



## DMS POWDERS

DRAFT SCOPING REPORT: UPGRADING OF THE  
DMS POWDERS STORM WATER CONTROL  
INFRASTRUCTURE

LOCALITY: MEYERTON

REF. NO.: GAUT: 002/12-13/E0203

**SHANGONI**  
*Management Services (Pty) Ltd*



## **DRAFT SCOPING REPORT**

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**LOCALITY: MEYERTON**

**REF. NO.: GAUT: 002/12-13/E0203**

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## **PROJECT DETAILS**

**Gauteng Department of Agriculture and Rural Development**

**Reference No.: GAUT: 002/12-13/E0203**

**Project Title: Upgrading of the DMS Powders Storm Water Control Infrastructure.**


**Project Number: DMS-EIA-31-01-12**

**Compiled by: Patricia van der Walt**

**Date: 27 August 2013**

**Location: Meyerton**

**Technical Reviewer: Brian Hayes**



**R B Hayes (Pr. Eng.)**



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# DEFINITIONS

## Building and demolition waste

Means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition [*NEM:WA, (Act No. 59, 2008)*].

## Demography

The scientific study of human population, especially, with reference to their size, structure and distribution.

## Domestic waste

Means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes [*NEM: WA, (Act No. 59, 2008)*].

## Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

## Environmental Aspects

Environmental aspects are elements of an organisation's activities, products or services that can interact with the environment.

## Environmental Degradation

Refers to pollution, disturbance, resource depletion, loss of biodiversity, and other kinds of environmental damage; usually refers to damage occurring accidentally or intentionally as a result of human activities.



## Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

## Environmental Impact Assessment

An Environmental Impact Assessment is the study of the environmental consequences of a proposed course of action.

## Environmental Impact Report

A report assessing the potential significant impacts as identified during the environmental impact assessment.

## Environmental impact

An environmental change caused by some human act.

## General waste

Means waste that does not pose immediate hazard or threat to health or to the environment, and includes-

- (a) domestic waste;
- (b) building and demolition waste;
- (c) business waste; and
- (d) inert waste [NEM: WA, (Act No. 59, 2008)].

## Hazardous waste

Means any waste that contains organic or inorganic elements compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment [NEM:WA, (Act No. 59, 2008)].

## Human Development Index

The **Human Development Index (HDI)** is a composite statistic used to rank countries by level of "human development" and separate developed (high development), developing (middle development), and underdeveloped (low development) countries. The statistic is composed from data on life expectancy, education and per-capita GNI (as an indicator of standard of living) collected at the national level using the formula given in the Methodology section below. There are also HDI's for states, cities, villages, etc. by local organisations or companies.

(<http://encyclopedia.thefreedictionary.com>).



## Land use

Land use is defined as the various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

## Pollution

Pollution means any change in the environment caused by -

- (i) substances;
- (ii) radioactive or other waves; or
- (iii) noise, odours, dust or heat,

emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future [*NEM: WA, (Act No. 59, 2008)*].

## Pollution Prevention

Pollution prevention can be any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal. [*NEM: AQA, (Act 39 of 2004)*]

## Public Participation Process

A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.

## Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

## Vegetation

Vegetation is defined as all of the plants growing in and characterising a specific area or region; the combination of different plant communities found there.

## Waste

Means any substance, whether or not that substance can be reduced, re-used, recycled and recovered-

- (a) that is surplus, wanted, rejected, discarded, abandoned or disposed of;



- (b) which the generator has no further use of for the purposes of production;
- (c) that must be treated or disposed of; or
- (d) that is identified as a waste by the Minister by notice in the *Gazette*, and includes waste generated by the mining, medical or other sector, but-
  - (i) a by-product is not considered waste; and
  - (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste [NEM:WA, (Act No. 59, 2008)].

## **Waste treatment facility**

Means any site that is used to accumulate waste for the purpose of storage, recovery, treatment, reprocessing, recycling or sorting of that waste [NEM:WA, (Act No. 59, 2008)].



# ABBREVIATIONS

<b>AQMP</b>	-	Air Quality Management Plan
<b>BID</b>	-	Background Information Document
<b>BTEX</b>	-	Benzene, Toluene, Ethylbenzene and Xylenes
<b>CRR</b>	-	Comments Response Report
<b>DEA</b>	-	Department of Environmental Affairs
<b>DMS</b>	-	Dense Medium Separation
<b>EAP</b>	-	Environmental Assessment Practitioner
<b>ECA</b>	-	Environmental Conservation Act of 1989
<b>EIA</b>	-	Environmental Impact Assessment
<b>EIR</b>	-	Environmental Impact Report
<b>EMF</b>	-	Environmental Management Framework
<b>EMP</b>	-	Environmental Management Programme
<b>FeSi</b>	-	Ferrosilicon
<b>GDARD</b>	-	Gauteng Department of Agriculture and Rural Development
<b>GN</b>	-	Government Notice
<b>HDI</b>	-	Human Development Index
<b>I&amp;AP</b>	-	Interested and Affected Party
<b>IDP</b>		Integrated Development Plan
<b>NEMA</b>	-	Environmental Management Act, Act 107 of 1998 as amended
<b>NEMWA</b>	-	National Environmental Management: Waste Act, Act No. 59, 2008
<b>R</b>	-	Regulation
<b>S&amp;EIR</b>	-	Scoping and Environmental Impact Reporting
<b>SAHRA</b>	-	South African Heritage Resources Agency
<b>SDM</b>	-	Sedibeng District Municipality
<b>SWMP</b>	-	Storm Water Management Plan
<b>TCLP</b>	-	Toxicity Characteristic Leaching Procedure
<b>VTAPA</b>	-	Vaal Triangle Air-shed Priority Area
<b>WWTW</b>	-	Wastewater Treatment Works





## EXECUTIVE SUMMARY

Dense Medium Separation Powders (Pty) Ltd is located on Portion 4 and 36 of the farm Kookfontein 545 IQ in Meyerton, which is approximately 8.7km to the north of Vereeniging. Dense Medium Separation (DMS) Powders produces ferrosilicon (FeSi) powders for use in dense media separation technology.

Steel shavings are used as an input for the FeSi production. The steel shavings are stored in large unroofed stockpiles. The steel shavings are classified as hazardous waste, as they are contaminated by grease and oil, used when drilling through steel.

Rainwater precipitating onto the steel shaving stockpile area becomes contaminated, generating affected storm water runoff classified as a hazardous wastewater. In future, the affected storm water will be collected in a 300m<sup>3</sup> collection sump after which it will be treated in a water purification plant to a discharge standard (Refer to Table 1). The treated affected storm water will then be discharged into the BHP Billiton storm water control dam that is situated within the Fouriespruit (the Fouriespruit has been diverted around the BHP Billiton storm water control dam).

The discharge of the treated affected storm water into the BHP Billiton storm water control dam triggers a water use license as it constitutes a Section 21(f) water use activity (Discharging of Waste or Water Containing Waste into a Water Resource through a Pipe, Canal, Sewer, Sea Outfall or Other Conduit) in terms of National Water Act, 1998 (Act No 36 of 1998).

The discharge of the treated affected storm water into the storm water control dam also triggers the following activities in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998).

GNR 544 of 18 June 2010 – Listing Notice 1 activity 11: *The construction of:*

- (i) canals;*
- (ii) channels;*
- (iii) bridges;*
- (iv) dams;*
- (v) weirs;*
- (vi) bulk storm water outlet structures;*
- (vii) marinas;*
- (viii) jetties exceeding 50 square metres in size;*
- (ix) slipways exceeding 50 square metres in size;*
- (x) buildings exceeding 50 square metres in size; or*
- (xi) infrastructure or structures covering 50 square metres or more*



*where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.'*

GNR 545 of 18 June 2010 – Listing Notice 2 activity 5: *'The Construction of Facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice R544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) in which case that Act will apply.'*

Activity 5 listed under GNR 545 of 18 June 2010 – Listing Notice 2 requires a full Environmental Impact Assessment (EIA) to be undertaken. The Environmental Impact Assessment process will aim to achieve the following:

- To provide a detailed assessment of the biophysical environments affected by the proposed project;
- To assess impacts on the study area in terms of environmental criteria;
- To identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- To undertake a fully inclusive public participation process to ensure that I&APs issues and concerns are recorded and addressed

The purpose of this document is to supply the Gauteng Department of Agriculture and Rural Development with the requested information pertaining to the National Water Act, 1998 (Act No 36 of 1998) and the National Environmental Management Act (NEMA), as stipulated by Regulation 28 of the Environmental Impact Assessment (EIA) Regulations, 2010.

Contained in this document is a brief overview of the activity and site specific information for the proposed project (location, topography, surrounds, vegetation, etc.). The latter part of the document contains an environmental management framework that includes a reflection of applicable legislation, the public participation process followed, the need and desirability of the project, identified alternatives, a quantitative risk assessment, and an environmental management plan.

## **Document layout:**

### **Section one – Introduction**

The purpose of this section is to provide a brief overview of the current operation, proposed activity and locality, applicable infrastructure and environmental licensing required.



## **Section two – Nature and extent of the environment affected by the activity**

The status of the environment in which DMS Powders is situated is discussed in section 2. The environmental areas, geology, climate, topography, soil, land use and land capability, fauna and flora, surface water, groundwater, archaeological and cultural sites, air quality and socio-economic aspects are described in this section.

## **Section three – Legislation and guidelines applicable**

Section three lists all environmental legislation and guidelines applicable to the proposed project.

## **Section four – Public participation process**

This section provides information pertaining to the consultation process that will be followed during this EIA process.

## **Section five – Need and desirability**

Section five describes the need and desirability of this project from the perspective of the developer and local community.

## **Section six – Identified alternatives**

Section six considers alternatives to project site selection for the proposed development; alternatives to layout of the development; and alternatives to construction methodologies and/or materials used for the development.

## **Section seven – Identification of anticipated environmental impacts**

This part of the document focuses on the identification of the major potential impacts the activities, processes and actions may have on the surrounding environment.

## **Section eight– Plan of study**

In this part of the document a description is given of the steps to be taken as part of the Environmental Impact Assessment process.

## **Section nine – Conclusion**

Section nine gives a brief conclusion based on all information obtained and potential environmental impacts identified during the scoping process.



