8 Haul trucks to be restricted to specified haul roads. 17.9 Suitable speed control measures to be put in place that are appropriate to the condition of the road, especially near sensitive receptors. 17.10 Optimise the movement of haul trucks and other vehicles with the aim to minimise travel distances and avoid unnecessary trips. 17.11 Dust generation and other disturbances in close proximity to residences to be kept to a minimum, especially during times when the wind direction is towards nearby residences. 17.12 Soil stripping and replacement during very high winds to be avoided where practically possible. A decision to stop activities to be at the discretion of the ECO, based on visual observations of dust liberation and the proximity to and impacts on sensitive receptors. 17.13 Non-essential material handling activities during very high winds to be avoided where practically possible. A decision to stop activities to be at the discretion of the ECO, based on visual observations of dust liberation and the proximity to and impacts on sensitive receptors. 17.14 Tarpaulin load covering, where possible, to prevent the generation of fugitive dusts while trucking product on public roads. 17.15 Implement suitable mitigation measures and/or at the Pit H destoning plant to mitigate the generation of fugitive dust and fine particulate emissions. These may include the following: surrounding the plant with suitable berms to act as a screens and/or installation of dust mist suppression sprays to knock out the dust at source on the destoning plant and in-pit crusher. 17.16 Strictly adhere to rehabilitation management guidelines (to ensure the size of disturbed / un-rehabilitated areas are kept to a minimum and that soil and overburden stockpiles and disturbed soil are stabilised and protected from wind erosion). 17.17 If possible, wind speed reduction measures must be implemented through sheltering for dust suppression when handling debris associated with demolition.	Ongoing	Y	Y	Y																
			Y	Y	Y																
			Y	Y	Y																
			Y	Y	Y																
			Y	Y	Y																
			Y	Y	Y																
			Y	Y	Y																
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A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
																			Project Phase	
EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report	
17.19	Suitable wet suppression methods / technologies are to be used when handling debris associated with demolition.	As required	Y	Y	Y	Y	Y													
17.20	Regularly evaluate air quality monitoring results to ensure timeous identification of problem areas and the implementation of corrective / improvement actions.	Monthly	Y	Y	Y	Y	Y											Y		
17.21	Visual inspections of unpaved roads and haul roads to ascertain efficiency of dust suppression measures to be undertaken monthly by suitable personnel such as the ECO. Implement corrective action based on findings of the inspections.	Monthly	Y	Y	Y	Y		Y										Y		
17.22	Corrective action to be implemented as required, including stopping activities generating unacceptable levels of dust.	As required.	Y	Y	Y	Y	Y													
17.23	Keep all air quality monitoring data on record on an ongoing basis. Report on air quality monitoring results as required by the environmental monitoring committee / authorities / auditors / by permit conditions.	Ongoing / As required	Y	Y	Y	Y												Y	Y	Y
17.24	Make the air quality monitoring report available to authorities on their request or as required by permit conditions.	Annually	Y	Y	Y	Y												Y	Y	Y
17.25	I&APs to be given access to monitoring results at environmental monitoring committee (EMC) meetings and community liaison forum meetings, or upon reasonable request.	Annually	Y	Y	Y	Y												Y	Y	Y
17.26	Develop and implement an air quality management plan that is specific to the site operations and adapted to the air quality monitoring results.	Prior to operation, reviewed annually		Y	Y	Y	Y													Y
17.27	Work with the local municipality and pursue and implement air quality off-set projects (i.e. energy efficient domestic fuel burners, and demand management initiatives) in neighbouring communities where baseline air quality levels are elevated (i.e. energy efficient domestic fuel burners, and demand management initiatives) and audit the long-term success of the off-set initiatives.	Ongoing, projects audited every three years in line with the community engagement programme		Y	Y	Y														Y
17.28	Complaints regarding dust to be registered in the complaints register and to be investigated and managed in accordance with the complaints procedure.	As required	Y	Y	Y	Y														Y
17.29	Visual inspections to ascertain efficiency of dust suppression measures must be undertaken by suitable personnel such as the ECO. Areas to be inspected include unpaved roads, haul roads, conveyor transfer points, main tipping points, crushing and screening, and active rehabilitation areas.	Ad hoc but at least weekly and during very high winds.	Y	Y	Y	Y	Y											Y		
17.31	An air quality post-closure management plan must be implemented and take into account air quality management issues relating to the water treatment plant and post-closure land uses.	Prior to post-closure phase			Y	Y														Y
17.32	Update the air quality cumulative impact assessment for the mine, taking into account Pits D, H and F (i.e. undertake a site wide model update), to assess and confirm the area-wide cumulative impacts	Once off	Y			Y	Y													Y
18	SPONTANEOUS COMBUSTION MANAGEMENT																			
	Environmental Aspect / Impact Source:																			
	Spontaneous combustion of coal is a fire initiated by the oxidation of coal. Coal fires require three basic elements to exist, i.e. oxygen, heat and fuel.																			
	Spontaneous combustion risks are increased in areas where mining takes place through old underground mine workings.																			
	Stockpiling of coal, or waste dumps containing discard coal material, in unconsolidated heaps where oxygen can come into contact with the coal and heat cannot dissipate.																			
	The problem is compounded when rainfall causes erosion, thereby progressively exposing more coal to the oxygen in the atmosphere.																			
	While it is unusual for intact (virgin) seams to burn in the highwall, the most common occurrence is when surface mines extract seams previously partially mined by underground board and pillar operations. Once exposed to the air the pillars that were left over from the previous mining operations start to burn within days and require special prevention and control techniques.																			
	Goals and Objectives:																			
	Install, operate and maintain technologies to avoid and control spontaneous combustion.																			
	Key Performance Indicators:																			

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V			
																			Project Phase		
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	No safety incidents caused by spontaneous combustion. No complaints about smells or smoke (related to mine fires / spontaneous combustion).																				
	Mitigation Measures:																				
	Stockpiles:																				
18.1.1	Avoid stockpiling of coal for longer than the time taken for heating to occur (dependent on quality and characteristics of the coal), if practically possible.	Ongoing	Y	Y						Y	Y	Y									
18.1.2	Provide appropriate fire protection and water cannons in high risk areas.	Ongoing		Y						Y	Y	Y									
18.1.3	Where space and site conditions allow, place stockpiles according to the prevailing winds to minimise the impact of wind on spontaneous combustion, where possible and bounded to space availability.	Ongoing		Y						Y	Y	Y									
18.1.4	Appropriate control measures to be adopted if hot or burning material is noticed. Measures to be implemented will depend on the specific situation and safety risks.	Ongoing		Y						Y	Y	Y									
18.2	Mine Pit:																				
18.2.1	Coal inventory in the mine cut should not be left longer than the time taken for heating to occur, where practically possible.	Ongoing		Y						Y											
18.2.2	Implement and adhere to the buffer blasting plan to reduce risk of spontaneous combustion in the mine pit.	Ongoing		Y						Y											
18.2.3	Provide water cannons in high risk areas.	Ongoing		Y						Y											
18.2.4	Coal discard to be placed in thin layers, compacted and covered with spoils as soon as possible.	Ongoing		Y						Y											
18.2.5	Discards should not be left in unconsolidated heaps for longer than the time taken for heating to occur, where practically possible.	Ongoing		Y						Y	Y										
18.2.6	The sequence of spoiling should result in carbonaceous material being covered with non-carbonaceous spoils, where practically possible.	Ongoing		Y						Y	Y										
18.2.7	Coal spilling from the seams should not be allowed to remain against the highwall longer than the time taken for heating to occur.	Ongoing		Y						Y											
18.2.8	If the coal is likely to spontaneously combust, loose coal must be cleared away, or extinguished / covered promptly and/or the highwall reinforced with soft, spoil material if it is to be left for an extended period.	Ongoing		Y						Y											
18.2.9	When spontaneous combustion occurs, implement control measures adapted to the individual situation and the extent of the spontaneous combustion problem.	Ongoing		Y						Y											
18.2.10	At the end of the life of mine pits, complete rehabilitation and closing of the final void to take place as per the rehabilitation plan.	Ongoing		Y						Y											
18.2.11	The final landform should be such that erosion and runoff is minimised and discard coal / carbonaceous materials are not exposed to the atmosphere.	Ongoing		Y						Y						Y					
18.2.12	Post-closure monitoring must take place to ensure no spontaneous combustion is taking place.	Post closure																			
18.2.13	When spontaneous combustion occurs post-closure, implement control measures adapted to the individual situation and the extent of the spontaneous combustion problem.	Post closure																			
18.3	On-surface discard storage:																				
18.3.1	On-surface discard storage is seen as a temporary measure. Discards to be moved to the mine pit as soon as space is available to reduce exposure to oxygen in the atmosphere.	Ongoing		Y							Y										
18.3.2	Avoid placing material in unconsolidated heaps that will be kept on surface for longer than the time taken for heating to occur (dependent on quality and characteristics of the coal).	Ongoing		Y							Y										
18.3.3	Discards that are placed for longer periods of time should be placed in layers and compacted using a roller, particularly on the edges of the dump, so that the infiltration of oxygen is minimal. Layers should be no more than 5 meters thick and should be covered with at least one metre of inert (non-carbonaceous) material.	Ongoing		Y							Y										
18.3.4	Particular caution should be taken where there is segregation of material sizes because of the stockpiling/dumping technique. A layer of coarser particles at the base and edges of stockpiles may result in increased ventilation passing through the coal. The situation is particularly aggravated by prevailing hot, moist winds and this may lead to a higher risk of spontaneous combustion in the summer months.	Ongoing		Y							Y										
18.4	Monitoring for early detection of spontaneous combustion:																				
18.4.1	Spontaneous combustion is a time-dependent phenomenon. Conduct visual and olfactory inspections of potential and known problem areas for heat haze and 'steam' plumes and distinctive mine fire smells.	Ongoing		Y						Y	Y	Y									Y
18.4.2	Where required, employ more sophisticated measure to detect hot spots in known problem area, i.e. infrared monitoring or photography.	Ongoing		Y						Y	Y	Y									Y
18.5	Monitoring the impact of spontaneous combustion:																				

A	EMP Number	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																				Project Phase				Applicable Project Activities								Action
Management Measures			Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
18.5.1		Air quality monitoring programme to be kept in place and maintained. Monitoring will include:	Ongoing	Y	Y				Y	Y	Y								Y	
18.5.1.1		Continuous BTEX (benzene, toluene, ethyl-benzene, and xylenes) monitoring station.	Quarterly	Y	Y				Y	Y	Y								Y	
18.6		Control measures when hot spots / fires have been detected:																		
18.6.1		Small-scale fires in stockpiles or areas exposed by mining must be controlled by appropriate measures such as being extinguished / covered with material / flooding with water / removing the burning material or any other measure which controls the small-scale fire and further spread of it.	Ongoing	Y	Y				Y	Y	Y									
18.6.2		Caution must be taken when fighting spontaneous combustion fires with water as a dangerous chemical reaction between the water and the heated coal can occur. An alternative method is the use of fire fighting foam for larger problem areas.	Ongoing	Y	Y				Y	Y	Y									
18.6.3		Hot material can be spread out to cool and the ash disposed of in the pit. Speed and safety are essential in such operations.	Ongoing	Y	Y				Y	Y	Y									
18.6.4		Protective clothing and breathing apparatus should be provided and the equipment must be suitable for the particular work (i.e. no rubber tyres or petrol driven equipment).	Ongoing	Y	Y				Y	Y	Y									
18.6.5		Only trained fire-fighters or appropriately trained personnel to respond to spontaneous combustion fires as and when required. Details of trained personnel, including proof of their training, to be kept on file at all times.	Ongoing																	
19		FIRE PROTECTION AND RESPONSE																		
		Environmental Aspect / Impact Source:																		
		Substances such as fuels, lubrication oils, hydraulic and brake fluid, solvents, paints and anti-corrosives, insecticides and pesticides, as well as the by-products and waste associated with use of these products to be present on the site.																		
		Inappropriate storage and handling of hazardous substances could result in the release of hazardous substances into the receiving environment, resulting in air, soil and water pollution and may affect the health and well being of people, plants and animals.																		
		Goals and Objectives:																		
		Ensure appropriate storage and handling of hazardous substances to prevent pollution and health risks.																		
		Mitigation Measures:																		
20.1		A hazardous substance storage and handling procedure to be put in place and kept up to date.	Prior to construction and ongoing, reviewed and updated annually	Y	Y															Y
20.2		Ensure appropriate location of all areas where fuels, lubricants and other hazardous substances, including hazardous wastes, are handled and stored. No hazardous substances to be stored within the 1:100 year floodline or 100 m of any stream or wetland. (i.e. whichever is the greater distance)	Prior to construction, and ongoing	Y	Y										Y					Y
20.3		Ensure appropriate protection for all hazardous storage areas and areas where hazardous substances are used (i.e. drip trays, linings and bunded areas).	Ongoing	Y	Y										Y					
20.4		Ensure that appropriate containers (i.e. skips, bins or drums) are used for storage of hazardous substances and that all containers are adequately marked for easy identification.	Ongoing	Y	Y										Y					
20.5		The design of bunds for hazardous substance storage areas to be based on the volume and nature of substances stored, the risk of spillages and the following minimum design criteria:	Prior to hazardous substances being stored. Ongoing	Y	Y										Y					
20.5.1		The bunded area to accommodate 110 percent of the stored liquids.	Ongoing	Y	Y										Y					
20.5.2		The bund floor and wall to be impervious and appropriate for the substance stored (i.e. concrete and plastic lined).	Ongoing	Y	Y										Y					
20.5.3		Prevent the integrity and capacity of the bunded areas being compromised by rainwater and stormwater ingress.	Ongoing	Y	Y										Y					
20.5.4		Bunded areas that are not covered, to be provided with valves for controlled release of clean rainwater.	Ongoing	Y	Y										Y					

