

**ENVIRONMENTAL IMPACT ASSESSMENT and
ENVIRONMENTAL MANAGEMENT PLAN
FOR THE PLANNED COAL MINING OPERATION
ON THE FARM VLAKVARKFONTEIN 213 IR,
EMALALHENI (WITBANK), MPUMALANGA.**

Reference Number: MP 30/5/1/1/2/483 MR

Revision: June 2012 Addendum

For
WESCOAL HOLDINGS Limited
P.O. Box 215
Fourways North
Fourways
2088

Prepared by:



Ferret Mining and Environmental Services (Pty) Ltd
PO Box 72313
Lynnwood Ridge
0040
Tel nr. 011 025 7711
Fax nr. 086 716 5576

Intention of this document

This document aims to clarify measures described in the Environmental Management Programme Revised June 2012 as referenced. The table of contents, List of Figures and List of Table indicate information provided in the mentioned Environmental Management Programme. Additional information is underlined using a dash line except for the map.

Contents

1	Project description	7
1.1	Resource description	7
1.2	Market	7
1.2.1	Product consumers	7
1.2.2	Contract details	7
1.2.3	Quality specifications	8
1.2.4	Uses	8
1.2.5	Prevailing market prices	8
1.2.6	Selling arrangements	8
1.2.7	In-house or contracted out	8
1.2.8	Cost applicable to the mining operation	8
2	Baseline information concerning the affected environment	9
2.1	Assessment of the environment likely to be affected in respect of the specific area applied and the surrounding environment	9
2.1.1	Location of the site	9
2.1.2	Climate	9
2.1.3	Geology	11
2.1.4	Topography	13
2.1.5	Soil	13
2.1.6	Land Use and Land Cover	16
2.1.7	Pre-mining land capability	16
2.1.8	Land use	17
2.1.9	Natural vegetation	18
2.1.10	Animal life	20
2.1.11	Surface water	20
2.1.12	Groundwater	20
2.1.13	Wetlands	22
2.1.14	Air quality	23
2.1.15	Noise	29
2.1.16	Sites of archaeological and cultural interests	29
2.1.17	Visual aspects	29
2.1.18	Sensitive landscapes	30
2.1.19	Regional socio-economic structure	31
2.1.20	Surface Water	32
2.1.21	Ground Water	39
2.1.22	Hydrogeology	41
2.1.23	Sensitive environmental features	54
2.2	Identify closure or end use objectives for the site applied for as guided by the baseline study	55
3	Mining actions, activities or processes which may cause pollution or environmental degradation	56
3.1	Main mining activities	57
3.1.1	A plan showing the location and aerial extent of the aforesaid main activities	59
3.2	List of main mining activities	61
3.2.1	Construction phase (~third quarter 2012 – Third quarter 2013)	61
3.2.2	Operational phase (~First quarter 2013 – Third quarter 2013)	65
3.2.3	Decommissioning phase (~2nd Quarter 2013 – 1st Quarter 2014)	72
3.2.4	Residual impacts after closure (~ 2nd Quarter 2014 onwards)	73
4	Impact assessment	78
4.1	Details of the engagement process with interested and affected parties	78

4.1.1	Details of the potential physical impacts that were identified by interested and affected parties	78
4.2	A list of the potential impacts of each of the aforesaid main mining activities	80
4.2.1	Construction phase	80
4.2.2	Operational Phase	88
4.2.3	Decommissioning phase	93
4.2.4	Post-closure phase.....	95
4.3	All the potential physical impacts identified by interested and affected parties relative to the respective main mining activities which represent their sources	95
4.4	All the potential impacts identified by State Department charged with the administration of any law which relates to matters affecting the environment relative to the respective main mining activities which represent their sources	96
4.5	A classification of all the potential impacts that are identified in terms of the respective phases of construction, operational, closure and post closure phases of the mining operation	96
4.5.1	An assessment of all the potential impacts-	96
4.5.2	A separate list of the aforesaid potential impacts which are identified and assessed as potentially cumulative	99
4.5.3	Identify knowledge gaps concerning the foregoing impact assessment	100
4.6	Assessment of the identified potential impact on the socio-economic conditions	101
4.6.1	Details of the engagement process with interested and affected parties	101
4.6.2	Details of the potential socio-economic impacts that were identified by interested and affected parties	101
4.6.3	All the potential socio-economic impacts identified by State Departments charged with the administration of any law which related to matters affecting the environment.....	102
4.6.4	An assessment of all the potential impacts thus identified	102
4.6.5	A comparative assessment of the identified land use and development alternatives and their potential social impacts.....	103
4.6.6	Identify knowledge gaps concerning the foregoing impact assessment	103
4.7	Potential impacts on any national estate	104
4.7.1	Details of the engagement process with interested and affected parties	104
4.7.2	Details of the potential impacts on national heritage sites that were identified by interested and affected parties	104
4.7.3	All the potential impacts on national heritage sites identified by State Departments charged with the administration of any law relates to matters affecting the environment.....	104
4.7.4	An assessment of all the potential impacts identified-	105
4.7.5	Identify knowledge gaps concerning the foregoing impact assessment	105
5	Environmental awareness.....	105
5.1	Scope	106
5.2	Objectives.....	106
5.3	Responsibilities.....	106
5.4	Legal requirements	106
5.5	Activity procedures	106
5.5.1	Induction Programme	106
5.6	Trainee needs	107
5.7	Training Planning.....	107
5.7.1	General environmental awareness training.....	107
5.7.2	Job specific environmental awareness training	107
5.7.3	Competency training	108
5.7.4	Certification	108
5.7.5	Records	108

