WATER USE LICENSE APPLICATION REPORT FOR KEBRAFIELD (PTY) LTD

in support of a

Water Use Authorisation in terms of Section 40 of the National Water Act, 1998

On

The farm Roodepoort 151 IS

Pullenshope,

Mpumalanga Province

M^2 Environmental Connections cc
P.O. Box 2047
Garsfontein East
0060
Tel: 012 993 2165
Fax: 086 621 0296
E-mail: corlien@menco.co.za

Title: Water Use License Application Report for Kebrafield (Pty) Ltd: Water Use License Application in support of the National Water Act, 1998 (Act 36 of 1998) on the Roodepoort Farm 151 IS, Pullens hope, Mpumalanga Province.

Client:
Kebrafield (Pty) Ltd: Roodepoort Colliery
Eyethu Coal, Stonehill Office Park
c/o Solomon Mahlangu & Disselboom Drive
PRETORIA

Contact:
Wayne van der Burgh
t_012 807 0229
f_012 807 0339

Report no:
WULA/KF/201309/R1

Author:
Corlien Lambrechts B.Sc. (Environmental Management & Zoology)

Review:
Morné de Jager B.Ing. (Chem)

DATE: September 2013

PROJECT: Facilitation of the Water Use Authorisation Process for the proposed Kebrafield Colliery (Pty) Ltd near Pullenshope.

LOCATION: Farm Roodepoort Farm 151 IS within the Gert Sibande (Nkangala) District, Mpumalanga Province.

LICENSEE: **Kebrafield (Pty) Ltd: Roodepoort Colliery**

Reg number:	2009-018854-07
Applicant:	Eyethu Coal
Telephone number:	012 807 0229
Delegated person:	Mr. Rirhandzu Owner Siweya
Contact details:	**011 867 0836**
Fax number:	**011 867 0520**
Mobile:	**082 971 5863 / 082 946 2214**

EAP Contact:	Mr. Henno Engelbrecht
Contact details:	Eco Elementum (Pty) Ltd 26 Greenwood Crescent Lynnwood Ridge Pretoria 0040
Telephone number:	012 348 5214
Fax number:	012 807 0339
Mobile:	082 690 9105
Email:	henno101@gmail.com

CONSULTANT: **M² Environmental Connections cc**

Contact:	Corlien Lambrechts
Contact details:	M² Environmental Connections cc P.O. Box 2047 Garsfontein East 0060
Telephone number:	012 993 2165 or 012 993 0651
Fax number:	086 621 0292
Email:	corlien@menco.co.za

EXECUTIVE SUMMARY

Kebrafield (Pty) Ltd is a small-scale coal mining operation that have applied for a mining right (Ref: MP30/5/1/2/2/479 MR) to mine coal on the farm Roodepoort 151 IS near Pullenshope in the Mpumalanga Province. Kebrafield (Pty) Ltd is an emerging coal mining company and only a short operational timeframe is planned (maximum two years) on Portion 17 of Roodepoort 151 IS.

The Kebrafield Colliery operation will be an opencast coal mining activity using truck and shovel methods to abstract the No.2 and No.4 coal seam found on the property. Concurrent rehabilitation will be conducted by means of the lateral rollover mining technique. Access to the coal reserves will be via an initial box cut and an access ramp. No beneficiation plant will be constructed as only crushing and screening activities will take place on site.

The mine envisaged to engage in several water uses that need to be authorised in terms of section 21 of the National Water Act, 1998 (Act 36 of 1998). The water uses that need to be applied for are:

- Section 21 (a) for the taking of water from a resource (for abstraction of potable water from a borehole and use of water from pollution control dam for dust suppression)
  No surface water abstraction is allowed within the quaternary catchment (under GA) as specified in Table 1.1 within Government Gazette Notice No 26187 during March 2004.[1]
  The taking of groundwater is regulated in terms of quantity and rate of abstraction by Table 1.2 within the same Gazette Notice mentioned.
- Section 21 (c) and (i) in respect of the altering of water courses by mining infrastructure
- Section 21 (g) for the disposing of mine waste in a manner which may impact on a water resource (for pollution control dams and discard dumps)
- Section 21 (g) for the dirty water containment structure (PCD)
- Section 21 (j) for removing of water from open pit operations

There are no General Authorisations applicable to this application.

Several impacts had been identified during the risk assessment (conducted as part of the IWWMP) that could influence the ambient water quality of the area. The most significant impact is the formation of Acid Mine Drainage (AMD) and the potential for decanting to occur. These are typical impacts to be expected for Mining operations and will be well mitigated to proceed with mining in an environmentally friendly manner. Kebrafields (Pty) Ltd are in the process to have all required legislative documents compiled and intend to implement in accordance to the specifications of the WUL, EMP and other environmental legislation on the subject.

[1] *Revision of General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act 36 of 1998)*

In an attempt to assist the regulatory authority with this task, the document will:

- Give a brief overview of the proposed activities of the Kebrafield Colliery Project;
- Identify the water uses as defined in Section 21 of the National Water Act, 1998 (Act 36 of 1998) applicable to the project;
- Provide all completed DW forms and legal administrative documents; and
- Provide an overview of the potential impacts on the surface water resources to assist with the decision making process.

APPLICATION CHECKLIST

Description	Guideline Section	Check
Are the applicant, property, ownership and occupancy forms for all applicants and properties correctly filled in, signed and included in the application?	Appendix 1	√
Are the appropriate water use forms correctly filled in, signed and included in the application?	Appendix 2	√
Are all required supplementary forms indicated in the water use forms marked off in the water use forms, correctly filled in, signed and included in the application?	Appendix 2	√
Is a brief report describing the proposed water use, the development that requires the water use and the expected impacts of the water use signed and included in the application?	Motivation Report:	√
Is a map showing the properties, water resources, water works, development requiring the water use and the affected users included in the application?	Motivation Report:	√
Is all the information identified in the pre-application consultation included in the report?	Pre-application consultation was held	√
Have all the consultations identified in the pre-application consultation been done and the information included in the application?	Pre-application consultation was held	√
Is the license application fee or proof of payment included in the application?	Appendix 3	√

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1 BACKGROUND

1.1 SITE AND PROJECT DESCRIPTION

The Roodepoort Farm, specifically Portion 17 (please refer to **Figure 1-1** for position) that is chosen for the project location is located close to the town of Pullenshope, between Middelburg and Hendrina. The site is north-west of the Hendrina Power Station and south west of the Optimum Coal operations. Current land uses within this portion is mostly maize production and grazing fields.

The proposed mining area is situated within the northern section of the Witbank Coalfield. The strata in which the coal seams occur consist predominantly of fine, medium and coarse-grained sandstone with subordinate mudstone, shale, siltstone and carbonaceous shale. The No 2 and No 4 coal seam is economically viable and open cast is chosen as the best extraction method. Mining will be conducted through a conventional strip method (roll-over method). The Witbank Coalfield contains a large and important resource of high yield export quality coal (especially in the No. 4 Seam).

No processing will be conducted at the coal operation. ROM from the mining area will be crushed and screened at a crush and screening plant to be placed on site as indicated on **Figure 2-2**. Coal extracted from the open cast area will be transported to the ROM stockpile. Haulage trucks will transport the coal product from the product stockpile to ESKOM and other markets.

The rehabilitation phase will include backfilling of open voids and seeding of backfilled areas. Backfilled areas will be free draining. The mine closure phase will be dedicated to the maintenance of rehabilitated areas as well as the compilation of a Closure Plan. Rehabilitation will run concurrently with the mining operation, typically of the technique used.

The proposed mining site is situated next to the Woestalleen wetland system. The stream linked to the wetland is an unnamed tributary of the Woestalleen Spruit. The field survey has revealed that the wetland soils are permanently waterlogged.

Specialist studies have been conducted to analyse the anticipated impacts on the environment. The area was recently burned and identification of wetland plants was thus not possible in most cases. A Fauna and Flora study was also conducted on the proposed area to determine whether sensitive species was present on site. Several were found and it may be noted that the field was in a good condition overall with several endemic species within the larger area. A strict environmental management plan should be adhered to and the appointment of an ECO to regulate proceedings is deemed necessary. The Environmental Impact Assessment (EIA) is inclusive of the relevant specialist studies conducted and will be available on request.

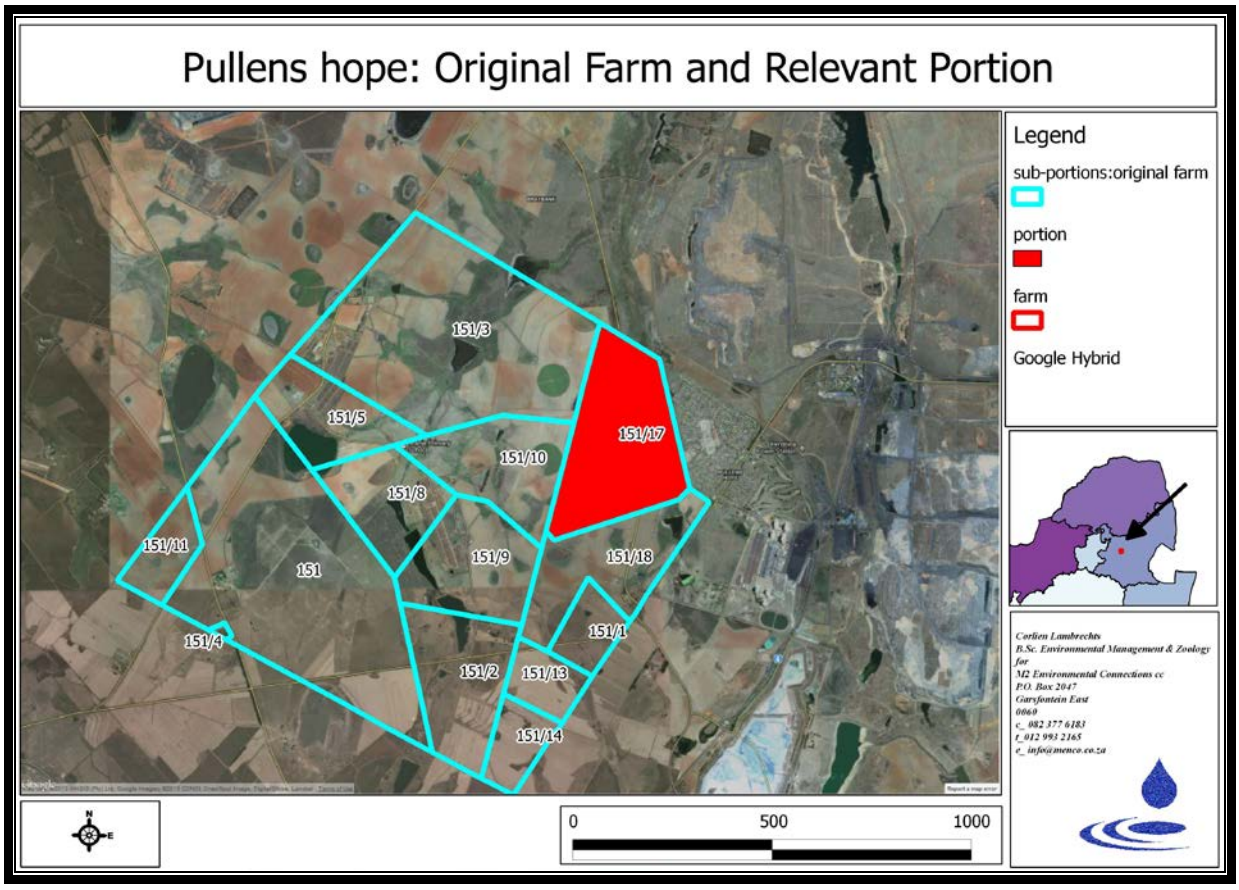

Figure 1-1: Original Roodeplaat Farm 151 IS Portion divisions

Table 1-1: Proposed mining areas and activities

Property	Portion	Description
Roodeplaat Farm No: 151 IS	Portion 17	Water management –storm water management system
		Mineral Processing – Crushing and Screening
		Waste Management – Hard and Soft Stockpiles
		Mine infrastructure – Haul roads, workshop, office
Current Landowner		Joseph Christiaan van Wyk

1.2 REGIONAL DESCRIPTION

The site of the proposed mine is located next to the small town of Pullenshope and falls in the Mpumalanga Province (**Figure 1-2**). It is under the jurisdiction of the Steve Tshwete Local Municipality and situated within the Nkangala District Municipality.