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V															
																			Project Phase				Applicable Project Activities								Action		
																			Construction (Includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
	Scheduling																																
	Management Measures																																
20.5.5	Bunds to be provided with appropriately sized sumps to allow for controlled pumping of contaminated liquids and contaminated rainwater and runoff likely to be experienced. Sumps to be sized for at least the 1:50 year event.	Y	Y	Y									Y																				
20.6	Prevent contamination of stormwater by correct storage of hazardous chemicals.	Y	Y	Y									Y																				
20.7	Prevent contamination of soil and down stream water courses by correct storage of hazardous chemicals.	Y	Y	Y									Y																				
20.8	Ensure adequate safety signage and fencing at hazardous storage areas.	Y	Y	Y									Y																				
	Prior to the bund being put into operation																																
20.9	The integrity of the bund to be tested (to ensure that it is impervious and that valves and sumps are fully functional).	Y	Y	Y									Y				Y																
	Prior to the bund being put into operation, every three years thereafter																																
20.10	Ensure that appropriate access is allowed for easy access and removal of waste containers (i.e. a ramp to provide access for a forklift or waste removal truck).	Y	Y	Y									Y																				
	Prior to the bund being put into operation																																
20.11	Access to hazardous substance storage areas to be controlled.	Y	Y	Y									Y																				
20.12	Ensure that the necessary approvals are in place for storage of controlled substances.	Y	Y	Y									Y					Y															
20.13	Maintain an inventory of all hazardous and controlled substances , with details about emergency response in case of spillage or personnel exposure (MSDS sheets).	Y	Y	Y									Y					Y															
	Reviewed and updated annually																																
20.14	Ensure regular inspections of all areas where hazardous substances are stored or handled.	Y	Y	Y									Y																				
20.15	A post closure hazardous substance storage and handling procedure to be put in place and kept up to date.																																
21	ABLUTION FACILITIES AND SEWAGE TREATMENT																																
	Environmental Aspect / Impact Source:																																
	Sewage sludge generated at the sewage treatment plant																																
	Goals and Objectives:																																
	Provide adequate ablation facilities.																																
	Ensure adequate treatment and disposal of sewage waste.																																
	Prevent the spread of biological contamination into the receiving environment.																																
	Prevent Health risks due to unhygienic conditions.																																
	Mitigation Measures:																																
21.1	Adequate toilet and proper sanitation facilities to be provided at all work areas, approximately one toilet per 15 staff members.	Y	Y																														
21.2	Toilets to be provided within reasonable walking distance from where employees are working.	Y	Y																														
	Ongoing																																
21.3	Toilets to be maintained to ensure hygienic conditions.	Y	Y																														
21.4	Chemical toilets to be secured to prevent them from blowing over.	Y	Y																														
21.5	Chemical toilets not to be placed in areas susceptible to flooding or within 100 m from water courses and wetlands.	Y	Y																														
21.6	Sewage sludge removed from chemical toilets and conservancy tanks (by a 'honey sucker') to be disposed off at a licensed facility for such waste.	Y	Y																														
	Ongoing																																
21.7	Provide a sewerage treatment plant that is appropriately sized to for the project and the number of personnel, including contractors.	Y	Y																														
21.8	Effluent from the sewage works to gravity feed into a pollution control dam, used for irrigation or dust suppression on unsurfaced roads, or discharged to water courses, provided discharge quality adheres to catchment WQPL.	Y	Y																														
	Ongoing																																
21.9	Sewage effluent to adhere to quality limits set for irrigation with sewage water. The quality of the effluent (including faecal coliforms) to be monitored as part of the surface water monitoring programme.	Y	Y																														
	Ongoing																																
21.10	Sewage effluent discharge to watercourses to adhere to WQPL for the catchment.	Y	Y																														
21.11	Provide sufficient ablation facilities that are linked to a septic tanks system that are emptied on a regular basis for disposal at a municipal / licensed sewage works.																																
	Continuous during construction phase																																
21.12	Sewage sludge generated at the sewage treatment plant to be removed off-site to a licenced waste disposal facility.	Y	Y																														
	Ongoing																																

A	EMP Number	C	Scheduling	D	E				G	H	I	J	K	L	M	N	O	P	Q	R	S	V
					Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure															All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Action
	22		SPILL PREVENTION, RESPONSE AND CLEAN-UP																			
			Environmental Aspect / Impact Source:																			
			Pollution or health impacts caused by inappropriate waste management practices.																			
			Goals and Objectives:																			
			Manage all waste types through the use of the waste minimisation hierarchy.																			
			1. Waste Avoidance and Reduction of the generation of waste.																			
			2. Recovery, Re-use and Recycling of the amount of waste generated.																			
			3. Treatment and Processing of waste; where applicable.																			
			4. If waste does not apply to the above mentioned, disposal (as a last resort) applies, using licensed contractors, transporters and disposal facilities which are permitted to handle and treat the various waste streams.																			
			Define and implement control measures to prevent inappropriate storage, treatment and disposal of waste.																			
			Implement appropriate waste management procedures for all waste streams.																			
			Prevent pollution or health impacts caused by inappropriate waste management practices.																			
	25.1		Waste Management Principles																			
			Mitigation Measures:																			
	25.1.1		Disposal of waste will be at registered landfill sites. There is to be no disposal of general waste or hazardous waste to land within the mining rights area unless approved as part of the waste management license.	Y	Y	Y		Y	Y													
	25.1.2		The waste management strategy is to be aligned with the IWWMP.	Y	Y	Y		Y	Y													Y
	25.1.3		For each type of waste generated:	Y	Y	Y			Y													
	25.1.3.1		Identify applicable feasible recycling and reuse techniques to assist in efficient waste management of the various waste types (including composting potential of identified waste types).	Y	Y	Y		Y	Y													
	25.1.3.2		Determine the potential risk posed associated with the various waste types if it is not managed/handled in a safe and responsible manner	Y	Y	Y		Y	Y													
	25.1.3.3		Identify the personal protection equipment required to ensure safe, responsible management/handling of the waste type.	Y	Y	Y		Y	Y													
	25.1.4		Training of all mining personnel and contractors, in the waste management system for the operation and safe handling of the various waste streams.	Y	Y	Y		Y	Y											Y		
	25.1.5		Maintain records of wastes removed from site and confirm end destination / disposal.	Y	Y	Y		Y	Y													Y
	25.1.6		Ensure that the necessary permits and training are in place for the management of engineering devices which contain nuclear sources.	Y	Y	Y		Y	Y													Y
	25.1.7		For on-site non-mineral waste facilities, compile operating manuals, procedures and codes of practice for known waste types and known quantities, prior to commissioning, in order to address significant adverse aspects and risks and or impacts.	Y	Y	Y		Y	Y													Y
	25.1.8		Ensure that all temporary storage facilities for hazardous wastes are designed and located appropriately to ensure no contamination and / or health exposure risks.	Y	Y	Y		Y	Y													
	25.1.9		Regular maintenance of the environmental controls and infrastructure must take place.	Y	Y	Y		Y	Y													
	25.1.10		Determine the hazardous properties and hazardous rating associated with each hazardous substance. Obtain the necessary classification for all the hazardous substances present on site. This will include documentation of pre-classified hazardous waste streams.	Y	Y	Y		Y	Y													
	25.1.11		Hazardous waste (including used oils, lubricants, paints, spent batteries, etc.) to be collected and temporarily stored in demarcated skips or bins, located in a covered bunded area (refer to Hazardous Substance Storage for design of bunded areas), and removed from the site to a licensed hazardous waste facility.	Y	Y	Y		Y	Y													

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V
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25.1.12	Management Measures	Ongoing	Y	Y		Y							Y					
25.1.13	Appoint approved waste transporter for hazardous substances, in accordance with regulatory requirements; to co-inside with integrated waste management strategy and associated Waste Management Procedures.	Ongoing	Y	Y		Y							Y					
25.1.14	Establish and maintain an up-to-date inventory of hazardous wastes.	Annually	Y	Y		Y							Y					Y
25.1.15	Evaluate the risks associated with the transportation, storage, transfer, handling, use and possible release of each hazardous waste.	Ongoing	Y	Y		Y							Y					
25.1.16	Ensure that training and awareness programmes cover the safe transportation, handling, storage, transfer, handling, use and disposal of all waste streams, and the location of waste receptacles for each waste stream.	Annually	Y	Y		Y							Y		Y			
25.1.17	Ensure that the inventory of hazardous substances is readily accessible and available, at all times.	Ongoing	Y	Y		Y							Y					Y
25.1.18	Waste to be separated at source to ensure that recyclable waste is not contaminated, rendering it unfit for recycling or re-use. At the salvage yard, all recyclable material to be separated and stored until such time it can be re-used, recycled (either on-site or off-site) or removed from the site.	Ongoing	Y	Y		Y							Y					
25.1.19	Appoint a waste contractor / recycling contractor (licensed if required by NEMWA) to remove wastes which cannot be reused or recycled on site, to an appropriate, licensed waste management facility (for re-use/recycling or final disposal).	Ongoing	Y	Y		Y							Y					
25.1.20	Develop procedures for addressing accidents, spills and other incidents related to the transportation, handling and storage of waste..	Prior to construction, update annually	Y	Y		Y							Y					Y
25.1.21	No waste to be burned or incinerated on site unless allowed or required by legislation.	Ongoing	Y	Y		Y							Y					
25.1.22	Access to all potentially dangerous waste management areas to be controlled and managed (brine pond, gypsum storage pad, general and hazardous waste skips / bins and salvage yard).	Ongoing	Y	Y		Y							Y					
25.1.23	Control litter on an ongoing basis.	Ongoing	Y	Y		Y							Y					
25.1.24	Ensure regular inspections and internal auditing of waste management facilities and waste handling.	Quarterly	Y	Y		Y							Y				Y	
25.1.25	Records of waste to be kept for five years and to include the following: numbers of waste bins in use for each waste type, date of pick up of waste, description of waste, cross reference to relevant waste transport documentation, quantity of waste, destination of the waste, intended end destination and fate (i.e. treatment, reprocessing or disposal).	Ongoing	Y	Y		Y							Y					Y
25.1.26	Appropriate and sufficient waste receptacles to be placed in work areas, sized in accordance with the quantities of waste generated and designed to prevent litter from being dispersed by wind, and infiltration by rain water.	Ongoing	Y	Y		Y							Y					
25.1.27	Work areas to be cleaned and all refuse to be placed in demarcated waste bins on a daily basis.	Ongoing	Y	Y		Y							Y					
25.1.28	Waste containers to be labelled for different types waste in order to keep these waste types separate and manageable.	Ongoing	Y	Y		Y							Y					
25.2	Develop a post closure integrated waste management strategy. The strategy will include a waste inventory and management measures for each waste stream generated. The post closure waste management strategy must be aligned with the IWWMP.	Prior to post closure	Y	Y		Y							Y					Y
	Organic Waste																	
	Environmental Aspect / Impact Source:																	
	Food waste and scraps from kitchen, staff dining room, canteen, offices, workshops, and any other source of organic waste types.																	
	Mitigation Measures:																	
	Appropriate demarcated bins with sealable lids, at appropriate points, for collection of organic waste, from relevant sources and temporarily storage, in skips or bins, to be provided.																	
25.2.1	On-site composting of organic wastes using the applicable risk free composting measures.	Ongoing	Y	Y		Y							Y					
25.2.2	Staff awareness training programme to accommodate training, on which bin to use for organic waste and on sealing the lid on the bin once organic waste has been discarded.	Ongoing	Y	Y		Y							Y		Y			
25.2.3	Non Recyclable General Waste																	
	Environmental Aspect / Impact Source:																	
	Plastics and paper not suitable for recycling, benign (non harmful) construction waste, wood, wrapping paper and rags (not oily rags), building & demolition materials.																	
	Mitigation Measures:																	
	Workshops, construction and operation activities, offices, etc.																	
25.3.1	Wastes not suitable for recycling to be temporarily stored in appropriate demarcated bins / skips with sealable lids at appropriate points for collection and removed from the site to a licensed waste facility.	Ongoing	Y	Y		Y							Y					

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
EMP Number	Management Measures	Scheduling	Project Phase				All activities	Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
			Construction (Includes pre-construction)	Operation	Decommissioning and Closure	Post Closure													
25.3.2	Collecting of dedicated and marked general waste bins, by licensed contractor and disposed off at offsite licensed waste management facility.	Ongoing	Y	Y	Y	Y							Y						
25.3.3	Only inert construction rubble may be applied to land as fill material during construction. Whenever inert waste is applied to land, it to be inspected by the ECO to verify that there are no hazardous or dangerous components contained in the waste. If there is any doubt then samples should be taken and sent away to a reputable laboratory for analysis to determine whether hazardous or dangerous components are contained within the rubble.	Ongoing	Y	Y	Y	Y							Y						
25.3.4	Construction effluent, which may contain cement particles and sediment, not be allowed to run into the veld. Effluent to be directed to a pollution control dam. A temporary dirty water dam must be provided when pollution control dam is not available (i.e. during the initial construction phase). No construction effluent may enter natural environment, it must be contained at all times and comply with applicable effluent standards prior to release.	Ongoing	Y	Y	Y	Y						Y							
25.3.5	Building and demolition materials and other inert construction waste to be stored in dedicated building waste areas and collected in by a licensed contractor for disposal at an licensed waste facility.	Ongoing	Y	Y	Y	Y							Y						
25.3.6	Plastic packaging that are not recyclable to be stored in general waste bins for disposal to a licensed waste facility.	Ongoing	Y	Y	Y	Y							Y						
25.4	Recyclable General Waste																		
	Environmental Aspect / Impact Source:																		
	Recyclable paper, cardboard, cans, recyclable plastics and glass, timber, metal waste.																		
	Workshops, storage areas, canteens, kitchen, offices, laydown area, crushing plant.																		
	Mitigation Measures:																		
25.4.1	Appropriately demarcated bins with sealable lids at appropriate points for collection of recyclable general wastes from relevant sources.	Ongoing	Y	Y	Y	Y													
25.4.2	Recyclable general waste to be collected and temporarily stored in skips or bins and removed from the site to an appropriate recycling facility.	Ongoing	Y	Y	Y	Y													
25.5	Hydrocarbon Waste (Hazardous)																		
	Environmental Aspect / Impact Source:																		
	Waste oil, oil contaminated water, hydrocarbon contaminated soil/sludge, hydrocarbon contaminated plastic pallets, crates and bulk containers																		
	Waste from oil separators, empty oil drums, bins, containers, oil trolleys, oily water tanks, oily sludge, absorbent used for oil, degreaser, grease, oily rags, oily filters, parts washer liquid waste and degreaser.																		
	Hydrocarbon waste from workshops, service bays, fuel storage areas, water separators, pump houses, crushing plant, laydown areas, fuel facilities, construction and operational equipment, and any other source of these hazardous hydrocarbon wastes.																		
	Mitigation Measures:																		
25.5.1	Waste oily/water to be stored in demarcated empty oil drums / bins / oil trolleys / oily water tanks in banded areas or stored in waste oil tanks and be collected by a licensed contractor and it can be recycled for use in fuels/oils and bitumen products.	Ongoing	Y	Y	Y	Y													
25.5.2	Coolant is not usually removed from engines unless contaminated, in which case the waste coolant is added to the demarcated waste oil tanks for collection by a licensed contractor.	Ongoing	Y	Y	Y	Y													
25.5.3	Oily rags and oil absorbent materials are to be stored in demarcated oily rag bins.	Ongoing	Y	Y	Y	Y													
25.5.4	Licensed waste contractor is to transport oil rags to a licensed facility for further processing.	Ongoing	Y	Y	Y	Y													
25.5.5	Oil filters to be stored in dedicated oil filter bin and licensed waste contractor / recycling contractor (licensed if required by NEMWA) to collect oil filters and transport them to a licensed facility where they are counted, crushed, shredded and sent to scrap metal. If there are recycling contractors that will recycle these oil filters then this option is to be considered. Residue oil is to be recycled.	Ongoing	Y	Y	Y	Y													
25.5.6	Empty oil drums to be stored in banded areas and collected by a licensed waste contractor / recycling contractor (licensed if required by NEMWA) for recycling or reuse as appropriate. Residual oil to be collected by a licensed waste oil contractor and taken to a licensed facility for refining.	Ongoing	Y	Y	Y	Y													
25.5.7	Waste grease to be stored in sealed drums and collected by licensed waste contractor or a drum recycling contractor (licensed if required by NEMWA) for recycling or reuse as appropriate. Residual grease is to be collected by a licensed waste grease contractor and taken to a licensed facility for refining.	Ongoing	Y	Y	Y	Y													

