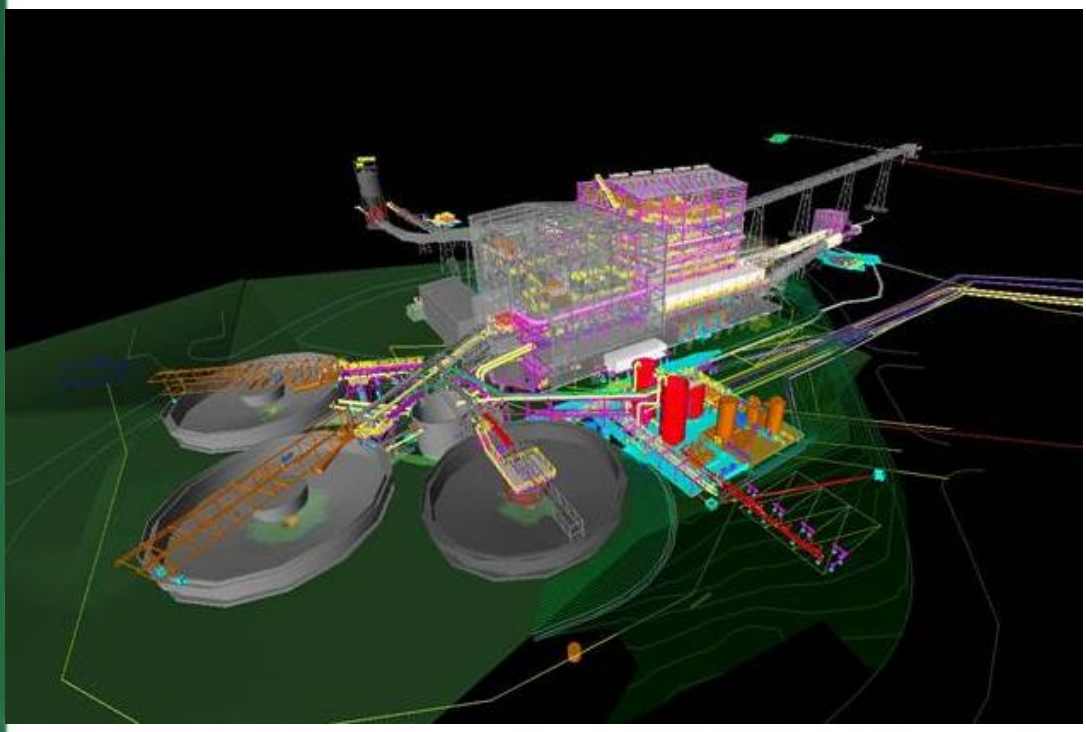
REPORT

18 July 2013

SOUTH AFRICAN COAL MINE HOLDINGS LIMITED (PTY) LTD

Plan of Study for the construction a new coal processing plant and tailings storage facility on portions 5 and 10 of the Farm Voorslag 274 IS, at the existing Umlabu mine, in the Breyten area of the Mpumalanga Province

Submitted to:
The Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET)
Directorate: Environmental Impact Management



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Contents

List of Figures

Table of Tables

Box 1: Definition of the term "environment"

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Signature:			
Date:	2013/07/16	2013/07/17	2013/07/17

Glossary

CA	**Competent Authority**
EAP	**Environmental Assessment Practitioner**
EIA	**Environmental Impact Assessment**
EMP	**Environmental Management Programme**
GNR	**Government Notice Regulation**
I&APs	**Interested and Affected Parties**
MDEDET	**Mpumalanga Department of Economic Development, Environment and Tourism**
NEMA	**National Environmental Management Act, 1998 (Act 107 of 1998)**
POS	**Plan of Study**
PPP	**Public Participation Process**
SAHRA	**South African Heritage Resources Agency**

1. INTRODUCTION

1.1 Project Background

The Applicant, South African Coal Mine Holdings Limited (PTY) LTD, is making an application for Environmental Authorisation for the construction of a new coal processing plant and tailings storage facility on the Farm Voorslag 274 IS, at the existing Umlabu mine, in the Breyten area of Mpumalanga Province, in terms of the National Environmental Management Act, Act No. 107 of 1998 (as amended). This Application for Environmental Authorisation is being made to the Competent Authority namely the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET), and is required since the proposed development includes activities which are listed in terms of the NEMA Environmental Impact Assessment (EIA) Regulations 2010.

Environmental Assurance (Pty) Ltd. (ENVASS) has been appointed by South African Coal Mine Holdings Limited (Pty) Ltd to undertake the Scoping and Environmental Impact Assessment process which requires compliance with the EIA Regulations of 2010, promulgated in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA) (as amended).

The project proposal entails the following**:**

1. The construction of a Coal Handling and Preparation Plant (CHPP). A coal handling and preparation plant is a facility that processes coal by washing it of impurities and preparing it for transportation to the end user or market. Coal processing is a vital part of coal handling and preparation plants as it needs to be stored at different stages of the preparation process and conveyed across the CHPP facility.

2. The construction of a tailings storage facility where the waterborne refuse mining tailing material will be pumped into to allow for sedimentation (meaning separation) of solid particles from the water.

1.2 Legislative Context

National Environmental Management Act, 1998 (Act 108 of 1998) [as amended):

The proposed development requires compliance with the EIA Regulations of 2010, promulgated in terms of the National Environmental Management Act, Act 107 of 1998 (as amended). The proposed activity requires a Scoping and EIA process as listed activities 11, 13, 18, 22 and 28 under Government Notice No R. 544 as well as listed activities 15 and 20 of Government Notice No R. 545 of the EIA 2010 Regulations are triggered.

National Water Act, 1998 (Act 36 of 1998):

The proposed development also requires compliance with the National Water Act, 1998 (Act 36 of 1998). An application for an integrated water use licence in terms of Section 21, was submitted, to undertake the following activities:

(a) taking water from a water resource;
(b) storing water;
(c) impeding or diverting the flow of water in a watercourse;

(i) altering the bed, banks, course or characteristics of a watercourse;
(g) disposing of waste in a manner which may detrimentally impact on a water resource;

The requirements of the following legislation have also been considered:

- Constitution of South Africa (Act No. 108 of 1996)
- National Biodiversity Act (Act No.10 of 2004)
- National Environmental Management Air Quality Act (Act No. 39 of 2004)
- National Environmental Waste Management Act (Act No. 59 of 2008)
- Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (as amended)
- Occupational Health and Safety Act (Act No. 85 of 1993)

1.3 Purpose of the Plan of Study

The Plan of Study (PoS) is a document which is intended to provide a summary of the key findings of the Scoping Phase of the EIA process, to ultimately describe the activities to be undertaken in the Impact Assessment Phase of the EIA process.

This PoS has been completed in terms of the requirements of Regulation 28 *(n)(i-iv)* of the EIA Regulations (2010), which sets out the approach to the Environmental Impact Assessment (EIA) of the Application which includes *inter alia*:

(i) A description of the tasks that will be undertaken as part of the EIA process, including any specialised reports or specialised processes, and the manner in which such tasks will be undertaken;
(ii) An indication of the stages at which the competent authority will be consulted;
(iii) A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and
(iv) Particulars of the public participation process that will be conducted during the environmental impact assessment process.