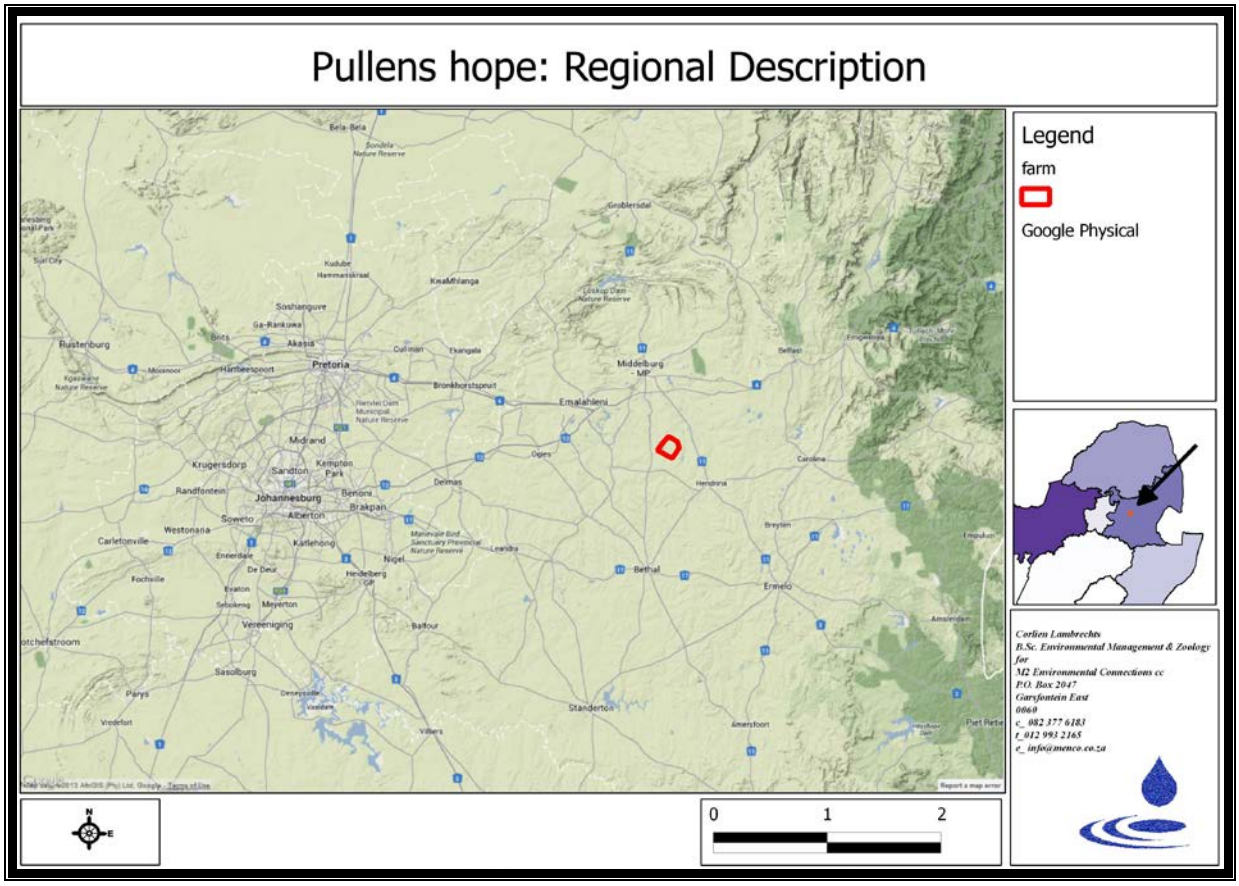

Figure 1-2: Regional description of the proposed Kebrafield Colliery

The proposed area chosen for development are located approximately 135 km to the South East of Pretoria and 150 km to the North East of Johannesburg (Gauteng Province). Middelburg and Emalahleni (Mpumalanga Province) is situated about 40 km to the North and North West of the study area.

1.3 SURROUNDING ACTIVITIES

Surrounding land uses in the vicinity of the proposed mining site are farming with agricultural as the predominantly activity as well as Power generation and the residential areas of Pullens Hope to the right. Agricultural activities include cultivated crops with clear irrigation practices (refer to pivot indications on **Figure 1-1** provided) and livestock farming. Optimum Colliery is an active colliery located to the right of Portion 17. Please refer to **Figure 1-3** provided below.

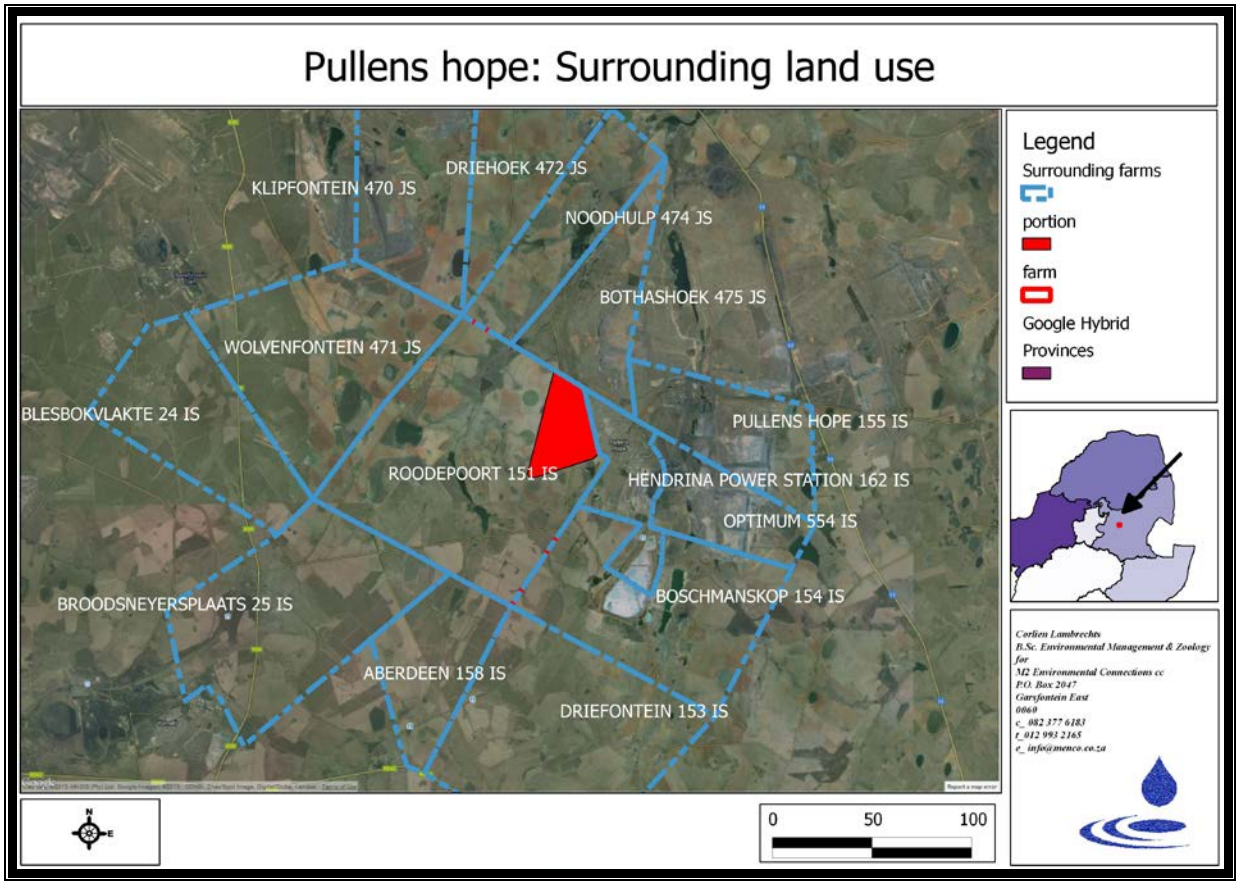

Figure 1-3: Surrounding land use description

Table 1-2: Zoning information of surrounding areas[2]

Title name	SG Code of Original	Zoning information
Roodepoort 151 IS	T0IS00000000015100000	Agricultural Holding (All Portions)
Bothashoek 475 JS	T0JS00000000047500000	Mining: Optimum Coal Mine
Pullens hope 155 IS	T0IS00000000015500000	Mining: Optimum Coal Mine (Portion 0 – 3, 9 - 12) Other Purposes: RSA Government Property (Portion 5) Mining: Privately Owned (Portion 6) Mining: Billiton Energy Coal (Portion 8)
Optimum 554 IS	T0IS00000000055400000	Open Cast Colliery: Mining Right
Hendrina Power Station 162 IS	T0IS00000000016200000	Other Purposes: Eskom (Portion 0) Government: Schools (Portion 1) Government: Business (Portion 2) Residential Area (Portion 4) Commercial / Industrial Purposes (Portion 6)
Boschmanskop 154 IS	T0IS00000000015400000	Agricultural Holding (All other)

[2] *Steve Tshwete Municipality: http://www.stevetshwetelm.gov.za/fnameselect.php*

		Other Purposes: Eskom (Portion 5) Commercial / Industrial Purposes (Portion 8) Mining: Optimum Coal Mine (Portion 11, 21)
Driefontein 153 IS	T0IS00000000015300000	Agricultural Holding (All other) Commercial / Industrial (Portion 38 – 41)
Aberdeen 158 IS	T0IS00000000015800000	Agricultural Holding (All)
Broodsneyersplaats 25 IS	T0IS00000000002500000	Agricultural Holding (All other) Public Service Infrastructure (Portion 14, 20, 21, 23-35) Mining: Billiton Energy Coal (Portion 9) Other Purposes: RSA Government Property (Portion 22)
Blesbokvlakte 24 IS	T0IS00000000002400000	Agricultural Holding (All other) Public Service Infrastructure (Portion 11-13)
Wolvenfontein 471 JS	T0JS00000000047100000	Agricultural Holding (All other) Mining: Anglo Operations (Portion 8) Commercial / Industrial Purposes (Portion 14) Other Purposes: RSA Government Property (Portion 15) Public Worship (Portion 23)
Klipfontein 470 JS	T0JS00000000047000000	Mining: Ingwe Surface Holdings (Portion 0-2)
Driehoek 472 JS	T0JS00000000047200000	Agricultural Holding (All)

1.4 SENSITIVE LANDSCAPES

1.4.1 Land Capability

The area investigated is typical high veld grassland. A big part of the area is used for dry land crop production. The rest of the area is low laying water canal with wetland properties and is primarily used for grazing. The soil texture is sandy loam and the average soil depth on arable land is 1.2 m. The grazing area's depth is about 400 mm. The total size of the investigated area is 150 hectares.[3]

According to the land capability report conducted by LantekSA; "The agricultural potential for crop production on the existing arable land is high. The area used as grazing has low to medium potential as crop production areas. The farms existing agricultural use of the area is optimum. The best agricultural purpose for the area is as it is currently being used."

Please also refer to the Fauna and Flora Specialist investigation conducted as part of the WULA Application.

[3] Lantek SA: Land Cpapbility Report at the proposed Kebrafields Roodepoort Colliery on Portion 17 of the farm Roodepoort 151 in Mpumalanga Province, Report Nr 5/11/2013 5/11

1.4.2 Nature Reserves and Protected areas

There are several reserves and sensitive areas noted in Mpumalanga (please refer to **Figure 1-4** provided below), but not anticipated to be impacted by any developments on Portion 17, due to relative distance between protected and sensitive areas and the mining footprint area.