6	Environmental remediation and mitigation	108
6.1	Mitigation measures.....	108
6.1.1	Construction phase	109
6.1.2	Operational Phase	115
6.1.3	Decommissioning phase	122
6.1.4	Residual impacts after closure.....	123
6.1.5	Mitigation measures for all the physical impacts identified by interested and affected parties.....	126
6.1.6	Mitigation measures for all the physical impacts identified by State Department.....	127
6.1.7	Mitigation measures for all cumulative impacts.....	127
6.1.8	Mitigation measures to address the identified potential impact on the socio-economic conditions.....	130
6.1.9	Classification of measures relative to the respective phases of construction, operational, closure and post closure phases of the mining operation.....	130
6.1.10	Information on the extent to which the proposed measures are reconcilable with the technical and supporting information attached as appendices.....	132
6.1.11	Information on the extent to which the proposed measures will contain or remedy the cause of pollution or degradation and mitigation of pollutants regarding cumulative impacts.....	132
6.1.12	Information on the extent to which the proposed measures are reconcilable with the prescribed waste standards or practices of the State Departments concerned.....	133
7	Monitoring and management of environmental impacts.....	133
7.1	A list of those management activities which, where applicable, will be conducted daily, weekly, monthly, quarterly, annually or periodically as the case may be in order to manage the aforesaid impacts effectively.....	133
7.1.1	Geology	133
7.1.2	Soil	133
7.1.3	Topography	133
7.1.4	Natural vegetation	134
7.1.5	Land capability	134
7.1.6	Land use.....	134
7.1.7	Surface Water	134
7.1.8	Groundwater	134
7.1.9	Air quality	135
7.1.10	Noise.....	135
7.1.11	Interested and affected parties	135
7.2	Action plans and a time schedule of actions	135
7.2.1	Mine Closure	135
7.2.2	Construction phase	136
7.2.3	Operational Phase	145
7.2.4	Decommissioning phase	155
7.3	Detail of procedures for environmental related emergencies and remediation.....	160
7.3.1	Introduction.....	160
7.3.2	Legal requirements	161
7.3.3	Responsibilities.....	161
7.3.4	Notification process	162
7.3.5	Emergency equipment and supplies	162
7.3.6	Communication systems.....	162
7.3.7	Emergency preparedness and response training	162
7.3.8	Monitoring and activity procedure	162
7.3.9	Review and revision.....	162
7.3.10	Emergency Response flowchart for Intibane Colliery	163

7.4	Environmental management programme performance assessment.....	165
7.5	Detail of the planned monitoring and environmental management programme performance assessment.....	165
8	FINANCIAL PROVISION.....	169
8.1	Rehabilitation plan.....	169
8.2	Ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed.....	169
8.3	Quantum calculation	171
8.4	Indicate that the required amount will be provided should the right be granted.....	172
9	CAPACITY TO MANAGE AND REHABILITATE THE ENVIRONMENT	172
9.1	A determination of the cost and classification of each of the mitigation measures.....	172
10	Undertaking	178

