



NORTHERN COAL (PTY) LTD

MINING RIGHTS APPLICATION, ENVIRONMENTAL IMPACT ASSESSMENT (EIA), ENVIRONMENTAL MANAGEMENT PLAN (EMP), FOR THE PROPOSED WELTEVREDEN PROJECT, BELFAST, MPUMLANGA PROVINCE

BACKGROUND INFORMATION DOCUMENT July 2008 Version 2

This document is also available in Afrikaans on request

PURPOSE OF THIS DOCUMENT

This document has been prepared by Digby Wells and Associates to inform you about the intention of Northern Coal (Pty) Ltd to apply for a Mining Rights Application in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. m28 of 2002) (MPRDA). An Application in terms of the National Environmental Management Act, 1998 (Act No. 107 Of 1998) (NEMA) will be submitted to the Mpumalanga Department of Agriculture and Land Administration (MDALA) for associated infrastructure that can be defined in terms of the listed activities of Government Notices No. R386 and R387. A Water Use License Application will be submitted to the Department of Water Affairs and Forestry (DWAF) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) for the proposed Weltevreden project.

This document provides you with information relating to:

- The location and description of the proposed project;
- The legal processes that will be undertaken;
- Specialist studies that will be conducted; and
- The registration process of Interested and Affected Parties (I&AP's)

**Please ensure your comments reach us by:
15 August 2008**

To ensure that you receive further documentation, and that all your comments and issues are considered, please complete the attached comments sheet, or contact:

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Introduction

Digby Well and Associates (Pty) Ltd has been appointed to conduct the necessary Mining Rights Application, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed conventional open-cast mining on portions 15 and 16 of the farm Weltevreden 381 JT.

Locality Development Property

The development property is known as portions 15 and 16 of the farm Weltevreden 381 JT and is 495.935ha in extent. The farm is located on the south-west corner of the junction of the N4 highway and the R33. This junction is 5km south-west of the town of Belfast in Mpumalanga and falls within the jurisdiction area of the Emakhazeni Local Municipality. (Please refer to Map at the end of the document for the Regional Setting)

Description of Mining Activity

The operation will be the opencast mining of the No.2 Coal Seam of the Witbank Coal Field. The seam thickness increases from 1,2 metres in the north to 3.62 metres towards the centre of the area and reaches a maximum 4,15 metres in the south western portion. Approximately 219ha will be mined opencast via truck and shovel method at a strip ratio of 5:1.

A feasibility study indicates that the coal is of an adequate quality to supply the inland market without further beneficiation. **Therefore the coal will be crushed on site and sold and transported directly to Eskom.**

The following will consequently not be required:

- Discard dump waste disposal
- Beneficiation plant and infrastructure
- Water abstraction
- Effluent disposal

The mine will have an expected life of approximately 8 years.

The coal will be sold to Eskom for the purposes of power generation and is not expected to be of export quality.

Assuming award of the Mining Right in March 2009 and commencement of mining in April 2009, decommissioning of all equipment and temporary structures on Weltevreden 381 JT will begin in February 2017 and be completed by July 2017.

The decommissioning program will consist of final open cast rehabilitation, pollution control infrastructure rehabilitation, area clean-up, removal of surface machinery, removal of haul roads and re-establishment of the required road network.



Legal Processes

- **Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)**

A Mining Rights Application will be submitted to the Department of Minerals and Energy (DME) in terms of the MPRDA. The MPRDA also requires that an Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) be submitted. The EIA documents will be made available to the public for review before submission to the relevant authority.

- **National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)**

An Application for Environmental Authorisation will be submitted to the Mpumalanga Department of Agriculture and Land Administration (MDALA) for applicable listed activities that define the infrastructure and activities that will form part of the Mining Right Application. It is proposed that the Application to MDALA will be submitted at the same time as the Mining Rights Application. EIA documentation will be made available to the public for review before submission to the relevant authority.