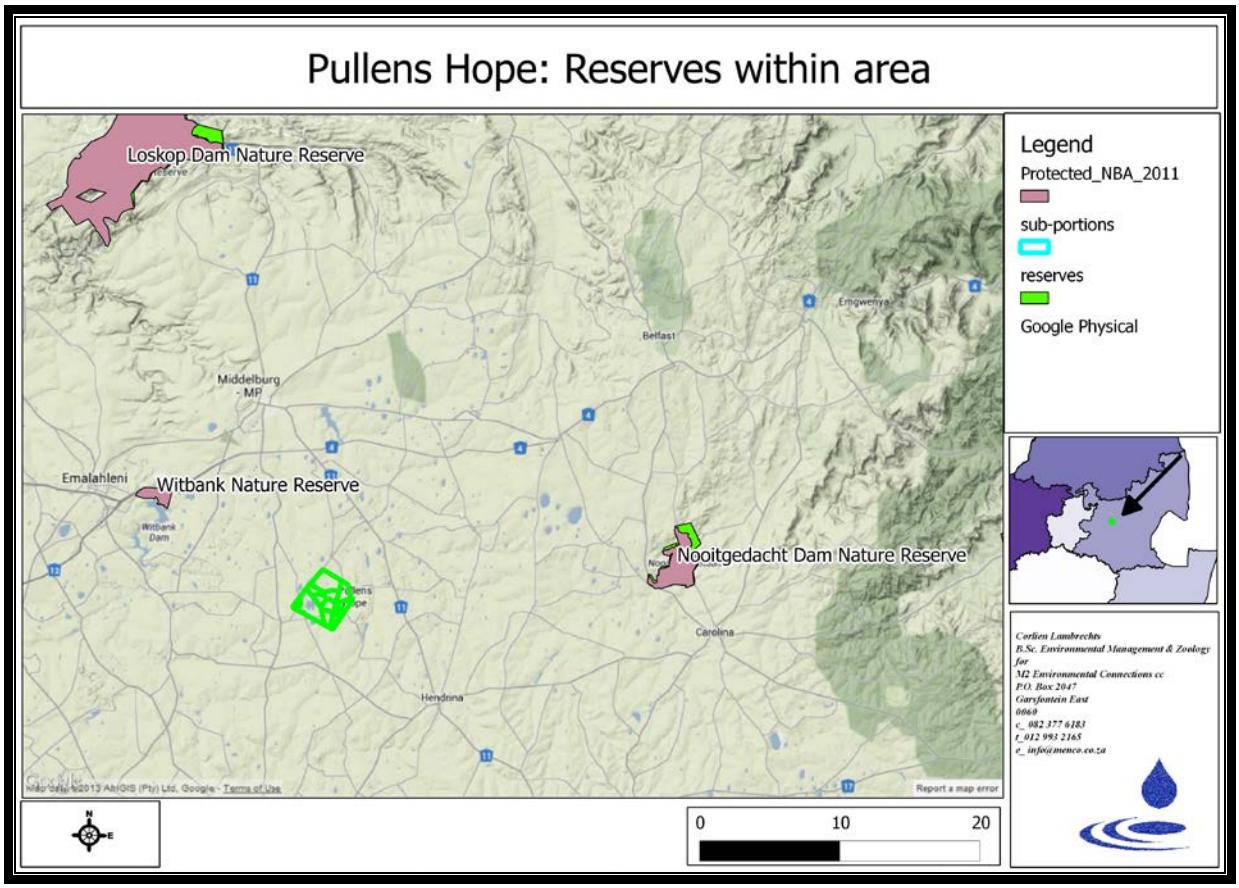

Figure 1-4: Reserves and protected areas in proximity of development

1.5 CATCHMENT INFORMATION

1.5.1 Localised movement

Table 1-3: Description of Water Resource (Local)

Quaternary catchment	River	Spruit	Resource description on Portion 17
B12B	Klein Olifants River	Woestalleen Spruit	The Woestalleen Spruit feeds the Klein Olifants River, with unnamed tributaries that transverses the Original Farm Roodeplaat 151 IS.
			Two palustrine wetland types inclusive of a channelled valley bottom wetland and unchannelled valley bottom wetland was identified during the wetland delineation process on the farm portion where Kebrafield want to develop (Portion 17).
			One small channelled valley bottom wetland that is within the footprint of the proposed mining plan (Please refer to **Figure 1-6** for a visual indication).

Portion 17, proposed for mining in the top-right corner, falls at the watershed between the B12B and the B12H quaternary catchments. However, surface water from the smaller mining area will only drain toward B12B.

Current impacts on the water resources include the construction of a dam within the wetland systems, grazing of cattle, erosion, a stormwater culvert, road crossings, seeping from a unknown source presumed to be the Optimum Colliery (refer to **Figure 3-2** below), agriculture, dam erosion and gullies formation are visible. The main local disturbances within the small perennial stream include erosion as well as head gully formations due to disturbances in flow and cattle grazing activity within the Roodepoort 151 IS, Portion 17. Mining and power generation are the main impacts on the aquatic environment (regional), as there are no other activities higher in the catchment that can impact on the surface water.

1.5.2 Regional movement

The proposed mining area falls in the B12B quaternary catchment area (illustrated in **Figure 1-4**) that forms part of the Upper Olifants River catchment and Olifants Water Management Area (WMA). The runoff from the proposed mining area drains towards unnamed tributaries of the Woestalleen Spruit that flows north-east before its confluence with the Klein-Olifants River.

Table 1-4: Available yield in the Olifants River (year 2000)[4]

Sub-area	Natural Resource		Useable Return Flow			Total
	Surface	Groundwater	Irrigation	Urban	Mining	
Upper Olifants	194	4	2	34	4	238

The upper Olifants River Catchment includes immediate areas within the catchment upstream of Loskop Dam. The study focussed on the environmental flow requirements downstream of impoundments only (Doringpoort, Witbank, Middelburg and Premier Mine Dams). The size of this catchment is about 1300 km^2, and the length of the main Olifants River within the upper catchment is about 200 km. There are two main tributaries of the Olifants River is the Wilge and the Klein Olifants Rivers.

The Klein Olifants River is the main catchment that is relevant to the project site and the Quaternary Catchment (B12B) falls within this drainage area. An outline of the streams applicable in relation to the proposed mining area is given in **Table 1-3** and indicated in **Figure 1-5**.

[4] *(in million m^3/ annum) NWRS, First Edition, September 2004 (D4: Water Management Area 4: Olifants)*

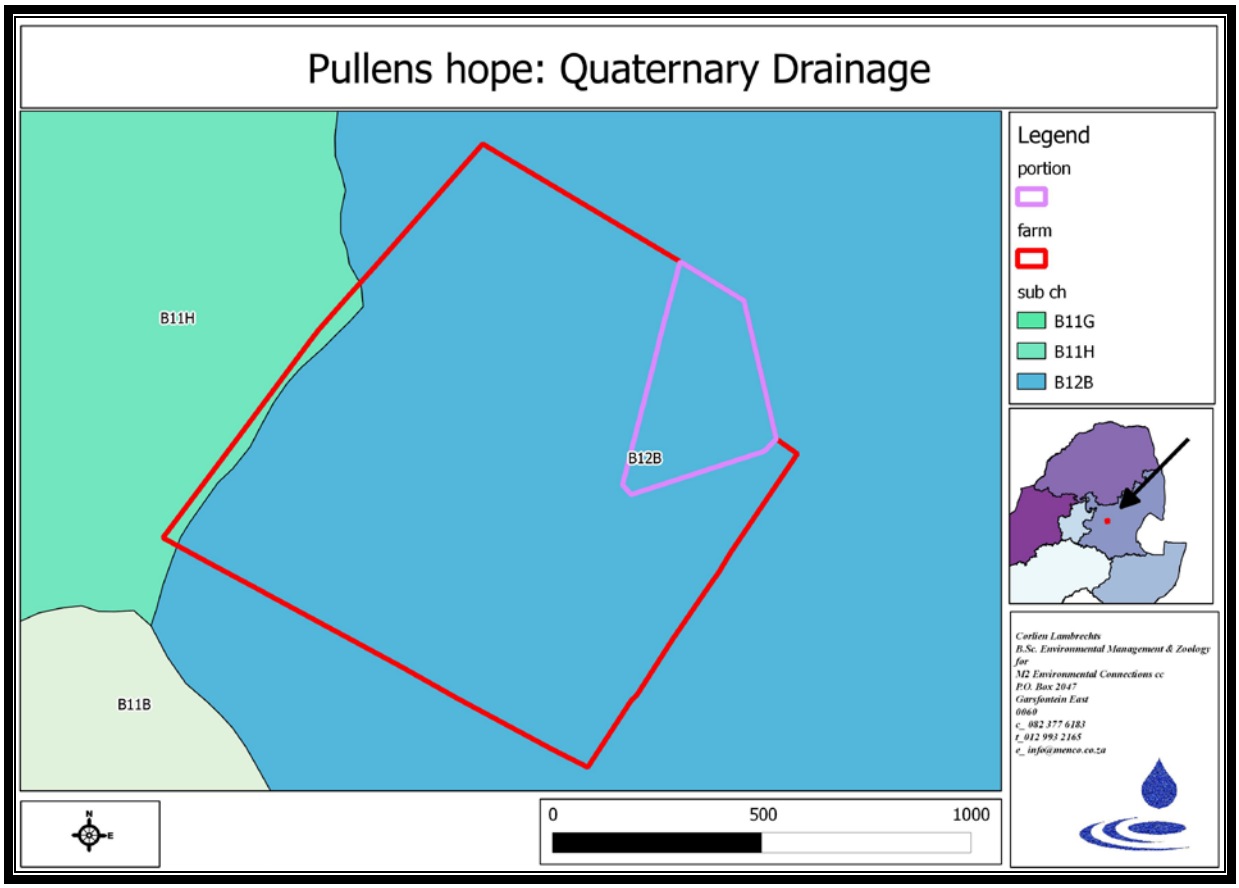

Figure 1-5: Quaternary drainage regions applicable to the study area

Table 1-5: Mean Annual Run-off for the B12B quaternary catchment

Component	B12B
Virgin Mean Annual Run-off (MAR) mm for catchment	370 x 10^6 m^3/a
Net MAR ($10^6 m^3$) for quaternary catchment	42
Applicable Upper Olifants catchment area (km^2):	1300
Applicable river MAR ($10^6 m^3$)	Not determined
Study Area (km^2)	0
Total Virgin MAR for study area ($10^6 m^3$)	0

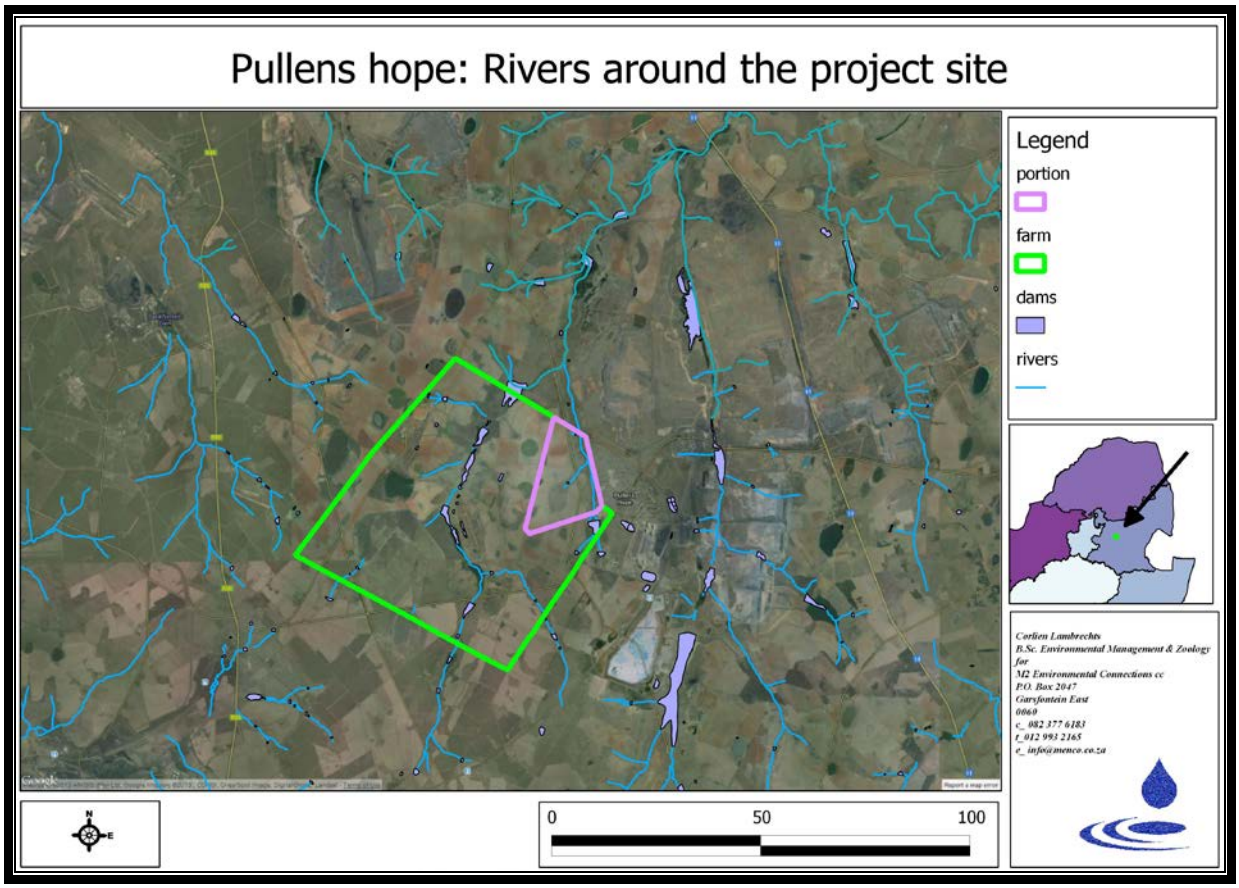

Figure 1-6: Rivers/streams in the vicinity of the proposed mine

1.6 PRESENT ECOLOGICAL STATUS AND SENSITIVITY

Table 1-6: Ecological Status of applicable drainage areas

Catchment description	EIS	PES
Upper Olifants Catchment: Segment of river upstream of Middelburg Dam	-	Without taking toxicity into account: C[5]
Klein Olifants Catchment	Moderate	Class C[6]