# 1. INTRODUCTION

## 1.1 Applicant

Name of Applicant	Dense Media Separation Powders (Pty) Ltd.
Postal Address	P.O. Box 945, Meyerton, 1960
Telephone No.	016 360 5200
Fax No.	016 360 5314
Company Registration No.	2005/038294/07
Website	www.dmspowders.com
Farm name and portion on which the activities take place	Portion 4 of the farm Kookfontein 545 IQ
Co-ordinates of operation	Latitude: -26.574657° Longitude: 27.987158°

## 1.2 Appointed Environmental Assessment Practitioner

Name of firm	Shangoni Management Services	
Postal address	P.O. Box 74726 Lynnwood Ridge Pretoria 0040	
Telephone No.	012 807 7036	
Fax	012 807 1014	
E-mail	lourens@shangoni.co.za	
Team of Environmental Assessment Practitioners on project		
Name	Qualifications	Responsibility
Lourens De Villiers	Bsc. (Hons) (PU for CHE) MSc.(UP)	Project Director
Lizette Crous	Post Graduate Certificate – Environmental Management	EAP
Patricia van der Walt	B.Sc. (Hons) (Applied Science in Environmental Technology)	Jnr. EAP

Detailed CV's for the project team are appended (Appendix F).



## 1.3 Current situation

DMS Powders produces ferrosilicon (FeSi) powder for use in dense media separation technology. Two different processes are used at DMS Powders, namely Atomised FeSi production and Milled FeSi production.

### 1.3.1 Atomised FeSi Production

Steel scrap and 75% ferrosilicon is melted in the M8 induction furnaces to produce molten ferrosilicon, with a silicon content of between 14 and 16%. The M8 induction furnaces use induction to heat metal to its melting point. The molten alloy is then atomised, dried and classified into various grades. The process is summarised in Figure 1:



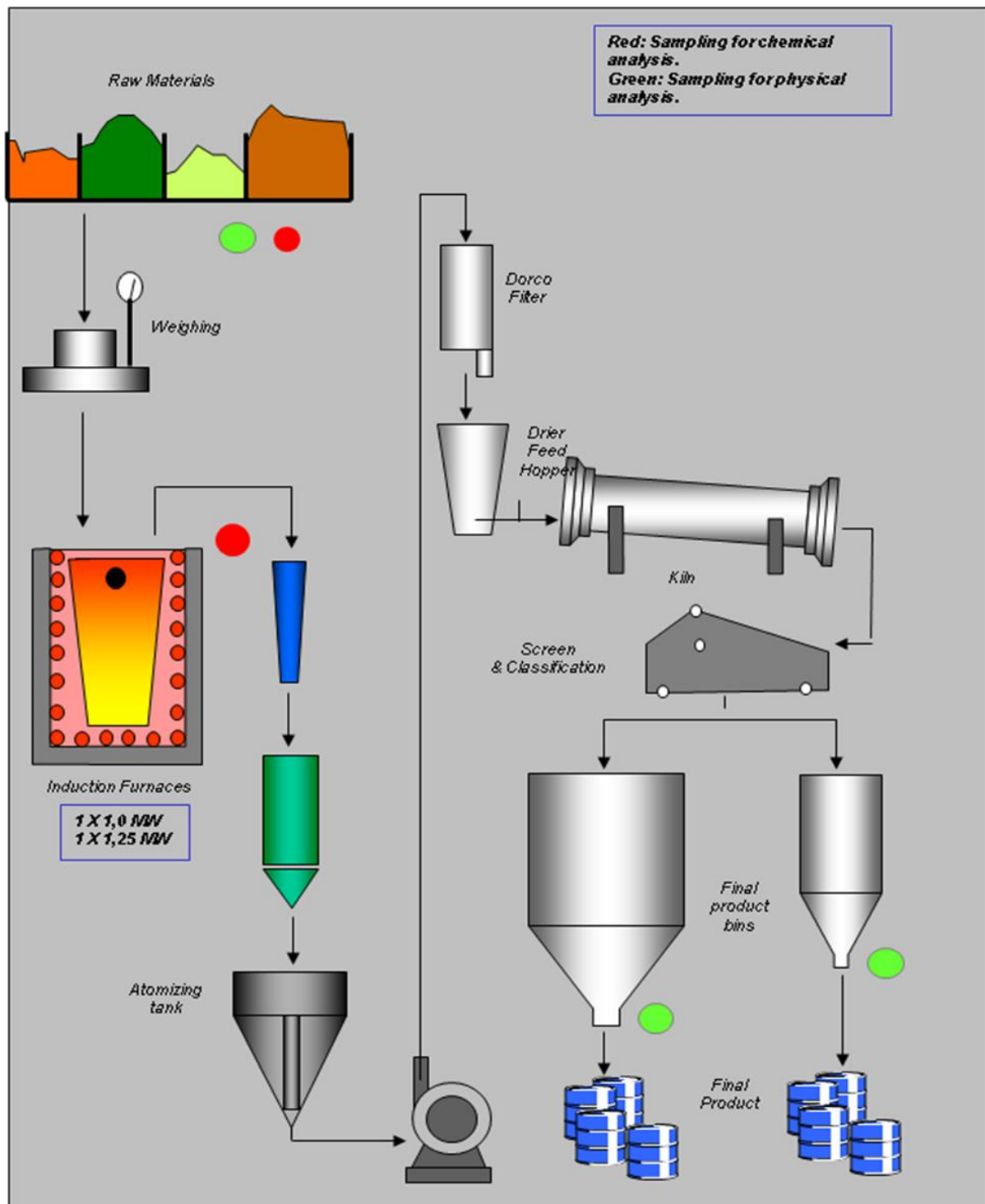


Figure 1: Atomised FeSi Production

### 1.3.2 Milled FeSi Production

Quartz, coal, coke and steel scrap are melted in the M9 submerged arc furnace to produce molten ferrosilicon with a silicon content of between 14 and 16%. The molten alloy is then water granulated, dried, milled and air classified into various grades. The process is summarised in the following diagram:



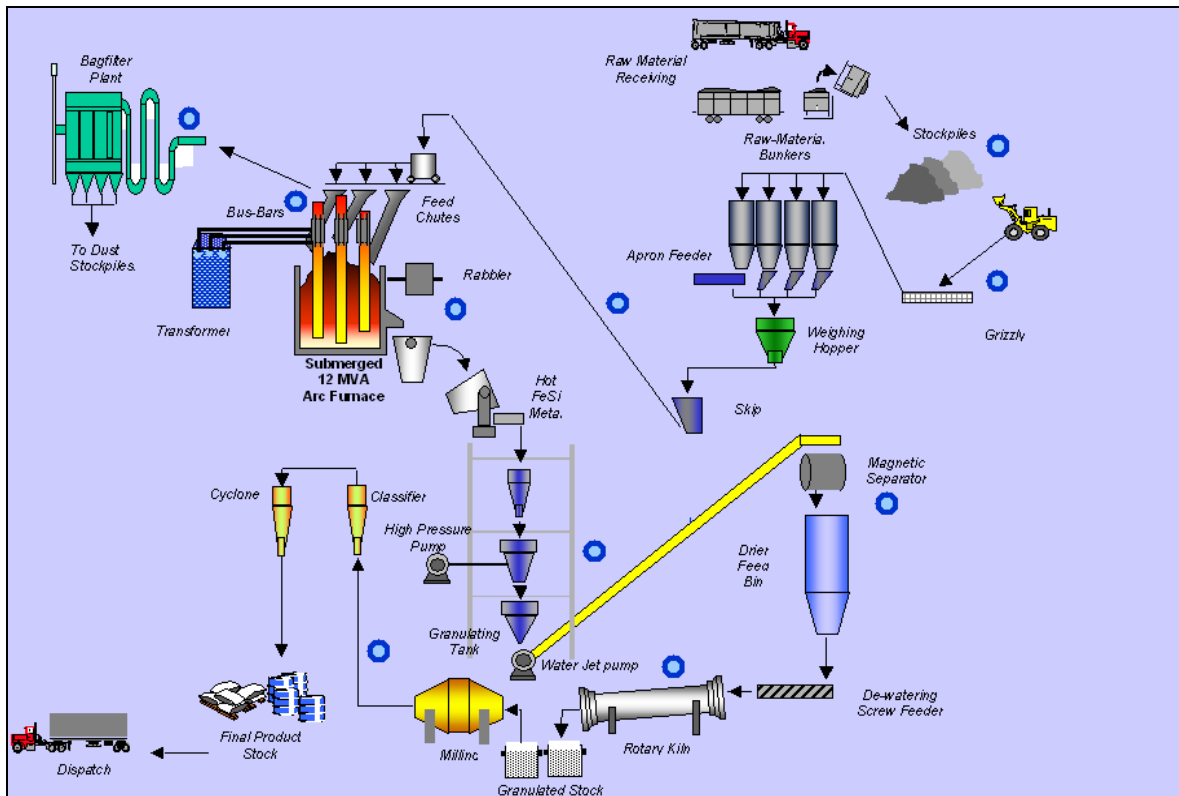


Figure 2: Milled FeSi Production

### 1.3.3 Storm water runoff

Steel shavings, obtained from drilling operations, are used as an input for the FeSi production. The steel shavings are stored in large unroofed stockpiles.

According to the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), the steel shavings are classified as hazardous waste. The definition of “hazardous waste” as stipulated in the Waste Act, 2008, is as follows:

“Hazardous waste” means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

The steel shavings are classified as hazardous waste, as they are contaminated by grease and oil, used when drilling through steel.

Rainwater precipitating onto the steel shaving stockpile area becomes contaminated and this affected storm water is classified as a hazardous wastewater due to its composition. The storm water includes small quantities of arsenic (As) and mercury (Hg), amongst other components, and the Total Petroleum Hydrocarbon (TPH) count is high.



Affected storm water from the DMS Powders site is currently not contained and is allowed to discharge into the BHP Billiton storm water control dam, located within the Fouriespruit (but historically diverted). As DMS Powders is managing their operations independently to BHP Billiton, the current storm water discharge from the DMS site is viewed to be discharging via a series of storm water channels into a watercourse.

## 1.4 Proposed Activity

To prevent contaminated storm water from leaving the DMS site, it is proposed that all affected storm water runoff be collected, treated and the final treated water be discharged into the existing storm water canal leading to the BHP Billiton storm water control dam.

For the purpose of treatment, the construction and implementation of a Wastewater Treatment Works (WWTW), consisting of a 300m<sup>3</sup> collection sump and a water purification plant, has been proposed.

The first flush of affected storm water flowing through the DMS Powders FeSi production plant will be collected in the 300m<sup>3</sup> collection sump (The sump will have sufficient capacity to contain a normal rainfall event). The water purification plant will then treat the collected affected storm water at a rate of 50m<sup>3</sup>/hr after which the treated water will be discharged.

This system will effectively remove all suspended solids up to a particle size of 0.02-micron and all dissolved impurities to produce water of discharge standard (Refer to Table 1).