- **National Water Act, 1998 (Act No. 36 of 1998)**

An Integrated Water Use Licence Application (IWULA) will be submitted to the Mpumalanga Department of Water Affairs and Forestry (DWAF) for activities in terms of Section C of the Act. It is intended that the public participation process coincides with the processes required in terms of the MPRDA and NEMA.

- **Public Participation Process (PPP)**

The public participation process forms an integral part of the EIA Process. It provides the opportunity for Interested and Affected Parties (I&AP's) to participate in a meaningful and constructive manner and to raise issues, comments and concerns in respect of the proposed mining operation.

Who is an I&AP?

- § Any person, group of persons or organisation who may be interested in or affected by a proposed activity; and
- § Any organ of state that may have jurisdiction over any aspect of the activity

As part of the process of compiling these documents, a consultation process must be undertaken to identify further issues and concerns associated with the mining operation. Issues identified will then be used to inform and guide specialist environmental studies which must be undertaken as part of the process.

Stakeholders are offered the opportunity to raise issues, concerns and suggestions regarding the proposed development and processes. These comments will be considered and incorporated into the final EIA/EMP document, where appropriate.

A draft PPP Report will be compiled and will outline identified issues and concerns and propose mitigation measures.

Specialist Studies

The following Specialist Assessments will be undertaken as part of the processes mentioned above:

- **Aquatic Assessment**

The Scope of Work encompasses a delineation of the wetland areas associated with sections of the farm Weltevreden 381 JT.

A desktop study will be undertaken to gather background information regarding the site and the associated wetland areas. This information will be used to gain an understanding as to what the wetlands would have been like under natural conditions so that the deviation from this natural condition can be better interpreted

The following tasks were identified in order to meet the project objectives:

- Conduct a desktop and field investigation of the wetlands within the study area;
- Assess, classify, delineate and map the identified wetlands,
- Determine the Present Ecological State and Ecological Importance and Sensitivity of the wetlands on site.
- Provide a report with maps of wetlands, detailing all the information.

The actual site assessment includes an 'on-site' evaluation of the wetland condition and associated soil and vegetation structure condition. This includes the general aquatic ecological integrity of the wetland itself.



The wetland delineation procedure takes into account (according to DWAF guidelines for wetland delineations, 2005) the following attributes to determine the limitations of the wetland:

- Terrain Unit Indicator – helps to identify those parts of the landscape where wetlands are more likely to occur;
- Soil Form Indicator – identifies the soil forms, which are associated with prolonged and frequent saturation;
- Soil Wetness Indicator – identifies the morphological “signatures” developed in the soil profile as a result of prolonged and frequent saturation; and,
- Vegetation Indicator – identifies hydrophilic vegetation associated with frequently saturated soils.

• **Archaeological Assessment**

The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) requires that all developers aiming to disturb a site must conduct a comprehensive assessment and where necessary obtain a permit for destruction from the relevant heritage resources authority.

Archaeological assessments identify and evaluate the significance of archaeological, palaeontological and/or heritage sites, potential impacts of developments upon such sites, and propose recommendations concerning mitigation and management of these sites. The National Environmental Management Act (No 107 of 1998) also states that an integrated environmental management plan should (23:2 (b)) “...*identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management...*”

Archaeological assessments identify and evaluate the significance of archaeological, palaeontological and/or heritage sites, potential impacts of developments upon such sites, and propose recommendations concerning mitigation and management of these sites. Therefore, the Archaeological Impact Assessment (AIA) will ensure that resources are effectively identified, recorded and assessed by qualified specialists prior to development, where after development may proceed within legislative guidelines and approval by SAHRA and/or the relevant heritage resources agency.

No mining, prospecting and/or related development may take place without an archaeological assessment and approval from the relevant heritage authority.