1.7 WETLANDS

The wetland delineated study indicated that there were three small wetlands on the property (**Figure 1-6**). These are:

- Un-channelled valley-bottom wetland (buffer zone adequate)
- Channelled valley-bottom wetland (within the mining footprint)
- Channelled valley-bottom (buffer zone adequate)

[5] *Department Of Water Affairs And Forestry, Directorate: Water Resources Planning (2001): Upper Olifants Water Quality - After the positive toxicity results: Class E was recommended. A positive in-stream Algal toxicity test was obtained, which indicate metal poising.*

6 DWAF: Surface Water Reserve Determination: RDM ref: 26/8/3/3/297

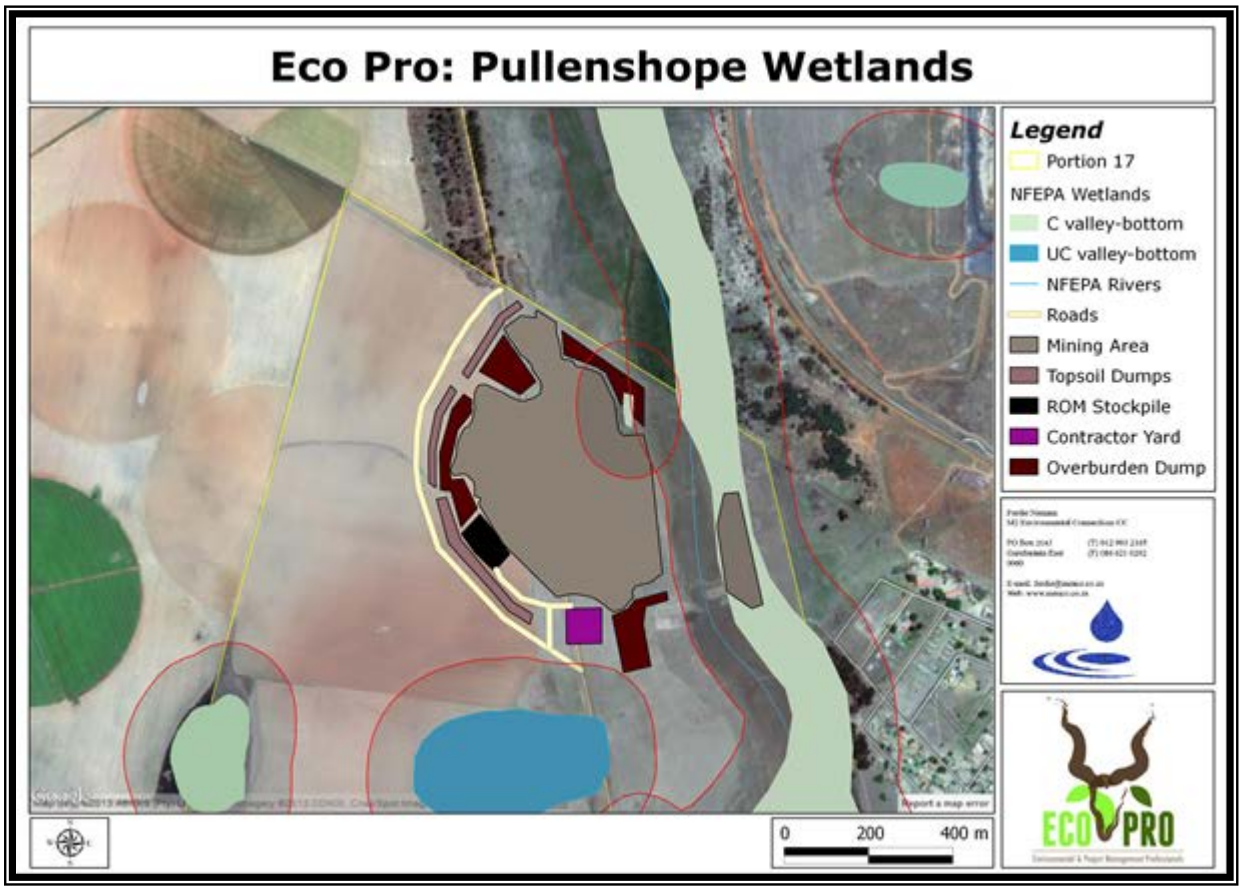

Figure 1-7: Wetlands at the location of the proposed Kebrafield

Current impacts on the wetlands (direct and indirect) include modified aggradations of sediment in the system due to farming, quarrying and grazing, a dam in the wetland, grazing and water abstraction.

1.8 SOCIO ECONOMIC ASPECTS

The Olifants WMA is one of the most economically important areas within South Africa. Activities are diverse and is mainly characterised by mining, metallurgic activities, commercial agriculture. Large coal deposits are found in the Emalahleni and Middelburg areas, while large platinum group elements (PGE's) are found in Steelpoort and Phalaborwa areas towards the North.

Eskom currently has seven coal fired power stations (and constructing an eighth) which support the country of 70 percent of their main power supply.

According to Statistics South Africa (2001), the total population of the Steve Tshwete Local Municipality is estimated to be 143 000 citizens that covers an area of approximately 3 993 km^2. However, the 2011 update indicated that the population of the Steve Tshwete Local Municipality was at 229 831 citizens. The population density of the within this Local Municipality is 58 citizens

/km^2.[7]

It is estimated that most (42 %) of the population of the Upper Olifants Catchment is economically active, 34 % not active, while 23% is unemployed. The largest group falls within the very poor-to-poor category of income.[8] This indicates poverty and a high reliance on social assistance, especially housing subsidies and Free Basic Services (FBS). It is estimated that approximately 6% of the population do not have access to piped water.

The main economic sectors are mining and quarrying (20 % of employment), community (social and personal services) up to 14 %, wholesale and retail (13% of employed persons) and the manufacturing sector constituting to 11 % of income generated.

1.9 RESERVE DETERMINATION

1.9.1 Water Quality

The Reserve for water quality was determined in terms of Section 17 (1) and is provided in the table below.

Table 1-7: Reserve determination (Water Quality)

Parameter	Ambient Ground Water Quality	Basic Human Needs Reserve	Ground Water Quality Reserve
Electrical Conductivity (mS/m)	38	<150	41.8
pH	7.6	5.0 – 9.5	5.0 – 9.5
Sodium (mg/l)	17	<200	18.7
Magnesium (mg/l)	18	<100	19.8
Calcium (mg/l)	29	<150	31.9
Chloride (mg/l)	21	<200	23.1
Sulphate (mg/l)	21	<400	23.1

[7] *http://www.stevetshwetelm.gov.za*

[8] *IUA Delineation Report*

Table 1-8: Target Water Quality Ranges

Chemical Parameter	Target Water Quality Ranges[9]		
	Class 0	Class I	Class II
pH	5-9.5	4.5-10	4-10.5
Electrical Conductivity	<70	70-150	150-370
Calcium as Ca	<80	80-150	150-300
Magnesium as Mg	<70	70-100	100-200
Sodium as Na	<100	100-200	200-400
Chloride as Cl	<100	100-200	200-600
Sulphate as SO_4	<200	200-400	400-600
Nitrate as NO_2 - N	<6	6-10	10-20

1.9.2 Water Quantity

Table 1-9: Reserve determination (Water Quantity)

Tertiary	Recharge (Mm^3/a)	Groundwater baseflow (Mm^3/a)	Baseflow required	BHN Reserve (Mm^3/a)[10]	Reserve as % of Recharge
B12	50.25	11.08	5.06	-	10.00

1.10 FLOOD LINES

A detailed surface water management plan was drawn up as part of the EIA and WULA application including the determination of flood lines, identification of sensitive receptors and existing surface water systems and flow paths, and civil engineering design reports for the required trenches and water management facilities. These are all incorporated into the proposed lay-out (Please refer to **Figure 2-2**). The geo-hydrological investigation will also feed into these designs as the anticipated pollution will be modeled. Please refer to the IWWMP and Surface Water Assessment for details regarding the floodline report.

9 DWAF: Preliminary Determination of Reserve (RDM ref: 26/8/3/3/297)

[10] *Basic Needs Reserve has been included in the Surface Water Reserve*

2 PROJECT DEVELOPMENT

The proposed development is the opencast mining of the No. 2 and No. 4 coal seam on Roodepoort Farm 151 IS, Portion 17 in Mpumalanga. The view of the target area is shown in the figure provided below**.** Truck and shovel methods will be used to abstract the coal. Rehabilitation will be done concurrently by means of the lateral rollover mining technique. Access to the coal reserves will be via an initial box cut and an access ramp. There will not be a beneficiation plant onsite and Run-of Mine (ROM) coal from the mine will be transported directly by road to one of Eskom's Power Stations and local markets.

Figure 2-1: View from the right side of the wetland and river areas towards the proposed site (far left in the distance)

2.1 PRODUCTION RATE ESTIMATION

It is anticipated that a maximum 800 000 tons of high grade coal will be moved / screened over the period of one (1) to two (2) years. An estimate of 50 000 tons will be removed monthly from the open pit to be processes. No coal washing will take place on the site, only crushing and

screening. Kebrafield (Pty) Ltd has approximately one (1) to two (2) years of life as determined from the proposed production rate.

2.2 EMPLOYEE BREAKDOWN

Table 2-1: Proposed employee structure for Kebrafields (Pty) Ltd

Occupational Category	Number of Employees
Senior Management	4
Geologist and Mine Planner	2
Survey and assistant	2
Safety, Health and Environment	5
Sub-total: Skilled	***13***
Bulldozer Operators	4
Hydraulic Excavator operator	4
Articulated Dump Truck Operator	10
General Operators	34
Grader Operator	5
Water Bowser	4
Overburden Drill Operator	6
Drill Assistant	4
Blaster Assistant	6
Blasting technician	2
Relief (sick) and temporarily	8
Sub-total: Contract Mining Labour	***87***
TOTAL	**100**

Approximately a hundred (100) employees will be employed by Kebrafield (Pty) Ltd during the Life-of-Mine (LOM).

2.3 INFRASTRUCTURE REQUIREMENTS

The infrastructure needed is outlined in **Section 2.2** and **Figure 2-2.**

2.3.1 Plants infrastructure

The following treatment plants will be constructed and operated:

- Crushing and Screening plant
- temporary sanitation

The crushing and screening plant will be a mobile operation. Dust suppression will be conducted as part of crushing and screening operations to suppress dust anticipated to increase over the footprint area. The crushing and screening plant will be deployed within the footprint of the dirty water area and all dirty water make will be contained in designated containment structures inclusive of Pollution Control Dams and storm water drainage canals.

2.3.2 Mining related activities and buildings

Activities and related buildings that will be constructed include:

- Site preparation;
- Box cut opencast mining with a roll over rehabilitation sequence;
- Crushing and screening of the ROM coal;
- Access road, haul road construction and road diversion of the existing road;

- Temporary site offices and security office;
- Temporary sanitation and change house;
- Stores and store yard;
- Workshop and maintenance area;
- Bulk fuel storage;
- Pollution control facility/dam (evaporation and dust suppression use);
- Clean and dirty water separation system;
- Trenching;
- Fencing;
- Mine fleet hard park;
- Staff and visitors parking;
- Drilling, blasting and explosives handling;
- Topsoil, subsoil, overburden, discard and ROM stockpiles;
- Security and weighbridge;
- Waste management;
- Mine closure and rehabilitation.