1.4 Details of the Applicant

Table 1: Details of Applicant

NAME OF APPLICANT	South African Coal Holdings Limited (Pty) Ltd
NAME OF MINE	The Umlabu Colliery (The Portion 5 and 10 of the Farm Voorslag 274 IS in Breyten, Mpumalanga Province)
CONTACT PERSON	Roelof Hugo
POSTAL ADDRESS	PO Box 55190 Northlands 2116
PHYSICAL ADDRESS	198 Oxford Road Illovo Johannesburg 2000
TELEPHONE NUMBER	011 025 3103

FAX NUMBER	086 663 3019
CELL PHONE NUMBER	071 875 5398
EMAIL	Roelof.hugo@sacmh.co.za
COMMODITY	Coal
ESTIMATED LIFE OF MINE	Estimated approximately 30 years

1.5 Details of the Environmental Assessment Practitioner

Table 2: Details of EAP

COMPANY	Environmental Assurance - ENVASS
CONTACT PERSON (EAP)	Rachelle Stofberg
POSTAL / PHYSCIAL ADDRESS	394 Tram Street, Brooklyn, Pretoria
TELEPHONE NUMBER	012 460 9768
FAX NUMBER	012 460 3071
EMAIL	rachelle@envass.co.za
RESPONSIBILITY ON PROJECT	EAP / Project Manager

2. PROJECT DESCRIPTION

The proposed project will entail the construction of a Coal Handling and Preparation Plant (CHPP) and tailings storage facility (TSF). A coal handling and preparation plant is a facility that processes coal by washing it of impurities and preparing it for transportation to the end user or market. Coal preparation is both a science and an art. It deals with the taking of raw coal and producing a saleable product that meets contract specifications by removing the impurities. Coal preparation, as commonly practiced today, is carried out in water based processes and makes use of slurry transport principles and procedures.

The study area is located on the Farm Voorslag 274 IS (Portions 5 and 10), at the existing Umlabu mine, in the Breyten area of Mpumalanga Province (refer to Figures 1 and 2 respectively).