In order to comply with relevant legislative requirements Digby Wells and Associates (Pty) Ltd have been appointed by Northern Coal as independent environmental consultants to undertake the environmental investigations and document compilation required by the various governmental departments in support of the Mining Right Application and to obtain environmental authorisation for the proposed project. As an integrated section of the environmental studies, an archaeological assessment will be completed for this study.

The objectives of an Archaeological Impact Assessment are:

- To prepare a report, including applicable maps, tables and figures as stipulated in the relevant South African legislation (NHRA no 25 of 1999 and NEMA no 107 of 1998);
- To describe and assess potential impacts related to archaeological and heritage resources in the project area that may result from project related activities;
- To include mitigation measures for the potential impacts and suitable recommendations;
- To recommend a monitoring programme (if applicable) detailing the frequency, reasoning, methodology and reporting to be implemented once construction commences;
- To identify and describe any fatal flaws to the project relating to archaeological and heritage resources in the environment; and
- To estimate capital and operating costs relating to the field of speciality (i.e. archaeology and heritage studies) for the proposed project.

The report will be written according to structures approved in South African legislation. The report will be called an “Archaeological Impact Assessment” (AIA) and will include the following information:

- Legislation, policies, standards, and criteria;
- Assessment methodology;
- Pre-historical and historical literature reviews;
- Proposed mitigation measures;
- Constructive recommendations;
- Impacts summary; and
- Plans, maps, and figures.



Step 1: Archival research

During this the phase one AIA will include the following aspects:

Phase, it will be necessary to determine the historical and pre-historical status of the area through archival research. Research will involve a desktop study to gather data and information on portion 15 and 16 of the farm Weltevreden 381 JT, with specific focus on archaeological sites, historical sites, graves, architecture, oral history and ethnographical information. The desktop survey will include an examination of existing aerial photographs to identify possible locations where archaeological sites may be located. Applicable maps or plans providing a spatial depiction of findings will be created during this phase.

Step 2: Physical study

A physical assessment of portion 15 and 16 of the farm Weltevreden 381 JT will be conducted. During this field survey, key stakeholder consultation will be undertaken in an effort to uncover further information related to oral history, and the locality and significance of graves, cemeteries and other sites of significance. This consultation will take place in the form of focus group meetings with key role-players in the local area. The physical study will serve to identify areas of possible historic and prehistoric activity. The majority of cultural and archaeological remains occur below surface. Subsequently, a physical walk through the study area will be undertaken. The study area will be surveyed by means of vehicle and extensive surveys on foot. Aerial photographs and 1:50 000 maps of the area will be used as a reference. The purpose of this is to identify topographical areas of possible historic and pre-historic activity. All sites discovered in the proposed development area will be plotted on 1:50 000 maps and their GPS co-ordinates recorded (35mm photographs on digital film will be taken at identified sites).

Step 3: Report writing

A phase one archaeological impact assessment report will be compiled after required surveys have been completed to identify significant sites and make recommendations for their management or mitigation. This specialist report will also be submitted to the relevant heritage authority for their perusal, i.e. South African Heritage Resource Agency (SAHRA).

Step 4: Phase two AIA (if required)

If a phase two AIA is required, a separate proposal will be compiled in association with recommendations by the relevant heritage authority. This could include the excavation of specific sites and/or detailed collection of artefacts at sites of significance that may be adversely affected by the proposed development. Developers may also choose to (or be encouraged to) enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

If mining related activities directly impact on graves and/or burial sites, it may have to be relocated. Relocation of the graves must be considered and completed with a full consultation process and relevant authorisations/permits. Graves must be managed according to the NHRA, as well as the Human Tissues Act (no 65 of 1983; National Department of Health) and any ordinances of the Provincial Department of Health. Exhumation of graves must conform to the standards set out in the Ordinance on Excavations (Ordinance no. 12 of 1980). Permission must also be gained from the descendants (where identified), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must be gained from various landowners (i.e. where the graves are currently located and where they will be relocated) before exhumation can take place.