The office mining infrastructure will be sufficient to cater for the small number of employees at the mine. Security fencing and gate control will also be implemented for safety purposes. There is a power supply line that transects the property.

The following infrastructure will be constructed in accordance with the civil engineering designs as indicated in **Figure 2-2** provided below.

- Opencast pit: Soil, overburden and underlying coal will be removed in sequence, so that soils and overburden being removed from a section being excavated are used to backfill the previous section (lateral roll-over mining technique). ROM coal will be stockpiled and a maximum of one strip will be open at one time.

- Pollution Control Dams: They will form an integral part of the waste water management facilities at the mine. Contaminated water from the dirty areas will be collected via drains and storm water systems to settling or pollution control dams. The PCDs will be designed taking cognizance of the requirements as contemplated in GN 704. The design capacity of the PCD will cater for the 1:50 year flood event with adequate provision for free board. The PCDs will be at least 1.5 mm HDPE lined. Water extracted from the open pit will be pumped to the PCD and will partly evaporate and dust suppression purposes.

- Storm water: Surface water drainage measures will be implemented in accordance with the stipulations as contained in GN 704 Regulations . Clean water will be diverted around the mining pit and other identified contaminated areas. Clean and dirty water will be separate systems with the emphasis on maximization of clean areas and minimization of dirty areas.

- Road diversion: The main road will be diverted towards the western side of the original road and around the planned open cast area. The construction of the open cast area will replace the position of the existing road that leads through the property. The road indicated is a secondary road that transverses the Roodepoort Farm.

- Crushing and Screening: Includes mobile crusher and screening area. The proposed project entails to make use of a mobile crushing and screening facility to ensure it can be easily moved and also reduce the footprint required for rehabilitation post life of mine. No washing of coal on site is proposed as the final product from the mobile crushing and screening facility will be taken away off site, and therefore significantly reduce the environmental impacts associated with washing of coal.

- Contractor's Yard: Stores, stores yard, workshop and maintenance area are all related activities and therefore discussed under one heading. All these facilities will be constructed with heavy steel structural support frames, covered with light steel sheet metal roofing and side panels (typically corrugated iron sheets) to prevent rain water from entering the facilities. These areas will house various hydrocarbon and chemical materials such as oils, greases and paints required for maintenance and operational purposes and therefore the need exist to keep such materials in designated bays designed specifically to ensure no contamination to the receiving environment. The floors of these areas will be constructed of impermeable layers typically concrete. Storm water management will be ensured around these areas to ensure clean and dirty water separation. An oil trap (oil-water separator) will be constructed to ensure oils and greases can be separated and oils/grease can be removed by an approved subcontractor for recycling purposes.

- Topsoil Dumps: The first step will be to strip the topsoil layer. Topsoil will be stripped and stockpiled separately within the mining footprint area.

- Overburden Dumps: Drilling takes place to enable blasting of the overburden. During step (2) the overburden is removed by conventional truck and shovel methodology and stockpiled separately within the mining footprint. Step (3) includes the removal of underburden which is typically associated with more hard material than fine material (typical of overburden) and is usually the sandstone layer on top of the coal seam. This material is also stockpiled separately.

- ROM Stockpile: The coal that delivers from the mine is called ROM (run-of-mine). This is the raw material for the Coal Preparation Plant (CPP) and consists of coal, rocks, middling, contaminants and minerals. ROM Coal has high variability of moisture and particle size. Coal is stockpiled according to the required top-sizes from where it can be loaded transported to the weighbridge once again via truck hauling, weighed and taken off site.

- Temporary offices: These include temporary container-type offices that include office buildings and security hut at the entrance of the operation. These are optimal in terms of the short

duration of the mining operation.

- Sanitation: Temporary sanitation building and change house which includes a typical septic tank that will be easily removed after the closure phase and may be emptied with a honey-sucker if the need arises. Mobile chemical toilets are also an option where needed.

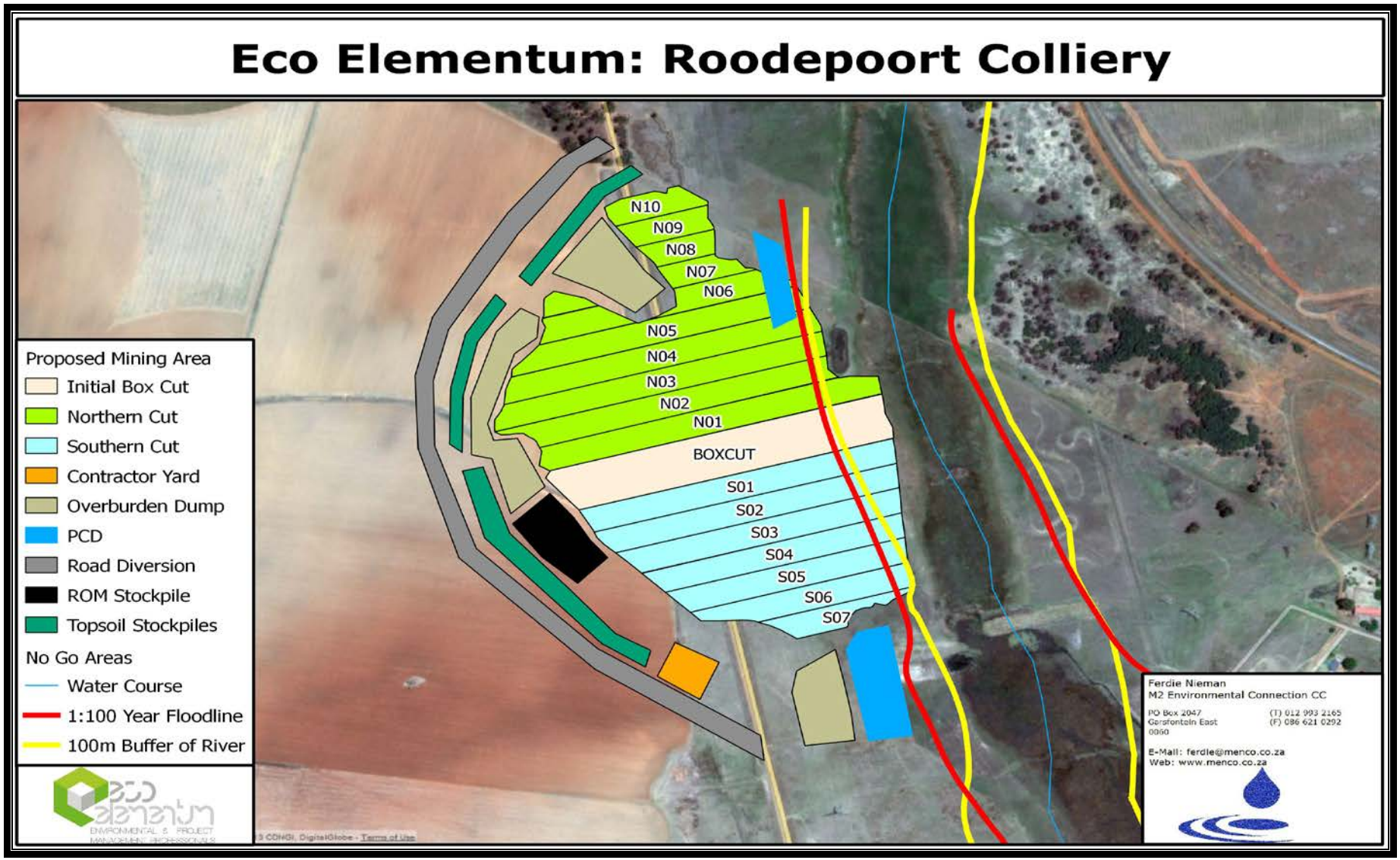

Figure 2-2: Mine Infrastructure Layout Plan of Kebrafield Colliery (Pty) Ltd

3 WATER USES

3.1 3.1 EXISTING LAWFUL USES

An Existing Lawful Water Use (ELU) as defined by Section 32 of the National Water Act, 1998 (Act 36 of 1998), is a water use that has taken place at any time during a period of two years immediately before the date of commencement of the Act and was authorised by a law before the date of commencement. As such there are no existing lawful water uses for the proposed development of Kebrafield (Pty) Ltd.

3.2 3.2 IDENTIFIED WATER USES

The following water uses have been identified and are being applied for, to be licensed in accordance with Section 40 of the National Water Act, 1998 (Act 36 of 1998), namely:

The following water uses have been identified and are being applied for, to be licensed in accordance with Section 40 of the National Water Act, 1998 (Act 36 of 1998), namely:

- Section 21 (a) – Taking of water from a resource;
- Section 21 (c) – Impeding or diverting the flow of water in a watercourse;
- Section 21 (g) – Disposing of waste which may detrimentally impact on a water resource (overburden dump, topsoil dumps, pollution control dam and ROM Stockpile);
- Section 21 (i) - Altering the bed, banks, course or characteristics of a watercourse; and
- Section 21 (j) – Dewatering activities.

Further details on the water uses are provided in **Table 3-1.**

Table 3-1: Detailed information on water uses to be licensed, their location and description

	Activity	Coordinates	Description	Dimensions	Type
S21(a)	Taking water from a resource	26°01'4.00"S 29°34'38.00"E	Borehole water will be abstracted for potable use	Abstraction from borehole on Portion 17 (already installed) Estimated **4 m^3/day, 1440 m^3/annually** (120 m^3 per 30 days)	**License**
S21(a)	Taking water from open cast pit	26°0'20.28"S 29°34'48.35"E	Water will be abstracted from the open cast as it fills with water	**120 m^3/day** estimated as inflow[11] that will have to be remove or **43 800 m^3 annually removed**	**License**
S21 (c)&(i)	Impacting on the natural drainage of permanent wetland (channeled valley bottom)	26° 0'15.49"S 29°34'51.99"E	The mining activities will be within 500 m of the wetland	n/a	**License**
S21 (c)&(i)	Impacting on the natural drainage of water of the non-channeled bottom valley wetland	26° 0'32.83"S 29°34'46.41"E	The mining activity will be within 500 m of the wetland	n/a	**License**
S21 (c)&(i)	Altering the beds & banks of the watercourse of the river indicated	**From:** 26° 0'26.23"S 29°34'55.19"E **To:** 26° 0'16.37"S 29°34'53.96"E	The main open cast will alter the banks of the watercourse to the right of the open pit.	**295 m** length along banks will be disturbed	**License**
S21 (c)&(i)	Altering the beds & banks of the watercourse of the river indicated	**From:** 26° 0'28.80"S 29°35'1.10"E **To:** 26° 0'21.33"S 29°34'58.77"E	The small open cast will alter the banks of the watercourse to the left of the smaller open pit.	**260 m** length will be disturbed within the riparian zone (channeled bottom valley wetland)	**License**

[11] *Geo-hydrological Report, Geo Pollution Technologies – Gauteng (Pty) Ltd*

	Activity	Coordinates	Description	Dimensions	Type
S21 (c)&(i)	Overburden Dump within 500 m buffer zone	26°0'13.53"S 29°34'53.81"E 26° 0'16.15"S 29°34'53.76"E	Overburden within 500 m of watercourse of the river indicated	**200 m x 120 m** area 120 m along watercourse	**License**
S21(g)	Disposing of overburden material & Overburden Dump within 500 m of watercourse of the river indicated	26° 0'28.49"S 29°34'53.52"E 26° 0'32.46"S 29°34'53.92"E 26° 0'32.78"S 29°34'51.63"E 26° 0'29.21"S 29°34'50.90"E	Total volume of material to be used in backfill 50 m^3	**125 m x 60 m** area 120 m along watercourse	**License**
		26° 0'11.48"S 29°34'39.71"E 26° 0'13.18"S 29°34'43.25"E 26° 0'11.93"S 29°34'44.61"E 26° 0'9.02" S 29°34'41.86"E		**100 m x 120 m** area	
	Disposing of soft materials (Topsoil)	26° 0'7.21"S 29°34'43.79"E 26° 0'7.95"S 29°34'44.44"E 26° 0'12.77"S 29°34'40.24"E 26° 0'11.70"S 29°34'39.87"E	Topsoil removed will be only temporary stored until backfilling and rehabilitation will be implemented	5 hectares and <3m height **500 m x 100 m**	**License**
		26° 0'29.90"S 29°34'44.94"E 26° 0'28.53"S 29°34'45.30"E 26° 0'20.98"S 29°34'38.75"E 26° 0'21.06"S 29°34'37.75"E	Topsoil removed will be only temporary stored until backfilling and rehabilitation will be implemented	2 hectares and <3m height **200 m x 100 m**	
	ROM Stockpile	26° 0'25.92"S 29°34'42.17"E 26° 0'24.98"S 29°34'43.43"E 26° 0'22.27"S 29°34'41.09"E 26° 0'23.63"S 29°34'39.88"E	Raw coal material temporary dump	**100 m x 100 m area** The ROM stockpiling area will be constructed to cover an area of approximately 1ha and will not contain more than 10 000 tons of ROM coal at one period. A height of 4 m will not be exceeded at any one point.	**License**
	Dust Suppression	26° 0'20.24"S 29°34'47.75"E	Process water will be used for dust suppression around the plant and open quarry area.	Stormwater run-off containing waste from Mining residues requires license.	**License**
	Pollution Control Dam (North)	26° 0'12.69"S 29°34'48.93"E 26° 0'15.98"S 29°34'49.48"E	Pollution control for waste water generated	**130 m x 50 m** **3 m height**	**License**