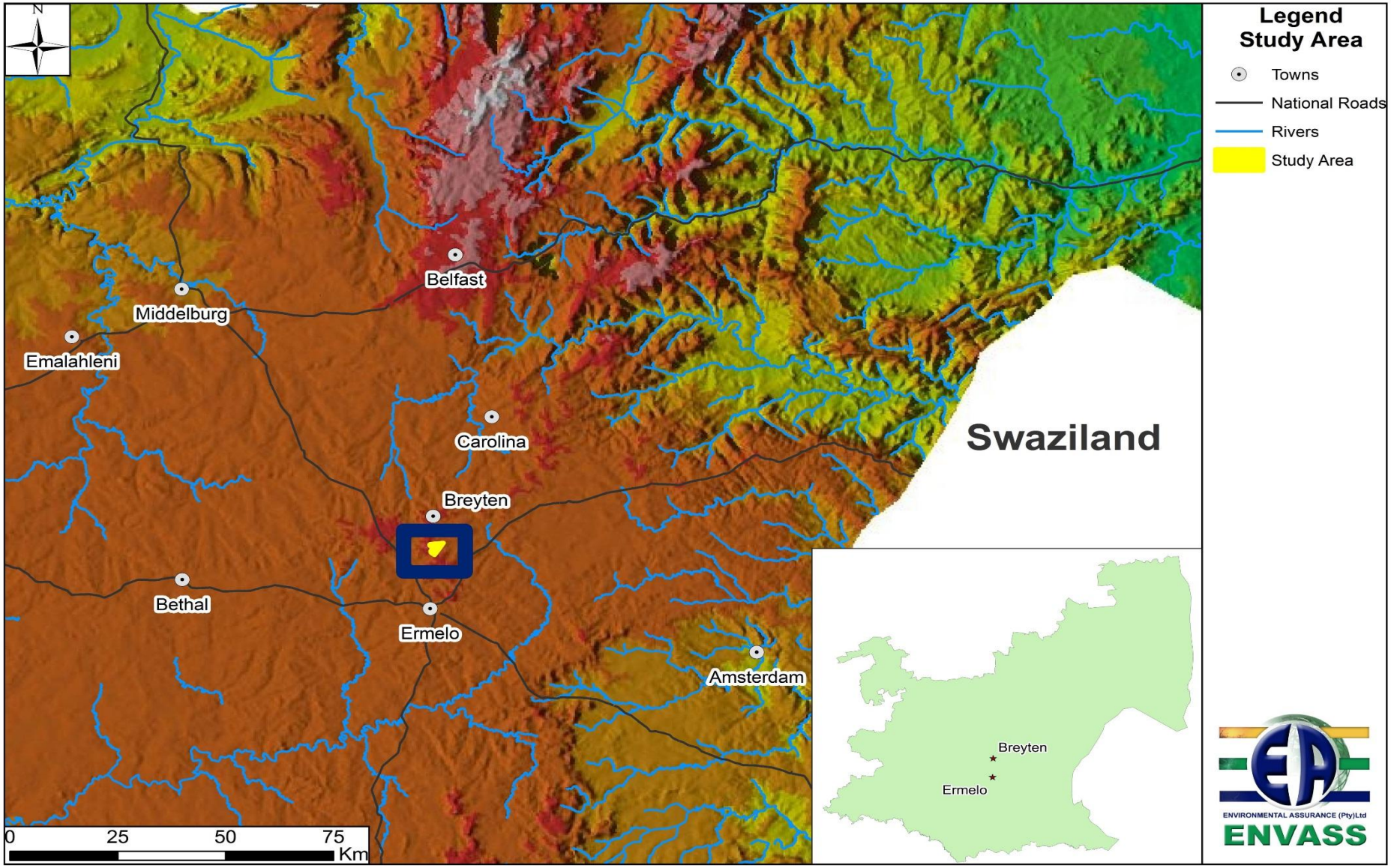


Figure 1: Study area

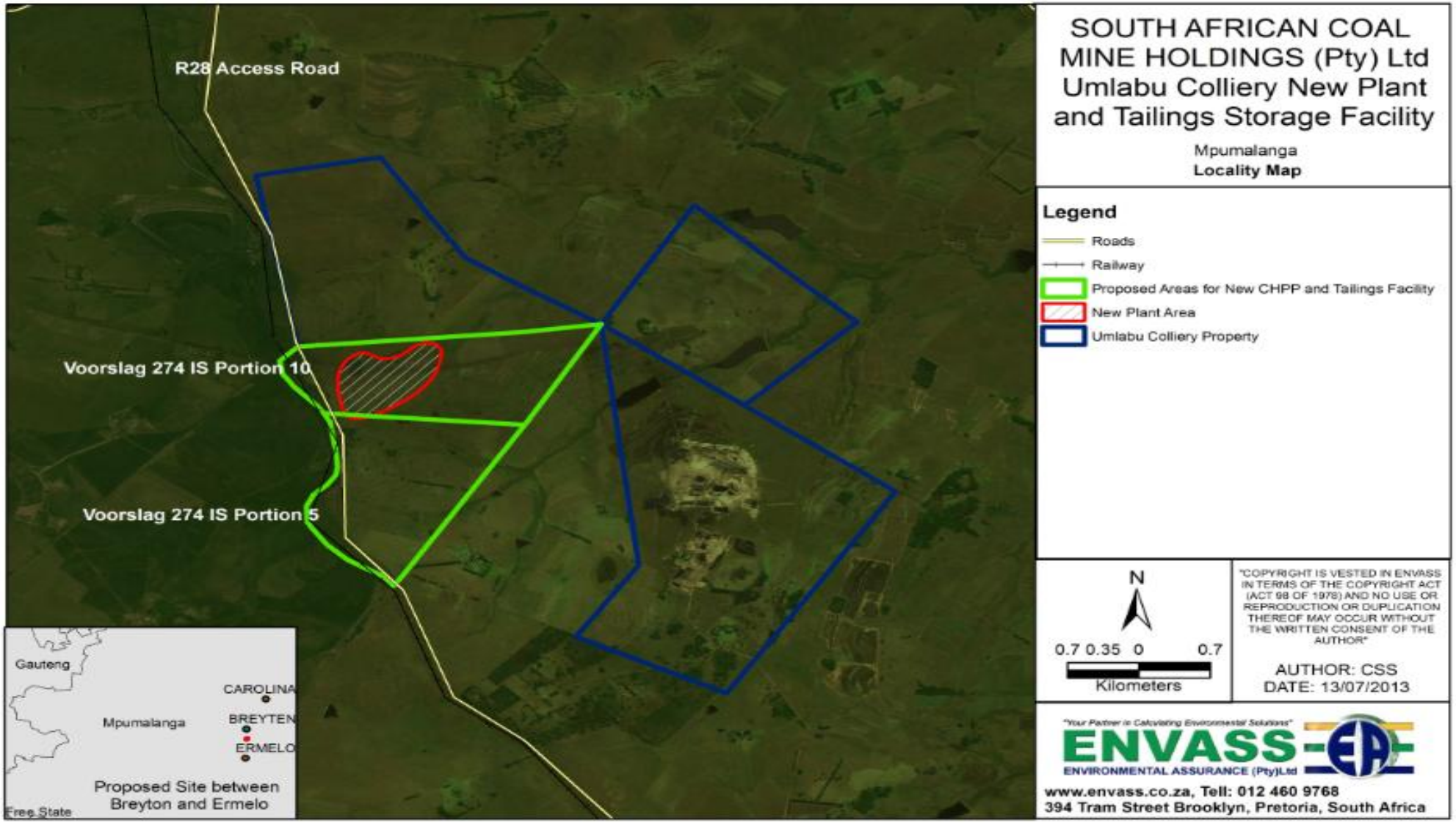


Figure 2: Locality Plan

3. PROCESS TO ASSESS ALTERNATIVES

Alternatives are defined in the NEMA EIA Regulations (2010) as "*different means of meeting the general purpose and requirements of the activity, which may include alternatives to: (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity; (d) the technology to be used in the activity; and (e) the operational aspects of the activity and (f) the option of not implementing the activity".* For the purpose of this Application, the following Alternatives have been investigated:

3.1 Location Alternatives

The alternative location that has been considered by the proponent would move the existing coal processing plant to an alternative location away from the drainage line of the tributary river to the Torbanite dam. The investigation concluded that the subject location (on the Farm Voorslag 274 IS) is the most suitable due to its ideal location in terms of the requirements for location of a coal handling and preparation plant.

The geotechnical assessment as well as prospecting boreholes indicated that the quality of the coal in the area where the proponent proposes to mine coal underground via an adit, is of the best quality and therefore no alternative site has been investigated. The coal handling and preparation plant would be ideally located in terms of the adit to the underground workings.

Therefore this alternative would see the existing coal handling and preparation plant moving from the Farm Mooifontein 109 IT to the better location Farm Voorslag 274 IS.

3.2 Input Alternatives

Various types of material can be used for construction purposes on the proposed processing plant. These include different brick types (face brick, cement brick etc.) roof types (pitched or flat), finishes (paint colour, external lighting, landscape features etc.), road surfacing (asphalt, brick paving) and underground tank types. The proposed development should however be aesthetically pleasing, to adjacent landowners and should blend in with the adjacent developments.

Energy effective building construction and orientation have not been considered to date. However, the following recommendations regarding structural designs are recommended by the environmental consultant:

- Use of building material that requires excessive amounts of energy to manufacture should be minimised;
- Use of building material originating from sensitive or scarce environmental resources should be minimised. E.g. no tropical hardwood may be used;
- Building material should be legally obtained by the supplier, e.g. wood must have been legally harvested, and sand should be obtained only from legal borrow pits and from commercial sources;
- Building material that can be recycled / reused should be used rather than building material that cannot; and

- Use highly durable building material for parts of the building that is unlikely to be changed during the life of the building is highly recommended.

3.3 Scheduling Alternatives

It is recommended that construction takes place during the drier winter months to avoid any complications in the wet weather. No detailed information regarding the proposed time frame for the project is yet available. However, it is anticipated that construction will start as soon as possible once all the necessary approvals are obtained.

3.4 Technology Alternatives

Generally coal companies use solid preparation plant waste to build an embankment in a hollow. Then this void is filled with the wet preparation plant waste, or slurry – a mix of coal dust, water and preparation plant chemicals. In the past ultra-fine coal (nominally minus 100 micron) was only beneficiated in the former Natal Province and in the Waterberg coalfield. The coking coals from these areas were amenable to flotation (froth flotation was usually employed on the total minus 0,5mm size fraction). In the Witbank area, the ultra-fine coal was not beneficiated and was disposed of by pumping the coal to slurry ponds or into old underground workings.

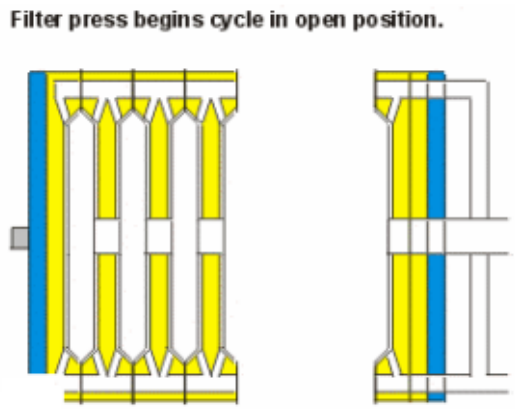
In recent studies in the USA (2001) it was found that coal waste: "*disintegrates rapidly, is highly soluble sulphates which reduce bonding strength, are non-cohesive and does not compact uniformly. A safe and economic dam could not be constructed from such material alone.*"

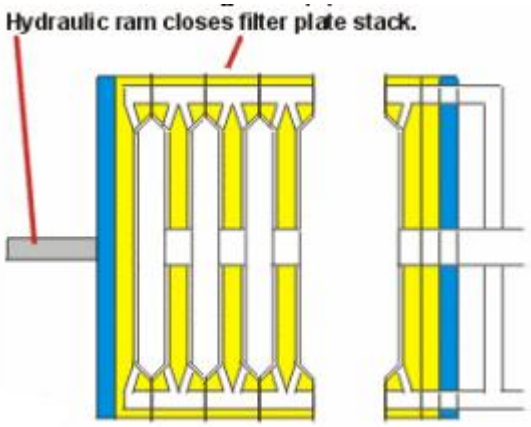
Slurry volumes can be reduced by improving fine coal recovery, minimizing the mass of solids for disposal and dewatering the coal waste using various tools including a filter press. Acceptable alternatives are highly dependent upon regional and site specific conditions.