List of Figures

Figure 1-1.	Process flow diagram for the Crushing and Screening Plants.....	9
Figure 2-1.	Average values for Tmax, Tmin and rainfall for the larger Johannesburg area (source of data – SA Weather Bureau).....	11
Figure 2-2.	Vegetation distribution in the vicinity of the application area.....	19
Figure 2-3.	Terrestrial biodiversity assessment of the ecological importance of the mining right area.	30
Figure 2-4.	Surface mining recommended land use (MTPCP).	31
Figure 2-5.	Surface Water Locations.....	33
Figure 2-6.	Dam and Spring Locations.....	34
Figure 2-7.	Distribution of cation and anion concentrations in surface water	37
Figure 2-8.	Stiff Diagram.....	37
Figure 2-9.	Piper Diagram	38
Figure 2-10.	Explanation of Classes of the Piper Diagram	38
Figure 2-11.	Geology of the Vlakvarkfontein Mining Area.....	41
Figure 2-12.	Locations of the boreholes used in the investigation.....	46
Figure 2-13.	Correlation between surface elevation and groundwater level of all the boreholes.....	47
Figure 2-14.	Static water level contour map.....	48
Figure 2-15.	Unsaturated aquifer thickness map.....	48
Figure 2-16.	Groundwater flow direction map.....	49
Figure 2-17.	Distribution of cation anion concentrations in groundwater.....	50
Figure 2-18.	Distribution of cation anion concentrations in groundwater (November 2007).....	51
Figure 2-19.	Piper diagrams depicting groundwater chemistry	51
Figure 2-20.	Explanation of Classes of the Piper Diagram.	52
Figure 2-21.	Aquifer boundaries.....	54
Figure 3-1.	Locality plan of Intibane Colliery.....	59
Figure 3-2.	Topographical plan of Intibane Colliery.....	60
Figure 3-3.	Aerial extent of Intibane colliery infrastructure.	60
Figure 3-4.	Mining layout in relation to the 1:20year flood line.....	63
Figure 3-5.	Mining layout in relation to the 1:100year flood line.....	64
Figure 3-6.	Groundwater flow during mining.	69
Figure 3-7.	Recovery in groundwater levels.....	75
Figure 3-8.	Groundwater flow after mining.....	76
Figure 4-1.	Position of Graves.....	104
Figure 7-1.	Emergency Response flowchart for Intibane Colliery.	164
Figure 8-1.	Plan for quantum determination.....	169

List of Tables

Table 2-1. Climatic Data for the Bronkhorstspruit Dam Area	10
Table 2-2. Baseline soil types at the Colliery	14
Table 2- 3. Agricultural potential of soils	15
Table 2- 4. Soil types, land use and land capability	17
Table 2- 5. Atmospheric stability classes	25
Table 2- 6. Air quality guidelines and standards for inhalable particulates (PM10)	27
Table 2- 7. Target, action and alert thresholds for ambient dustfall	28
Table 2- 8. Hydro census data of the dams in use	34
Table 2- 9. Hydro census data of the springs.....	35
Table 2- 10. Hydro census data of the pans	35
Table 2- 11. Results of major cation and anion analyses	36
Table 2-12. Hydro Census Borehole Information of Vlakvarkfontein	45
Table 2-13. Hydrocensus Borehole Information of Bankfontein.....	45
Table 2-14. Results of major cation and anion analyses	50
Table 3-1. Boreholes affected by drawdown	68
Table 3-2. Boreholes affected by plume	77
Table 4-1. Impact Table for communities, based on the definitions above	97
Table 4-2. Matrix indicating a summary of cumulative proposed impacts and assessment	100
Table 6-1. Available topsoil to be stripped for rehabilitation purposes	111
Table 7-1. Surface water monitoring programme	134
Table 7-2. Groundwater monitoring program.....	135
Table 7-3. Monitoring Programme	166
Table 9-1. Activity based impact assessment, estimated timeframe, mitigation measures, annual cost and concurrent Rehabilitation cost	173

Additional Information

6.1.1 Construction phase

Construction of the settling dam (pollution control dam)

- Intibane Colliery appointed a civil engineer to oversee the construction of the settling dam and the storm water collection berms and trenches. The civil engineer will design the settling dam, the storm water collection berms and trenches to design specifications. Geotechnical survey will be conducted on the soil and the results of the survey will be utilised to select appropriate material to be used during rehabilitation and construction. The surface area of the settling dam is approximately 0.71 ha. The appointed civil engineer will sign off the constructed settling dam and the storm water berms/trenches after completion. All the design specifications and plans will be submitted to the Department of Water Affairs during the applications of water use licenses. The design would be submitted to the relevant departments for approval before construction of the facility commences.