The requirements of the Mpumalanga Cemeteries, Crematoria and Exhumation of Bodies Act 8 of 2005 will also be adhered to should the exhumation of graves be necessary.

• **Biodiversity Assessment**

The Biodiversity Act sets out a framework for planning the conservation and sustainable use of biological diversity within a broader framework of planning for sustainable development. Mining and its associated activities has a significant impact on the soils, land use, land capability, vegetation and animal life. The use of land for mining and agriculture leads to the destruction of vegetation and therefore the loss of habitat for fauna. As a result of the destruction of natural vegetation and wetlands, change in land use and the contamination of the surrounding environment, the level of biodiversity within mining areas is normally diminished. With proper planning, responsible mining with concurrent rehabilitation and through the conscious conservation and protection of resident natural species these impacts and the associated loss of biodiversity can be addressed.

Digby Wells and Associates (DWA) were commissioned by Northern Coal South Africa (Pty) Ltd (Northern Coal) to conduct Biodiversity Assessment studies in order to determine the current status with regards to flora, fauna and macro-invertebrates within the areas of the Weltevreden 381 JT. This will be done by combining the information and results from the soil, wet and dry season flora and fauna surveys into a comprehensive Biodiversity Report. This report details the wet season component of the study.

The objectives of the Biodiversity Assessment are:

- To perform wet season Biodiversity Assessment surveys in order to identify main vegetation types, associations, plant communities and sub-communities.
- To perform dry season Biodiversity Assessment surveys in order to identify winter flowering species
- To identify during the surveys and confirm with desktop studies the following:
 - § Plant communities and descriptions of plant communities;
 - § Dominant veld type;
 - § Dominant indigenous species (fauna and flora);
 - § Endemic species (fauna and flora);



- § Insects and amphibians
- § Dominant exotic species (fauna, but mainly flora); and
- § Rare or endangered species (fauna and flora).

- To perform wet season baseline animal surveys within the identified plant communities.
- To communicate any additional relevant issues that might be of significance to the project.
- Surveys will only be done on the site of disturbance since the area falls within an area that has been identified as “No Natural Habitat Remaining” and “Least concern” in terms of the Mpumalanga Biodiversity Conservation plan in terms of its sensitivity, the only portion which is “Highly significant” has been disturbed by agricultural activities, ploughed and now only *Zea mays* and alien species occur. The surrounding area has largely been disturbed by agricultural activities.
- To compile a report that discusses the findings and gives recommendations.

The above objectives will be achieved by firstly doing the desktop exercises, collecting books and materials that have the information about Mpumalanga, these include animals, plants, birds that are found in the area of interest and the surrounding environments. Books, such as *Birds of Southern Africa*, *Newman’s Birds of Southern Africa*, *Sasol Birds of Southern Africa* (3rd Ed.) will be used to determine the distribution of birds found in the Province or Area of Interest.

Vegetation classification: Desktop studies will be done to determine the species that occur or could occur in the area. Studies done previously related to this project will also be consulted. SANBI will be consulted to get the PRECIS plant lists of the species that occur in these QDS GRIDS. The project will start with the dry season and later on, the wet season as many species, especially grasses can be easily identified by inflorescence and flowers. Braun Blanquet method will be used to sample the species. Every species collected will them be identified, and the unknowns will be taken to SANBI herbarium or University of Pretoria herbarium for identification. The species will be imported into the Turboveg and Megatab programs which will produce the vegetation communities. The same methodology will be used during the dry season survey.

• **Baseline Dust Monitoring**

The study will include baseline dust fallout monitoring and baseline climatic and air quality characterization through interpretation of available local and regional monitoring data, assess all impacts to air quality with specific reference to the activities associated with the mining operations as well as analysis of the latest legislative and regulatory requirements relating to the project as prescribed in the scope of work document. The study will consider the cumulative impact on all surrounding receptors, thus this study will be relevant to the EIA and EMP procedure for the project.