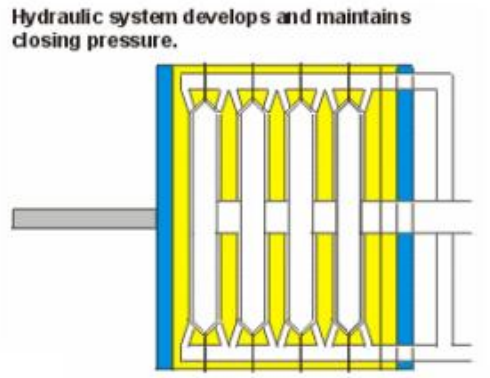
Froth flotation is still the only beneficiation process for ultra-fine coal and in recent years a number of floatation plants were built in the Witbank area. The main problem with beneficiating the ultra-fine coal is not so much the actual processing of the coal – flotation works well enough despite the fact that it is a very expensive process – but the dewatering of the product obtained. The ultra-fine flotation product has high moisture content, even after dewatering, and this increases the moisture content of the product coal railed from the mine – for a mine producing thermal coal this can make it very difficult to meet quality specifications and to economically justify the installation of a froth flotation plant. For this reason, it is important to improve the dewatering of ultra-fine coal and to find better methods to employ for this purpose. One should also keep in mind that, even when a plant has a flotation circuit, there is still the need to dispose of flotation tailings.

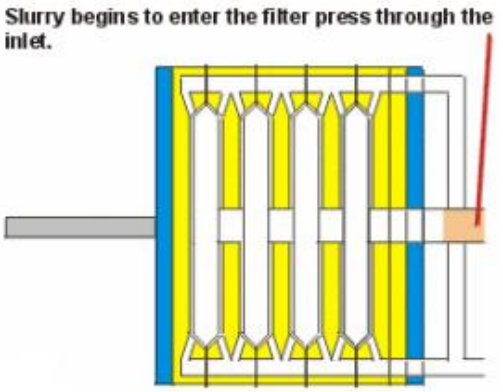
In recent years a number of filter presses were installed in South Africa and these units proved to be the most effective method currently available to dewater ultra-fine coal. Filter presses have the greatest capacity for solid capture and can be used to close a plant's water circuit. The fact that the filtration pressure and the filtration times can be adjusted allows these units to produce relatively lower product moisture content than the other types of filters available in the past. Filter presses are however, more expensive in terms of capital and operating expenditure than the older filter types.

Filter presses operate on a semi batch basis and the filtration cycle consists of a number of steps.

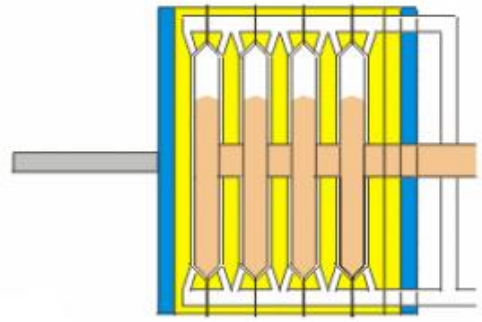

Filter press begins cycle in open position.


Hydraulic ram closes filter plate stack.

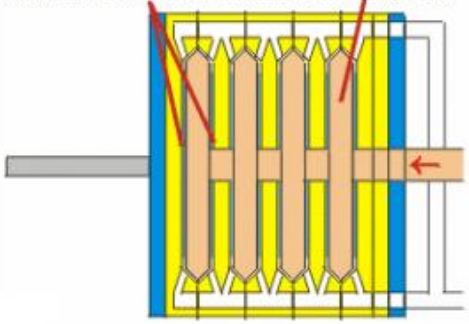

Hydraulic system develops and maintains closing pressure.


Slurry begins to enter the filter press through the inlet.

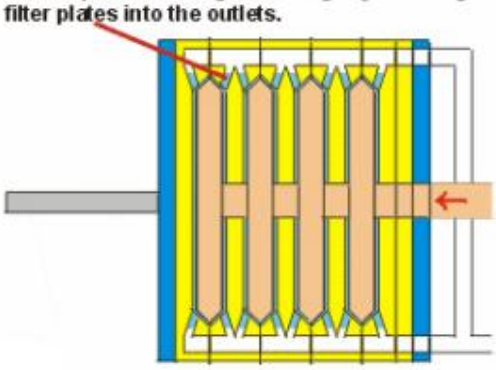
Filter press fills with slurry.



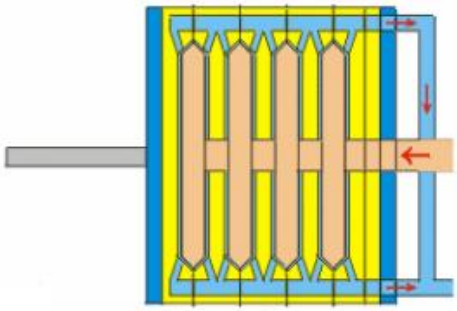
Filtration takes place as filtrate passes through the filter cloth and cake builds in the chambers.



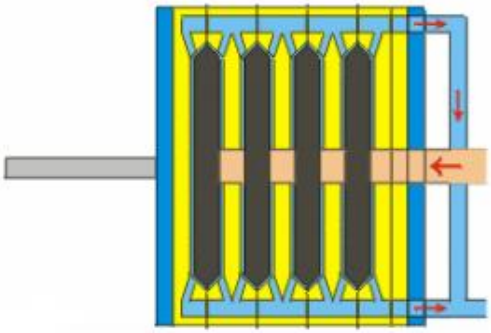
Filtrate passes through discharge eyes at edge of filter plates into the outlets.



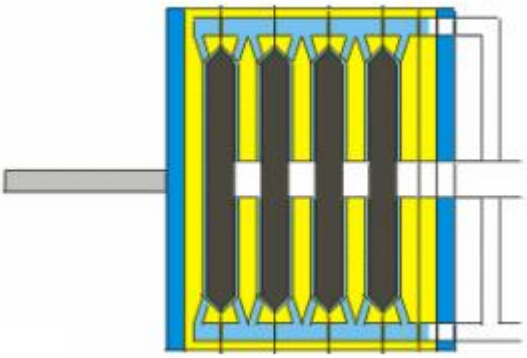
Filtrate exits the filter press through the outlets.



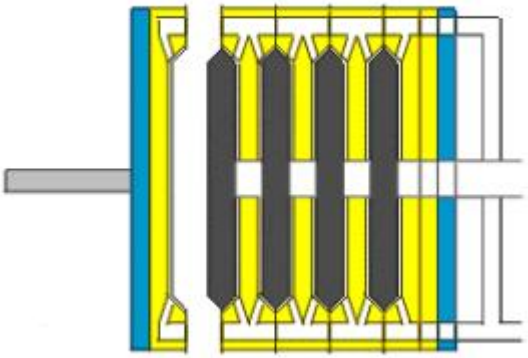
Filter cake builds as slurry continues to dewater.



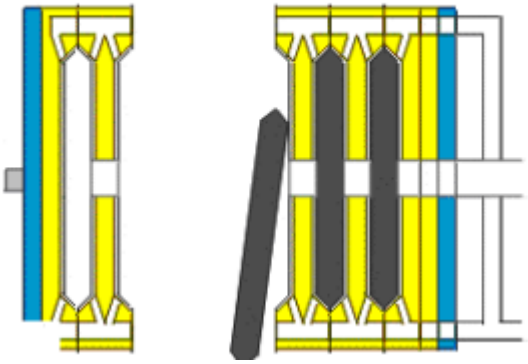
Forward flow is stopped.