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																			Project Phase
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25.5.8	Level of contamination of hydrocarbon contaminated soil/sludge to determine if collected by licensed waste contractor / recycling contractor (licensed if required by NEMWA) for disposal at approved facility or if bio-remediated on site to take place.	Ongoing	Y	Y	Y	Y	Y							Y					
25.5.9	Research into bioremediation methods of hydrocarbon soil to take place to determine cost-effective methods to be used in the remediation of soil.	Prior to construction / Ongoing if feasible	Y	Y	Y	Y	Y							Y					
25.6	Paints and Resins (Hazardous)																		
	Environmental Aspect / Impact Source:																		
	Paint and resins, water and soil contaminated with paints and resins, absorbents used for paints and resins																		
	Workshops, storage areas, offices, construction and operational equipment and activities.																		
	Mitigation Measures:																		
25.6.1	Minimise paints and resin waste by producing / procuring only the amount necessary.	Ongoing	Y	Y	Y	Y	Y							Y					
25.6.2	Paints and resins, water and soil contaminated with paints and resins, absorbents used for paints and resins, are to be stored in special demarcated waste bins.	Ongoing	Y	Y	Y	Y	Y							Y					
25.6.3	Transport paints and resin waste off site by licensed contractor to material recovery facility.	Ongoing	Y	Y	Y	Y	Y							Y					
25.6.4	Research into recapturing methods of paints and resins to take place to determine if there are cost-effective methods to reuse paints and resins. This type of method can result in economic savings, resource savings and prevent environmental pollution.	Ongoing	Y	Y	Y	Y	Y							Y					
25.7	Scrap Tyres (Hazardous)																		
	Environmental Aspect / Impact Source:																		
	Workshops, service bays, construction and operational equipment such as trucks and other vehicles.																		
	Mitigation Measures:																		
25.7.1	Stockpile scrap tyres in an appropriate demarcated location.	Ongoing	Y	Y	Y	Y	Y							Y					
25.7.2	Scrap tyres stored, awaiting disposal or transport for take-back and recycling, or waste-to-energy options to be stored in stable stacks less than 3 meters high, and at least 10 meters from any other scrap tyre storage area, or combustible or flammable material, including vegetation.	Ongoing	Y	Y	Y	Y	Y							Y					
25.7.3	All reasonable and practicable fire prevention measures to be implemented, including removal of grass and other materials within a 10 meter radius of the scrap tyre storage area.	Ongoing	Y	Y	Y	Y	Y							Y					
25.7.4	Scrap tyres to be re-used in innovative ways if economically feasible, recycled through economically feasible recycling technologies or reconditioning, or disposed of at applicable licensed waste facility by a licensed waste contractor.	Ongoing	Y	Y	Y	Y	Y							Y					
25.7.5	Large tyres to be sent to applicable licensed waste site by a licensed waste contractor if not recyclable.	Ongoing	Y	Y	Y	Y	Y							Y					
25.8	Asbestos (Hazardous)																		
	Environmental Aspect / Impact Source:																		
	Old buildings, pipes and structures to be demolished in advance of construction of infrastructure and opencast mining.																		
	Mitigation Measures:																		
25.8.1	Old buildings/pipes containing asbestos to be demolished, this waste to be separated from all other waste types and stored clearly marked, sealed containers, transported by a licensed waste contractor to a licensed facility that accepts asbestos waste in accordance with regulations. Only licensed and approved asbestos handling companies to handle and demolish asbestos. Asbestos to be sealed before disposal, in accordance to regulatory requirements. An Approved Inspector Authority to sign of scope of work before demolition commences and also to provide a clearance certificate on completion of work.	Ongoing	Y	Y	Y	Y	Y							Y					
25.9	Clinical And Medical Waste (Hazardous)																		
	Environmental Aspect / Impact Source:																		
	First Aid Room and any other source of medical waste.																		
	Mitigation Measures:																		
25.9.1	Clinical & Medical Waste to be stored in clearly marked, sealed demarcated containers and collected by licensed contractor and transported to licensed facility for appropriate disposal.	Ongoing	Y	Y	Y	Y	Y	Y						Y					
25.10	Waste Batteries (Hazardous)																		
	Environmental Aspect / Impact Source:																		

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
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.	Lead Acid Batteries, vehicle batteries and other battery types.
.	Workshops & service bays, construction and operational equipment and any other source of lead acid batteries, vehicle batteries and other battery types.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
25.10.1	Batteries to be stored in a dedicated area, safe for reuse, recycling or disposal.	Y	Y	Y	Y	Y							Y						
25.10.2	Batteries suitable for recycling and reuse e.g. Lead Acid Batteries and vehicle batteries, to be collected and sent for re-use (i.e. trade in) or recycling.	Y	Y	Y	Y	Y							Y						
25.10.3	If disposing batteries that cannot be reused or recycled, these must be sent to a registered hazardous waste site.	Y	Y	Y	Y	Y							Y						
25.11	Fluorescent Light Tubes (Hazardous)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Offices, canteens, workshops, construction and operational equipment and any other source of fluorescent light tubes.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
25.11.1	This waste to be removed by an appropriate licensed waste company for disposal at a licenced waste management facility.	Y	Y	Y	Y	Y							Y						
25.12	Aerosols (Hazardous)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Workshops and service bays.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
25.12.1	Collected in demarcated bins by licensed contractor. Empty cans to be sent to a scrap metal recycler by licensed contractor.	Y	Y	Y	Y	Y							Y						
25.13	Electronic Waste	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Offices, canteens, workshops.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
25.13.1	All electronic waste to be re-used or recycled. No disposal of electronic waste is required.	Y	Y	Y	Y	Y							Y						
26	COAL DISCARD (MINERALOGICAL WASTE)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Pollution or health impacts caused by discard and spoils.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Pollution caused by mineral waste: Mining and mineral process waste. This includes mining waste, discard material stockpiles, tailings, backfill. The material may be in liquid, brine, slurry, paste or solid form. Mineral waste excludes domestic, medical, industrial and hazardous substances.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Goals and Objectives:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Avoid the contamination of land, surface water, or ground water by implementing and ensuring compliance through efficient management of spills and discard.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Minimise the footprints of mineral waste facilities, as far as possible.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
26,1	A surface discard storage area to be developed in a mined out area of the mine pit where overburden has been replaced. The storage area should be in an area of the mine pit that is located lower than the post mining groundwater recharge / decant elevation.	Y	Y	Y	Y	Y							Y						
26,2	Compile operating manuals, procedures and codes of practice for discard management to address significant adverse impacts. Keep information up to date.	Y	Y	Y	Y	Y							Y						
26,3	Seepage and geohydrological modelling was done for the EIA. Seepage and geohydrological modelling must be updated based on the latest Life of Mine (LOM) plan, and models calibrated on a regular basis.	Y	Y	Y	Y	Y							Y						Y
26,4	Geochemical modelling was done for the EIA. Geochemical modelling must be updated based on the latest Life of Mine (LOM) plan, and models calibrated on a regular basis.	Y	Y	Y	Y	Y							Y						Y

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
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26.5	Clean water diversions drain/berm and a concrete lined dirty water collection drains will be included around the perimeter of the facility. The construction of these will be phased in accordance to the development of the surface discard facility.	Prior to commissioning, update every two years		Y	Y				Y										
26.6	Clean water will be diverted away from the surface discard facility to join the general clean water system, whilst the dirty water will be drained through a silt trap system, collected and pumped to a pollution control dam.	Prior to commissioning, update every two years		Y	Y				Y			Y							
26.7	Prior to construction of temporary discard stockpile at Pit F, strip and stockpile soils, and strip first layer of soft dig overburden. This will protect the soils from contamination and help direct seepage towards the active mining window.	Ongoing	Y																
26.8	Seepage from temporary discard stockpile at Pit F must be drawn eastwards towards the active mining window, and intercepted by an in-pit sump. Before the start of LOM year 4, remove the discard from the stockpile and backfill into pit.	Ongoing	Y					Y											
27	MACHINERY, EQUIPMENT, VEHICLE MOVEMENT AND ROADS																		
	Environmental Aspect / Impact Source:																		
	Noise, dust, vibrations and other nuisances due to presence and use of machinery, equipment and vehicles.																		
	Public safety risks.																		
	Hydrocarbon spills.																		
	Risks to livestock and wild animals.																		
	Goals and Objectives:																		
	Minimise disturbances and public safety risks during operation and use of machinery, equipment and vehicles.																		
	Minimise risks to livestock, people and wild animals along the service road and at conveyor crossings.																		
	Manage traffic on the project site to minimise dust, maintain visibility and safe driving conditions.																		
	Mitigation Measures:																		
27.1	Develop a traffic management plan for construction and operation.	At start of construction, updated as required thereafter	Y	Y						Y									Y
27.2	Develop a traffic management plan for decommissioning and closure.	Decommissioning and closure			Y														Y
27.3	Develop a traffic management plan for post-closure.	Post closure				Y													Y
27.4	Maintain machinery, vehicles and equipment in good condition to prevent unnecessary noise output, emissions, and risks of hydrocarbon spills (fuels and lubricants).	Ongoing	Y	Y				Y		Y		Y	Y						Y
27.5	All vehicles utilising public roads to be roadworthy, and to thus meet applicable maximum noise output requirements.	Ongoing	Y	Y						Y									
27.6	All vehicles on mine roads to adhere to prescribed / agreed speed limits as indicated on road signage and/or specific instructions or procedures issued by the GM or ECO to prevent accidents, road damage and danger to people, livestock and wild animals.	Ongoing	Y	Y						Y									
27.7	Speed limits on mine roads at river and wetland crossings to be reduced based on the likelihood of wild animals using the area as migration corridor and potentially crossings to be signposted accordingly. Speed limits to be defined by the GM in consultation with the ECO.	Ongoing	Y	Y						Y									
27.8	Vehicles to remain on existing roads and tracks and to not be permitted to drive off-road and in the veld, unless strictly necessitated by an emergency situation or with the approval of the ECO.	Ongoing	Y	Y						Y									
27.9	Use of any private access roads to be agreed with the landowners in writing.	Ongoing	Y	Y						Y									Y
27.10	All private roads not to be used for the purpose of construction, but to be intersected by construction roads and where no fences are present, to be marked clearly with no entry signs. Where relevant as per agreement with the landowner.	Ongoing	Y	Y						Y									Y
27.11	Other than the roads described in the EIA project description, no new roads and tracks to be created, unless approved by the ECO and regulatory authorities where required.	Ongoing	Y	Y						Y									

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
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27.12	Minimise movement of construction traffic along public roads as far as reasonably possible during peak traffic hours.	Ongoing	Y							Y					Y					
27.13	Public and third-party private road sections and intersections affected by construction to be kept in an acceptable condition.	Ongoing	Y							Y					Y					
27.14	Upon completion of construction, all private roads used during construction to be rehabilitated to their original condition and to the satisfaction of the landowner.	At end of construction	Y							Y										
27.15	Construction equipment and vehicles to stay within designated construction areas.	Ongoing	Y							Y					Y					
27.16	Traffic and movement over stabilised / rehabilitated areas to be appropriately restricted to avoid compromising erosion control measures and damage to topsoil or vegetation cover.	Ongoing	Y	Y						Y										
27.17	All vehicles to be frequently inspected for oil leaks.	Ongoing	Y	Y						Y			Y							
27.18	No vehicle maintenance is to take place in any other area of the mine other than in the demarcated maintenance yard unless emergency repair work is required in the field in which case drip trays are to be used to capture potential hydrocarbon spills. The ECO must also be notified of any spills.	Ongoing	Y	Y						Y			Y							
27.19	Apply dust suppression on all gravel / unpaved roads and haul roads as per the requirements of the air quality management plan.	Ongoing	Y	Y						Y										
27.20	Use Route 2 for transporting coal from Pit F.	Ongoing	Y	Y						Y										
27.21	Implement traffic signals on the off-ramp of the interchange with the N12.	Prior to coal trucking	Y							Y										
27.22	Collaborate with neighbouring mining operations and the Mpumalanga Provincial Department DPWRT, regarding the responsible party for the upgrading of the section of the R545 from the T-junction with Route R555 in the southpast the access to the Zibulo Opencast Coal Mine in the north.	Ongoing		Y						Y										
27.23	Upgrade access road to comply with standard geometric detail (layout) of the Department Roads and Transport, Gauteng Province.	At start of construction	Y							Y										
28	ACTIVE WATER MANAGEMENT	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Pumping, treatment and use / release of water from underground mine workings.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Pumping, treatment and use / release of dirty water generated at New Largo Colliery.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Wastes / by-products produced at water treatment plant.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Goals and Objectives:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Provide adequate water storage, pumping and treatment capacity throughout all the phases of the project to actively manage water from old underground mine workings and dirty water generated in the mine pit, at surface infrastructure and coal handling, washing and handling facilities.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
28,1	Develop detailed procedures for active water management.	Ongoing	Y	Y	Y	Y							Y					Y		
28,2	Detailed procedures for active water management must be in line with the water management recommended in the operational phase water balance as well as for the individual pits.	Ongoing	Y	Y	Y	Y							Y					Y		
28,3	Sequencing of dewatering must be calibrated for the IWULA and IWMMP on an ongoing basis.	Ongoing	Y	Y	Y	Y							Y					Y		
28,4	Training of all responsible persons on active water management.	Ongoing	Y	Y	Y	Y							Y			Y				
28,5	Evaluate alternative water treatment technologies. Consider energy use and the characteristics of wastes / by-products produced as key design selection criteria. For example: aim to avoid or minimise the generation of brine.	Ongoing	Y	Y	Y	Y							Y							
28,6	Install mobile water treatment plant(s) and increase treatment capacity as required (specified in water balance) to provide treatment from the start of the project.	As required	Y	Y	Y	Y							Y							
28,7	Install a permanent water treatment plant later in the operational phase of the project to life of the mine to be operational until active water treatment is no longer required post closure (refer closure plan).	As required	Y	Y	Y	Y							Y							
28,8	If brine is produced, provide a brine disposal pond designed as a hazardous waste storage lagoon equipped with liners to avoid seepage and leakage, of which the designs and location have been approved by the DWS.	As required / Ongoing	Y	Y	Y	Y							Y							
28,9	Gypsum produced at the mobile water treatment plant to be temporarily (< 90 days) stored on a designated storage pad, of which the designs and location have been approved by the DWS.	As required / Ongoing	Y	Y	Y	Y							Y							