*Table 1: Discharge standards regulated by Water Affairs.*

Substance / Parameter	Limit
Faecal Coliforms per 100ml	< 1 000
Chemical Oxygen Demand (mg/l)	75
pH	5.5 – 9.5
Ammonia (ionised and un-ionised) as Nitrogen (mg/l)	6
Nitrate/Nitrite as Nitrogen (mg/l)	15
Chlorine as Free Chlorine (mg/l)	0.25
Suspended Solids (mg/l)	25
Electrical Conductivity (mS/m)	70mS/m above intake to a maximum of 150mS/m
Ortho-Phosphate as Phosphorus (mg/l)	5
Soap, oil or grease (mg/l)	2.5

The wider site area is not owned or controlled by DMS Powders limiting the control over upstream storm water runoff. By improving the current storm water control system, DMS Powders will be able to more effectively regulate the quality and quantity of their storm water runoff. To improve the current storm water control the following construction and upgrading activities are proposed:

- A rounded barrier (bump) will be constructed parallel to the storm water channel to increase the drainage capacity by using the road to channel storm water runoff;
- The depth of the channel may also be increased to enhance capacity;





- Some of the sections of the channel are covered with solid sheets. These solid sheets will be replaced with grids to avoid runoff flowing directly over the channel into the DMS Powders plant.

## 1.5 Proposed Locality

DMS Powders is located on Portion 4 and 36 of the farm Kookfontein 545 IQ in Meyerton (Refer to Figure 7), which is approximately 8.7km's to the north of Vereeniging. The site is situated within the Midvaal Local Municipality of the Sedibeng District Municipality, Gauteng Province. GPS coordinates for the site are: 26°34'32.54"S; 27°59'21.19"E.

*Table 2: Direction and distance to the nearest town*

Direction	Distance from site	Closest town
North	8.7km	Vereeniging

The site photographs are shown in Figure 4 to Figure 6, as in Appendix B.



*Figure 3: Illustration of steel shaving stockpiles (1).*





*Figure 4: Illustration of flooding during a rain storm (1).*



*Figure 5: Illustration of flooding during a rain storm (2).*



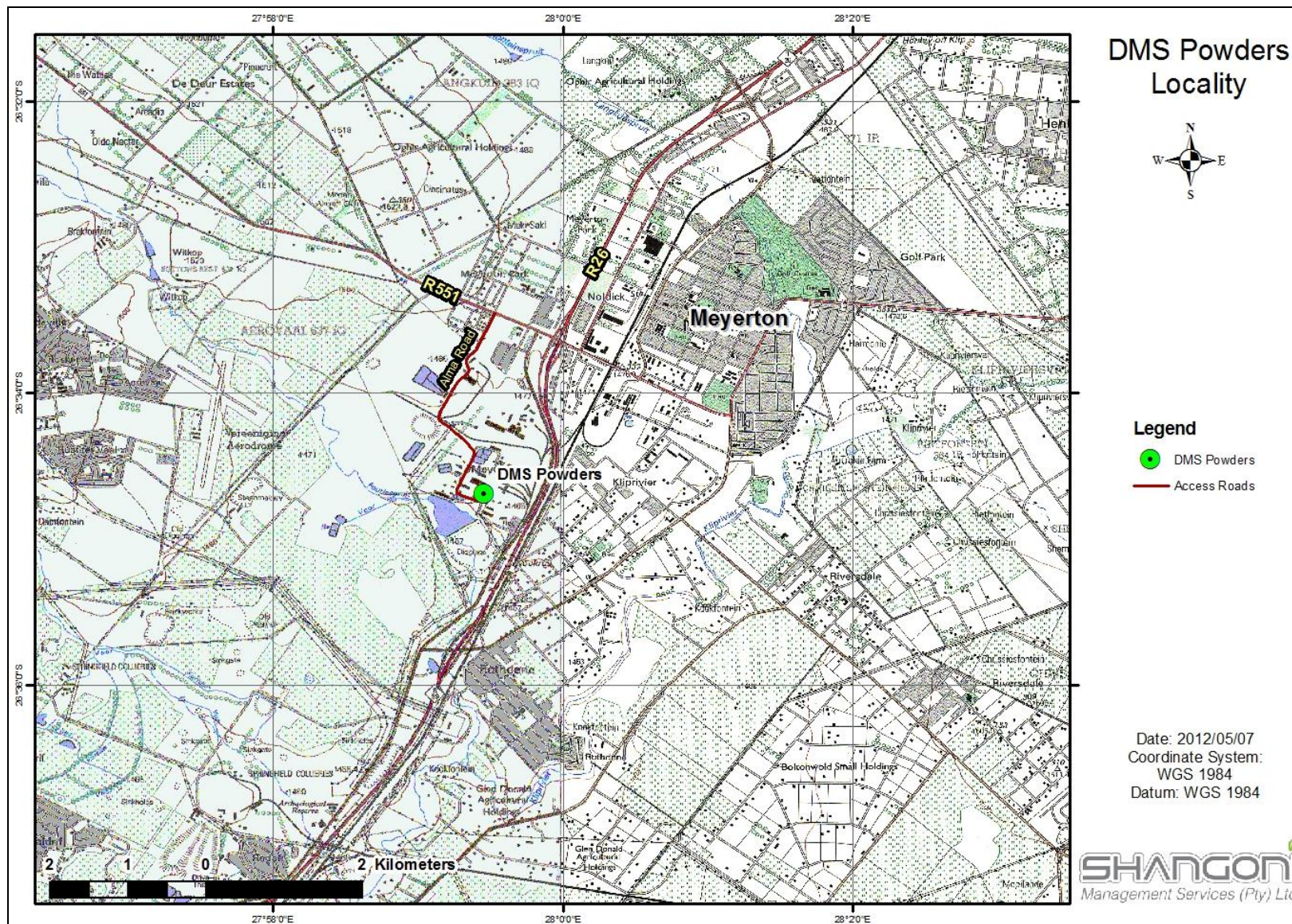


Figure 6: Locality Map

## 2. NATURE AND EXTENT OF THE ENVIRONMENT AFFECTED BY ACTIVITY

### 2.1 Regional climate

The regional climate of the area can be described as summer rainfall season with heavy thunderstorm in the late afternoons. The area has an average of 645.7mm of rain per year with the main prevailing wind direction being north-north west.

#### 2.1.1 Rainfall and Evaporation

The area receives a mean annual rainfall of 645.7mm per year, of which most is received during typical late afternoon thunderstorms in the summer months.

The gross annual evaporation is on average 2001mm – 2200mm.

Table 3: Average Monthly Rainfall (mm)

Date	Rainfall (mm)
January	118
February	88.1
March	86.8
April	30.5
May	12.4
June	7.9
July	2.6
August	6.5
September	25
October	69.3
November	93.3
December	105.3
<b>Annual</b>	<b>645.7</b>

#### 2.1.2 Temperature

The mean annual maximum and minimum temperatures for the area is 24.0°C and 9.3°C and the mean annual temperature is calculated to be 16.7°C for the area. The mean monthly temperatures for the area are provided in Table 3 below.

Table 4: Mean monthly temperatures (°C).

Months	MAX	MIN	MEAN
January	27,9	15,9	21,9
February	27,4	15,2	21,3
March	26,3	13,6	19,9
April	23,2	9,6	16,4

May	20,7	4,4	12,6
June	17,7	0,4	9,1
July	18,5	0,2	9,3
August	21,4	3,4	12,4
September	24,9	8,6	16,7
October	26,0	11,8	18,9
November	26,6	13,8	20,2
December	27,7	15,0	21,3
Yearly	24,0	9,3	16,7

### 2.1.3 Wind

The dominant wind course in Vereeniging is in a south easterly direction with an average wind speed of 6.5 knots. The following wind roses (Refer to Figure 8 to 19) were based on observations taken from February 2006 to April 2013 daily from 7am to 7pm ([www.windfinder.com](http://www.windfinder.com)).

## 2.2 Biophysical aspects affected

### 2.2.1 Geology

The following geological information was abstracted from the Specialist Groundwater Phase I Investigation Report compiled by Shangoni Aquiscience, a division of Shangoni Management Services (Pty) Ltd. The geology and geohydrology of the catchment were characterised by a desktop study with information gathered from topographical, geological and hydrogeological maps including data sourced from the Groundwater Resource Directed Measures (GRDM).

The 2626 West Rand 1:250 000 geology map series indicates that DMS Powders is located on the contact of the Vryheid Formation belonging to the Ecca Group of the Karoo Supergroup and the Malmani subgroup belonging to the Chuiniespoort Group of the Transvaal Supergroup (Refer to Figure 20). A representative stratigraphic section of the Karoo Supergroup was obtained by Cilliè and Savage (1961) from a borehole drilled in the Springfield mining area to the south of BHP Metalloys (Table 5). The Vryheid Formation consists predominantly of arenaceous rocks with beds of shale and coal at depths of approximately 400m, 500m and 700m. The Dwyka Group consisting of shale, sandstone and conglomerate directly underlies the Ecca Group and is situated at approximately 850m. The Chuiniespoort dolomite is found below the Dwyka Group at approximately 890m. Major fault zones occur to the north and west of Meyerton (approximately 10km).