Filter press is opened and plates are shifted one at a time.



Filter cakes drop as each plate is moved.



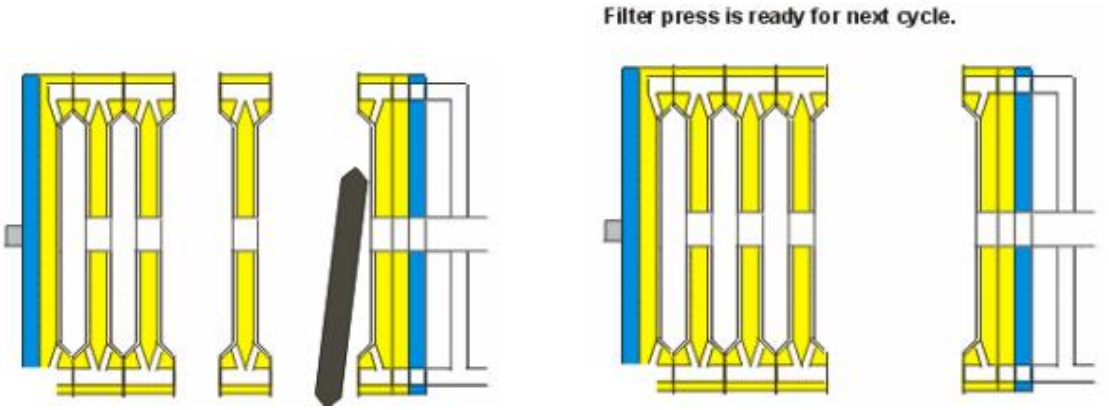


Figure 3: Filter processes

Filter presses have been proven to be effective in filtering ultra-fine coal to a moisture content which is low enough to render the filter cake transportable on conveyor belts. The filters can recover virtually all the solids in the feed which make it especially suited to closing water circuits in plants.

3.5 NO-GO Alternative

One of the options to be considered for this report is one of no development at all. This will entail leaving the coal handling and preparation plant in its present location. The Farm Voorslag 274 IS is currently vacant. This would result in the site being unattended, uncontrolled and unmanaged which could subject the site to erosion and degradation, as no control mechanisms will be in place to ensure that environmental consequences are kept at a minimum. This would further result in the coal handling and preparation plant remaining on the Farm Mooifontein 109 IT, in the direct line of a tributary of the Torbanite Dam. This situation will result in the possible contamination of the sensitive Upper Vaal River region through activities associated with the coal handling and preparation plant.

Another consideration is that should the adit be moved to mine good quality coal on the Farm Voorslag 274 IS, it would require the movement of the mined coal to the existing coal handling and preparation plant on the Farm Mooifontein 109 IT. The movement of mined coal via heavy vehicles can possibly result in the contamination of the sensitive environment en route to the coal handling and preparation plant.

It makes sense to move the coal handling and preparation plant as close as possible to the adit to minimise further environmental impacts on the surrounding environment. Therefore, the status quo option is not a viable option and with the necessary specialists' studies, it will be proven as an option which should not be further investigated.

4. METHODOLOGY OF THE EIA PROCESS

4.1 Approach to the EIA

An Environmental Impact Assessment (EIA) is a good planning tool. It identifies the environmental impacts of a proposed development and assists in ensuring that a project

Box 1.: Definition of the term "environment"

The term "environment" is used in the broadest sense in an environmental impact assessment. It covers the physical, biological, social, economic, cultural, historical, institutional and political environments.

will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The EIA for this project complies with the National Environmental Management Act (1998) (as amended) and the NEMA EIA Regulations (2010) of the Department of Environmental Affairs (DEA). The guiding principles of an EIA are listed below.

4.2 Guiding principles for an EIA

The EIA must take an open participatory approach throughout. This means that there should be no hidden agendas, no restrictions on the information collected during the process and an open-door policy by the proponent. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.

There should be ongoing consultation with interested and affected parties representing all walks of life. Sufficient time for comment must be allowed. The opportunity for comment should be announced on an on-going basis. There should be opportunities for input by specialists and members of the public. Their contributions and issues should be considered when technical specialist studies are conducted and when decisions are made (Refer to **Error! Reference source not found.**.).

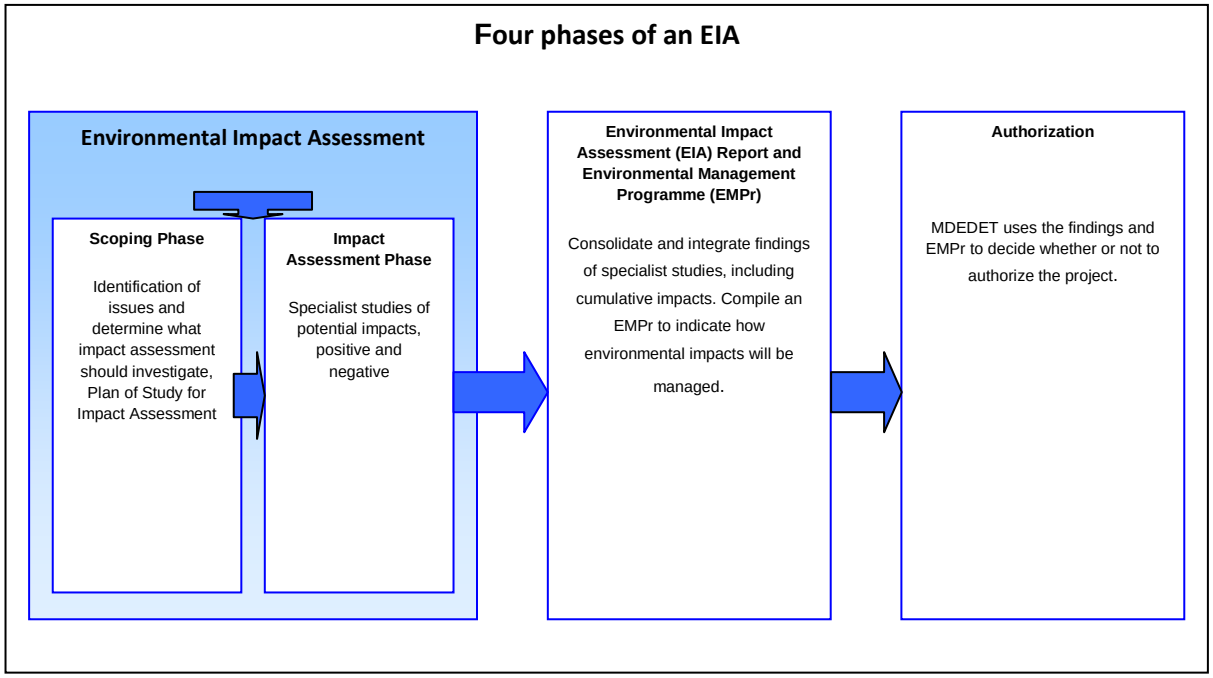


Figure 4: Four phases of the EIA

4.3 Consultation with authorities

The NEMA application for environmental authorisation was submitted to MDEDET and the project was registered on 13 November 2012. A timeframe extension request in terms Regulation 67 of the EIA Regulations (2010) was submitted to MDEDET with extension granted on 10 April 2013.