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
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28,10	Gypsum will initially be removed from the site but, once there is sufficient space in the mine pit, gypsum may be put into the mine pit if other uses have not been identified. Research to be undertaken to determine the re-use potential of gypsum. The management of gypsum will be adapted as technological advancements are made and uses for the gypsum are identified.	Ongoing	Y	Y	Y	Y						Y	Y						
28,11	Contaminated water (pre-treatment water) will be stored in dams / reservoirs and tanks, of which the designs and locations have been approved by the DWS.	Ongoing	Y	Y	Y	Y						Y	Y						
28,12	Once the details of the permanent water plant is known, provide, appropriate waste management infrastructure for the water treatment plant waste will be provided.	As details become available	Y	Y	Y	Y						Y	Y						
29	WATER USE AND CONSUMPTION	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Depletion of natural water resources due to mining and associated activities.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Abstraction from farm dams, springs and boreholes.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Catchment yield and hydrology.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Goals and Objectives:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Optimisation of natural resource consumption and conservation. Minimise the water demand of process water and re-use process water where possible.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Minimise the loss of yield during the operational phase.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Mitigation Measures:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
29,1	Minimise water consumption, create awareness, provide training and encourage all staff to use water sparingly.	Ongoing	Y	Y	Y	Y						Y	Y				Y		
29,2	Identify key water consumption activities and review objectives, targets and controls for these.	Annually	Y	Y	Y	Y						Y	Y						
29,3	Ensure adequate maintenance of water tanks, pipes and taps and repair all drips and leaks as soon as possible.	Within 24 hours of detection	Y	Y	Y	Y						Y	Y						
29,4	No water abstraction which requires a license or general authorisations from the DWS to take place without these approvals being in place.	Prior to water use	Y	Y	Y	Y						Y	Y						
29,5	Authorised / licensed water abstraction from springs, farm dams, boreholes and the underground mining workings may not be increased (above the quantities listed above) without the permission of the DWS.	Prior to increase of water abstraction volumes	Y	Y	Y	Y						Y	Y						
29,6	New Largo Coal (Pty.) Ltd. must have written agreements with landowners for use of any water from private boreholes or dams. If a water authorisation or license is then required for use of water from private boreholes or dams then these must be obtained from the DWS.	Prior to water use	Y	Y	Y	Y						Y	Y						
29,7	Establish and maintain a water balance as a tool to effectively manage water.	Update annually	Y	Y	Y	Y						Y	Y						
29,8	Compare actual water consumption to present targets and improve operations if not being met.	Annually	Y	Y	Y	Y						Y	Y						
29,9	Water demands should as far as possible be met by re-use and reclamation.	Ongoing	Y	Y	Y	Y						Y	Y						
30	WATER MANAGEMENT	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Environmental Aspect / Impact Source:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Clean and dirty water management.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Coal spills.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Hydrocarbon and chemical spills.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Old flooded underground mine workings.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Workshops, offices, stockyards, admin and coal processing plant area.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Changes to water quality.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Changes to catchment water yield.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Impact of decant in terms of salt loading in the natural system after closure.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Water treatment plant and associated activities.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	Increased suspended solids, erosion and run-off from construction activities	
.	Roads and conveyors crossing streams.	

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
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	R645 realignment																			
	Goals and Objectives:																			
	Mitigate impacts on groundwater and surface water quality.																			
	Minimise and control erosion and contaminated runoff.																			
	Minimise impacts on third parties and downstream environments.																			
	Monitor the potential cone of depression according to the monitoring system suggested in this EMP.																			
	Minimise footprint of disturbed area																			
	Mitigation Measures:																			
30,1	Put in place and maintain a water management information system and implement the integrated water and waste management plan (IWWMP).	Prior to construction, update annually	Y	Y	Y	Y	Y					Y	Y	Y						Y
30,2	At Pit F, pump excess water from the Run of Mine stockpiles to the Pollution Control Dams.	Ongoing		Y	Y						Y	Y	Y							Y
31	WETLAND, WATER AND BIODIVERSITY MANAGEMENT																			
	Environmental Aspect / Impact Source:																			
	Loss or destruction of wetlands and associated wetland vegetation and habitat.																			
	Loss or displacement of wetland dependant fauna.																			
	Impacts on adjacent, downslope and downstream wetlands (disruption of hydrology, wetland vegetation and fauna, increased sediment movement, soil compaction, increased sediment load, acid mine drainage, erosion and water quality deterioration).																			
	Decant of polluted water into wetlands.																			
	Increased sediment movement into wetlands.																			
	Presence of sensitive habitats within the footprint area affected by the project.																			
	Loss or destruction of natural habitat.																			
	Loss of ecological connectivity.																			
	Destruction of threatened Red Data plant populations.																			
	Mortality of animals.																			
	Water quality and quantity.																			
	Insufficient rehabilitation and re-colonisation.																			
	Increase in sediment loads / turbidity.																			
	Acid mine drainage.																			
	Increase in metals.																			
	Chemical leaching.																			
	Goals and Objectives:																			
	Minimise impacts on wetland areas not to be mined through.																			
	Minimise impacts on wetlands adjacent, downslope and downstream of the mining area.																			
	Prevent habitat destruction.																			
	Minimise impacts on aquatic, flora and fauna species and ecosystems.																			
	Maximise opportunities to protect sensitive habitats (plants, animals) within the project footprint area.																			
	Minimise the disruption of habitat fragmentation, ecological connectivity, migration routes and territorial infringement.																			
	Minor repositioning of structures, i.e. the roads, especially at river and wetland crossings to minimise impacts.																			
	Avoid indiscriminate clearing of the servitude area to minimise the impact on sensitive habitats.																			
	Mitigation Measures:																			
31,1	General measures for wetland, water and biodiversity management																			
31.1.1	New Largo Coal (Pty.) Ltd. (in consultation with the Department of Water Affairs, Mpumalanga Parks and Tourism Agency, South African National Biodiversity Institute, Working for Wetlands, etc.) to develop a plan which considers and investigates appropriate and feasible mitigation measures for impacts on wetlands, considering the establishment of a protection area to mitigate wetland, biodiversity and landscape impacts, possible reinstatement of wetlands or alternative wetland mitigation options.	Within 24 months of the environmental authorisation being granted.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V																
																			Project Phase				Applicable Project Activities										Action	
																			Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
EMP Number	Management Measures	Scheduling																																
31.1.4	Pollution prevention of wetlands rivers and streams due to contamination with hydrocarbons, sediments and other chemicals to be prevented.	Ongoing	Y	Y			Y	Y		Y		Y																						
31.1.5	All wetlands boundaries within the project area to be clearly indicated on mine layout plans.	During construction	Y				Y	Y		Y		Y																						
31.1.6	Design and planning of all proposed activities adjacent to or in the vicinity of rivers, streams and wetlands shall consider the following measures:	Ongoing	Y				Y	Y		Y		Y																						
31.1.7	Biodiversity and surface water monitoring of springs and wetlands downstream or adjacent to the active mining area shall be investigated and monitored to ensure their continued functioning where appropriate and applicable.	Ongoing	Y	Y			Y	Y		Y		Y						Y																
31.1.8	All construction roads and supporting infrastructure in or adjacent to the riparian zone shall be minimized where appropriate, comply to the requirements of the IWULA at all times and, if required, shall be aligned and managed so as to minimize disturbance and to ensure uninterrupted flow above and below infrastructure which crosses the riparian zone and in-stream habitats.	Ongoing	Y				Y	Y		Y		Y			Y																			
31.1.10	Rehabilitation of areas at river and wetland crossings affected by construction activities to happen as soon as possible and in accordance with measures prescribed by a wetland specialist.	Ongoing	Y	Y			Y	Y		Y		Y			Y																			
31.1.11	Regular inspections of all river and wetland crossing to assess the success of rehabilitation measures, post-construction to be undertaken. Corrective measures to be implemented where required.	Monthly		Y			Y	Y		Y		Y			Y																			
31.1.12	A wetland and stream health assessment should also be conducted to determine success of rehabilitation measures and to propose remedial measures where required.	As determined by IWWMP.		Y			Y	Y		Y		Y			Y																			
31.1.13	In-stream construction activities should be limited to as short a time as possible and scheduled to take place in the drier months of the year, wherever practically possible within the limitations of the project schedule and timeous delivery of coal to Eskom.	When possible	Y	Y			Y	Y		Y		Y			Y																			
31.1.14	The efficiency of erosion control and protection measures installed as part of the construction of the project will be monitored specifically after high rainfall events.	Construction / After each high rainfall event for 1st three years of operation, then as required.	Y	Y			Y	Y		Y		Y			Y																			
31.1.15	Erosion control and protection measures installed as part of the construction of the project will be adapted for the specific area and situation where signs of erosion appear.	As required		Y			Y	Y		Y		Y			Y																			
31.1.16	The viability of utilising treated water outside the coal reserve area in irrigation projects in order to create or expand existing downstream wetlands to be investigated in consultation with the wetland and soils specialist.	Within 24 months of the environmental authorisation being granted.	Y				Y	Y		Y		Y																						
31.1.17	Clean water intercepted and diverted around the actively mined areas, to be reintroduced into the adjacent and downstream valley bottom wetlands in a manner which does not create erosion of the watercourse and which aids in dispersion across most of the width of the downstream wetlands.	Ongoing	Y	Y			Y	Y		Y		Y			Y																			
31.1.18	The viability of creating suitable plantations (with non invasive vegetation, and, if possible, with no alien vegetation), within the mining right area, in order to compensate for evapotranspiration reduction and to reduce the water make to groundwater, to be investigated in consultation with the wetland, soils and ecological specialist.	Tests to start within 24 months of the commencement of mining operations.		Y			Y	Y		Y		Y			Y																			
31.1.19	A 100 m buffer around the confirmed and potential habitat of the threatened Red Data plant species <i>Frithia humilis</i> , is required and must be maintained.	Design / Prior to construction	Y				Y	Y		Y		Y			Y																			
31.1.20	Avoid the placement of stockpiles, supporting infrastructure and roads on wetlands where possible. Alternatively site specific method statements to be developed and implemented to minimise the impacts on adjacent and downstream wetlands.	Prior to construction, ongoing.	Y	Y			Y	Y		Y		Y			Y																			
31.1.21	Utilise subsoils (with organic matter to encourage plant growth) from within the stockpile footprint for construction of low level water deflection berms (1 m high, and 2 - 3 m wide) between the open cast workings / soil stockpiles and outside the boundary of valley bottom wetlands' boundaries to mitigate increased sediment movement offsite into drainage lines and wetlands. These berms would serve to intercept flows containing suspended soils and create a depositional environment.	Prior to construction	Y				Y	Y		Y		Y			Y																			
31.1.22	Soil areas, compacted outside the mining reserve due to construction activities, to be ripped to break up the compacted soil surface in order to aid infiltration and decrease run-off.	As required	Y	Y			Y	Y		Y		Y			Y																			

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
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31.1.23	Topsoil stockpiles to be re-vegetated with non invasive vegetation, and, if possible, with no alien vegetation, in order to stabilise the soil, reduce run-off and minimise erosion into adjacent and downstream wetlands.	Design / Ongoing	Y	Y				Y	Y		Y	Y							
31.1.24	The stockpiles to be designed and managed in order to permit the interception and dissipation of flows.	Design, ongoing	Y					Y	Y		Y	Y							
31.1.25	Water emerging from the mine and accumulating in the backfilled and rehabilitated voids to be treated in order to avoid or mitigate acid mine drainage, and released into adjacent and downstream wetlands / streams as defined by the reserve determination and water use license.	Design / Ongoing	Y	Y	Y	Y	Y	Y	Y		Y	Y							
31.1.26	Develop a biodiversity action plan which includes provision for the management of key biodiversity risks as reflected in this EMP. This biodiversity action plan is to be kept up to date throughout all project phases.	Prior to operation, updated every three years	Y	Y	Y	Y		Y	Y		Y	Y	Y						Y
31.1.27	The target of no net biodiversity loss or net positive contribution to biodiversity in respect of New Largo's impacts on wetlands is to be considered as part of the formulation of the wetland mitigation programme.	Ongoing	Y	Y	Y			Y	Y		Y	Y							
31.1.28	The current extent and condition of the habitats where <i>F. humilis</i> was previously identified, and the likelihood of similar rocky ridge habitat in the MRA to support <i>F. humilis</i> should be determined via a survey conducted by a suitably qualified/experienced botanist in the flowering season (wet season 2021). Areas where the species occurs should then be marked out and fenced off as necessary, to ensure that no further loss or disturbance of this species takes place	Design / Prior to Construction	Y	Y				Y	Y		Y	Y							Y
31.1.29	In the event that the in-situ conservation of this species is considered at risk due to pre-existing sand mining operations, options for the harvesting of seed of the species for propagation, or translocation, will be explored and agreed with the relevant permitting authorities (e.g. SANBI, Mpumalanga Parks and Tourism Agency).	Design / Prior to Construction	Y	Y	Y			Y	Y		Y	Y							
31.1.30	At Pit F, retain a minimum buffer of 32 m between remnant patches of hillslope seep wetlands not directly impacted by mining, and Project activities. No construction, habitat transformation or vehicular access should be permitted within this zone.	Ongoing	Y	Y	Y	Y													
31.2	R545 Deviation																		
31.2.1	The viability of providing additional ecological crossings / links along the R545 deviation to be investigated in consultation with the wetland and ecological specialists.	Prior to construction / Design	Y													Y			
31.2.2	Design of drainage at the R545 deviation crossing hillslope seepage areas, to be finalised in consultation with the wetland specialist. Wetland crossing procedure to be developed.	Prior to construction / Design	Y													Y			
31.2.3	The level of the R545 deviation to cross all river and stream systems perpendicular where practical.	Prior to construction / Design	Y													Y			
31.2.4	Positioning of the R545 deviation at wetland and stream crossings to be finalised in consultation with the wetland and ecological specialists as there may be potential for diverting the road around sensitive areas.	Prior to construction / Design	Y													Y			
31.2.5	Regular inspection and maintenance of the R545 road deviation to ensure the subsurface drains are in a working order.	As per DPWRT requirements		Y												Y			
31.2.6	Regular inspections and maintenance of R545 deviation river crossings to be carried out to identify problem areas. Problem areas could include, for example, erosion, hydrocarbon spills, etc.	As per DPWRT requirements		Y												Y			
31.2.7	The viability of utilising the deeper soil layer, to reduce the quantity of ingress water and increase the retention of water in the upper soil profile in order to encourage wetland and associated function development, to be investigated in consultation with the wetland and soils specialist.	Prior to construction / Design	Y					Y	Y		Y	Y							
31.2.8	Make a commitment to identify, understand and manage impacts on sensitive sites or species (rare or endangered species, habitat, ecosystem, protected areas).	Ongoing	Y	Y	Y	Y		Y	Y		Y	Y							