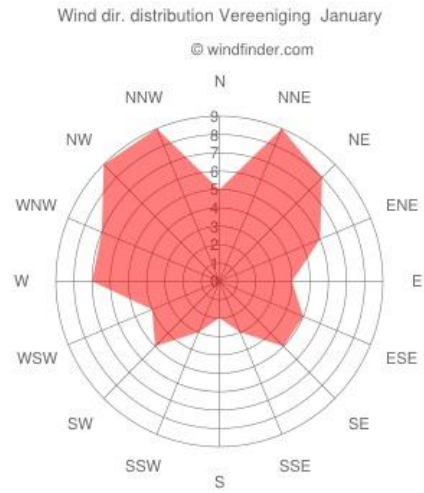


Figure 7: Wind rose for January

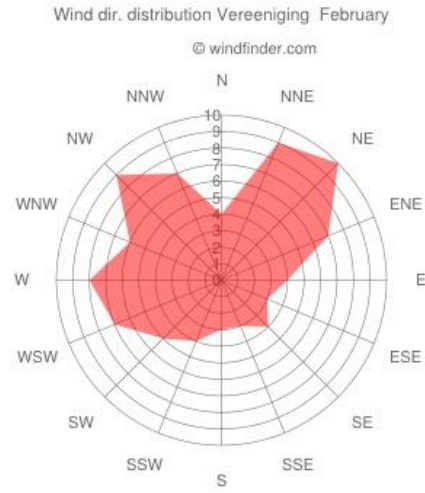


Figure 8: Wind rose for February

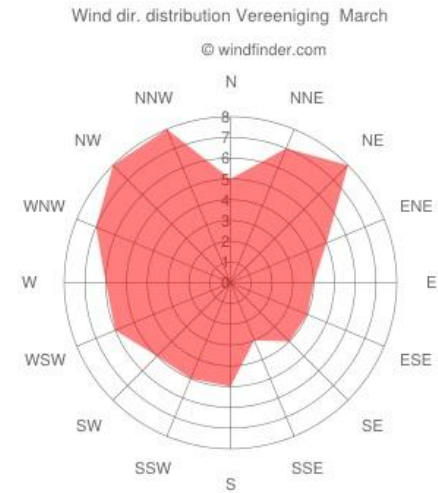


Figure 9: Wind rose for March

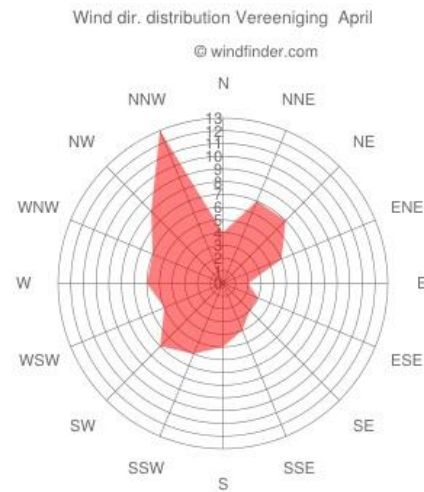


Figure 10: Wind rose for April

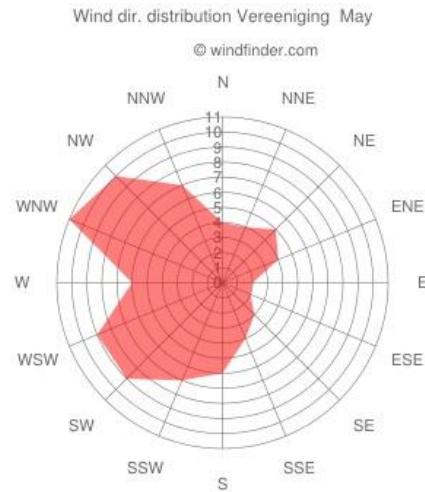


Figure 11: Wind rose for May

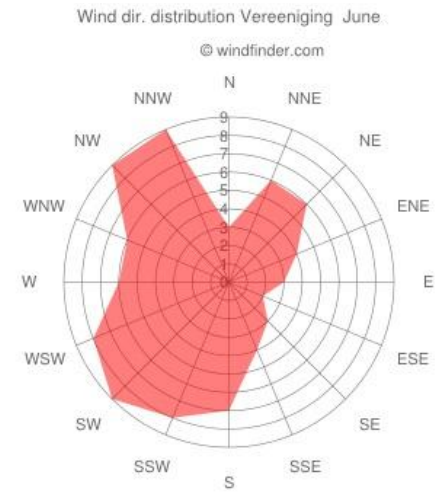


Figure 12: Wind rose for June



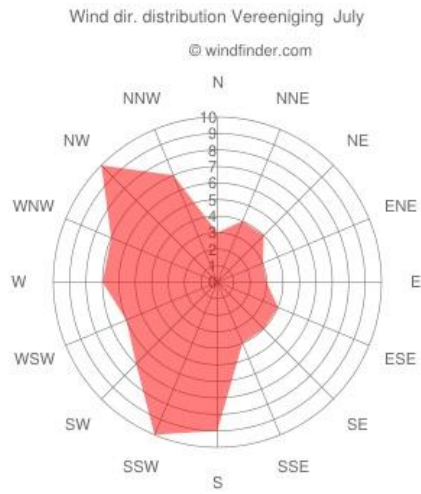


Figure 13: Wind rose for July

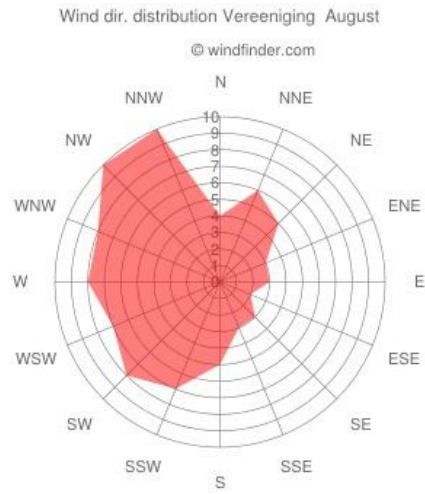


Figure 14: Wind rose for Augustus

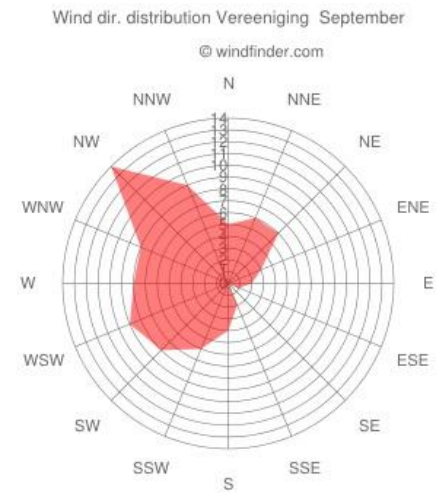


Figure 15: Wind rose for September

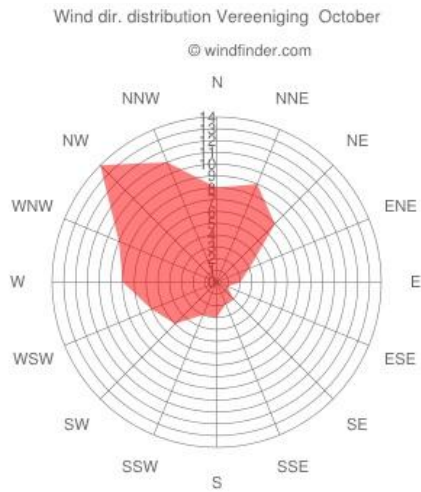


Figure 16: Wind rose for October

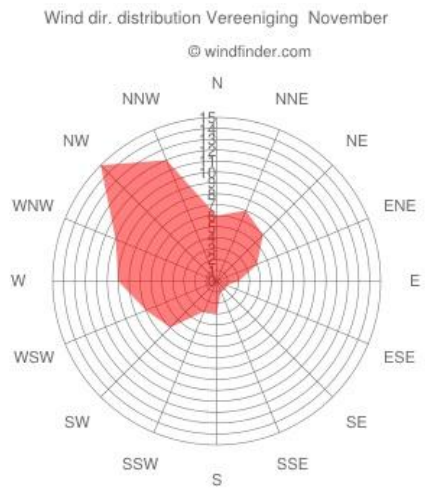


Figure 17: Wind rose for November

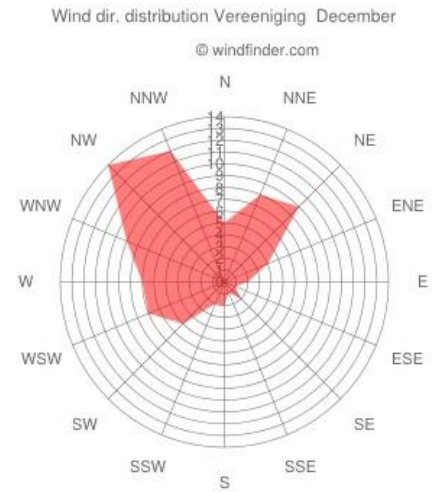


Figure 18: Wind rose for December



Table 5: Representative succession of the Karoo Supergroup south of BHP Metalloys in the Springfield mining area.

Group	Formation	Lithology	Thickness (m)	Depth (m)
Regolith		Sand, gravel		
ECCA	Vryheid	Sandstone, micaceous	128	226
		Shale, micaceous, black, sandy	174	399
		Coal, <b>Top seam</b>	6	405
		Shale and sandstone bedded	21	427
		Coal, <b>Middle seam</b>	104	531
		Sandstone, micaceous	18	549
		Shale, micaceous, sandy grey to black	119	668
		Coal, <b>bottom seam</b>	55	722
		Shale/ brown, <b>bottom seam</b>	12	735
		Coal, <b>bottom seam</b>	119	853
DWYKA	Mbizane	Shale, sandstone, conglomerate	9	863
	Elandsvlei	Diamictitie	21	884
Chuiniespoort		Dolomite	+ 0.6	890

### 2.2.2 Topography

DMS Powders is situated at an elevation of 1474m (Refer to Figure 21). The surrounding environment gently slopes to the south. Most of the adjacent area is built up and surface water runoff is canalised. The general slope along the site is gentle at approximately 1:60. There is a depression on site between the plant and the raw material stockpile area where damming is confirmed to occur during the raining season (Shangoni Management Services (Pty) Ltd., 2012).

### 2.2.3 Soils

The soils in the area are classified as S2 (Refer to Figure 22) and described as Red, Yellow and greyish soils with a low to medium base status with a water holding capacity of 41-60mm (AGIS, 2007).