	Activity	Coordinates		Description	Dimensions	Type
		26° 0'15.57"S 26° 0'12.65"S	29°34'51.15"E 29°34'50.42"E		**22 700 m^3 capacity**	
	Pollution Control Dam (South)	26° 0'28.43"S 26° 0'32.56"S 26° 0'32.33"S 26° 0'28.34"S	29°34'53.94"E 29°34'54.42"E 29°34'56.25"E 29°34'55.43"E	Pollution control for waste water generated	**130 m x 50 m** **3 m height** **22 700 m^3 capacity**	**License**
S21(j)	Removing water from the mining pits as it fills with water	26°0'20.28"S	29°34'48.35"E	See S21(a) on pit dewatering	**120 m^3/day** estimated as inflow and will have to be removed – **43 800 m^3 annually removed**	**License**

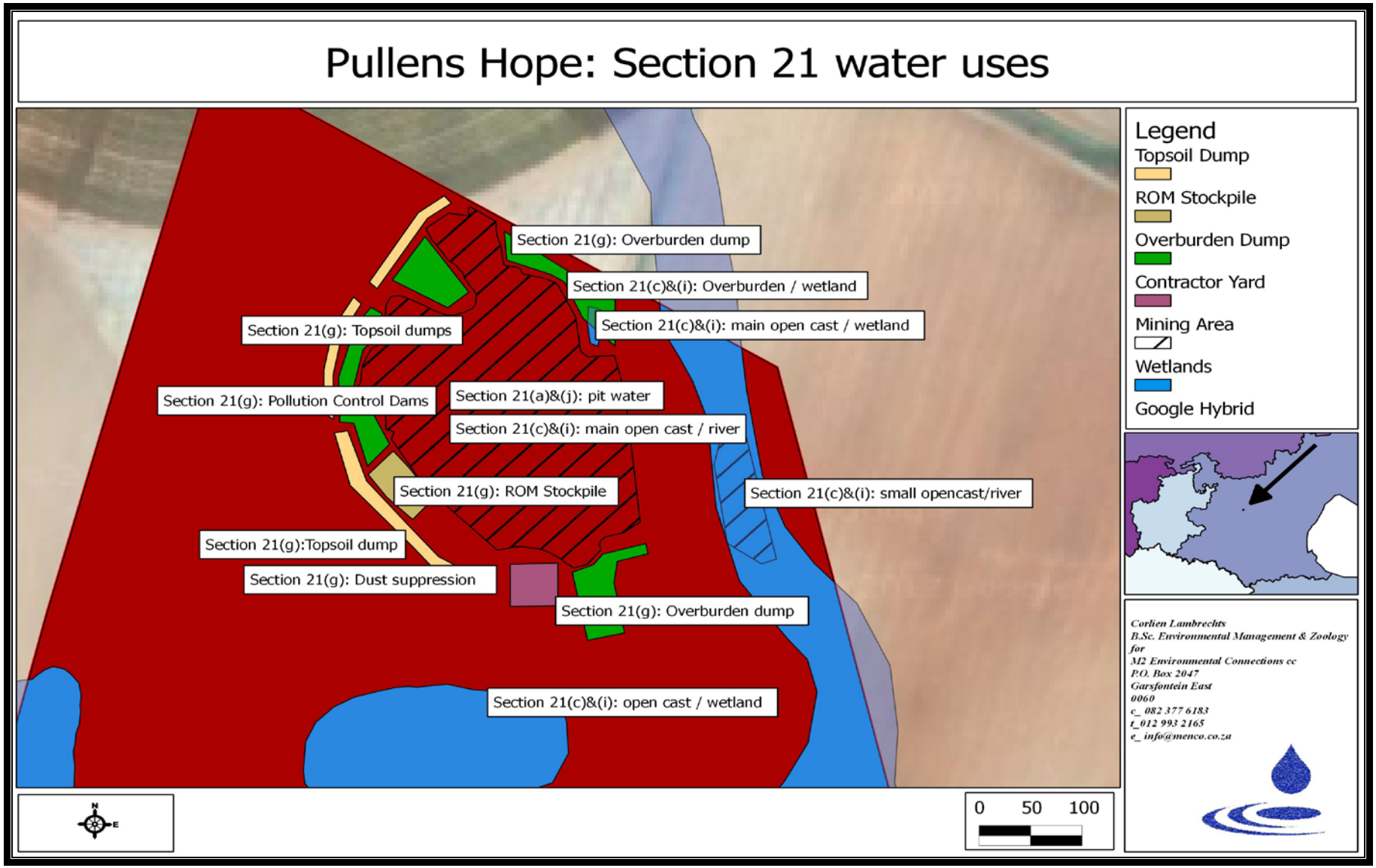

Figure 3-1: Section 21 water uses specified visually

3.2.1 Section 21 (a) water uses

In terms of Section 21 (a) of the National Water Act (Act 36 of 1998), the specified area for development within Portion 17 falls within "Groundwater Taking: Zone C" from Table 1.2: Groundwater Taking Zones provided by Department of Water Affairs within Government Gazette No. 26187 regarding 'Revision of General Authorisations in terms of Section 39 of the National Water act, 1998 (Act 36 of 1998)'.

This implicates that users classified as small industry users may abstract ground water up to 75 m^3 per hectare in terms of General Authorisation (GA). As a coal mining activity is not considered a small industrial user, Kebrafield (Pty) Ltd will apply for a section 21(a) water use license.

Potable water will be estimated to be 25 liters per person per day, giving the amount of 2,5 m^3/day (calculated if 100 persons are employed: please refer to **Table 2-1** above). This will be extracted from a borehole located on portion 17 of the farm Roodepoort 151 IS.

Process water will be abstracted from the open cast pit on Roodepoort 151 IS (Portion 17). Approximately 120 m^3/day will be abstracted from the open pit and pumped to the Pollution Control Dams and used for dust suppression purposes.

Potential impact:
Section 21(a): The impact of abstraction of ground water on the ground water quantity can be considered to be of low significance as the water will only be for potable water and not for mining activities. The volume is considered insufficient to impact on the water levels potentially causing a drawdown cone.

Section 21(a), (g): As water from the open cast pit will be used for dust suppression, it is important to monitor the water quality of the dams and ensure adequate storm water management practices.

3.2.2 Section 21 (c) and (i) water uses

According to Government Gazette GN 1199 of 18 December 2009, a buffer zone of 500 m should be maintained around wetlands. It will not be possible to keep to a 500 m buffer, as is shown on **Figure 1-6**. A 500 m buffer is indicated around the mine to determine if a wetland zone will be compromised during the development of the open cast. A wetland unit (un-channelled valley-bottom) falls within the 500 m buffer surrounding the mine development, meaning a 500 m buffer around the given wetland cannot be maintained. A buffer zone of 100 m will be maintained around the indicated wetland areas. This will require a Section 21 (c) & (i) water use license authorization to be obtained.

The second Section (c) and (i) water use that will need licensing is the development of the open cast pit within the proximity of the (western) bank of the river.

A third water use authorization that needs to be included, is the smaller open pit that will fall directly within the section of the river. A section 21(c) and (i) water use needs to be applied for, for the placement of the quarry activities.

During the field survey conducted for the Wetland delineation, the PES for the Pullenshope wetland is Class D (Largely Modified) with the overall classification in terms of the EIS is Moderate, indicating that the Wetland is not considered of National importance.

It could be reported that a large change in ecosystem processes and loss of natural habitat and biota has occurred within the proposed project area due to surrounding mining activities and power generation activities. The photos taken below during the field assessment show a shallow depression formation with questionable water quality observed from the opaque colour. The primary contributor is usually the acid leachate from mines, the leachate characterized as having a low pH (below 5) and high concentration of dissolved salts. Please refer to the picture (**Figure 3-2**) given below.

Optimum Colliery is known to have a sponge situation within their back-filled open cast, which may be leaching into the Woestalleen East Spruit system.[12]

Although the wetlands identified appear to be degraded, the proximity of the mining operation concluded to a Section 21 (c) & (i) water use to be licensed. The section 21(c) and (i) water uses relates to the fact that the proposed mining footprint will intersect three areas where the outer perimeter of delineated wetland areas fall within the 500 m buffer zone as contemplated in GN 1198 of 18 December 2009. A water use authorisation needs to be lodged with the Department of Water Affairs to mine up to 100 meters of the delineated wetland areas.

The footprint for the proposed opencast activities with associated infrastructure entails an area of 50 hectare that constitutes only 15% of the property (Portion 17) to be impacted by mining activities. It is anticipated that the two overburden stockpiles will impact less than 5 ha and 2 ha respectively.

The location of these stockpiles will be outside the demarcated wetland areas but located within the buffer zone of 500 meters as contemplated in Government Gazette GN 1199 of 18 December 2009. Kebrafield (Pty) Ltd must apply for a section 21(c) and (i) water use authorisation for the placement of these dumps.

[12] *Viljoen, JNJ on Optimum Colliery: Water Management for the proposed Pullens Hope Mining Area*

Figure 3-2: Photo taken during the field assessment

Figure 3-3: Salty deposition due to seepage within the area within the vicinity of the proposed mining area

Diversion channels will be constructed to allow for the separation of clean and contaminated storm water. These channels will result in changes in the drainage characteristics of the local area. No river diversions are planned or would be carried out. The diverted runoff will flow to the nearest drainage line that it would normally enter without causing any negative impact on the bottom valley wetlands.

Potential impact

The building of mining infrastructure requires the diversion of storm water from higher lying areas. However, the footprint of disturbance will be kept to a minimum. Management of the storm water infrastructure will be implemented as part of the master water management plan. Please refer to the Integrated Water Resource Management Plan (IWRMP) for more details on the matter.

3.2.3 Section 21 (g) water uses

Coal Mining is classified as **Category A Mine**,[13] meaning a license will need to be obtained for the waste dumps created that may have a significant impact if leaching occur. This excludes the colliery from falling under General Authorisations (GA).

a) Water from the open pit areas will be used for dust suppression activities. Dust suppression using water carts.
b) Waste material from the mining activities will be disposed of on discard dumps. There will be discard dumps for the hard overburden generated from the open cast.
c) Waste material removed in the form of Topsoil will be moved and stored on topsoil dumps that will be licensed.
d) ROM Stockpile will need licensing.
e) Pollution Control Dam (North & South).

Potential impact

The water resource in the area has no buffer capacity (alkalinity) and is therefore susceptible to acidification. Any uncontained spillage from or polluted storm water run-off from the overburden and discard stockpiles will contribute towards degradation of water quality. Spillage from these sources should be prevented. If dams are constructed, these dams should be built according to GN704 Regulations.

Water run-off and seepage from the ROM stockpile are highly contaminated. Mitigation will be required to minimize impacts to acceptable low limits, but will be implemented as part of the master water management plan.

3.2.4 Section 21 (j) water use

An anticipated amount of 120 m^3/day needs to be removed from the proposed pit. This water consists of seepage from groundwater resources and/or precipitation that will gather in the open

[13] *Government Gazette Notice: No 26187 (339) published 26 March 2004: Revision of General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act no. 36 of 1998)*

pit. The dewatering activities are necessary to allow for the efficient continuation of mining and for the safety of people. Once removed from the opencast area the water is pumped to a storm water system and/or used for dust suppression purposes.