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V
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31.2.9	An ecological specialist to conduct pre-construction ecological surveys of the active mining area and R545 deviation that would be disturbed during construction, preferably from December to February, to identify flora species, specifically sensitive habitats and threatened Red Data species. The ecological specialist will recommend the best approach to deal with the specific sensitive areas and species on a case by case basis. Measures could include:	Y					Y	Y		Y	Y	Y						
31.2.9.1	Specifications for plant protection and relocation.	Y					Y	Y		Y	Y	Y						
31.2.9.2	Use of larger-diameter fencing in key migration areas to allow small animals to migrate across the R545 deviation. Please note that the diameter is to allow access for small animals but should be of a size to not allow access for small children.	Y					Y	Y		Y	Y	Y						
31.2.9.3	Minor R545 route re-alignment around sensitive areas.	Y					Y	Y		Y	Y	Y						
31.2.9.4	Repositioning of fence line around sensitive areas.	Y					Y	Y		Y	Y	Y						
31.2.10	Biomonitoring to be carried out as per recommendations of an aquatic specialist. The monitoring programme to be reviewed and updated every two years.		Y					Y										
31.2.11	The following activities are prohibited:	Y	Y				Y	Y		Y	Y	Y						
31.2.11.1	Trapping, hunting and killing of animals.	Y	Y				Y	Y		Y	Y	Y						
31.2.11.2	Chopping down, damage to and removal of plants, unless this is for clearing of a demarcated construction area, or forms part of alien eradication programme to be developed by ECO.	Y	Y				Y	Y		Y	Y	Y						
31.2.12	The ECO to put in place a system of fines and/or penalties for prohibited activities that could disturb sensitive areas.	Y	Y				Y	Y		Y	Y	Y						
31.2.13	An active list with a key (identification pictures) of the latest threatened Red Data flora species expected to occur in the active mining area, is to be compiled, reviewed and regularly updated in order to assist the ECO with the task of monitoring the area for possible threatened Red Data flora species which were not observed/ recorded during the latest ecological assessment undertaken for the project.	Y	Y				Y	Y		Y	Y	Y						
31.2.14	If threatened red data species are recorded during future monitoring activities, a vegetation specialist to be consulted to assess the best approach to deal with the observed species.	Y	Y				Y	Y		Y	Y	Y						
31.2.15	All linear infrastructure associated with the mine to include ecological crossing areas where animals can safely cross such structures (roads, pipelines, conveyors etc.).	Y					Y	Y		Y	Y	Y						
31.2.16	Creation / establishment of microhabitats to be investigated as part of the rehabilitation plan, where appropriate.	Y	Y				Y	Y		Y	Y	Y						
31.2.17	Any fauna on site are to be protected by all available means to ensure their survival, where this is not possible, a relocation plan is to be put in place.	Y	Y				Y	Y		Y	Y	Y						
31.2.18	No wetlands or streams to be disturbed without the necessary approvals, i.e. water use license.	Y	Y				Y	Y		Y	Y	Y						
31.2.19	No protected plants to be disturbed without the necessary permits in place.	Y	Y				Y	Y		Y	Y	Y						
31.3	Wetland Mitigation Strategy																	
31.3.1	Develop a wetland mitigation strategy, and put in place a wetland mitigation plan.	Y																Y

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
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31.3.2	Involve I&APs, stakeholders and authorities in the development of the wetland mitigation plan through the EMC. Evaluate comments and recommendations made by these parties.	Y												Y						
31.3.3	Obtain regulatory approval of the wetland mitigation plan	Y												Y						
31.3.4	Implement wetland mitigation as per the accepted plan, in consultation with appropriate specialists.		Y	Y	Y									Y						
31.3.5	Audit and report on the progress of implementation of the wetland mitigation plan.		Y	Y	Y									Y			Y			
31.3.6	Review and update wetland mitigation plan. Involve I&APs, stakeholders and authorities in the development of the wetland mitigation plan through the EMC. Evaluate comments and recommendations made by these parties.		Y	Y	Y									Y				Y		
32	REHABILITATION PLAN																			
32.1	Soil Management																			
	Environmental Aspect / Impact Source:																			
	Land clearing and removal of topsoil and vegetation in preparation of construction and mining.																			
	Delineation of areas where topsoil must be stripped, stockpiled and reused.																			
	Soil handling and replacement.																			
	Long-term stockpiling of material removed from initial box-cut.																			
	Live placement of soil.																			
	Soil amelioration.																			
	Vegetation establishment.																			
	Deficiency of utilisable soil for rehabilitation.																			
	Vehicle and equipment movements causing compaction.																			
	Stormwater control.																			
	High winds and rain causing erosion.																			
	Wind and water erosion.																			
	Presence of hydrocarbons and carbonaceous material.																			
	Contaminated soils.																			
	Soil remediation.																			
	Soil disturbance, loss of nutrients, loss of in situ structure and physical and chemical properties.																			
	Goals and Objectives:																			
	Prevent unnecessary grading, damage to vegetation and disturbance to soils.																			
	Phase the stripping plan with the mining plan.																			
	Reduce soil loss from the stripping and placement operation.																			
	Minimise the stockpiling of soil.																			
	Minimise the compaction of soil during stockpiling and placement.																			
	Ensure that the smallest footprint area possible is affected at any one time.																			
	Maximise soil recovery.																			
	Maximise availability of soil as growth medium to enable sustainable vegetation cover after rehabilitation.																			

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
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	Optimise soil stripping and placing to maximise the thickness of the utilisable soil layer in rehabilitation of mine pit to enable sustainable vegetation cover and manage water infiltration, groundwater recharge and water treatment requirements.	
	Correct stripping, stockpiling and replacement to avoid mixing incompatible soils and dilution / loss of utilisable soils.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Optimise equipment used to minimise handling and compaction and exposure to wind erosion.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Minimise and manage erosion of soil throughout the life of the mine.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Performance Targets: The active mining activities will take place within a maximum of 10 consecutive mining cuts, after which spoil levelling and rehabilitation will follow. The 10 mining cuts will consist of a sequence of topsoil stripping, pre-stripping in clay areas, drilling, established buffer, exposed no 4 seam, exposed no 2 seam, open void, followed by the first and second spoil line, spoil line being levelled, placement of pre-strip material in selected areas (clay material) on levelled area, placement of topsoil, profiling, fertilizing and seeding.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Soil balance plan in place and up to date.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Land capability reconciliation in place and up to date.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Mitigation Measures: Develop a soil balance plan and keep the plan updated.		Y	Y	Y										Y				Y
33.1.1	Develop a soil balance plan and keep the plan updated.	Prior to operations, updated monthly	Y	Y	Y										Y				
33.1.2	Conduct regular land capability reconciliations and ensure that rehabilitation commitments are met.	Annually	Y	Y	Y										Y				
33.1.3	Develop a soil management map to indicate all areas where available topsoil is to be stripped. The map will cover the footprint areas where project infrastructure is to be developed and the borrow pits.	Prior to operations, updated annually	Y	Y	Y			Y							Y				
33.1.4	Develop a soil stripping, stockpiling and placement procedure according to the following principles:	Prior to construction / update as required	Y	Y	Y			Y							Y				Y
33.1.5	Soil Stripping																		
33.1.5.1	<i>Opercast Mine Pit</i>																		
33.1.5.1.1	Pre-strip all utilisable soil to the estimated depths indicated on the Depth of Utilisable Soil Map (refer to Section 4.11 in 2012 EIA Report), 0 to 1.6 metres, with an average of 0.95 metres.	As required	Y	Y				Y							Y				Y
33.1.5.1.2	Pre-strip soft overburden clay material separately in accordance with the Estimated Total Soil Stripping Depth Map (refer to Section 4.11 in 2012 EIA Report).	As required	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y				Y
33.1.5.1.3	Review and update the Depth of Utilisable Soil Map and the Estimated Total Soil Stripping Depth Map (refer to Section 4.11 in 2012 EIA Report). This will be based on the information obtained from the continuous drilling activities being conducted ahead of mining.	Every three years																	
33.1.5.1.4	Hydromorphic (wet based) clay material is to be handled separately and is not to be mixed with other utilisable soil.	As required	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y				Y
33.1.5.1.5	Utilisable soil and pre-stripped soft overburden clay material is not to be mixed with the remainder of the overburden.	As required	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y				Y
33.1.5.1.6	Only clear vegetation and strip soils when and where necessary.	As required	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y				Y
33.1.5.1.7	Vegetation cover to be stripped with the utilisable soil (remove only large fragments, and vegetation to be removed as part of the alien and invasive species control).	As required	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y				Y
33.1.5.1.8	Minimise handling of utilisable soils when saturated (too wet) or alternatively apply amelioration for wet stripping.	As required	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y				Y
33.1.5.2	<i>Deep excavation areas where the majority or all of the soil profile is affected</i>																		
33.1.5.2.1	Strip all utilisable soil. Soil stripping and disturbance must be limited to only occur where soils are to be disturbed by activities that are described in the design report, and where a clearly defined end rehabilitation uses for the stripped soil has been identified.	As required	Y	Y				Y							Y				Y
33.1.5.3	<i>Less invasive areas (offices, workshops, parking, etc.) and any material stockpile or storage area</i>																		
33.1.5.3.1	Strip available topsoil, or in areas where with a very thin topsoil layer, strip least 150 mm of the utilisable soil. Soil stripping and disturbance must be limited to only occur where soils are to be disturbed by activities that are described in the design report, and where a clearly defined end rehabilitation uses for the stripped soil has been identified.	As required	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y				Y

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V
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33.1.6	Soil stockpiling (applicable for material excavated from box-cuts)																	
33.1.6.1	Soils will be stockpiled together with any vegetation cover present (only large vegetation to be removed prior to stripping).	Ongoing	Y	Y			Y	Y	Y	Y			Y					Y
33.1.6.2	Minimise vehicle and equipment movement over utilisable soil layers.	Ongoing	Y	Y			Y		Y	Y			Y					Y
33.1.6.3	Avoid undesirable compaction of the utilisable soils where possible. If compaction occurs, implement corrective action once soil has been placed as part of rehabilitation process.	Ongoing	Y	Y			Y			Y			Y					Y
33.1.6.4	It is imperative that all soil stockpiles are located in a manner where they do not interfere with current and future mining operations and with final replacement of topsoil on either subsoil or reshaped spoils in mind.	As required	Y	Y			Y		Y	Y			Y					Y
33.1.6.5	The utilisable soils should preferably be placed in a free draining location to minimize soil erosion and possible waterlogging.	As required	Y	Y			Y		Y	Y			Y					Y
33.1.6.6	No traffic / vehicles / machinery is allowed on the soil stockpiles, except when they are created and when replaced on rehabilitated land.	As required	Y	Y			Y		Y	Y			Y					Y
33.1.6.7	Provide adequate drainage on and around stockpiles to control erosion from wind and water. Provide berms and trenches or suitable alternative control measure such as netting.	Ongoing	Y	Y			Y		Y	Y			Y					Y
33.1.6.8	Store the soil derived from surface infrastructure areas as close as possible, practical and ready for closure rehabilitation purposes.	Ongoing	Y	Y			Y		Y	Y			Y					Y
33.1.6.9	Stockpiles are not to be located in wetlands, streambeds and areas prone to flooding or where the flow of water could cause ponding of water, soil erosion and sedimentation of downstream areas.	Ongoing	Y	Y			Y		Y	Y			Y					Y
33.1.6.10	A logical maximum safe height should be applied, so that the material can be placed, without repeated traffic over already placed material to reduce compaction. The slopes of soil stockpiles must be kept to a minimum to minimize soil erosion. Maintain the physical, chemical and biological properties of stockpiled soil by restricting stockpile heights where possible between 3 to 6 m so as to reduce compaction and damage to the soil seed bank, especially soils stripped from natural vegetation areas.	Ongoing	Y	Y			Y		Y	Y			Y					Y
33.1.6.11	The slopes of soil stockpiles must be kept to an appropriate angle to minimize soil erosion.	Ongoing	Y	Y			Y		Y	Y			Y					Y
33.1.6.12	Topsoil stockpiles must be seeded with suitable grass species to minimize soil erosion and to keep biological processes (e.g. carbon and nitrogen recycling to maximum) and to build up pasture/native grass species seed bank in the stockpile.	As required	Y	Y			Y						Y					Y
33.1.6.13	Appropriate mitigation measures will be applied to stockpiled soil to reduce and alleviate compaction and damage to soil seed banks.	Ongoing	Y	Y			Y		Y	Y			Y					Y
33.1.7	Soil Placement and Rehabilitation																	
33.1.7.1	Pre-stripped utilisable soil to be replaced on top of levelled overburden (in some cases this will be on top of the pre-stripped soft overburden clay materials).	As required	Y	Y			Y						Y					Y
33.1.7.2	Pre-stripped soft overburden clay material is to be replaced on top of levelled overburden.	As required	Y	Y			Y						Y					Y
33.1.7.3	Once replaced, the utilisable soil will be the upper and the pre-stripped soft overburden clay materials will be the lower part of the reinstated soil layer.	As required	Y	Y			Y						Y					Y
33.1.7.4	Stripping and replacement of utilisable soil and soft overburden material will be done with the aim of maximising the reinstated soil depths, as per the Estimated Total Reinstated Soil Depth Map (refer to Section 4.11 of the approved 2012 EIA). Reinstated soil depth refers to the combined depth of utilisable soil and pre-stripped soft overburden).	As required	Y	Y			Y						Y					Y
33.1.7.5	Review and update the Depth of Utilisable Soil Map and the Estimated Total Soil Stripping Depth Map (refer to Section 4.11 in the approved 2012 EIA Report).	Every three years																
33.1.7.6	Minimise vehicle and equipment movement over utilisable soil layers.	Ongoing	Y	Y			Y						Y					Y
33.1.7.7	Avoid undesirable compaction of the utilisable soils where possible. If compaction occurs, implement corrective action once soil has been placed.	Ongoing	Y	Y			Y	Y		Y			Y					Y
33.1.7.8	All potential and actual pollution sources and run off to be redirected to prevent contamination and sterilization of topsoil.	Ongoing	Y	Y			Y						Y					Y
33.1.7.9	Subsoils (and not utilisable soil) to be used for cladding safety berms on highwalls and ramps where applicable.	As required	Y	Y			Y				Y		Y					Y
33.1.7.10	Address soil compaction by applying appropriate measures for example ripping.	As required	Y	Y			Y						Y					Y
33.1.7.11	Ameliorate as required based on soil analysis. Special attention to be given to both quality and compaction when placing soil that was stockpiled for extended periods of time and for soils stripped from old agricultural fields where nutrients are denuded.	As required	Y	Y			Y						Y					Y