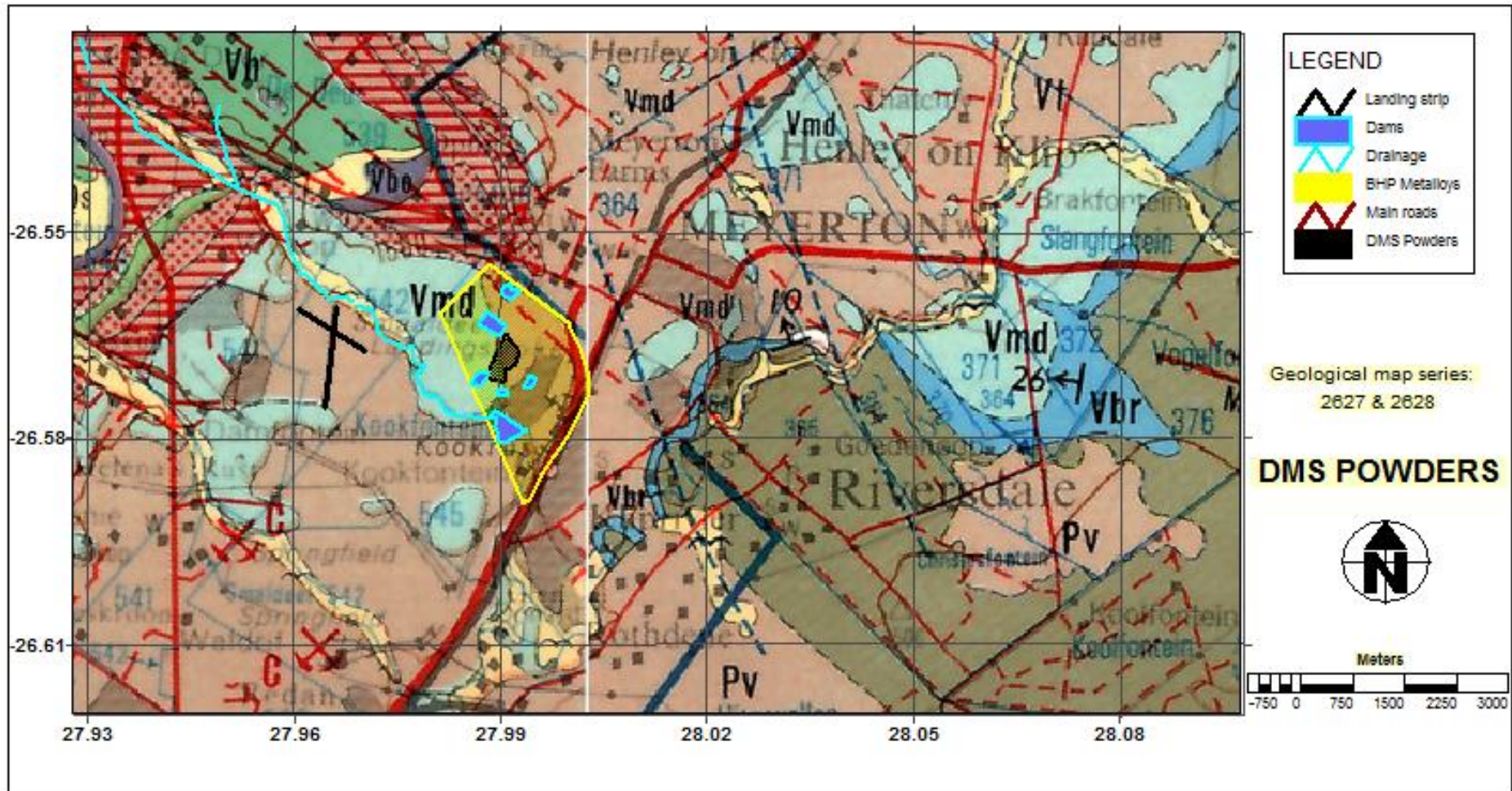


Figure 19: 2528 Pretoria Geological Map 1:250 000

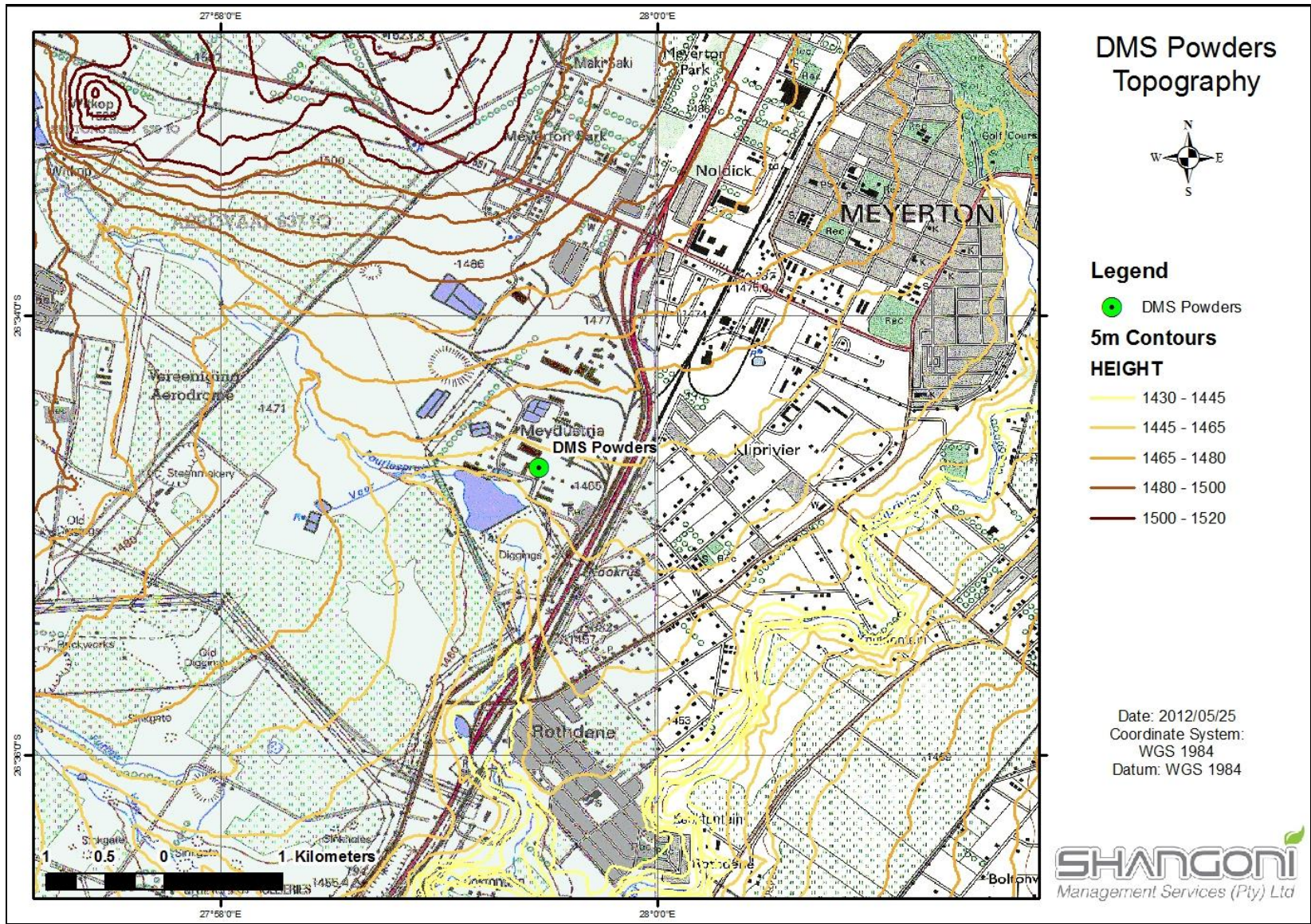


Figure 20: Topography Map of the area

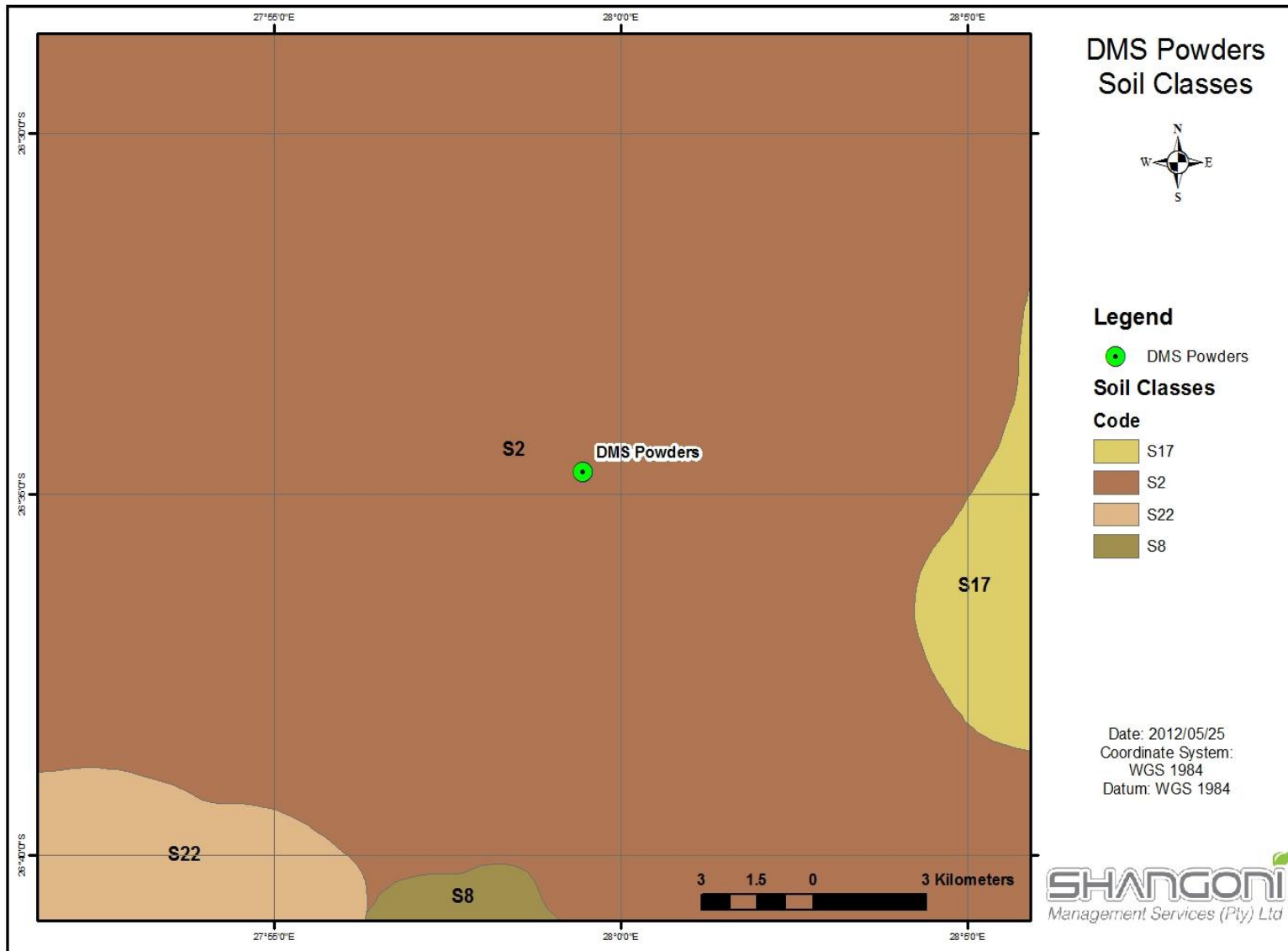


Figure 21: Soil classes map of the area.

## 2.2.4 Fauna and Flora

The site falls within the Soweto Highveld grassland (Figure 23) type and the vegetation type is generally described as a gently to moderately undulating landscape on the Highveld plateau supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. In places not distributed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover (Mucina, L., & Rutherford, M. C., 2006). Refer to Table 6 for plant species of importance in the Soweto Highveld grassland.

Table 6: Plant species of importance in the Soweto Highveld grassland.