4.4 Information gathering

Early in the EIA process, the EAP identified the information that would be required for the impact assessment and the relevant data were obtained. In addition, available information about the receiving environment was gathered from reliable sources, interested and affected parties, previous documented studies in the area and previous EIA Reports. The project team then visited the site to gain first-hand information and an understanding of the existing operations and the proposed project.

4.5 Description of impacts identified during the scoping phase

The following potential impacts were identified during the Scoping Phase:

Table 3: Table of impacts

IMPACT	DESCRIPTION
Water Resources:	• The proposed new plant is not expected to have a significant impact upon water resources at the site.
Air Quality:	• Potential air pollution during the earthworks associated with the construction phase of the project; • During the operational phase windblown fugitive dust is the only significant air quality issue.
Destruction of Sensitive Flora and Fauna:	• The ecological *status quo* of the Farm Voorslag 274 IS will be changed; • Wetlands on site and in the surrounding area could be damaged; and • Spill-over impacts, which may occur on adjacent ecological systems.
Soils and Land-use Capability:	• Loss of soil resources for agricultural land uses; • Soil degradation as a result of beneficiation process and coal handling; and • Storage of topsoil for final rehabilitation of plant area.
Noise vibration and shock:	• Increase in the ambient noise level as a result of the new tertiary crusher; however this will be housed within the coal handling and preparation plant. • The construction of an additional dump hopper will generate noise. • The installation of larger capacity conveyors moving at a lower speed should result in a decrease in noise emissions.
Waste:	• The plant relocation and upgrade result in an increase in course reject production due to the removal of the coarser

	size fraction by using a new spiral reject dewatering screen and floatation cells. • The proposed new Umlabu plant will enable the removal of all particles greater than 0,5mm from tailings. Hence the proportion of the smallest size fraction (0,063mm) in the tailings reject material will increase. The introduction of floatation devises will recover a greater proportion of the -0.063mm material which will reduce its proportion in the tailings. This will effectively return the proportion of the +0.063mm material to the current level. • The impact of the change to tailings management from the current plant to the new Umlabu plant will be temporary and will not be expected to contribute long term or significant impacts upon the stability of the tailings dam. The impact of the change in particle size due to the new plant construction will be subject to geotechnical investigation that will be submitted as additional information.
Visual:	• Change of the visual character of the area as a result of the establishment of mining infrastructure (The plant will be situated on the watershed which is also the highest contour on site).
Traffic:	• The change in the traffic patterns as a result of traffic entering and exiting the South African Coal Holdings Limited (Pty) Ltd coal operations on the Farm Voorslag 274 IS. • No impact on traffic on the surrounding road infrastructure and existing traffic is envisaged.
Job Creation:	• Job creation in an area where the main source of income is generated through primary activities e.g. farming; • Creation of job opportunities during construction, operation, maintenance and decommissioning (rehabilitation and aftercare) phases for residents of the region; • The provision of improved infrastructure and social upliftment by creating short term employment and skills transfer to unskilled and semi-skilled unemployed individuals.

Further details associated with the construction and operation of the various activities as listed in the Project Description will be discussed in the EIA Report. The EIA Report will assess the impacts of each of the activities as well as ascertain the cumulative impacts of the development in totality. The EIA Report will outline the necessary mitigation measures and define any issues/areas which could be the cause for concern.

4.6 Specialist Assessments

Based on the impacts identified during the Scoping Phase, the following specialist studies have been identified to be completed and form part of the EIA. The main objective of the specialist studies is to provide independent scientifically sound information on issues of concern relating to the project proposal.

Table 4: Specialist Studies to form part of the EIA

ORGANISATION	SPECIALIST INFORMATION / STUDY
ENVASS	Visual Impact Assessment Baseline Air Quality Assessment
Private	Heritage Impact Assessment
ENVASS	Ecological Assessment
MENCO	Surface water report and Wetland delineation focussing on PES and EIS
Lanteksa	Land Capability Assessment
GPT	Geohydrological Assessment

The findings of the various specialist studies undertaken will be incorporated into the Draft EIA Report. The Terms of Reference (ToR) for the various specialist assessments are as follows:

4.6.1 Visual Assessment

The scope and objectives of the Visual Assessment will include the following:

- Describe the existing visual characteristics of the proposed sites and its environs;
- Determine the area from which the proposed site will be visible;
- Recommend the less visual alternative;
- Propose possible mitigation measures; and
- The overall objective of the Visual Impact Assessment (VIA) is to compare the visual impacts of the proposed development alternatives, concluding on significance and making a recommendation based on visual impact.

VIA methodology:

- A desktop survey will be done using a 1:50 000 map and 1:10 000 aerial photographs. These will be used to identified landforms and landscape patterns, allowing a better understanding of the landscape and surrounding areas;
- The Methodology will further be employed to gain an understanding of areas where the proposed developments will actually be visible. This will be achieved through simulations run through the view shed GIS software application, variables including area (physical locations) and heights of infrastructure and

- The level of visual exposure will then be determined by modelling the decreasing visual impact within concentric radii zones of 1km to 10km from the site. No readings for exposure beyond 10km will be tested as other studies have shown visual exposures beyond this point as insignificant. This level of exposure is measured as follows:

    - 0-1 km (very high exposure);
    - 1-2 km (high exposure);
    - 2-4 km (High to moderate exposure);
    - 4-5 km (Moderate exposure);
    - 5-10 km (Moderate to low exposure)
    - >10 km (insignificant exposure).

- The visual exposure rating is confirmed through a series of onsite photographical references, in such ensuring that no sensitive areas (ground truthing) are missed;
- The methodology further employs an impact rating approach in support of the exposure rating, determine the actual significance of visual disturbances on surrounding areas but specifically on pre-determined viewpoints within the 1 – 4 / 5 km radius; and
- The Methodology concludes with the identification of possible mitigation measures.

4.6.2 Baseline Air Quality Assessment

The proposed air quality baseline assessment will include the monitoring and measurement of the ambient air quality at the site proposed. Passive and active sampling will be undertaken. The ambient air quality monitoring, measurement, analyses and reporting will include once off active indicative as well as passive sampling in the 8 main compass point directions for:

- Gravimetric Dust Fallout
- PM_{10} dust particulate (active sampling)
- Carbon Monoxide Concentrations (active sampling)
- Carbon Dioxide Concentrations (active sampling)
- Volatile Organic Compound Concentrations (active sampling)

4.6.3 Heritage Impact Assessment

A Heritage Impact Assessment will be undertaken in order to assess the impacts and significance in terms of cultural and heritage and the proposed mitigation measures. A phase 1 Heritage Impact Assessment of the property in accordance with the requirements of Section 38 (3) of the National Heritage Resources Act (Act 25 of 1999), including:

Conducting a detailed desktop level investigation to identify all known archaeological, cultural and historical facilities on the property;

- Undertake fieldwork to verify results of desktop investigation;
- Undertake an assessment of the Aesthetic / Architectural compatibility of the proposed project;
- Document using GPS co-ordinates and maps all sites, objects and structures identified on the proposed project site;
- Undertake any required consultation with the Mpumalanga Department;
- Compile a report which would include:

    - Identification of all possible archaeological, cultural and historic sites on the property;
    - Evaluation of the potential impacts of construction, operation and decommissioning of the proposed coal handing plant on archaeological, cultural and historical resources, in terms of the scale of the impact (local, regional, national), magnitude of impact (low, medium, high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction); and
    - Recommendations for mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

- Make recommendations; which would include:

    - Any additional investigations that may be required as a result of finding such resources;
    - Identify and describe any formal legal processes which should be followed as a result of finding significant resources; and
    - Assessments must take into account the expected community response as well as the applicable heritage and archaeological guidelines.