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V
EMP Number		Scheduling	Construction (Includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Earthworks	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
33.1.7.12	After topsoil has been placed and surveyed, all profiled surfaces will be thoroughly ripped to ensure disturbance of the soil / spoil interface is undertaken.	As required	Y	Y	Y			Y							Y				Y
33.1.7.13	Provide stormwater drainage as required.	As required	Y	Y	Y			Y							Y				Y
33.1.7.14	Revegetate as soon as practically possible.	As required	Y	Y	Y			Y							Y				Y
33.1.7.15	Paved roads to be ripped up, the wearing course treated as waste for potential re-use and the sub-base ripped or ploughed and shaped to restore the natural contours and covered with at least 300 mm of utilizable soil.	As required		Y	Y		Y					Y		Y	Y				
32.2	Alien and Invasive Species Management																		
	Environmental Aspect / Impact Source:																		
	Alien invasive species occur currently on portions of the mining area.																		
	Introduction and spread of alien and invasive species.																		
	Disruption to and loss of natural habitats.																		
	Goals and Objectives:																		
	Current present alien and invasive populations to be reduced. Establishment of new populations to be prevented.																		
	Prevent the alteration of natural ecological systems and processes due to the introduction and spread of alien and invasive species.																		
	Mitigation Measures:																		
33.2.1	Alien and invasive species management to be prioritised for the following alien and invasive species control areas:	As required	Y	Y	Y		Y					Y			Y				
33.2.1.1	Areas where vegetation cover is disturbed.	As required	Y	Y	Y		Y					Y			Y				
33.2.1.2	Areas where soils imported from external sources are applied.	As required	Y	Y	Y		Y					Y			Y				
33.2.1.3	All rehabilitated areas.	As required	Y	Y	Y		Y					Y			Y				
33.2.1.4	Areas within the mining right area that are already invaded by alien species such as Wattle.	As required	Y	Y	Y		Y				Y				Y	Y			
33.2.1.5	Road fringes.	As required	Y	Y	Y		Y								Y	Y			
33.2.1.6	100 metre radius around areas where treated sewerage effluent is applied or released.	As required	Y	Y	Y		Y					Y			Y	Y			
33.2.1.7	100 metres upstream and downstream of the point where treated water from the water treatment is released.	As required	Y	Y	Y		Y					Y			Y	Y			
33.2.1.8	100 metres upstream and downstream of stream and wetland crossings along linear infrastructure routes.	As required	Y	Y	Y		Y					Y			Y	Y			
33.2.1.9	Topsoil and overburden stockpiles.	As required	Y	Y	Y		Y					Y			Y	Y			
33.2.1.10	100 metres around existing homesteads and residences.	As required	Y	Y	Y		Y								Y	Y			
33.2.2	Develop an alien and invasive plant management program to pro-actively strive towards the eradication and control of alien invasive species within the mining right area. The program will cover the following:	As required	Y	Y	Y		Y								Y				Y
33.2.2.1	The ECO to take 'before' photos of the alien and invasive species control areas (as listed above) to establish a baseline.	As required	Y	Y	Y		Y								Y				Y
33.2.2.2	The ECO to take regular follow-up photos of the alien and invasive species control areas to monitor progress and the status of alien and invasive species control measures.	As required	Y	Y	Y		Y								Y				Y
33.2.2.3	Soil from areas that are already invaded by alien species, such as Wattle not to be moved to other areas unless treated.	As required	Y	Y	Y		Y								Y				Y
33.2.2.4	Imported materials (including soil, borrow material and construction aggregate) to be free of alien and invasive species, weeds and seeds of alien or invasive species.	As required	Y	Y	Y		Y								Y				Y
33.2.2.5	Sources of imported soil, borrow material and construction aggregate to be listed and pre-approved by the ECO based on an inspection of the source areas by the ECO. Where there are uncertainties about the occurrence of aliens and invasive species at the source areas, the ECO to seek the advice of a specialist with appropriate knowledge of alien and invasive species.	As required	Y	Y	Y		Y								Y				Y
33.2.2.6	All imported soil, borrow material and construction aggregate from sources that have not been pre-approved by the ECO, to be inspected by the ECO before brought onto the site. The ECO to make recommendations for handling of materials should there be concerns about the presence of alien species, which may include refusal of the use of the material on the New Largo Colliery.	As required	Y	Y	Y		Y								Y				Y
33.2.2.7	The ECO to inspect control areas, as defined above, for the presence of alien and invasive species.	As required	Y	Y	Y		Y								Y				Y
33.2.2.8	The ECO to regularly inspect newly rehabilitated areas for the presence of alien and invasive species during the first year of rehabilitation.	As required	Y	Y	Y		Y								Y				Y
33.2.2.9	Stands of trees to be checked for breeding owls and breeding raptors. If there are any, then these trees should be left as is, if all possible, particularly during the breeding season.																		
33.2.2.10	Control areas, as defined above, to be monitored by a botanical specialist for the presence of alien and invasive species.	As required	Y	Y	Y		Y								Y				Y

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
EMP Number	Management Measures	Project Phase				Applicable Project Activities											Action		
		Construction (Includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report	
33.2.3		As required	Y	Y	Y	Y												Y	
33.2.3	Strategies and procedures to control the spread of alien and invasive species to be developed and implemented, on a case by case basis, depending on the specific species involved and the scale of the infestation. Specialist advise to be sourced as an when required.																		Y
32.3	Spoil Handling (overburden and interburden)																		
	Environmental Aspect / Impact Source:																		
	Opencast mining involves removal and replacement of soil layers found above and between coal seams that are extracted.																		
	Long-term environmental degradation due to incomplete site clean-up and incomplete rehabilitation.																		
	Goals and Objectives:																		
	Ensure that erosion and sedimentation is minimised.																		
	Ensure that water infiltration and groundwater recharge is optimally managed.																		
	Mitigation Measures:																		
33.3.1	Mined out voids to be backfilled and rehabilitated as soon as practically possible after being mined.	As required	Y	Y	Y			Y											
33.3.2	Once sufficient space (3 cuts) has been created behind the strip being mined, live placement of overburden and soils will take place and each consecutive strip will be dealt with in a continuous roll-over mining method.	As required	Y	Y	Y			Y											
33.3.3	Rehabilitated spoils to be layered as far as possible, with hard overburden at the bottom of the spoils.	As required	Y	Y	Y			Y											
33.3.4	Partial spoiling of soft/hard overburden will occur due to the limitations of dragline activities, but the highly weathered soft material should as far as practically possible be placed on the top.	As required	Y	Y	Y			Y											
33.3.5	Adhere to spontaneous combustion management measures.	As required	Y	Y	Y			Y											
33.3.6	Manage backfilling operations to optimize even compaction and reduce water infiltration.	As required	Y	Y	Y			Y											
32.4	In-pit Discard Placement																		
	Environmental Aspect / Impact Source:																		
	Lower quality coal requires washing, which in turn produces coal discard (coal processing waste).																		
	Goals and Objectives:																		
	Place discard in the best possible position to control pollution and spontaneous combustion risks.																		
	Mitigation Measures:																		
33.4.1	All coal discards will be backfilled into the mine pit.	As required	Y	Y	Y			Y	Y	Y									
33.4.2	Discard will be placed in the bottom of the pit, on the No. 2 coal seam floor (bottom coal seam) and spread in thin layers.	As required	Y	Y	Y			Y	Y	Y									
33.4.3	Discard layer thicknesses to be minimised but to take cognisance of the overall available space in the mine pit and decant points. Layers thicknesses not to exceed 2.5 m.	As required	Y	Y	Y			Y	Y	Y									
33.4.4	Discard to be compacted if placed on surface.	As required	Y	Y	Y			Y	Y	Y									
33.4.5	Discard to be covered with spoils as soon as practically possible but should not be left exposed longer than the time taken for heating to occur, in order to prevent spontaneous combustion. Additional salt load from in-pit discard disposal to be handled by the immediate implementation of the Water Treatment Plant	As required	Y	Y	Y			Y	Y	Y									
32.5	Gypsum Placement and Use																		
	Mitigation Measures:																		
33.5.1	A temporary gypsum storage pad will be provided as per design approved by the DWS as part of the IWULA.	Ongoing	Y	Y	Y														
33.5.2	Various alternatives are available for management of the gypsum after being removed from the WTP site. During the operational phase these include:	Ongoing	Y	Y	Y														
33.5.2.1	The base case is to place gypsum into the mine pit during operation.	As required	Y	Y	Y														
33.5.2.2	Utilise gypsum to provide a layer of low permeability below the rehabilitated soil layer in the mine pit and borrow pits to reduce water infiltration and increase water availability in the top layers of the soil for vegetation growth and biodiversity support.	As required	Y	Y	Y														
33.5.2.3	Remove from site.	As required	Y	Y	Y														
33.5.2.4	Sell the gypsum commercially.	As required	Y	Y	Y														
33.5.3	During the decommissioning, closure and post closure phase, alternatives to in-pit placement will have to be found based on the characteristics and market demand for gypsum at the time of mine closure. Due to the long life of the mine it is not possible to accurately determine the post closure application of gypsum. The base case post closure management for gypsum is removal from the site.	Ongoing	Y	Y	Y														

A	EMP Number	C	Scheduling	D E F G H I J K L M N O P Q R S V																	
				Project Phase				Applicable Project Activities						Action							
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32.6																					
33.6.1			Ongoing / As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.6.2			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.6.3			Ongoing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.6.4			After high rainfall events, and monthly	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
32.7																					
33.7.1			As required		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.1			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.2			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.3			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.4			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.5			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.6			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.7			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.8			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.7.2.9			As required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
32.8																					
33.8.1			As required			Y			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.8.2			As required			Y			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
33.8.3			As required			Y			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
32.9																					
33.9.1			As required			Y				Y				Y	Y	Y	Y	Y	Y	Y	Y
33.9.2			As required			Y		Y								Y	Y	Y	Y	Y	Y
33.9.3			As required			Y		Y								Y	Y	Y	Y	Y	Y
33.9.4			As required			Y		Y					Y			Y	Y	Y	Y	Y	Y
33.9.5			As required			Y		Y								Y	Y	Y	Y	Y	Y
33.9.6			As required			Y		Y								Y	Y	Y	Y	Y	Y
33.9.7			As required			Y		Y								Y	Y	Y	Y	Y	Y
33.9.8			As required			Y		Y								Y	Y	Y	Y	Y	Y
33.9.9			As required			Y		Y								Y	Y	Y	Y	Y	Y

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
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33.9.10	A minimum of 0.3 metre deep utilisable soil (A horizon and B2/1 horizon soil) to be placed over the entire area where structures are demolished.	As required			Y	Y								Y						
33.9.11	Fertilization and seeding to be carried out over the entire area where soil was replaced.	As required		Y		Y								Y						
33.9.12	All vehicles, plant and workshop equipment to be removed for salvage or resale.	As required		Y		Y								Y						
33.9.13	All fixed assets that can be profitably removed to be removed for salvage or resale.	As required		Y		Y								Y						
33.9.14	Any item that have no salvage value to the mine but could be of value to individuals to be sold (zero salvage assumed in cost closure cost estimation).	As required		Y		Y								Y						
33.9.15	Structures containing structural steel will be demolished / dismantled and the scrap steel will be sold to recover some of the costs. These costs were calculated in this report, but are not deducted from the total cost of the liability.	As required		Y		Y								Y						
33.9.16	All terracing and foundations to be levelled to restore the natural contours.	As required		Y		Y								Y						
33.9.17	Unpaved roads to be ripped and shaped to restore the natural contours.	As required		Y		Y								Y						
33.9.18	Dismantle and remove redundant fencing materials for salvage, where needed.	As required		Y		Y								Y						
33.9.19	Plough or rip the strip of land along the redundant fence lines and cover with utilisable soil where necessary.	As required		Y		Y								Y						
33.9.20	Restrict or prevent public access to avoid damage to rehabilitated areas by removal or closure of access roads and tracks, except where formally requested by post closure land owner / established land uses	As required		Y		Y								Y						
32.10	Water and Waste Management																			
33.10.1	Decommission and remove obsolete water management structures and rehabilitate the land.	As required		Y										Y						
33.10.2	Update the water balance and risk / impact assessment as the water management facilities are decommissioned. Risk assessments to be reviewed or updated on an annual basis until liabilities are zero or a closure certificate has been issued.	Annually		Y										Y				Y		
32.11	Waste																			
32.12	Vegetation Establishment																			
	Environmental Aspect / Impact Source:																			
	Construction activities associated with R545.																			
	Opencast mining involves removal and destruction of vegetation and surrounding habitat.																			
	Increase in water flow and loss of habitat due to removal of vegetation.																			
	Goals and Objectives:																			
	Obtain a minimum of 10% vegetation basal cover on all level rehabilitated areas.																			
	Introduce a mixed grass cover that includes indigenous grass species where possible.																			
	Ensure that water infiltration and groundwater recharge is optimally managed.																			
	Restore fertility to the soil in terms of nutrients																			
	Increase biodiversity to allow natural ecological processes to take place.																			
	Mitigation Measures:																			
33.12.1	Design of drainage system and rehabilitation measures at stream and wetland along R545 to be done in consultation with wetland specialist.	Post construction of R545	Y																	
33.12.2	The re-vegetation programme, part of shall take cognisance of the climatic and seasonal conditions but should generally be undertaken annually starting in spring and early summer.	Ongoing	Y	Y	Y									Y	Y			Y		