Graminoid	
<i>Andropogon appendiculatus</i>	<i>Brachiaria serrata</i>
<i>Cymbopogon pospischilii</i>	<i>Cynodon dactylon</i>
<i>Elionurus muticus</i>	<i>Eragrostis capensis</i>
<i>Eragrostis chloromelas</i>	<i>Eragrostis curvula</i>
<i>Eragrostis plana</i>	<i>Eragrostis planiculmis</i>
<i>Eragrostis racemosa</i>	<i>Heteropogon contortus</i>
<i>Hyparrhenia hirta</i>	<i>Setaria nigrirostris</i>
<i>Setaria sphacelata</i>	<i>Themeda triandra</i>
<i>Tristachya leucothrix</i>	<i>Andropogon schirensis</i>
<i>Aristida adscensionis</i>	<i>Aristida bipartite</i>
<i>Aristida congesta</i>	<i>Aristida junciformis</i> subsp. <i>galpinii</i>
<i>Cymbopogon caesius</i>	<i>Digitaria diagonalis</i>
<i>Diheteropogon amplexans</i>	<i>Eragrostis micrantha</i>
<i>Eragrostis superba</i>	<i>Harpochloa falx</i>
<i>Microchloa caffra</i>	<i>Paspalum dilatatum</i>

Herbs	
<i>Hermannia depressa</i>	<i>Acalypha angustata</i>
<i>Berkheya setifera</i>	<i>Dicoma anomala</i>
<i>Euryops gilfillanii</i>	<i>Geigeria aspera</i> var. <i>aspera</i>
<i>Graderia subintegra</i>	<i>Haplocarpha scaposa</i>
<i>Helichrysum miconiifolium</i>	<i>Helichrysum. nudifolium</i> var. <i>nudifolium</i>
<i>Helichrysum rugulosum</i>	<i>Hibiscus pusillus</i>
<i>Justica anagalloides</i>	<i>Lippia scaberrima</i>
<i>Rhynchosia effuse</i>	<i>Schistostephium crataegifolium</i>
<i>Selago densiflora</i>	<i>Senecio coronatus</i>
<i>Vernonia oligocephala</i>	<i>Wahlenbergia undulate</i>

Geophytic Herbs	
<i>Haemanthus humilis</i> subsp. <i>hirsutus</i>	<i>Haemanthus montanus</i>

Herbaceous Climber	
<i>Rhynchosia totta</i>	

Low Shrubs	
<i>Anthospermum hispidulum</i>	<i>Anthospermum rigidum</i> subsp. <i>pumilum</i>
<i>Berkheya annectens</i>	<i>Felicia muricata</i>
<i>Ziziphus zeyheriana</i>	



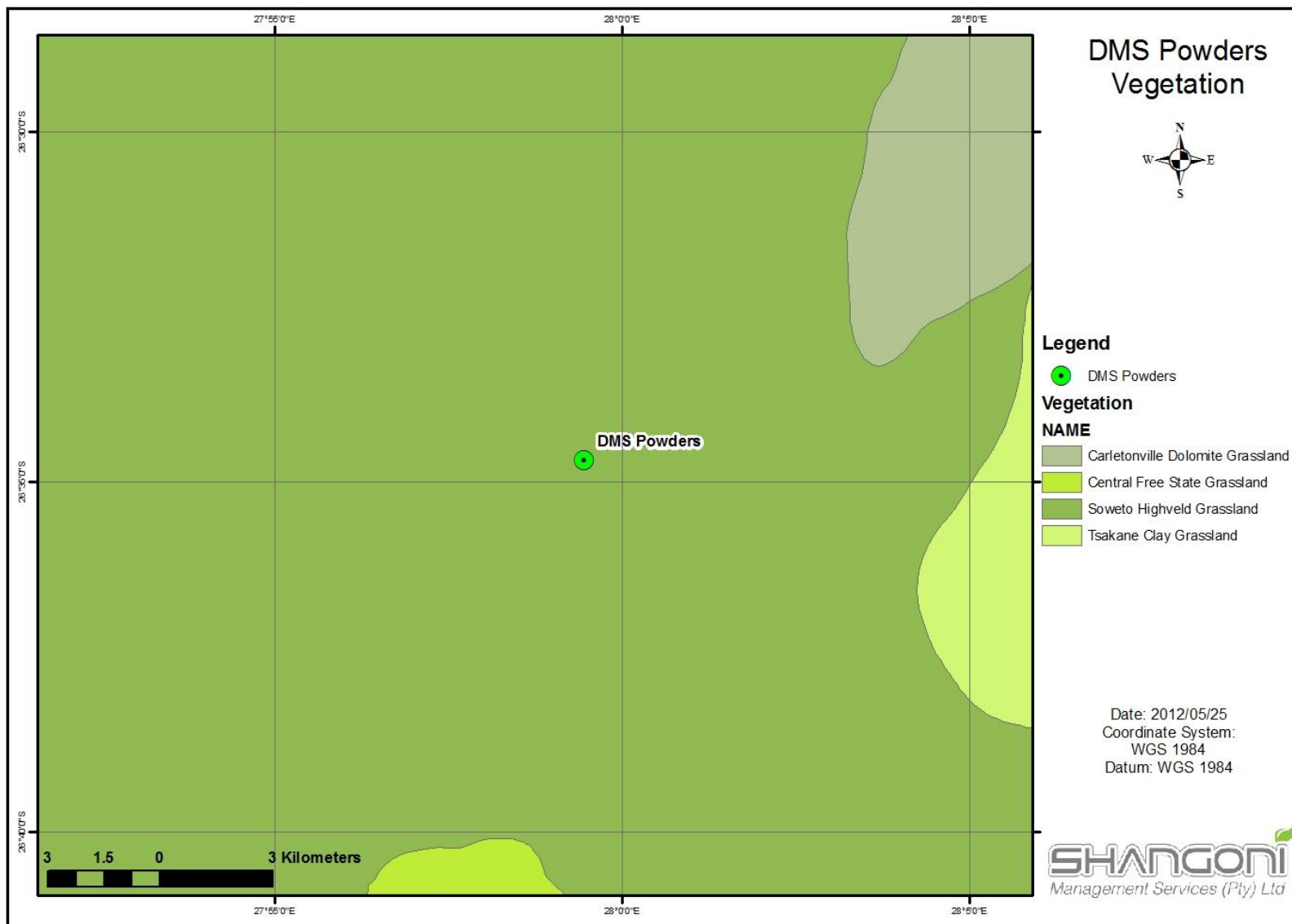


Figure 22: Vegetation Map of the area

## 2.2.5 Surface water

Surface water drainage from and in the vicinity of the DMS Powders site will be predominantly from north to south, towards the Fouriespruit and Klip River. The Klip River is approximately 2.6km to the south east of DMS Powders and the Fouriespruit is approximately 550m to the south west of DMS Powders.

### Quantity

The DMS Powders site is divided into three catchment areas: Northern stockpile area, Southern stockpile area, and Plant area. The storm water leaving the DMS Powders site is currently collected within an affected water dam (BHP Billiton pollution control dam). Table 7 and Figure 24 illustrate the surface runoff at DMS Powders.

Table 7: Modelled runoff volumes for the DMS Powders Site (Snyman, J., September 2012).

Catchment areas	Runoff volumes (m3)			
	1:50 24hours	1:50 48hours	1:100 24hours	1:100 48hours
Northern Stockpile area	637	839	738	977
Southern Stockpile area	915	1205	1060	1404
Plant area	218	287	253	335

### Quality

The following information was abstracted from the Specialist Groundwater Phase I Investigation Report compiled by Shangoni Aquiscience, a division of Shangoni Management Services (Pty) Ltd. Leachate tests and Acid Base Accounting (ABA) analyses were done on the iron shavings-, coal-, Si-carbide- and 'lumpy' stockpiles to determine their impact on the storm water quality emanating from the site. The following tests were done:

- Three TCLP leaching tests of iron shavings for organic and inorganic parameters.
- Three distilled water leaching tests of the coal stockpiles for inorganic parameters.
- Three ABA analyses' on coal, Si-carbide and 'lumpy' stockpiles stored on site.

The water quality of the storm water; emanating from the raw material storage area, the M9 process water together with the storm water emanating upstream from but draining through DMS Powders, was analysed to identify contaminants that may originate from the site (Refer to Table 8).



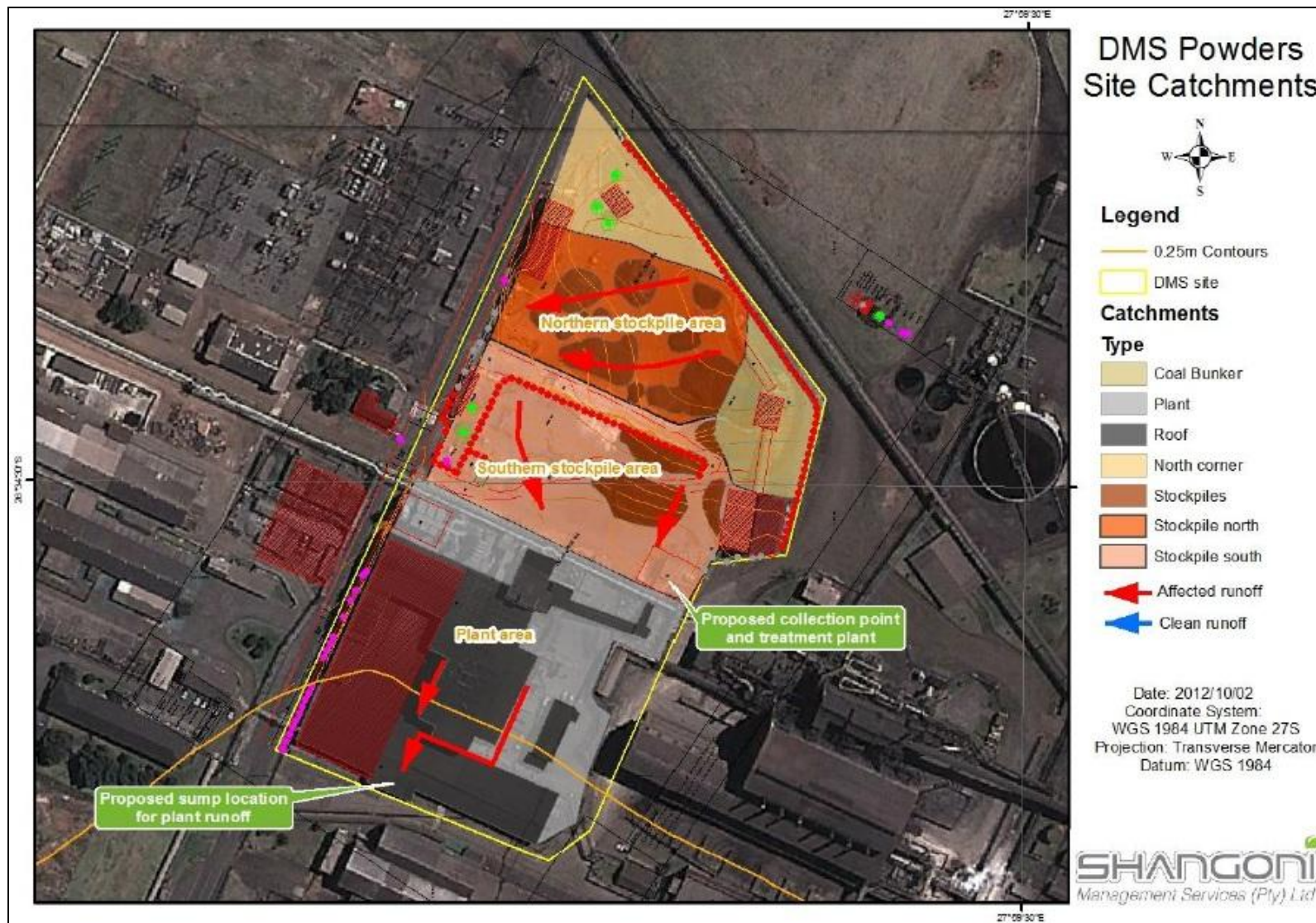


Figure 23: Onsite drainage catchments

Table 8: Groundwater Phase I investigation test results.