Potential impact

Water found in the mine is characterized by higher nitrates caused by explosives, suspended solids and sulphates. The water abstracted should be treated before it enters the watercourse and wetland areas. The impact on water quantity in the catchment will be minimal as the location of the mine in the headwaters contributes towards low volumes of water.

Further information on the water uses and their potential impact on the water resources can be found in the Surface Water Assessment and the Integrated Water Resource Management Plan.

3.3 WATER USE MANAGEMENT

The water uses foreseen at the open cast colliery will be managed well and managed in accordance with the following principles to mitigate and control water uses and possible impacts anticipated.

The following will be implemented on site: (Please refer to the IWWMP for more details on this matter)

- **Waste minimisation and recycling:** *Very little waste will be produced on site as no washing of coal will take place on the proposed quarry site*
- **Water Use Efficiency:** *Abstracted water that are obtained through pit dewatering, will be re-used in dust suppression practices*
- **Water Containing Waste***: No sewage effluent will be produced as the mining activities will make use of a portable chemical toilet. The only other "waste water" generated on site will be from storm water runoff and pit dewatering*
- **Storm Water Management:** *Storm water management measures will comply with GN704 regulations*
- **Groundwater Management:** *Several impacts had been identified that could influence the ambient groundwater quality of the area. The most significant impact is the formation of Acid Rock Drainage (ARD) and the potential for decanting to occur.*
- **Remediation and Rehabilitation:** *The mining areas will be rehabilitated to a state as prescribed by DMR or the land owner. A final rehabilitation and closure plan will ensure efficient rehabilitation to set post-mining land capability classes.*
- **Water Monitoring:** *Both surface and groundwater monitoring will take place. Surface water quality monitoring was conducted to characterise the receiving environment.*
- **Emergency and Contingency Discharge Management:** *In case of an extreme rainfall event, the risk of spilling or overflow to the wetland systems are considered may be possible but chances are expected to be low due to efficient management. However, should this occur these incidents will be monitored and records will be kept.*

3.4 ACID MINE DRAINAGE

Sulphate can normally be used as an indicator of coalmine pollution. The reactions of acid and sulphate generation from sulphide minerals are discussed according to the three stage stoichiometric example of pyrite oxidation in which one mole of pyrite oxidized forms two moles of sulphide:

Reaction (2.1) represents the oxidation of pyrite to form dissolved ferrous iron, sulphate and hydrogen. This reaction can occur abiotically or can be bacterially catalysed by *Thiobacillus ferrooxidans*.

$$FeS_2 + 7/2\ O_2 + H_2O \leftrightarrows Fe^{2+} + 2SO_4^{2-} + 2H^+ \qquad (2.1)$$

The ferrous iron, (Fe^{2+}) may be oxidised to ferric iron, (Fe^{3+}) if the conditions are sufficiently oxidising, as illustrated by reaction (2.2). Hydrolysis and precipitation of Fe^{3+} may also occur, shown by reaction (2.3). Reactions (2.1), (2.2) and (2.3) predominates at pH > 4,5.

$$Fe^{2+} + 1/4O_2 + H^+ \leftrightarrows Fe^{3+} + 1/2H_2O \qquad (2.2)$$

$$Fe^{3+} + 3H_2O \leftrightarrows Fe(OH)_3\ (s) + 3H^+ \qquad (2.3)$$

Reactions (2.1) to (2.3) are relatively slow and represent the initial stage in the three-stage AMD-formation process. Stage 1 will persist as long as the pH surrounding the waste particles is only moderately acidic (pH > 4,5). A transitional stage 2 occurs as the pH declines and the rate of Fe hydrolyses (reaction 2.3) slows, providing ferric iron oxidant. Stage 3 consists of rapid acid production by the ferric iron oxidant pathway and becomes dominant at low pH, where the Fe^{2+} (ferric iron) is more soluble (reaction 4):

$$FeS_2 + 14\ Fe^{3+} + 8H_2O \leftrightarrows 15Fe^{2+} + 2SO_4^{2-} + 16H^+ \qquad (2.4)$$

Without the catalytic influence of the bacteria the rate of ferrous iron oxidation in an acid medium would be to slow to provide significant AMD generation. As such the final stage in the AMD generation process occurs when the catalytic bacteria *Thiobacillus ferrooxidans* have become established. Reactions (2.2) and (2.4) then combine to form the cyclic, rapid oxidation pathway mainly responsible for the high contamination loads observed in mining environments

The reduction and prevention of acid mine drainage (AMD) will be incorporated into the Environmental Management Plan as well as Closure Plan (as part of EIA, EMP and Rehabilitation after closure etc.).

4 PUBLIC CONSULTATION

A comprehensive public participation process had been followed up to date as part of the Environmental Impact Assessment (EIA) stage of the development.
Initial Public Participation has already been conducted during the Mining Right Application Phase (Ref MP 30/5/1/2/2/479 MR) by GEM-Science CC and is captured in the Public Participation Report dated 15 January 2011 in Annexure 2 of the Scoping Report. This report however was for a mining right over several properties, also including the property being applied for in this NEMA EIA.

A more focussed Public Participation process was followed for the NEMA application (only the farm Roodepoort 151 IS portion 17). The mining right public participation was very thorough but extensive in terms of the properties covered. Issues and concerns raised during the Mining Right EIA process will also be incorporated and addressed into the EIA.

The following were conducted to date for the proposed new Kebrafield Roodepoort Colliery as part of the prescribed EIA process:

1. Identification of key Interested and Affected Parties (affected and adjacent landowners) and other stakeholders (organs of state and other parties);
2. Formal notification of the application to key Interested and Affected Parties (all adjacent landowners) and other stakeholders;
3. Consultation and correspondence with I&APs and Stakeholders and the addressing of their comments; and
4. Release of the Draft Scoping Report to I&APs and stakeholders for review and comment.

4.1 INTERESTED AND AFFECTED PARTIES (I&APS)

Public Participation is the involvement of all parties who are either potentially I&AP by the proposed development. Interested and Affected parties (I&APs) representing the following sectors of society has been identified as:

- National, provincial and local government;
- Agriculture, including local landowners;
- Community Based Organisations;
- Non-Governmental Organisations;
- Water bodies;
- Tourism;
- Industry and mining;
- Commerce; and
- Other stakeholders.

4.2 PROJECT ANNOUNCEMENTS

i. Formal notification of the application to key Interested and Affected Parties (all adjacent landowners) and other stakeholders. I&AP's and other key stakeholders, who included the abovementioned sectors, were directly informed of the proposed development by e-mail. The Background Information Document (BID) and Registration and Comment sheets were also supplied to all parties. I&APs were given 30 days to comment and / or raise issues of concern regarding the proposed development.

ii. Public media announced were as follows:
   - One local newspaper
   - One provincial newspaper

iii. Public notice placement:
   - Notices informing the public of the proposed mining activities and the Open Days to take place and inviting their input, comments and concerns were done by fixing of four notice boards at places conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is or is to be undertaken.

4.3 PUBLIC MEETINGS AND ISSUES AND RESPONSE REPORT

Public Meetings, Open days have been held during the EIA and Scoping Phase. A Public Participation Report was compiled during these stages and will be included within the Appendices of this application.

4.4 DRAFT SCOPING REPORT RELEASED

The Draft Scoping Report (DSR) and Plan of Study (POS) were submitted to the Competent Authority as per the requirements of Regulation 56 (4). The DSR and supporting documentation were subsequently released for a period of 40 days for public review and comment. All stakeholders and I&AP's was notified of the DSR availability for comment. Hardcopies of the DSR was submitted to all organs of state and relevant authorities. The Draft Scoping Report and supporting documentation was made available for review at the Pullenshope Public Library; and via email upon request to info@ecoelementum.co.za.

4.5 FUTURE DEVELOPMENTS

All stakeholders and registered I&AP's will have the opportunity to review and comment on all the documents released in the Final Scoping, Draft EIA and Final EIA phases respectively. All final reports will be released for a period of 21 days for review and comment. The draft EIA will be released for 40 days. During all the PPP phases, hardcopies and CD's of all reports and supporting documents will be submitted to the organs of state and relevant authorities. All the reports will also be placed at the Pullenshope Public Library and via email upon request to info@ecoelementum.co.za.

All comments and responses received and sent throughout the entire process will be updated and included in comments and responses chapter.

All verified information is available from Kebrafield (Pty) Ltd or alternatively from Eco Elementum (Pty) Ltd (Mr. H Engelbrecht) on request.

5 SECTION 27 MOTIVATION

5.1 EXISTING LAWFUL WATER USES

There are currently no existing lawful water uses on the proposed mining area. Kebrafield (Pty) Ltd needs to apply for a water use license in terms of the National Water Act of 1998 (Act 36 of 1998). A complete breakdown of the anticipated water uses was provided within **Section 3** of this WULAR document.

5.2 THE NEED TO REDRESS PAST RACIAL AND GENDER DISCRIMINATION

Kebrafield (Pty) Ltd: Roodepoort Colliery is an emerging coal company and registered as a 30% Black Empowered Company.

Kebrafield (Pty) Ltd: Roodepoort Colliery is committed to the development of the South African workforce and to the availability of the mining operations skills and competence required for the successful mining and production of this commodity.

5.3 EFFICIENT AND BENEFICIAL USE OF WATER IN THE PUBLIC INTEREST

5.3.1 Taking of water

Potable water will mainly be obtained from the borehole on the property. Water for mining activities will be obtained from contained dirty water in the pollution control dams as well as recycling of water from pit dewatering.

Rainfall into the pit areas will be contained and reused at the mine for dust suppression. The quantities of water taken from the pit will depend mainly on the rainfall intensities, but is estimated at 80 300 m^3/annum if storm water is diverted around the mining area.

In accordance of the NWRS (2013), the use of surface water should be supplemented by the use of ground water in areas where possible (please refer to **Section 5.6.** below for more details). Accessible groundwater should always be utilised, even where surface water is available, in order to reduce the demand on surface supplies. Conjunctive use is often the sensible approach. The reduction in surface water use reduces the need to import very costly, and sometimes very scarce, additional supplies. Local groundwater is almost always a cheaper source than new imports of surface water.

5.3.2 Altering the natural characteristics of the wetland areas

The opencast pit and the resulting waste rock/overburden dump will influence the natural drainage pattern of the area, thus altering the natural characteristics of the resource. However, as the mining areas are relatively small the impact would be minimal. The short duration of the mining

will mean that only one / two rainy season(s) is expected and would afterwards return to normal drainage conditions.

5.3.3 Waste disposal

The three section 21(g) applications for the disposal of waste in a manner that may be detrimental to the environment are for dust suppression and for the discard dumps (Overburden and ROM stockpiles). Storm water management should prevent drainage to enter the adjacent wetland zones.

5.3.4 Removing of water from the opencast pits

Water will be removed from the opencast workings to prevent contaminated water from leaving the area/zone of influence. This is also needed to ensure that the mining activities can continue and for the safety of the workers. The water will be re-used (dust suppression) and effective storm water management should be implemented.

5.4 THE SOCIO-ECONOMIC IMPACT OF THE WATER USE OR USES IF AUTHORISED

The mining activities will have a positive effect on the socio-economic structure of the region. The proposed mining activities will create new employment opportunities, thus impacting indirectly on dependents and the economic environment. Should the application be successful, it will have a positive effect.

The main positive impacts are:

- Employment to a number of people during the construction and operational phases. The numbers of jobs created are significant to the local and regional economy.
- A large capital investment and substantial offshore revenue generation.
- Capital investment in the form of the company payroll.
- Significant amounts paid to the government in the form of local, regional and national taxes and levies.
- Creation and support of service-sector jobs, the annual procurement of large quantities of consumables and the outsourcing of service provision to local service providers.
- The generated produce will go towards Eskom's Power Generation needs and therefor the electricity output needed in South Africa

The positive impacts described above can be even further enhanced in the context of the communities surrounding the project site. Further measures to enhance socio-economic opportunities should focus on the promotion and development of small and medium enterprises in the local communities, especially due to the short timeframe expected. Larger contracts should be broken down into smaller more accessible contracts and local people should be employed where possible.