The following proposed methodology will be undertaken:

- The preliminary investigation will include a survey of the available literature in order to review previous research and to determine the potential of the area;
- Various databases will be consulted. These include the Archaeological Data Recording Centre (ADRC), housed at the National Cultural History Museum, Pretoria and the Environmental Potential Atlas;
- The topo-cadastral and other maps will also be studied. Similarly, aerial photographs, if available, will be studied;
- Special attention will be given to archaeologically sensitive areas, e.g. outcrops (for stone walled sites and rock engravings); hills (for settlements and rock shelters), river banks (for Iron Age settlements) etc;
- All sites, objects and structures that are identified will be documented according to the general minimum standards accepted by the archaeological profession; and
- Co-ordinates and individual localities will be determined by means of the Global Positioning System (GPS) and plotted on a map.

4.6.4 Ecological Assessment

The Ecological Assessment will provide specialist advice on the issues relating to the potential biodiversity and ecological impacts. This will be achieved by means of studies on the floral and faunal components of the study area. The ecological assessment shall also ensure compliance with the requirements of the Provincial Authorities, Departmental divisions and regional requirements, by means of:

- The assessment of the current status of the habitat components and its conservation status;
- Identification the floral and faunal species on site and to recommend steps to be taken should a Red list or protected species be found;
- Highlight the potential impacts the development may have on the ecosystem components of the study area; and
- Provide management recommendations to mitigate negative impacts and enhance positive impacts of the proposed activity.

4.6.5 Surface Water Assessment and Wetland Delineation (focussing on PES and EIS)

A. Surface water assessment

- The protocol/methodology for a surface water assessment is as follows:
- Field survey and collection of water samples and in situ measurements;
- Delineation of affected catchment and GIS map work identifying the various quaternary drainage areas in relation to project area;
- Desktop study to characterize the receiving water environment in terms of PES and EISC as well as recommended Eco-Health Class and Reserve (RQO's) based on the Aquatic Ecology study conducted by ENVASS;
- Describing the project area in terms of MAR, drainage density, normal dry weather flow, groundwater recharge and the environmental water balance;
- Based on the infrastructure layout, the requirement for flood-line calculation needs to be determined;
- As part of impact assessment the UP Flood model will be used to determine the various flood recurrence intervals to assist in the design of water related infrastructure and compilation of a conceptual Water Balance;
- Impact of activity will be assessed in terms of the identified water users in the area;
- Mitigation measures will be proposed as part of the EMP;
- Water quality data will be obtained as part of a field survey in order to establish baseline conditions and to assist in the development of a monitoring programme.
- The Water and Salt Balance will be compiled in the structure and format as depicted in the following departmental guideline: D*epartment of Water Affairs and Forestry (2006): Best Practice Guideline BPG G2: Water and Salt Balances*

B. Wetland delineation

The purpose of a wetland delineation report is to convey an objective, factual picture of the extent and location of wetlands on the site. The report is based on the collection of field data and review of any pertinent background information. A report must contain field data sheets; an accurate map of the site, including wetland boundaries and the location of all the data collection points; and a narrative that explains the delineator's approach to collecting data as well as his or her conclusions.

- Conclusively identify the presence or absence of wetland conditions as prescribed by the DWAF (2005) delineation guideline;
- Identify the outer edge of the wetland temporary zone, or edge of the riparian zone;
- Classify the wetland or riparian areas according to the system proposed in the national wetlands inventory if relevant;
- Indicate the relative functional importance of the wetland or riparian areas (EIS, PES and Eco Services);
- Discuss wetland buffer zones;
- Indicate possible impacts on the wetland or riparian areas; and
- Recommend mitigation measures in order to limit the impact of the proposed development on the wetland or riparian areas.

4.6.6 Land Capability Assessment

The Terms of Reference for the Land Capability Assessment are as follows:

- Determine the potential of the land according to the *"CRITERIA FOR HIGH POTENTIAL AGRICULTURAL LAND IN SOUTH AFRICA"* Report nr. GW/A/2002/21.
- Establish the *status quo* of agricultural resources within the study area;
- Undertake fieldwork to gather additional data and to determine the soil potential of the site (including soil samples);
  - Soil colour;
  - Limiting factors;
  - Clay content;
  - Slope of the site;
  - A detailed map indicating the locality of the soil forms;
  - Size of the site.

- Undertake an assessment to predict the potential impacts on agricultural potential of the site; and
- Propose mitigation measures that could reduce or eliminate the identified impacts.

4.6.7 Geohydrological Assessment

The Terms of Reference for the Geohydrological Assessment are as follows:

- Generally describe the geology of the study area, preferably in a mapped format;

- Determine potential impacts of the proposed activity on the surface geological structures in the study area;
- Describe general concerns with regard to the proposed activity in terms of potential impacts on the surface geological structures of the study area and indicate potential mitigation measures;
- Determine any areas of general sensitivity of surface geology to the potential impacts of the proposed activity; and
- Rate the areas of sensitivity in terms of sensitivity levels in order to indicate more or less preferred areas for conducting the proposed activity.

5. EIA IMPACT ASSESSMENT METHODOLOGY

5.1 Introduction

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines, published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989). Although the ECA EIA Regulations have been repealed, the Guideline Document still provides good guidance for significance determination.

The level of detail as depicted in the EIA regulations were fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. The impact assessment criteria used to determine the impact of the proposed development are as follows:

- *Nature* of the impact;
- The *Source* of the Impact;
- Affected Stakeholders;
- *Extent* - The physical and spatial scale of the impact;
- *Duration* - The lifetime of the impact, that is measured in relation to the lifetime of the proposed development;
- *Intensity* - The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself;
- *Probability* - This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time;

- *Mitigation*: The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

- *Determination of Significance – Without Mitigation:* Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required.

- *Determination of Significance – With Mitigation*: Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the identified mitigation measures.

Previous experience has shown that it is often not feasible or practical to only identify and address possible impacts. The rating and ranking of impacts is often a controversial aspect because of the subjectivity involved in attaching values to impacts. Therefore, the assessment will concentrate on addressing key issues.

The methodology employed will involve a circular route, which will allow for the evaluation of the efficiency of the process itself. The project will be divided into three phases in order to assess impacts related to the Pre-construction, Construction and Operational phases. The assessment of actions in each phase will be conducted in the following order:

a) Identification of key issues;

b) Analysis of the activities relating to the proposed development;

c) Assessment of the potential impacts arising from the activities, without mitigation; and

d) Investigation of the relevant mitigation measures, as well as an assessment of their effectiveness in alleviating impacts.

5.2 Assessment of Biophysical and Cumulative impacts

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines and in terms of the Environmental Conservation Act, 1989 (Act No 73 of 1989) [ECA]. Although the ECA EIA Regulations have been repealed the Guideline Document still provides good guidance for significance determination.