Area	Test/analysis	Results
Iron shavings stockpiles	TCLP leaching tests	<ul style="list-style-type: none"> <li>Above detection limits of mostly petroleum hydrocarbons comprising volatile aromatic hydrocarbons (mostly phenols and cresols), including polycyclic aromatic hydrocarbons (PAH),</li> <li>Chlorophenol 4-chloro-3-methylphenol which was recorded in trace quantities.</li> </ul>
Coal stockpiles	Distilled water leaching tests <sup>4</sup> ABA analyses	<ul style="list-style-type: none"> <li>High total sulphur content of 0.52%,</li> <li>Potential to generate acid,</li> <li>Soluble and mobile major and trace metals. Metals recorded above detection limits which may pose a potential risk to the environment include F, Al, Fe, Mn, Mo, Sn and Zn.</li> </ul>
"Si-Carbide and "Lumpy" stockpiles	ABA analyses	<ul style="list-style-type: none"> <li>Lower total sulphur contents for the Si-Carbide (0.09%) and lumpy stockpiles (0.04%),</li> <li>Non-acid forming.</li> </ul>
Raw material storage area	Storm water analysis	<ul style="list-style-type: none"> <li>Contained constituents similar to the iron shavings leach tests but also recorded trace quantities of metals not found in the iron shavings or coal stockpiles, which included As, Cd, Hg, Pb and Cr,</li> <li>The organic parameters recorded included mostly petroleum hydrocarbons consisting of phenols, cresols and polycyclic aromatic hydrocarbons. Chlorophenol, 3-chloro-4-methylphenol was also recorded.</li> </ul>
M9 process water	Storm water analysis	<ul style="list-style-type: none"> <li>Some of the BTEX compounds were recorded for M9 process water but in relatively low concentrations.</li> </ul>
BHP Metalloys area	Storm water analysis	<ul style="list-style-type: none"> <li>Trace quantities of a few polycyclic hydrocarbons were recorded.</li> </ul>

### 2.2.6 Groudwater

The following information was abstracted from the Specialist Groundwater Investigation Report, phases I & III compiled by Shangoni Aquiscience, a division of Shangoni Management Services (Pty) Ltd.

DMS Powders is located in the C22E quaternary catchment of South Africa in the Upper Vaal Water Management Area of the Gauteng Province.

#### Quantity

The groundwater occurrence in vicinity of the study area is associated with weathered and fractured sedimentary/sandstone/dolomite rocks not associated with dolerite intrusions but more related to compressional stresses and offloading. According to the hydrogeological map series 2526 Johannesburg (Barnard, 2000), the entire Meyerton region including BHP Metalloys and DMS Powders are situated in a C5 Karstic type aquifer (>5l/s) and not in the Vryheid sandstones of lesser quantities. The groundwater yield potential is classed as excellent on the basis that 50% of boreholes drilled into the Malmani dolomites produce more than 5l/s.





## Quality

Reference boreholes relative to DMS Powders (BHP owned) was sampled to assess the impact of DMS Powders on the groundwater regime. The upgradient groundwater quality can be described as neutral, non-saline and soft with high to elevated levels of phosphate ( $\text{PO}_4$ ) and ammonia ( $\text{NH}_4$ ) and low to trace amounts of As, and petroleum products including toluene and styrene. The water is unfit for human consumption given the high ammonia concentration of 10.3mg N/l.

The groundwater quality downgradient from DMS Powders can be described as neutral to slightly acidic, non saline with high levels of nitrate ( $\text{NO}_3$ ) and trace quantities of toluene, styrene and halogenated hydrocarbons. Although the  $\text{NO}_3$  concentration recorded in the downgradient borehole (11.2mg N/l) marginally exceeds the domestic limit for recommended use (<11.0mg N/l) it is not attributed to DMS Powders since ammonia ( $\text{NH}_4$ ) concentrations are already elevated at the upgradient borehole (nitrification process). However the presence of the halogenated hydrocarbons can most probably be related to DMS Powders activities.

### 2.2.7 Water authority

The Gauteng Department of Water Affairs is the responsible water authority. DMS Powders is situated within the Upper Vaal water management area. The plant obtains its water directly from Rand Water.

### 2.2.8 Air Quality

#### Vaal Triangle Air-shed priority area

DMS Powders falls within the Vaal Triangle Air-shed Priority Area (VTAPA) as declared in Government Notice No 365 in Government Gazette No 28732 of 21 April of 2006. The VTAPA has 6 hotspots located all over the priority area. DMS Powders falls within the "Hotspot" Zone 4 (Refer to Figure 25).

The pollutants of concern relating to "Hotspot" Zone number 4 are indicated in Table 9 and 10 below.

Table 9: Ambient Air Quality for common Pollutants as adopted to be the Air Quality Objection for Vaal Triangle Airshed Priority Area

Substance	10 Minute Maximum ( $\mu\text{g}/\text{m}^3$ )	1 hour maximum ( $\mu\text{g}/\text{m}^3$ )	8 hour maximum ( $\mu\text{g}/\text{m}^3$ )	24 hour maximum ( $\mu\text{g}/\text{m}^3$ )	Annual average ( $\mu\text{g}/\text{m}^3$ )
Sulphur Dioxide ( $\text{SO}_2$ )	500	350		125	50
Nitrogen dioxide ( $\text{NO}_2$ )		200			40
Carbon Monoxide (CO)		30 000	10 000		
Particular Matter (PM10)				75	40
Ozone ( $\text{O}_3$ )		200	120		
Lead (Pb)					0.5
Benzene					5



Table 10: Priority "Hotspot: zones indicating the sensitive receptors within the main contributing sources

Hotspot Zone	Sensitive Receptors within the Zone	Emission Sources within the Zone	Additional Sources not quantified and included	Pollutants of concern
4	Residential developments of Vereeniging and Meyerton	Industrial activities (viz. ArcelorMittal, Vaal works, ArcelorMittal Klip Works, BHP Metalloys, Commercial boilers and other smack industrial activities) and domestic fuel burning	Agricultural Activities and large areas of biomass burning	PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>2</sub> , Ozone, VOC's

\*\* Table C from the Vaal Triangle Air-shed Priority Area, Air Quality Management Plan

In Section 5 of the VTAPA Air Quality Management Plan (AQMP) BHP Metalloys Samancor, was identified as one of the industries that have to reduce their emission to assist the air shed area to be able to reduce their emission within a certain time period. Refer to Table 11 for Ferroalloys contribution to inhalable particulate emissions.

DMS Powders operates on BHP Metalloys Samancor's property and therefore shares the responsibility to reduce the emissions generated from that area to reach the targets as set-out in the VTAPA AQMP.

Table 11: Source Contribution of inhalable Particulate Emissions.

Industry	Emission %
Iron & Steel Processes	30.70%
Petrochemical	10.01%
<b>Ferroalloys</b>	<b>2.08%</b>
Power generation	15.60%
Domestic Fuel Burning	5.14%
Vehicles	13.71%
Mines and Ash dumps	12.30%
Commercial	0.13%
Other Industries	10.33%

\*\* Vaal Triangle Air-shed Priority Area Air Quality Management Plan, May 2009



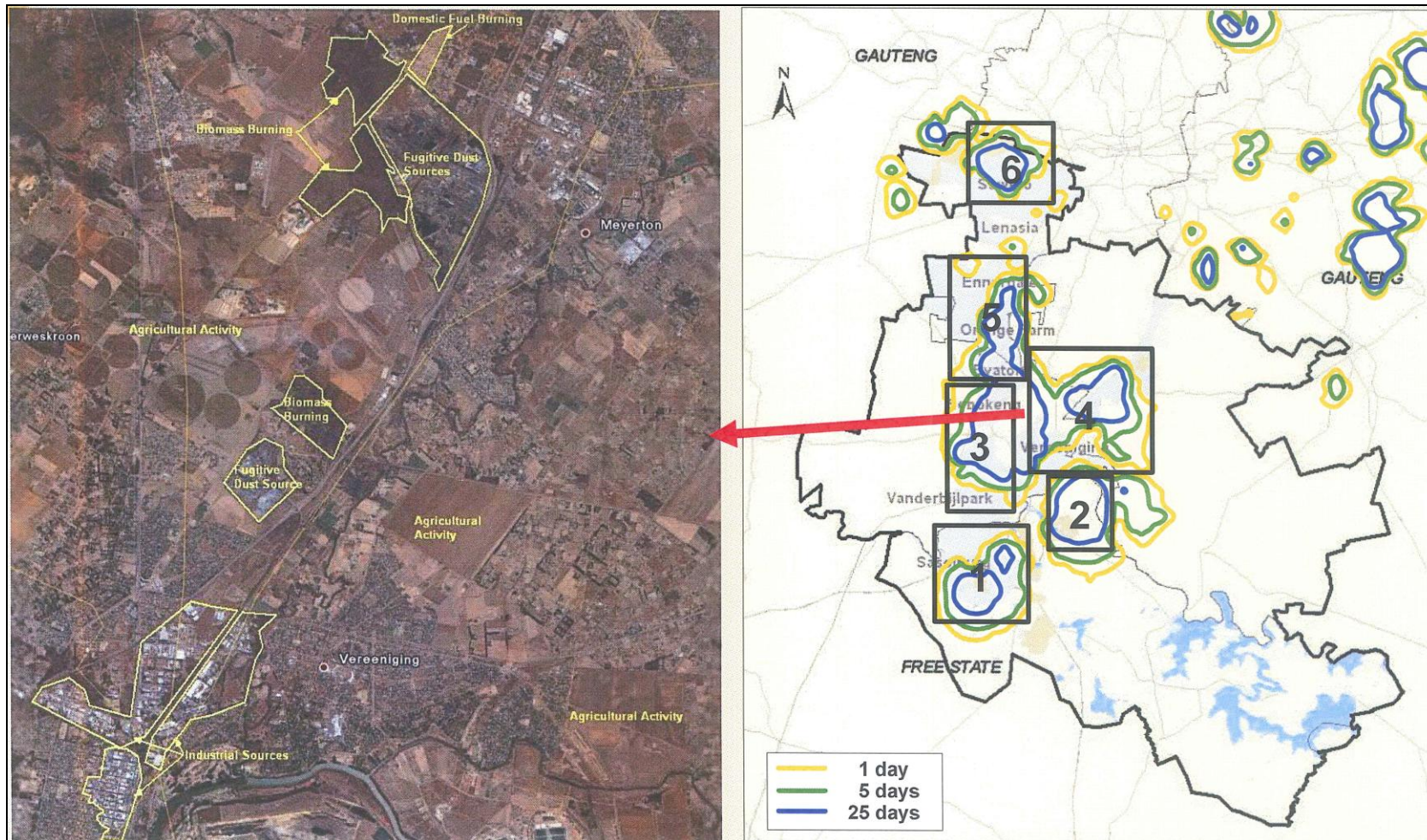


Figure 24: "Hotspot" Zone Number 4.