The monitoring of fall-out dust utilising the bucket collection is internationally recognised and documented as an accepted method of determining fall-out dust from various sources.

The standard procedure accepted internationally is the ASTM 1982 “Standard Method for Collection and Analysis for Dust Fall” (Settleable Particulates). As a general criterion, generated dust from a source like a factory, plant, or mine rises into the air due to thermal action, wind velocity or by other means. Depending on the particulate size and wind velocity, the dust begins to fall out as soon as the immediate thermal or other effects that lifted the dust are dissipated.

The air quality impact assessment study will comprise of three stages:

Phase 1: Compilation of an Emissions Inventory

Identification and quantification of pollutants found to be emitted from the proposed Weltevreden coal mining operations near Belfast by means of on-site measurements and or computational methods.

Phase 2: Dispersion Modelling phase

This phase requires the application of powerful modelling software to determine, by mathematical techniques, the fate and transport of the mentioned airborne pollutants once they are emitted, taking into account factors such as the rate of pollutant release, meteorological conditions, and the surrounding topography.

Phase 3: Evaluation phase:

Once the extent of the pollutant dispersion has been modelled, the impact on identified receptors in the immediate region can be determined. These will be dust and health impacts. Recommendations will be made regarding mitigation and/or management measures to address the unavoidable impacts identified.

Identification and quantification of pollutants found to be emitted from the proposed Weltevreden coal mining operations near Belfast by means of on-site measurements and or computational methods.

The baseline dust fallout assessment:

For the purpose of measuring fugitive dust levels for Northern Coal (Pty) Ltd proposed Weltevreden project, Belfast, Mpumalanga, five multi-directional dust bucket samplers are going to be put up on the following farms: portion 2, 15 and 16 of the farm Weltevreden 381 JT, portion 10 of the Farm Zoekop 426 JS and portion 17 of the farm Blyvooruitzicht 383 JT. Directional dust samplers are designed in such a way so as to allow for the interpretation of the origin of the dust fallout with



respect to direction. This means that it is possible to interpret the baseline dust levels on site and at a later stage ascertain whether the activities on site are having an affect on the air quality, or whether it is coming from a different source.

The position of the samplers is essential to the interpretation of the results, and needs to take into account the historical directional wind data for the area, and topographical features that may affect the wind direction. Each sampler should have the north bucket orientated to true north (compass located) to allow for accurate interpretation of the data.

Before the samplers are erected on site the area is surveyed using topographical maps and historical climate data to determine the various wind flow patterns and topographical features that may influence the migratory patterns of fallout dust on site. Once these factors have been determined the location of the dust buckets is pinpointed taking into consideration the position of various infrastructures on site which require monitoring such as the pit and haul roads.

The buckets are filled with distilled water and the stations will be left out on site for a period of three months, from there the buckets will be sampled monthly and transported to a reputable Laboratory for analysis.

In order to assess the results, the collected dust is filtered through a sub-micronic pre-weighed filter using a vacuum filter bench. Once the wet filtrate has been desiccated by evaporation of any retained moisture, the filter is reweighed to ascertain the collected mass (Insoluble particulate). The soluble particulate is assessed by evaporating the catch media and weighing the resulting solids.

S.A. Classification (DEAT)	mg/m²/day
Slight	<250
Moderate	251 – 500
Heavy	501 – 1200
Very heavy	>1200

Fallout dust classification as per the standards set by the Department of Environmental Affairs and Tourism (DEAT)

Units will be monitored and particulate collected monthly.

The results are then analysed and placed into various graphs and tables that best indicate the dust fallout situation on site. A report is then compiled detailing all findings and includes a full assessment of the results along with conclusions and recommendations for future monitoring on site.