6.1.2.8 Ground water

Mitigation measures:

- Continuous measuring of static levels of surrounding boreholes
- Any major structures with preferred groundwater flow must be grouted
 - o The design of the ROM stockpile would as a minimum include:
 - Topsoil stripping and storage in designated area
 - Compaction of ROM Stockpile surveyed area
 - A geo-membrane would be placed to minimize infiltration
- Affected groundwater users must be compensated

7.2.2.3 Soil

Services of a suitably qualified person will be used for construction of bunded area where diesel tank will be installed. A suitably qualified person will ensure that the diesel tank is constructed to the maximum allowable heights and that it is surveyed prior to installation. The Mine Manager or his appointed representative will ensure that the diesel tank is installed as specified by suitably qualified person and/or the appointed supplier.

Action Plan

Action plans	Time schedule
Ensure that installation of diesel tank is conducted properly	
Design the installation of bunded diesel tank, <u>whether self-bunded or building of bunded facility.</u>	Prior to construction phase
Install diesel tank above ground as specified in the design plan	Prior to construction phase

7.5 Detail of the planned monitoring and environmental management programme performance assessment

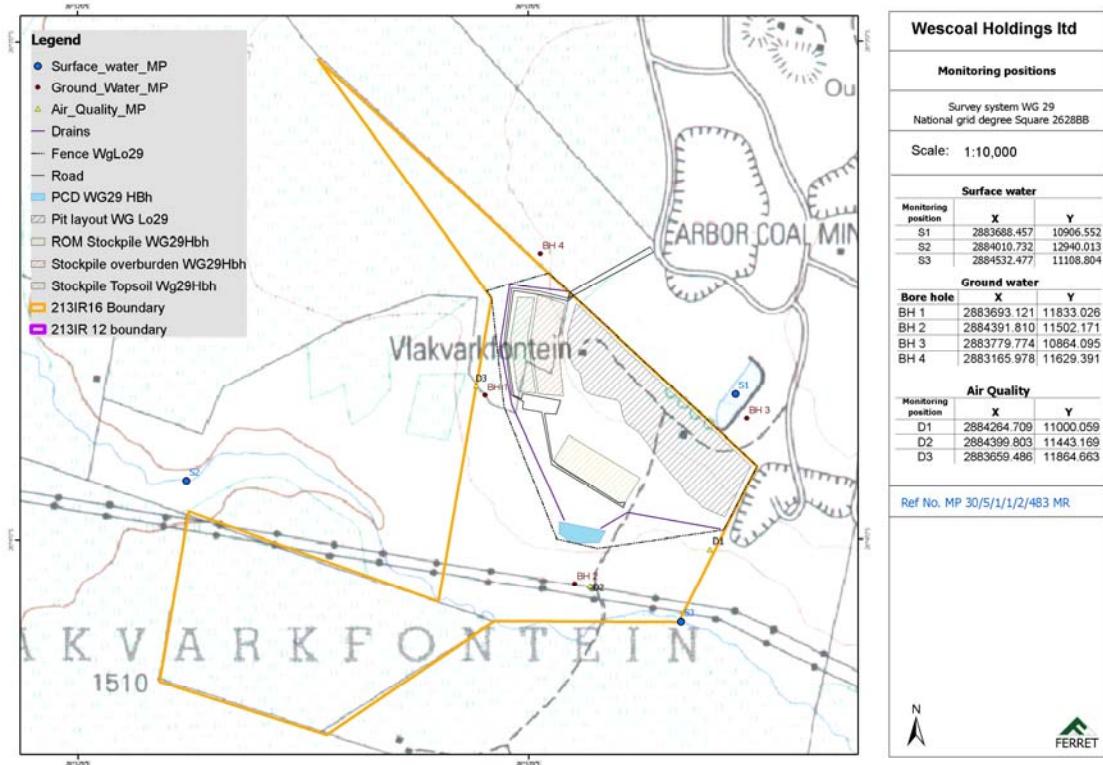


Figure 7-5. Monitoring positions.

Undertaking

I _____ The undersigned and duly authorised thereto by Wescoal Holdings Pty Ltd, have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to be the Regional Manager and approved on _____

Signed at _____ this _____ day of _____ 2012.

Signature of applicant

Designation