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V
EMP Number	Management Measures	Scheduling	Project Phase				Applicable Project Activities										Action	
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33.12.3	Vegetation establishment to include indigenous grass species found naturally in the area, or as determined by the site specific conditions and advice of a specialist.	Ongoing		Y	Y	Y								Y				
33.12.4	Aftercare of the area should be done by applying nutrients and fertilisation, including controlled burns of vegetated land after rehabilitation.	As required until closure certificate has been obtained.		Y	Y									Y				
33.12.5	Burning of rehabilitated areas should be controlled. Fire controls that are to be put in place include firebreaks, cool burning times, fire control equipment on site, and notification of neighbours.	Ongoing		Y	Y	Y								Y				
33.12.6	All sensitive rehabilitation areas should have firebreaks to minimise uncontrolled burns and damage to new rehabilitated land.	Ongoing		Y	Y	Y								Y				
33.12.7	A three yearly interval in burning of rehabilitation should be followed. The type of burn (hot/cold/wet/dry) should be investigated by the responsible person for rehabilitation prior to burning.	Ongoing		Y	Y	Y								Y				
33.12.8	Application of appropriate fertilisation must be based initially on an annual sampling (in Feb/May), and, when pasture fertility has been established, on a three-yearly sampling frequency.	Ongoing		Y	Y	Y								Y				
33.12.9	Corrective fertilisation and initial nitrogen fertiliser applications should be made each year in Sep/Oct, repeated in January. (The quantity and timing of application of this second dressing of nitrogen will depend to some extent on the weather. In normal seasons, January is a satisfactory time for application).	Ongoing		Y	Y	Y								Y				
33	CLOSURE PLAN																	
	Closure Vision:																	
	Design New Largo Colliery with closure in mind and construct and operate all facilities focussing on rehabilitation, establishment of end land uses and post closure use of the infrastructure.																	
	Manage natural habitats in non-operational areas for biodiversity conservation, throughout operation of the mine and beyond closure.																	
	Rehabilitate mine pits so that there is a net increase in food production, jobs creation and economic contribution to that currently generated by agricultural activities within the mine pit area. The bulk of the land will revert to grazing, with some areas utilised for intensive farming (alternative crops to maize).																	
	Rehabilitation programme will provide predominately grazing land with areas of intensive agricultural practices and conservation areas which align with the priorities in the Province. Facilitate recreational use of the land where appropriate. Activities should not degrade / compromise the status of land that has been rehabilitated.																	
	Ensure the entire mining right area is safe, stable and non-polluting.																	
	Mitigation Measures:																	
33.1	General Closure Management																	
34.1.2	Ensure that adequate rehabilitation performance monitoring and rehabilitation take place throughout the life of the mine and that residual impacts are managed and monitored post closure.	Ongoing		Y	Y	Y											Y	
34.1.3	Throughout the life of the mine, mined out voids to be backfilled and rehabilitated as soon as practically possible after being mined to ensure that post mining land uses, as per the closure vision, can be established as soon as possible on mined out areas.	Ongoing		Y	Y	Y												
34.1.4	Minimise post closure liabilities and the need for major modifications near closure through proactive planning and implementation and corrective actions over the life of the mine.	Ongoing		Y	Y	Y												
34.1.5	Monitor the success of rehabilitation efforts throughout the life of the mine and optimise rehabilitation practices accordingly to ensure that post mining land capability is optimised (also towards achieving the commitment to no nett loss of agricultural production capability) and that residual impacts are minimised.	Ongoing		Y	Y	Y											Y	
34.1.6	Establish beneficial and sustainable post closure land uses within the mine footprint aligned with the objective of no nett loss of agricultural production capability.	Ongoing		Y	Y	Y												
34.1.7	Strive to unlock socio-economic value during the operational stage, in order to leave behind a positive post-closure legacy.	Ongoing		Y	Y	Y												
34.1.8	Optimise post mining land use alternatives in line with the closure vision and take into account operational / mine plan changes, social development / changes, technological developments and biophysical changes that occur through time.	Ongoing		Y	Y	Y												
34.1.9	Manage I&APs, stakeholders and local community expectations and reduce the dependency of communities on New Largo Colliery through the whole life cycle of the operation.	Ongoing		Y	Y	Y												

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																			Project Phase						Applicable Project Activities										Action
EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
34.1.10	Ensure that I&APs, stakeholders and local communities are aware of residual post closure impacts and risks, that they are involved in the optimisation of the post mining land uses and closure plan.	Ongoing			Y	Y	Y												
34.1.11	As part of the closure planning process, engage with local stakeholders that wish to contribute to the refinement of, and/or participate in, the preferred post closure land use and economic options, through an appropriate engagement plan, taking cognisance of the remaining life of the operation.	Ongoing		Y	Y		Y												
34.1.12	Identify ways in which the mine could facilitate the provision of institutional support (e.g. partnerships, alliances, independent business development, etc.) required to ensure the success of the post mining land uses.	Ongoing		Y	Y		Y												
34.1.13	Allocate, on an ongoing basis, the necessary funds to achieve the required provision for closure.	Ongoing		Y	Y		Y												
34.1.14	Allocate, on an ongoing basis, the necessary resources (funding, time, people, expertise and equipment) to achieve the closure plan.	Ongoing		Y	Y		Y												
34.1.15	Monitor the implementation of ongoing closure activities to evaluate whether the closure vision is to be realised.	Annually		Y	Y		Y											Y	
34.1.16	Estimate and annually update the premature, end of life and post closure costs.	Ongoing		Y	Y		Y											Y	
34.1.17	Review and amend closure plans annually or as required by relevant legislation to incorporate changes in the mine/rehabilitation context, receiving environment and the affected communities based on the remaining life of the operation.	Every five years		Y	Y		Y											Y	Y
34.1.18	Achieve a final closure plan at least 5 years prior to mine closure and incorporate the closure plan as part of the operational EMS.	Five years before closure		Y															Y
34.1.19	Execute all decommissioning and post-closure activities as per the final closure plan.	Ongoing		Y	Y		Y												Y
34.1.20	Ensure that the end closure objectives and agreements have been met.	Ongoing		Y	Y		Y												
34.1.21	Ensure that competent personnel are appointed to address closure and post closure management, including the management of the WTP and auditing of end land uses long-term during post closure.	Ongoing		Y	Y		Y							Y				Y	
33.2	Water and Waste Management																		
34.2.1	Infrastructure associated with active management of mine water to remain post closure until such time as active management is no longer required.	Ongoing		Y	Y		Y						Y	Y					
34.2.2	Update the water balance and risk / impact assessment on an annual basis until liabilities are zero or a closure certificate has been issued.	Ongoing	Y	Y	Y		Y					Y	Y	Y				Y	Y
34.2.3	Adapt the operational phase water management and monitoring plan during closure with the aim to manage remaining water impacts.	Ongoing		Y	Y		Y					Y	Y	Y				Y	Y
34.2.4	Avoid impacting on downstream water quality at all times through active management of mine water through a pump and treat system that would maintain water levels below the environmentally safe water level to prevent decant into the environment.	Ongoing		Y	Y		Y					Y	Y	Y					
34.2.5	When the water treatment technology for the permanent WTP is selected during the operational phase of the mine, the long-term post closure minimisation of impacts associated with energy use and waste generation should be considered.	Ongoing		Y								Y	Y	Y		Y			
34.2.6	Appropriate on-going post closure management of wastes / by-products produced at the WTP, adapted to the quantities and qualities of the wastes / by-products produced (not defined at this point in time as water treatment technology for the permanent WTP will only be chosen later in the life mine).	Ongoing			Y							Y	Y	Y					
34.2.7	Monitor the water table rebound and, if necessary, update modelling to quantify the long-term impacts. If necessary, amend management measures based on the revised modelling results. Effective means of optimising the post closure water balance by adapting operational practices as needed must be continuously investigated, and must consider the implications of the mine plan, envisaged post mining topography, soils handling practices and the in-pit discard deposition plan on the predicted excess mine water make, the time available to decant, and the contamination concentrations	Ongoing			Y							Y	Y	Y				Y	
34.2.8	Maintain releases from the WTP to catchments as per the requirements of up to date catchment release requirements and a reserve determination at the time of closure, to account for social development / changes, technological developments and biophysical changes that occur through time.	Ongoing			Y							Y	Y	Y					
34.2.9	Determine, in consultation with the relevant regulators and stakeholders, appropriate uses of excess treated water (over and above the environmental reserve released to streams) in line with an updated reserve determination.	Ongoing			Y							Y	Y	Y					
34.2.10	Implement a post mining water management plan to ensure sustainable and robust water management post closure.	Ongoing			Y							Y	Y	Y					Y
34.2.11	Maintain WTP in place post closure until such time as monitoring results prove that active water management is no longer required.	Ongoing			Y							Y	Y	Y					Y

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V	
																			Project Phase						Applicable Project Activities						Action
EMP Number	Management Measures	Scheduling	Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report
34.2.12	Decision on when active water management can cease to be based on an annual review of all historic monitoring data by New Largo Coal (Pty.) Ltd. in conjunction with DWS.	Ongoing			Y	Y						Y	Y						Y
34.2.13	Phasing out of water quality monitoring to be agreed with DWS as part of the decision that active water management may cease.	Ongoing			Y	Y						Y	Y					Y	
33.3	Rehabilitated Land Management																		
34.3.1	Rehabilitated areas to be monitored on a regular basis to determine the nominal and the functional land capability classification(s) achieved; the requirement for additional or replacement plantings, and site-specific specifications for soil fertility and soil structure amelioration as well as on-going care and maintenance requirements. Alien and invasive species control programmes must also be implemented.	Every six months		Y	Y	Y		Y							Y			Y	
34.3.2	Follow up fertilisation and seeding may be required to ensure the development of a sustainable sub-climax vegetation community. Fertiliser to be applied annually, before the summer rains, at a rate dependant on the soil requirements. Such requirements shall be determined by annual soil sampling and analysis and implemented until the pre-determined relinquishment criteria are achieved.	Every six months		Y	Y	Y		Y							Y				
34.3.3	Monitoring of alien plant establishment to take place every 6 months for a period of 3 years. Control of alien plant species must be done as per the requirements of the Conservation of Agricultural Resources Act 43 of 1983. The objective is for alien and invasive plants to be controlled through appropriate means while at a young age preferably before seeds are set.	Every six months		Y	Y	Y		Y							Y			Y	
34.3.4	Monitoring for soil erosion and surface subsidence to be done every 6 months for a period of 3 years, or until the pre-determined relinquishment criteria are met. Remedial action to be taken where necessary. This may include the repair and or addition of diversion berms and drains.	Every six months		Y	Y	Y		Y							Y			Y	
34.3.5	Maintenance and after care of rehabilitated areas will continue for a minimum period of 3 years after the mine pit has reached a stable rehabilitated and geo-technical state and erosion issues have been corrected.	ongoing until 3 years after stable and no erosion noticed		Y	Y	Y		Y							Y				
33.4	Biodiversity Management																		
34.4.1	Adapt the operational phase biodiversity management plan during closure with the aim to manage all remaining residual biodiversity impacts.	At closure			Y	Y		Y							Y				Y
34.4.2	Ensure that any areas specifically set aside for biodiversity conservation (including any off-site mitigation / offset areas) are protected and managed according to their defined objectives.	Ongoing			Y	Y		Y							Y				
33.5	Soils and Land Capability																		
34.5.1	Optimise soil management during the operational phase in order to maximise the re-establishment of pre-mining land capability classifications as far as possible. An envisaged post-mining land capability plan must be developed and regularly updated as needed to accommodate changes future changes in the mine plan.	Ongoing		Y	Y			Y		Y			Y	Y	Y				
34.5.2	Pre-mining records on soil depths to be kept.	Ongoing		Y	Y			Y		Y			Y	Y	Y			Y	Y
34.5.3	The topsoil stripping plan must be developed in more detail to include planning for specific mining blocks, and the stripping plan should be updated when significant changes to the mine plan are made. The topsoil stripping plan must be implemented and operational monitoring and associated record keeping are required to ensure that soil handling practices are adequate to protect the soil resource during stripping, stockpiling and placement, as well as the maintenance phases. It is critical that topsoil is not overstripped (strip only the usable soil component as indicated on Figure 6 in the closure framework), that soils are not handled when wet, that appropriate equipment is used for soils handling, and that arable and non-arable soils are separately stockpiled. More guidance on topsoil management requirements is given in Section 7 of the closure framework. Operational soils management and the tracking of success in this regard should be a key focus area of the annual EMP audits	Ongoing		Y	Y			Y		Y			Y	Y	Y			Y	Y
34.5.4	Soil management and replacement throughout the life of the mine to be monitored to ensure compliance with the rehabilitation plan.	Ongoing			Y	Y		Y		Y			Y	Y	Y			Y	
34.5.6	Placement of sediment and erosion control structures at strategic locations where insufficient surface cover is noted during operational phase and inspection of these on a regular basis for a period of 3 years post-closure.	Ongoing			Y	Y		Y		Y			Y	Y	Y			Y	