• **Groundwater Assessment (Geo-hydrological and Geochemical)**

A baseline assessment is a detailed assessment of an area to e.g. define the groundwater system of an area or determine the extent of an impact on the groundwater resource. Tasks related to the site-specific geohydrological evaluation of the Weltevreden project area include:

1. Site Visit

A site visit is needed to initiate the project and familiarise DWA with the current on-site water use activities and state of the groundwater regime. This site visit will be integrated into the Hydrocensus.

2. Collect data relevant to the site and the scale of the assessment.

Sources will include:

- Hydrocensus;
- DWAF Directorate: Information Management;
- Geological reports from the exploration phase;

Information types include:

- Hydrogeological reports, borehole logs, test data;
- Monitoring data;
- Published geological maps;
- Published hydrogeological maps;
- Information on water levels, quality and water use;

3. The existing information will be collated, evaluated and interpreted. GIS maps will be prepared at an appropriate scale indicating the:

- Geology and hydrogeology of the site (including structural controls);
- Groundwater flow directions, potential pollution sources and position of boreholes;
- Expected impacted/risk areas and level of impact/risk;
- Protection zones.

4. All data will be compiled into a database file.



5. The information will be used for the evaluation of the hydrogeological environment surrounding the Weltevreden project, as well as the related impacts according to the conceptual model and monitoring data available.

A report will be prepared with information included as stipulated below.

- Available data and information.
- Geology and hydrogeology of the Weltevreden site.
- Geological structural controls that govern groundwater flow.
- Status of groundwater levels and groundwater quality (including a discussion on the geochemistry) at the site.
- Recharge and flow mechanisms that govern groundwater flow.
- Preliminary risk assessment.
- Delineation of protection areas as a result of the risk assessment.
- Recommendations on a monitoring network.
- GIS maps of the geology, groundwater flow, groundwater quality, expected impacted and protection areas.

• **Soil Assessment, Land Capability and Land Use**

• **Soil**

To enable accurate surveying a fixed point grid with a density of 150 x 150 m will be generated. The soils will be surveyed by hand auger observations at grid points. Coordinates of the observation points will be loaded onto a GPS to locate points in the field. Additional observations will be made in-between grid points where necessary to accurately locate soil boundaries. Auger observations will be made to the depth of the first restricting layer or to a maximum depth of 1500 mm. The following attributes will be recorded at each observation:

- Soil form and family classified according to the Taxonomic Soil Classification System for South Africa, 1991.
- Soil depth.
- Estimated soil texture.
- Soil structure.
- Underlying material.
- Current land use.
- Land capability.

The topsoil and subsoil (0-300 and 300-600 mm) of the dominant soil forms will be sampled at a rate of approximately 1 topsoil and subsoil sample per 100 ha. Samples will be analyzed for soil acidity and fertility indicators as follows:

- pH (water)
- Extractable cations Na, K, Ca, Mg (Amm.Acetate.)
- Phosphorus (Bray1)

• **Land Use**

The extent of all land use practices will be surveyed and mapped in the field during the time of the soil assessment.

• **Land Capability**

Soil properties of soil units mapped during the detail soil assessment will be evaluated and categorized in land capability classes of arable land, grazing, wetlands and wilderness land.

• **Noise Assessment**

The approach used in investigating noise impacts is based on guidelines provided by the South African National Standards (SANS). In these guidelines, sound pressure level is often used as the measurement unit for noise guidelines (SANS 10103:2004). Currently there are no statutory regulations governing environmental noise emissions. SANS have no documented standards describing acceptable noise levels for a mine. The Standard SANS10103:2004 "The measurement and rating of environmental noise with respect to health, land use, annoyance and to speech communication, covers methods and gives guidelines to assess working and living environments with respect to acoustic comfort, excellence, preservation of health, land use and with respect to possible annoyance by noise indicates the acceptable levels of noise in both residential and non residential areas", has been used as a guideline (SANS 10103:2004). The standard SANS10103:2004 is essentially in line with the recommendations of the World Health Organisation for community exposure.