The main potential negative impacts are:

- Closure of the project (both prematurely and as planned) could have serious impacts on local communities reliant on the project. The impacts can be mitigated through the promotion of diversification in the local communities by investment in small and medium enterprises, through advice and encouragement for employees on how to take responsibility of their futures in their own hands as well as through appropriate rehabilitation of the project site to enable the trout farming and tourism potential of the land to be exploited after closure of the mine.
- Population influx into the area around a project site and associated squatting and crime (including trespassing and stock theft) is often associated with the chance of job opportunities. Well defined employment/recruitment and housing policies will help negate the possibility of squatter settlements and the associated problems. In addition, co-operation with the local police will help to ensure that private property rights are protected on the project site and surrounding farmland.

5.5 THE SOCIO-ECONOMIC IMPACT OF THE FAILURE TO AUTHORISE THE WATER USE

If this project does not continue, the applicant will be prevented to invest large sums of money reaching a desperate community in the form of salaries, which will have a direct impact on the local community. The presence of the mining activity, the employment of local persons and the utilisation of local services will result in an increased income for local communities and business and an increased tax base for traditional authorities and municipalities. These opportunities will be lost should the project not proceed, and will have consequences on local, regional and national.

5.6 THE CATCHMENT MANAGEMENT STRATEGY APPLICABLE TO THE RESOURCE

The former Department of Water Affairs and Forestry is responsible for the National Water Resource Strategy for South Africa. This strategy defined key elements for a broad strategic perspective for each Water Management Area. According to the National Water Act, 1998 (Act 36 of 1998), a Catchment Management Agency (CMA) should be established for each water management area. The second edition, published in 2013 by the Department of Water Affairs, (NWRS2) outlines the key challenges, constraints and opportunities in water resource management and proposes new approaches to be adopted in ensuring effective responses to these challenges, constraints and opportunities. The Olifants Water Management Area (WMA) is responsible for the management of the relevant catchment area[14].

Annexure A of the NWRS (2013) provides exact details for this WMA[15] and this is listed below:

1) Implementation of water conservation and water demand management in all sectors: improve operating rules, eradicate unlawful water use, remove invasive alien plants, water use efficiency, etc;

[14] *Government Gazette Notice. 1160 on 1st October 1999 as well as revised WMA (2012) within the Government Gazette Notice. 35517 of 20 July 2012*

[15] www.gov.za/nwrs2013

2) The use of mine water and treated effluent;
3) Development of groundwater resources, notably for mining;
4) Water Trading: water saved through agricultural efficiencies could be moved into the mining and industrial sectors. The provision of surface water from the Inyaka Dam (completed in 2002) has led to the abandonment of groundwater supply schemes in many villages. However, the conjunctive use of surface and groundwater is essential if all requirements are to be met, and if risks in the failure of supply are to be reduced. Existing groundwater resources must be refurbished;
5) Properly operated and maintained, and new groundwater sources developed.

These principles will be adopted within the surface water management of Kebrafield (Pty) Ltd wherever possible. This will ensure that Kebrafield (Pty) Ltd remains in synchronization with the NWRS (2013) in terms of water use and conservation.

5.7 THE LIKELY EFFECT OF THE WATER USE ON WATER USERS

No other water uses will be affected by the authorization of the Water Use License. There are however significant benefits to the social and economic environment if the water use is authorized.

5.8 THE CLASS AND THE RESOURCE QUALITY OBJECTIVES OF THE WATER RESOURCE

Management area

Drainage area:	B12B
River name:	Klein Olifants River
Management Unit:	Upper Olifants Water Management Area

The Minister of Water Affairs is required to establish a classification system, and to determine the class and resource quality objectives for all or part of the resources considered to be significant. The quaternary drainage area B12B was given as a Class C (Moderately Modified) with the Best Achievable Management class set at Class B (please refer to **Section 1.8** above for details on reserve determination for the specific management unit). Resource Water Quality Objectives for Kebrafield (Pty) Ltd is given within **Table 1-7** and **Table 1-8** above.

The Ecological Reserve (quantity), as defined at present, cannot be met and reconciliation study is to be completed as well as revision of the DWA water balance for the catchment.[16] The ecological requirements are highlighted by the position of the Kruger National Park at the bottom end of the catchment. The Kruger National Park and other wildlife reserves and recreational facilities are important tourist destinations and significant income generators for the country.

[16] *NWRS (2013): Olifants Water Management Area (WMA)*

Water quality problems are serious, often originating from identifiable point sources. The treatment of effluent and mine water is already being implemented in Emalahleni, providing an important source of utilisable water.

5.9 INTERIM RESOURCE OBJECTIVES AND STANDARDS

The NWRS2[17] introduces four business principles that will form the foundation of sustainable water resources and infrastructure management:

1) Striving for efficiency from source to tap and back. This implies that the value chain from river or groundwater to wastewater should be considered in its entirety when making water-resource management decisions.
2) Implementation of life cycle planning and sustainable management of assets and services. This must be addressed through rigorous asset management and allocation of adequate funds.
3) Sustainable financial management. Clear decisions are needed on who should pay for what; and where and why transparent subsidising is to be used.
4) Applying sound management principles and practices within a developmental framework. This includes effective communication and consultation, on-going investment in skills, capacity and education (short and longer term), as well as investment in knowledge, information and monitoring systems.

These principles will be incorporated into the Environmental Management Plan (EMP) and Kebrafield (Pty) Ltd will abide by the National Water Resource Strategy in terms of efficiency, life cycle planning and management practices that will be strictly implemented on site.

5.10 INVESTMENTS ALREADY MADE BY THE WATER USER

The applicant made various investments in terms of appointment of specialists to conduct environmental investigations in support of the Water Use License Application.

- A Mining Right have been obtained from the Department of Mineral Resources (Ref: MP30/5/1/2/2/479 MR);
- EMP, EIA and Geo-hydrological studies and impact assessments have been conducted. In South Africa, legislation sets out the legal framework governing mineral exploration and exploitation related activities. These include EIA, EMP and Closure Plans to be submitted with application for a mining right. This ensures adequate management for the anticipated impacts that was identified during the EIA phase;
- Water samples have been taken to determine a reference condition which must be maintained during operation of the colliery.
- Floodline Report has been compiled by PG Consulting Engineers (Pty) Ltd

[17] *National Water Resource Strategy 2013*

- Engineer Design drawings for Pollution Control Facilities, Stormwater Management as well as Water Balances have been determined for the Roodepoort Colliery and final lay-out of the mining infrastructure has been based on these designs.

5.11 THE DURATION OF WATER USE

The water uses associated for the mine will be required for a maximum of two (2) years.

Table 5-1: Implementation phases of the Kebrafield (Pty) Ltd colliery

Time frames	2014	2014 – 2015	2016
Construction phase			
Operational phase			
Rehabilitation phase	Concurrent with the coal mining phase		
Closure phase		Closure plan	
ROM tons	250 000	300 000 – 400 000 tons/annum	

5.12 THE STRATEGIC IMPORTANCE OF THE WATER USE TO BE AUTHORIZED

5.12.1 Site specific

The strategic importance of the water use is to allow mining to commence in suitable conditions. The water is used for dust suppression to alleviate dust within the neighboring residential areas. The dust suppression also creates better health conditions and working environment for the employees on site. Another important feature will be the management of topsoil (prevent erosion) and entering of excess sediment into the surrounding wetland systems and create possible smothering effect or possible unnecessary alteration in drainage within the nearby wetland zones.

The storm water to be licensed is an important feature; it helps to contain dirty water within the storm water system and also allows re-use, which controls the quantity needed on the project area. This protects the water resource as well as re-uses the available water, which is in line with the National Water Resource Strategy.

The coal will also be used for power generation with power generation being of strategic importance in South Africa.

5.12.2 National Importance

Should coal mining prove viable, the mining activity would have positive social and economic benefits that would be experienced on local, regional, provincial and national scales.

The benefits of the proposed mining activities include:

- Security of employment and subsequent contribution to stabilizing the economic activity in the area

- An increase in foreign exchange earnings for the country
- The provisioning of coal to Eskom to provide for the sustainable generation of electricity
- The establishment of contractual agreements with Steve Tshwete Local Municipality to render services to the mine (domestic waste disposal, servicing chemical toilets)

It should be noted that the proposed colliery is situated in close proximity to wetland areas such as the Woestalleen Spruit system. The mine will not be a consumptive user of the available water resources; therefore the water resource will not be further stressed in terms of water quantity.

According to the Chamber of Mines of SA, the mining sector contributed 8.8% directly and 10% indirectly to South Africa's GDP in 2009 (GCIS, 2011). It creates about one million direct and indirect jobs. The sector accounts for approximately one third of the market capitalisation of the JSE and it is the major attractor for foreign investments. The NGP has set a potential employment target of 140 000 new jobs by 2020 for the mining sector (DED, 2010).

Mining and related activities require significant quantities of water and impact on the environment through associated potential pollution. The mining sector is also faced with legacy issues of past pollution, for example, acid mine drainage. The development of new mines in water-scarce areas requires planning to make arrangements for the transfer of water and development of new sources, and appropriate attention to waste processing and remediation.

The produce of the Kebrafield (Pty) Ltd is aimed to supplement supplies to Eskom, and power generation remains a use of strategic importance and therefor the colliery will contribute indirectly to a sustainable future within South Africa.

5.13 ENFORCEMENT AND MANAGEMENT

5.13.1 Management Plans

Enforcement and Management for the water resource and therefor the water uses that is required for the Kebrafield (Pty) Ltd will be well managed and a complete EMP will be drafted along with the EIA (on-going at present stage).

5.13.2 Monitoring

Water management and monitoring will be thorough and conducted as specified within the IWWMP that is submitted along with this application. Monitoring is suggested for various points that include upstream and downstream points to detect any impacts that may be resulting from the water uses at the mine. Bio-monitoring is also included to determine the habitat and riparian health that should remain the same as conducted during the initial field assessments to prove minimum impact from the colliery.

The Kebrafield (Pty) Ltd colliery will be based on a SHEQ system that will seek continuous improvement and therefor data and document control will be strictly implemented for purposes of

management and early detection in terms of water uses and possible anticipated impacts that was identified and discussed within the Integrated Waste Water Management Plan (IWWMP) of this WULA application. Please refer to the included IWWMP for more details on this matter. Reporting timeframe to the Department of Water Affairs is also provided within the IWWMP.

6 CONCLUSION AND RECOMMENDATION

Several impacts had been identified during the risk assessment (conducted as part of the IWWMP) that could influence the ambient groundwater quality of the area. The most significant impact is the formation of Acid Mine Drainage (AMD) and the potential for decanting to occur. These are typical for Mining operations and should be well mitigated. Mitigations to prevent decanting of the opencasts include the reduction of the hydraulic conductivity of the opencast backfilled material, reduction of the rainfall recharge at the opencast, evaporating water from the final void in the pit, intercepting decant or redesigning the aerial extent of the opencast. With mitigation measures in place, the significance of the potential impacts on the ground water is considered to be Low.

The riparian wetlands within the footprint of the study area are considered a low significance in terms of national importance. The wetlands in the wider study area are considered most sensitive with unique species composition and aquatic ecosystem functioning. It is not foreseen that Kebrafield will impact on the Pullenshope wetland systems. The mine will include as part of the rehabilitation plan the restoration of degraded wetlands caused by current surrounding activities and invasion of alien plant species. Mining within the area of Roodepoort, Portion 17 can only commence with the issuance of a water use license for the relevant water uses.

Very little waste will be produced on site. However, the following waste management hierarchy will be applied: reduce at source, re-use, and re-cycle. Any waste generated will be disposed in an environmentally responsible manner. Therefore, the impact of waste is considered to be Low with mitigation.

It is therefore recommended that Kebrafield (Pty) Ltd will be issued a Water Use License for the requested period.

7 REFERENCES

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Government Gazette Notice: No 26187 (339) published 26 March 2004: Revision of General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act no. 36 of 1998)

Steve Tshwete Municipality Webpage: http://www.stevetshwetelm.gov.za/fnameselect.php

Appendix 1

Water Use License Application Forms

APPENDIX 2

Certified Copy of the Applicants / Responsible Person's Identity Document / Legal Documents

APPENDIX 3

Copy of the Title Deeds of the Applicable Farm Properties

APPENDIX 4

Lease Agreement for Surface Use & Mining Right

APPENDIX 5

Proof of Payment for the Water Use License Application