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	V		
EMP Number	Management Measures	Scheduling	Project Phase				Applicable Project Activities											Action		
			Construction (includes pre-construction)	Operation	Decommissioning and Closure	Post Closure	All activities	Earthworks, Earthworks, Soil Management	Mining Activities	Coal Processing & Discard Management	Materials Handling and Transport	Supporting Infrastructure	Water Management	Waste Management (Non-Mineralogical)	Rehabilitation	R545 Road Deviation	Training	Monitor/Auditing	Procedure, Plan or Report	
33.6	Air Quality Management																			
34.6.1	Implement appropriate dust control measures for activities remaining post closure, most notably the handling and transportation for WTP plant waste / by-products (gypsum).	Ongoing until WTP decommissioned			Y	Y	Y						Y							
33.7	End Land Use Management																			
34.7.1	Establish a combination of beneficial and sustainable post closure land uses (end land uses) within the mining right area as soon as possible in areas where mining has ceased, rehabilitation has been completed and the areas have been made stable. The Conceptual End Land Use Plan (as per Section 13.3 of the approved 2012 EIA) sets the base case for the establishment of end land uses.	Prior to closure certificate being issued				Y	Y													
34.7.2	The Conceptual End Land Use Plan (as per Section 13.3 of the approved 2012 EIA) has been optimised for agricultural end land uses and provides for:	As per EIA Section 13.3																		
34.7.2.1	Pastures (livestock grazing or stocked game).	as above	Y	Y	Y	Y	Y													
34.7.2.2	Rehabilitated grasslands (livestock grazing, game stocking, re-population by certain wildlife species possible).	as above	Y	Y	Y	Y	Y													
34.7.2.3	Rainfed grain.	as above	Y	Y	Y	Y	Y													
34.7.2.4	Irrigated crops.	as above	Y	Y	Y	Y	Y													
34.7.2.5	Fruit production.	as above	Y	Y	Y	Y	Y													
34.7.2.6	Feedlots and poultry units.	as above	Y	Y	Y	Y	Y													
34.7.3	The End Land Use Plan must be reviewed and revised regularly, in consultation with the EMC, to take into account operational / mine plan changes, social development / changes, technological developments and biophysical changes that occur through time.	Review every 5 years	Y	Y	Y	Y	Y													
34.7.3.1	The review of the End Land Use Plan must take cognisance of the following possible land uses as listed by I&AP's, specialists and New Largo Coal (Pty.) Ltd. during the EIA process:	Review every 5 years	Y	Y	Y	Y	Y													
34.7.3.2	Wilderness / conservation areas.	as above	Y	Y	Y	Y	Y													
34.7.3.3	Feedlots, poultry units, piggeries (protein production).	as above	Y	Y	Y	Y	Y													
34.7.3.4	Industrial e.g. regional water treatment and bottling plant.	as above	Y	Y	Y	Y	Y													
34.7.3.5	Recreational (e.g. fishing, bird watching, hiking, adventure sports, etc.).	as above	Y	Y	Y	Y	Y													
34.7.3.6	Landfill/waste disposal site (e.g. request for use for old quarries, but this will be mined).	as above	Y	Y	Y	Y	Y													
34.7.3.7	Alternative energies (e.g. algae – based on presence of power infrastructure in region).	as above	Y	Y	Y	Y	Y													
34.7.3.8	Urban development (e.g. expansion of Phola), outside the mine pit footprint.	as above	Y	Y	Y	Y	Y													
34.7.3.9	Organic agricultural tunnels – availability of excess water (high intensity farming practices).	as above	Y	Y	Y	Y	Y													
34.7.3.10	Hydroponics (high intensity farming practices).	as above	Y	Y	Y	Y	Y													
34.7.3.11	Infrastructure with post-closure use e.g. workshops, office block, etc.	as above	Y	Y	Y	Y	Y													
34.7.3.12	Carbon sequestration / sink through a sustainable vegetation cover (i.e. in the form of woodlots / bamboo / other suitable vegetation cover).	as above	Y	Y	Y	Y	Y													
34.7.3.13	Energy production (solar / wood chips / charcoal).	as above	Y	Y	Y	Y	Y													
34.7.3.14	Human settlement.	as above	Y	Y	Y	Y	Y													
34.7.4	Incorporate the implementation of the end land use plan as part of the operational EMS.	5 years before closure	Y	Y	Y	Y	Y													Y
34.7.5	During the post closure phase, audit end land uses on an annual basis to ensure that rehabilitation efforts implemented over the life of the mine are not compromised and in turn that water infiltration, recharge and water treatment (the WTP) are not negatively affected, until such time that a closure certificate has been issued.	Annually until closure certificate is in place	Y	Y	Y	Y	Y													Y

Aspect	Impacts requiring monitoring / programmes / objectives	Detailed Actions	Monitoring Location	Parameters	Roles and Responsibilities	Frequency of submission of performance assessment report	
Biodiversity		- Monitor the status of the <i>Frithia humilis</i> and the 100 m buffer zone around these sensitive habitats in the northern portion of the mining right area.	Refer to 2020 Terrestrial biodiversity report	Refer to 2020 Terrestrial biodiversity report	New Largo ECO to appoint independent subcontractor.	Annually	
		Develop a detailed wetland rehabilitation and monitoring plan for the MRA, that will complement the overall wetland mitigation strategy for the MRA.	Refer to 2021 impact assessment report	Refer to 2021 impact assessment report	New Largo ECO to appoint independent subcontractor.	Once-off	
		- Check for the occurrence of plants and animals requiring relocation prior to topsoil stripping and mining.	Refer to 2020 Terrestrial biodiversity report	Refer to 2020 Terrestrial biodiversity report	New Largo ECO to appoint independent subcontractor.	Annually	
		- Produce a biodiversity monitoring report and make the report, including a non-technical summary available to I&APs, communities and competent authorities.	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Annually	
		- Compare the findings in the annual report to that of the previous year.	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Annually	
		- Revise the biodiversity action plan based on the findings of the biodiversity monitoring results.	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Annually	
		- Implement corrective action where required.	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Annually	
		Maintain the meteorological stations established during 2011/12, in good working order.	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Ongoing	
		Conduct ongoing monitoring of the following variables in order to facilitate air quality reporting in line with relevant national standards (NAAQS) and corporate standards:					
		- Conduct dust fallout / total suspended particulates monitoring.	Refer to 2020 Air impact assessment report (Figure 19) & 2021 Air impact assessment report (Figure 16)	Refer to 2020 Air impact assessment report	Refer to 2020 Air impact assessment report	New Largo ECO to appoint independent subcontractor.	Ongoing
Air Quality		- Inhalable particulate matter (PM10 and PM2.5).	Refer to 2020 Air impact assessment report (Figure 19) & 2021 Air impact assessment report (Figure 16)	Refer to 2020 Air impact assessment report	New Largo ECO to appoint independent subcontractor.	Ongoing	
		- H ₂ S, SO ₂ and BTEX.					
		Analyse air quality monitoring results on a monthly basis to identify potential problem areas that immediate corrective action. Implement corrective measures and determine the success of the measures in subsequent monthly monitoring results.	n/a	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Ongoing
		Produce an air quality monitoring report and make the report, including a non-technical summary available to I&APs, communities and competent authorities.	n/a	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Ongoing
		Compare the findings in the annual report to that of the previous year.	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Ongoing	

Aspect	Impacts requiring monitoring / programmes / objectives	Detailed Actions	Monitoring Location	Parameters	Roles and Responsibilities	Frequency of submission of performance assessment report
		Revise the air quality management plan based on the air quality monitoring results and changes that have occurred, and implement corrective action and measures to maintain air emissions within relevant national standards (NAAQS) where required.	n/a	n/a	New Largo ECO to appoint independent subcontractor.	Annually
		Develop a waste monitoring programme and keep up to date. The waste monitoring procedure will outline the sites to be monitored and frequency of monitoring. Monitoring will be undertaken to:			New Largo ECO, Contractors	Update annually
		- Access the adequacy of waste management practices throughout the project site.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		- Inspect all facilities where wastes are transferred, stored, handled and used.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		- Determine compliance with the waste management license conditions.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		- Identify maintenance and repair requirements.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		- Identify areas for corrective action and areas for improvement.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		- Monitor the implementation and success of the corrective action.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		- Monitor the success of waste reuse and recycling efforts.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		- Check waste records to determine the adequacy of off-site reuse, recycling or disposal.	n/a	n/a	New Largo ECO, Contractors	Quarterly
		Implement the detailed surface water and groundwater monitoring programmes as outlined in the IWUL.	Refer to 2020 and 2021 Surface Water Impact Assessment & Groundwater Impact Assessment Reports	Refer to 2020 & 2021 Surface Water Impact Assessment & Groundwater Impact Reports	New Largo ECO to appoint independent subcontractor.	Ongoing
		Determine the realistic reserve qualities for compliance with actual background groundwater qualities and ensure compliance with this reserve quality.	n/a	Refer to 2020 Surface and Ground Water Impact assessment	New Largo ECO to appoint independent subcontractor.	Prior to construction / thereafter as required
		Develop an alien and invasive plant management program to pro-actively strive towards the eradication and control of alien invasive species within the mining right area. The program will cover the following:			New Largo ECO	During Construction
		- The ECO to take 'before' photos of the alien and invasive species control areas (as listed above) to establish a baseline.	All areas disturbed by mining activities and land reinstated by rehabilitation activities		New Largo ECO	As required
		- The ECO to take regular follow-up photos of the alien and invasive species control areas to monitor progress and the status of alien and invasive species control measures.				
		- Soil from areas that are already invaded by alien species, such as Wattle not to be moved to other areas unless treated.	TBC	n/a	New Largo ECO, Contractors	As required
		- Imported materials (including soil, borrow material and construction aggregate) to be free of alien and invasive species, weeds and seeds of alien or invasive species.	TBC	n/a	New Largo ECO, Contractors	As required
		- Sources of imported soil, borrow material and construction aggregate to be listed and pre-approved by the ECO based on an inspection of the source areas by the ECO. Where there are uncertainties about the occurrence of aliens and invasive species at the source areas, the ECO to seek the advice of a specialist with appropriate knowledge of alien and invasive species.	TBC	n/a	New Largo ECO, Contractors	As required
		- All imported soil, borrow material and construction aggregate from sources that have not been pre-approved by the ECO, to be inspected by the ECO before brought onto the site. The ECO to make recommendations for handling of materials should there be concerns about the presence of alien species, which may include refusal of the use of the material on the New Largo Colliery.	TBC	n/a	New Largo ECO, Contractors	As required
Alien and Invasive Plants						

Aspect	Impacts requiring monitoring / programmes / objectives	Detailed Actions	Monitoring Location	Parameters	Roles and Responsibilities	Frequency of submission of performance assessment report
		Design blasts for vibration amplitudes below 50 mm/s at any part of other pipelines.	Refer to 2012 Blasting Impact Assessment	Refer to 2012 Blasting Impact Assessment	New Largo ECO, Contractors	Ongoing
		Design blasts for vibration amplitudes below 150 mm/s at any part of the road (R545, N4, N12).	Refer to 2012 Blasting Impact Assessment	Refer to 2012 Blasting Impact Assessment	New Largo ECO, Contractors	Ongoing
Noise		A noise survey should be undertaken shortly before and immediately after mining commences at a selection of suitable reference points (i.e. sensitive receptors)	Refer to 2020 & 2021 Noise Impact Assessment Reports for localities of sensitive receptors	Refer to 2020 & 2021 Noise Impact Assessments Reports for localities of sensitive receptors	New Largo ECO, Contractors	Prior to operation / Design / thereafter annually or as required
		Monitoring is to be undertaken in alignment with the SANS methods and include A-weighted equivalent continuous noise level in a sequence of 10-minute intervals covering the night-time. NB. As per the recently published GNR 320 of the NEMA, night-time monitoring will take place over a minimum of two nights, with each sample taken at two different times of the night in order to record the typical ambient sound levels at the different time of night.	Refer to 2020 and 2021 Noise Impact Assessments for localities of sensitive receptors	Refer to 2020 and 2021 Noise Impact Assessments	New Largo ECO, Contractors	Once-off prior to commencement, once-off after closure and as required.
Visual		The success of operational rehabilitation activities, particularly the vegetation of berms and planting of screening trees, and their effectiveness in mitigating potential visual impacts, should be monitored at appropriate intervals throughout operation (e.g. every five years), during the same season. Monitoring data should consist of both qualitative and quantitative data	All areas disturbed by mining activities and land reinstated by rehabilitation activities	n/a	New Largo ECO, Contractors	As required
		Monitoring should remain ongoing for at least a period of five years when the life of mine had been reached and all rehabilitation procedures have been completed	mining activities and land reinstated by rehabilitation activities	n/a	New Largo ECO, Contractors	As required
Closure		Monitor changes (improvement) in surface water quality following final rehabilitation at closure (to determine when water quality objectives and targets are met)	Refer to Surface Water report	Refer to surface water report	New Largo ECO, Contractors	At least 10 years post-closure (or until a closure certificate is issued)
		Monitor the recovery of catchment yield after closure rehabilitation has been completed, ensuring the long-term integrity of the surrounding rivers	Refer to Surface Water report	Refer to surface water report	New Largo ECO, Contractors	At least 10 years post-closure (or until a closure certificate is issued)
		Monitor the health and ecological integrity of aquatic life in the surrounding catchment systems, and to track changes over time with the intention of assessing changes in relation to changing water quality and other potential mining impacts	Refer to Aquatic biodiversity report	Refer to Aquatic biodiversity report	New Largo ECO, Contractors	Bio monitoring will continue for at least 5 years post-closure (or until a closure certificate is issued)
		Monitor ground water quality in both natural aquifers and mine workings, to track water quality changes (improvements) over time as a result of closure rehabilitation activities	Refer to Ground Water report	Refer to Ground Water report	New Largo ECO, Contractors	Monitoring of boreholes will continue for at least 10 years post-closure (or until a closure certificate is issued)
		Monitor the piezometric (water table) levels in all bore openings to determine the dewatering impacts of mining, and to measure the rate of recharge to underground workings in closed mining areas	Refer to Ground Water report	Refer to Ground Water report	New Largo ECO, Contractors	Monitoring of boreholes will continue for at least 10 years post-closure (or until a closure certificate is issued)
		Measure rehabilitation performance against the land capability objectives committed to as part of next land use planning. This should be done throughout operations and should include nominal and functional land capability assessments to inform adaptive and/or corrective management throughout operations and in preparation for mine closure and the establishment of the envisaged next land uses	All areas disturbed by mining activities and land reinstated by rehabilitation activities	Refer to Closure Report	New Largo ECO, Contractors	Land capability assessment is typically a once-off exercise on rehabilitated units within 3 years of completion of the rehabilitation work
		Measure whether basal soil fertility levels that will support a self-sustaining vegetation cover (within 5 – 10 years of completion of rehabilitation) have been achieved	All areas disturbed by mining activities and land reinstated by rehabilitation activities	Refer to Closure Report	New Largo ECO, Contractors	within 5 – 10 years of completion of rehabilitation

Aspect	Impacts requiring monitoring / programmes / objectives	Detailed Actions	Monitoring Location	Parameters	Roles and Responsibilities	Frequency of submission of performance assessment report
		<p>Monitor rehabilitated areas for soil erosion to ensure that a self-sustaining vegetation cover is established that will minimise soil loss through raindrop impact and rainfall runoff erosion</p> <p>Measure the successful establishment of suitable perennial grass species on rehabilitated areas, and the persistence of these perennial species in the rehabilitated landscape</p> <p>Monitor the progress of eradication or control of declared Category 1, 2 and 3 invader species on both rehabilitated land and on unmined areas within the mining rights area</p>	<p>All areas disturbed by mining activities and land reinstated by rehabilitation activities</p> <p>All areas disturbed by mining activities and land reinstated by rehabilitation activities</p> <p>All areas disturbed by mining activities and land reinstated by rehabilitation activities</p>	<p>Refer to Closure Report</p> <p>Refer to Closure Report</p> <p>Refer to Closure Report</p>	<p>New Largo ECO, Contractors</p> <p>New Largo ECO, Contractors</p> <p>New Largo ECO, Contractors</p>	<p>On an annual basis for the first 5 years (end of wet season), and every 3 years thereafter until landform equilibrium is met</p> <p>Monitor annually for 5 years, then every 3 years until a sustainable vegetation cover has been established</p> <p>Annually for the first 3 years after closure, and then every 3 years, at least, until closure</p>