Numerous environmental factors determine the level of sound at a given point of reception. These factors include: distance from the source of sound to receptor; surrounding terrain; ambient sound level; time of day; wind direction; temperature gradient and relative humidity.

There are three major categories of noise sources associated with mining. They are: fixed equipment or process operations (generators, pumps, conveyors, electrical equipment); mobile equipment or process operations (drilling, haulage, service operations); and transport movements of products, raw material or waste (truck traffic) (SVT, 2005)



The objectives of a noise report are:

- To prepare a report, including applicable maps identifying noise monitoring sites and tables indicating measured noise levels with comments;
- To describe and assess potential noise impacts resulting from project related activities;
- To include mitigation measures for the potential noise impacts and suitable recommendations;
- To recommend a noise monitoring programme detailing the frequency and reporting to be implemented prior to and during the life of mine.

In order to assess ambient noise levels, baseline noise monitoring needs to be conducted on weekends and during the week, in areas where noise sources will be generated and at possible noise receptors, such as the proposed mine site, nearby roads (more specifically the R33), and on the following farmlands: Portion 10 – Zoekop, Portions 4 & 17, Blyvooruitzicht and Portion 2 – Weltevreden.

All measurements need to be taken once during the daytime and once in the evening at each identified noise source site. Monitoring should be taken at a measurement of 1.8 meters above ground level, and between a minimum period of 30 minutes and a maximum period of one hour.

Noise monitoring should be conducted before, as mine construction commences, and during the operation of the mine. The averages can then be calculated and used to compile an acceptable minimum and maximum noise range. Predicted noise levels (delta rating) will be calculated and a comparative analysis will be completed with the baseline data.

The noise monitor used will be calibrated and a calibration certificates will be available on request.

An environmental noise monitoring programme will be implemented and adhered to.

A report will be compiled using the data collected.

• **Surface Water Assessment**

The quantity and quality of the surface water resources that may be affected by the proposed development on the Weltevreden site should be examined prior to mining activities taking place on the site. The aim of this study is to gather baseline information about the surface water systems in order to determine and predict the impacts that the mining activities might have on it.

The following tasks will be completed during the execution of the surface water studies.

A site visit should be conducted in order for the specialists to get familiarised with the site. All the surface water bodies should be identified and noted. Water samples should be taken from these bodies and analysed in a reputable laboratory to determine the concentrations of the constituents in the water.

A desk top study should be done to gather existing information relating to the site and the surrounding area. All the data should then be collated, evaluated and interpreted. GIS maps should be used to depict the results of the study visual.

The following aspects should be considered:

Surface water quantity

Catchment boundaries

A topography map covering the catchment area should be obtained to determine the catchment boundaries of the streams flowing through the site. The boundaries will be indicated on the surface water map which will be included in the report. The quaternary catchment should also be identified.

Mean annual run-off (MAR)

The MAR for the catchment which will be impacted by the proposed project will be determined in proportion to the total MAR. This information can be obtained from the Department of Water Affairs and Forestry (DWAF).

Normal dry weather flow

Data on the normal dry weather flow should be obtained from the DWAF.

Flood volumes

The flood volumes for the streams will be determined using South African methods such as the Standard Design Flood which takes the floods which occurred in 2000 in the southern African region into account. The flood lines will then be indicated on the surface water map.

Surface water quality

Samples will be taken upstream and down stream of the proposed site and the water quality discussed as part of the baseline investigations.

The potential impacts associated with the project will be discussed and rated in accordance with the proposed EIA methodology for the project. Mitigatory measures will be recommended as part of the study.



Surface water use

Surface water users identified should be recorded and additional mitigatory measures should be proposed to reduce any impacts from the project on these users.

Drainage density of areas to be disturbed

The drainage densities of the areas to be disturbed will be determined from a measurement of the length of rivers and streams within the area of interest as well as the catchment area

Water authority

The local water authority should be identified and consulted as part of the Public Participation Process.