Activities within the framework of the proposed development and their respective construction and operational phases, give raise to certain impacts. For the purpose of assessing these impacts, the project has been divided into two phases from which impacting activities can be identified, namely:

a) Construction phase: All the construction related activities on site, until the contractor leaves the site.

b) Operational phase: All activities, including the operation and maintenance of the proposed development.

The activities arising from each of these phases have been included in the tables. This is to identify activities that require certain environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

5.2.1 Assessment Criteria

Table 5: Assessment Criteria

EXTENT: GEOGRAPHICAL	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring properties, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extent beyond the boundaries of South Africa.
DURATION	
Short term	The impact would either disappear with mitigation or will be mitigated through natural processes in a period shorter than that of the construction phase.
Short – Medium term	The impact will be relevant through to the end of the construction phase.
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
INTENSITY	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
PROBABILITY	
Impossible	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0%).

Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.
Highly likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.
Definite	The impacts will take place regardless of any provisional plans, and or mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.

5.2.2 Mitigation

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

Determination of Significance – Without Mitigation

Significance is determined through a synthesis of impacts as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive". Significance is rated on the following scale:

a) No significance: The impact is not substantial and does not require any mitigation action.

b) Low: The impact is of little importance, but may require limited mitigation.

c) Medium: The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

d) High: The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

Determination of Significance – With Mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

a) No significance: The impact will be mitigated to the point where it is regarded as insubstantial.

b) Low: The impact will be mitigated to the point where it is of limited importance.

c) Low to Medium: The impact is of importance however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

d) Medium: Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

e) Medium to High: The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.

f) High: The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

Assessment Weighting

Each aspect within the impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it is necessary to weigh and rank all criteria.

Ranking, Weighting and Scaling

For each impact under scrutiny, a scale weighting factor is attached to each respective impact (refer to **Error! Reference source not found.**). The purpose of assigning such weights serve to highlight those aspects considered most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspects criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Extent	Duration	Intensity	Probability	Weighting Factor (WF)	Significance Rating (SR)	Mitigation Efficiency (ME)	Significance Following Mitigation (SFM)
Footprint 1	Short term 1	Low 1	Probable 1	Low 1	Low 0-19	High 0,2	Low 0-19
Site 2	Short to medium 2		Possible 2	Low to medium 2	Low to medium 20-39	Medium to high 0,4	Low to medium 20-39
Regional 3	Medium term 3	Medium 3	Likely 3	Medium 3	Medium 40-59	Medium 0,6	Medium 40-59
National 4	Long term 4		Highly Likely 4	Medium to high 4	Medium to high 60-79	Low to medium 0,8	Medium to high 60-79
International 5	Permanent 5	High 5	Definite 5	High 5	High 80-100	Low 1,0	High 80-100

Figure 5: Description of the biophysical assessment parameters with its respective weighting.

6. PUBLIC PARTICIPATION

6.1 Introduction

The section provides details about the proposed Public Participation Process (PPP) activities to be undertaken during the EIA phase. The PPP undertaken to date is summarized in the Scoping Report.

Public Participation is an integral part of the EIA and must be undertaken in accordance with the requirements stipulated in Regulation 54 of the EIA Regulations (2010). Furthermore, in terms of Section 24(4)(a) of NEMA, procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, ensure with respect to every application for environmental authorisations:

- *Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than on organ of state;*

- *That the findings and recommendations flowing from an investigation, the general objectives of integrated environmental management laid down in Section 2 of NEMA are taken into account in any decision made by an organ of state in relation to any proposed policy, programme, plan or projects; consequences or impacts; and*

- *Public information and participation procedures which provide all interested and affected parties (I&AP's), including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures.*

6.2 Proposed Public Participation Process

The specific objects associated with the PPP for the EIA phase are to:

- *Provide all relevant stakeholders (organs of state and I&AP's) with appropriate opportunities to raise potential issues, concerns and queries relating to the proposed project and EIA process;*

- *Facilitate the distribution of information through suitable means to ensure that all relevant stakeholders and I&AP's are informed about the progress of the project and to give feedback and responses regarding queries and issues raised;*

- *Provide all relevant stakeholders and I&AP's the opportunity to be part of the decision-making process by means of providing them with an opportunity to comment on the findings of the specialist assessments and other relevant information contained in the EIA Reports; and*

- *Gather the relevant skills and local knowledge to inform and improve the EIA process and impact assessment.*

Steps to be completed for the PPP during the EIA phase:

A) Identification of Stakeholders and I&AP's

Various I&AP's and stakeholders have been identified to date. All have been notified of the proposed project (please refer to Scoping Report). However, additional I&AP and stakeholder identification will be ongoing throughout the EIA process. All stakeholders will be kept informed on the progress of the EIA process and will be provided with an opportunity to comment on the Draft and Final EIA Reports.

B) Advertising and distribution of Draft and Final EIA Reports availability for comment

The Draft and Final EIA Reports will be distributed to all stakeholders and I&AP's for review and comment. The Draft EIA Report will be made available for comment for a period of 40 calendar days and the Final EIA Report for 21 calendar days.

The availability of these reports will be communicated and advertised to relevant stakeholders by means of:

- Newspaper advertisements in Highvelder newspaper; and
- Personal letters, fax and emails to all the registered I&AP's and on the distribution list.

The EIA reports will be made available for review and comment by the public at the Gerald Sekoto Community Library (Wanderers Avenue, Middelburg. Tel: 013 249 7314) as well as the Ermelo Public Library (017 801 3621). The reports can also be obtained from the ENVASS website (http://www.envass.co.za). All relevant authorities will receive hardcopies and CD's of the EIA reports.

C) Public Meeting / Open Day

Quarterly public meetings will occur throughout the EIA process. Significant issues identified during each phase of the EIA will be addressed accordingly at the following public meeting. The purpose of these public meetings is to present the findings and potential impact identified in the various reports after which key issues and concerns can be discussed and debated by stakeholders and I&AP's. Additional issues raised will then be further assessed and addressed in the consecutive phase of the EIA.

D) Feedback to stakeholders and I&AP's on comments and issues raised

The EIA Report shall contain a Comments and Responses Report where all comments and issues raised by stakeholders and I&AP's as well as the responses issued by EAP will be formally recorded. Proof of all correspondence will also be included in the EIA Report.

E) Recordkeeping of PPP completed

Proof of all correspondence (comments and responses) and additional activities undertaken during the PPP will also be included in the EIA Report documentation.

7. EIA MILESTONES AND PROJECT PROGRAMME

The following key milestones and timeframes for the EIA phase have been identified:

- Distribution of the Draft EIR and EMPr for public comment – March 2014
- Distribution of the Final EIR and EMPr for public comment – April 2014
- Submission of the Final EIR and EMPr to CA (MDEDET) for authorisation – June 2014

Note: The proposed programme detailed above are provided as guidance only and are subject to change depending on the various components and external factors that informs and influences the EIA process.

8. CONCLUSION

This PoS developed for the EIA Phase for the development has been compiled to meet the requirements contained in Regulation 28 *(n)(i-iv)* of the EIA Regulations (2010). The proposed specialist assessments and PPP methodologies considered for the EIA is deemed to be adequate to inform the EIA Report and environmental process. The CA will therefore receive appropriate integrated information required to allow for informed decision making on the application for authorisation.