Wetlands

The wetlands present on the proposed site should be delineated according to the accepted DWAF methodology during the aquatic studies and shown on a plan.

• **Blasting/Vibration Assessment**

A Ground Vibration and Air Blast Study will be undertaken by Blast Management and Consulting. Blast Management and Consulting is a company providing services regarding all aspects concerning safe, proper and effect performance of blasting activities associated with mining and the civil and construction industries. Services are delivered on the following aspects: ground vibration & air blast, blast preparation, audits, pre-blast structure inspections, blast input analysis which could consist of the following: velocity of detonation, product timing, explosives product quality, face profiling, fragmentation analysis, high speed video, borehole inspection, and Iso-seismic surveys. The assessment will be undertaken over a radius of 2km around the development properties.

The scope of the study for the Weltevreden project will include:

- Assessing the possible impacts of blasting operations on the immediate surroundings and current infrastructure in the vicinity of the proposed project area with regards to the following aspects:
 - Review of area and identification of infrastructure
 - Current legislation and protocols
 - Ground vibration
 - Air blast
 - Fly rock
 - Safety and limits
 - Surface blasting and underground blasting influences
 - Monitoring
 - Pre-blasting recommendations
 - Recommendations on minimising impacts where applicable

The above aspects will be considered in one report providing a professional opinion based on theoretical calculations of expected influences. Attention will also be given to the opencast operations and associated shafts, its surroundings an possible influences. With the provision of detail information of proposed mine plans influence spheres can be generated with indications of critical areas. The report will include all limits and criteria applicable for blasting operations currently applied in South Africa. This report will also contain alternatives for preventative measures that will be required if need be for specific situations where applicable.

• **Visual Impact Assessment**

Visual Assessments are used to determine the impact a proposed development will have on the visual aesthetic of the surrounding area. The proposed Weltevreden Open Cast Mine will disturb the visual integrity of the site itself as well as the surrounding area.

The objectives of the visual assessment are:

- To identify the visibility of the project and the nature and intensity of the visual impact.
- To describe the visual sensitivity of the area and residing receptors.
- To determine the size of the viewshed area (area which has a direct visual connection / line-of-sight with the proposed site).
- To determine the nature and susceptibility of receptors within the viewshed area (residents, roads nature reserves etc).
- To determine the visual absorption capacity (ability of the environment to absorb the visual impacts).

The methodology employed will be as follows:

- Topographical information will be used in a Geographical Information System (GIS) to form a Digital Terrain Model (DTM) which depicts elevations and slopes in the relevant area. The DTM in conjunction with the proposed site plan will be used to model the Viewshed area.
- Aerial Photography / Satellite Imagery will be used to identify potential receptors within the viewshed area in order to assess the significance of the visual disturbance.



- Factors and impacts will be investigated and rated. Findings will be incorporated into the EIA/EMP document, a separate report will not be provided.
- Mitigation measures which can reduce the visual impact will be recommended.

Registration as Interested and Affected Party

To ensure that you are registered as an Interested and Affected Party, provided with an opportunity to comment on these documents, and that you receive updated project information, please complete the enclosed comments sheet, or contact:

Digby Wells & Associates:

Niqui Viljoen

Tel: (011) 504 1421

Fax: 086 502 1589

Email: niqui@digbywells.co.za

Postal: Private Bag X10046, Randburg, 2125

INDEPENDANT CONSULTANT

Digby Wells and Associates (DWA) is an independent consultant with a wealth of experience in undertaking public consultation.

The company has been commissioned to undertake the PPP for the project, and to independently record issues and concerns identified by stakeholders. Where negative impacts are identified, recommendations will be made to Northern Coal (Pty) Ltd with regard to how these impacts should be avoided or minimised.

DWA has no private interest in Northern Coal (Pty) Ltd and operates independently to reflect both the interests of the stakeholders and the mine.