\*\*Vaal Triangle Air-Shed Baseline Characterisation presentation 11 October 2007 – Airshed Planning Professional

## DMS Powders' Atmospheric Impact

The production of Ferrosilicon (FeSi) powders at DMS Powders triggers the activity listed in Category 4, Subcategory 4.9: Ferro-alloy production in terms of Government Notice No. 248 as contemplated in Section 21(1)(a) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). Refer to Table 12 for the minimum emission standards for this listed activity.

Table 12: Subcategory 4.9: Ferro-alloy production.

Description	Production of alloys of iron with chromium, manganese, silicon or vanadium, the separation of titanium, slag from iron-containing minerals used in heat		
Application	All Installations		
Substance or mixture of substances		Plant	Mg/Nm <sup>3</sup> under standard conditions of 273K and 101.3kPa
Common Name	Chemical Symbol	Status	
Sulphur Dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of Nitrogen	NO <sub>x</sub>	New	400
		Existing	750
Particulate matter from primary fume capture system, open and semi-closed furnaces			
Particulate Matter	PM	New	30
		Existing	100
Particulate matter from primary fume capture system, closed furnaces			
Particulate Matter	PM	New	50
		Existing	100
Particulate Matter from secondary fume capture system, all furnaces			
Particulate Matter	PM	New	50
		Existing	100

Processes and associated installations that contribute to atmospheric emissions include the;

- Atomised Ferrosilicon: M8 Furnaces, M8 Baghouse and Drier, M8 Atom Tank, M8 Vacuum Pump,
- Milled Ferrosilicon: M9 Furnace, Ball Mills (MM4, MM5, MM6, MM7)

A consultant from Poltech visited the DMS Powders facility on 7 and 8 October 2010 to conduct emission measurements on the above mentioned installations. The results can be viewed in Table 12.



Table 13: Stack Emission concentration taken at the various stack emission points (I-CAT, 2010).

Sample Number	Pollutant Monitored	Emission Concentration (mg.Nm <sup>3</sup> )	Mass flow (kg/h)
MM4, MM5 and MM6 (8/10/10 from 09:00 – 10:00)			
VAR 271	Total Particles	21.52	0.03
MSI 150 PRO Gas Monitor	Nitrogen Oxide	17.4	0.025
	Sulphur dioxide	ND	N/A
	Carbon monoxide	0.1%	N/A
	Carbon Dioxide	20.8	N/A
	Oxygen		N/A
MM7 Mill (8/10/10 from 10:10-11:10)			
VAR 273	Total Particles	16.11	0.17
MSI 150 PRO Gas Monitor	Nitrogen Oxide	21.3	0.22
	Sulphur dioxide	ND	N/A
	Carbon Monoxide	ND	N/A
	Carbon Dioxide	0.1%	N/A
	Oxygen	20.8%	N/A
Baghouse and drier M8 (8/10/10 from 11:15-12:15)			
VAR 269	Total Particles	170.54	0.57
MSI 150 PRO Gas Monitor	Nitrogen Oxide	25.7	0.083
	Sulphur dioxide	ND	N/A
	Carbon Monoxide	ND	N/A
	Carbon Dioxide	0.3%	N/A
	Oxygen	20.5%	N/A
M8 atom tank (7/10/10 from 11:30 – 12:30)			
VAR 266	Total Particles	16.02	0.046
MSI 150 PRO Gas Monitor	Nitrogen Oxide	1.54	0.004
	Sulphur dioxide	ND	N/A
	Carbon Monoxide	ND	N/A
	Carbon Dioxide	0.1%	N/A
	Oxygen	20.8%	N/A
M8 Vacuum pump (8/10/10 from 11:15-12:15)			
MSI 150 PRO Gas Monitor	Nitrogen Oxide	ND	N/A
	Sulphur dioxide	3.2	0.0008
	Carbon monoxide	ND	N/A
	Carbon Dioxide	0.1%	N/A
	Oxygen	20.7	N/A

M9 Drier (7/10/10 from 14:00-15:00)			
VAR 270	Total Particles	1002.24	4.29
MSI 150 PRO Gas Monitor	Nitrogen Oxide	11.5	0.05
	Sulphur dioxide	28.4	0.13
	Carbon monoxide	ND	N/A
	Carbon Dioxide	2.5%	N/A
	Oxygen	17.9%	N/A
M9 Baghouse (7/10/10 from 10:00-11:00)			
VAR 274	Total Particles	30.51	0.95
MSI 150 PRO Gas Monitor	Nitrogen Oxide	22.4	0.69
	Sulphur dioxide	168.4	5.25
	Carbon monoxide	1.5	0.047
	Carbon Dioxide	0.4%	N/A
	Oxygen	20.3	N/A
M9 Granulation (7/10/10 from 15:10-16:10)			
VAR 269	Total Particles	15.37	0.076
MSI 150 PRO Gas Monitor	Nitrogen Oxide	3.4	0.017
	Sulphur dioxide	ND	N/A
	Carbon monoxide	ND	N/A
	Carbon Dioxide	0.4%	N/A
	Oxygen	20.4	N/A
**Kg/hr	Kilogram per hour		
**Mg/Nm <sup>3</sup>	Milligrams per normal cubic metre (at 0°)		
**NA	Not Applicable		
**ND	Pollutant Not detected		
	Highlighted blocks indicate areas where the figure is above regulation values		

DMS Powders' nitrogen- and sulphur oxide emissions are well within the regulatory specification. Particulate matter concentrations sampled at the Bag House & Drier M8 and M9 Drier were however of concern. DMS Powders are investigating feasible ways to harness the emissions effectively and to mitigate this problem (*I-CAT, 2010*).

## 2.2.9 Aesthetics

### Land use

The land use and the land cover of the area have been identified as a built up area; the DMS Powders site is located within an existing industrial area on the M61 just west of the town of Meyerton (Refer to Figure 26).



### **Sites of Archaeological and cultural interest**

The South African Heritage Resources Agency (SAHRA) requested a Phase 1 Heritage- and Archaeological Impact Assessment, for the project. They also stipulated that should the property be very small or disturbed and there are no significant sites, the heritage specialist may choose to send a letter to the heritage authority to indicate that there is no necessity for any further assessment.

### **2.2.10 Socio-economic aspects**

DMS Powders are located within ward 3 of the Midvaal Local Municipality (LM) within the jurisdiction of the Sedibeng District Municipality.

#### **Demography**

The Demography of the Midvaal Local Municipality, especially relating to the labour force in relation to the district municipality and the other local municipalities in the Sedibeng district, is described in the sections below.

#### **Major economic activities**

The major economic activities within the Midvaal local municipality can be divided into three (3) sectors namely primary, secondary and tertiary sectors. The main activities in the different sectors have been set out in Figure 27.



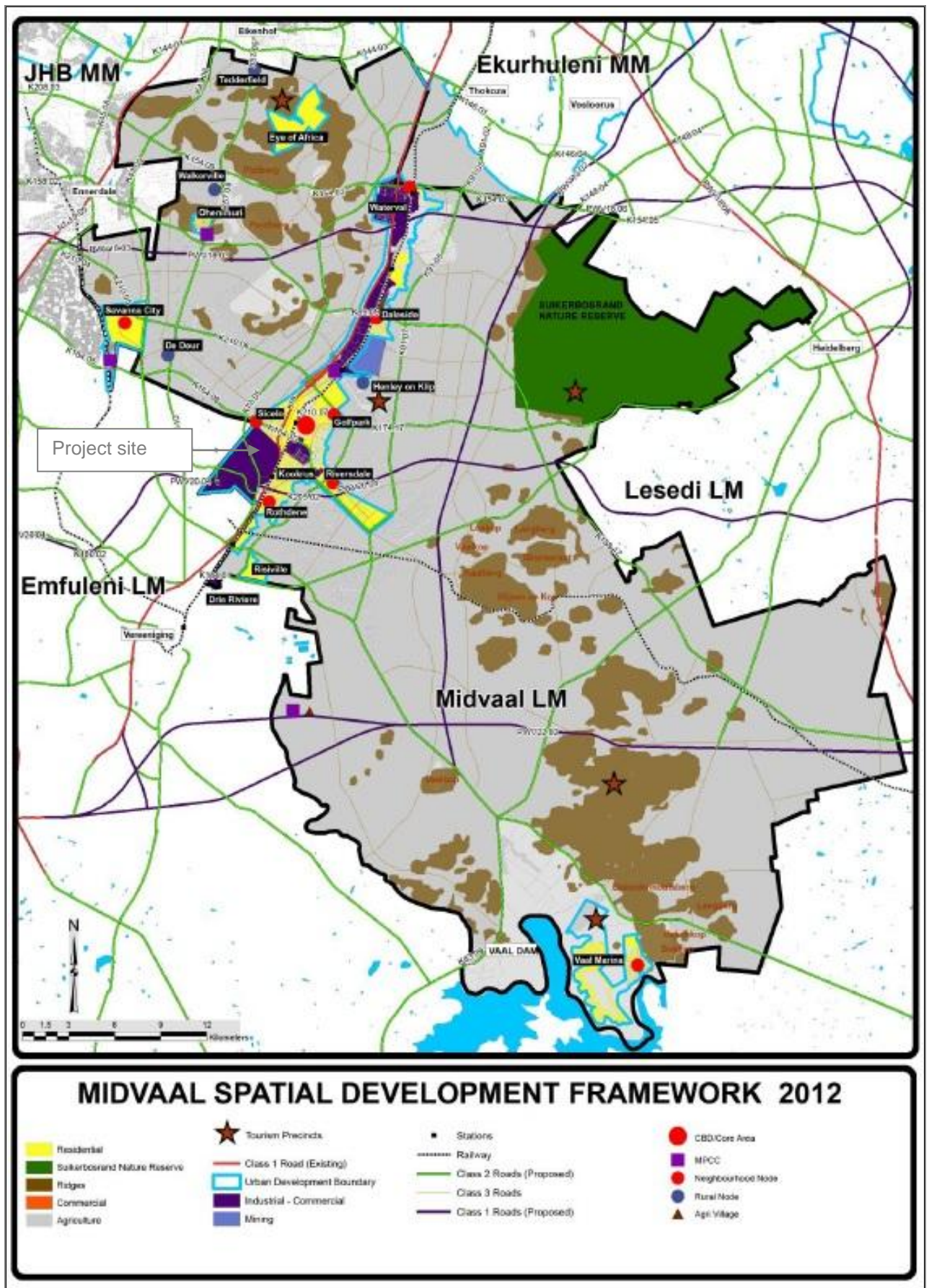


Figure 25: Map of the Midvaal Local Municipality (IDP 2012-2016 for 2012-2013).



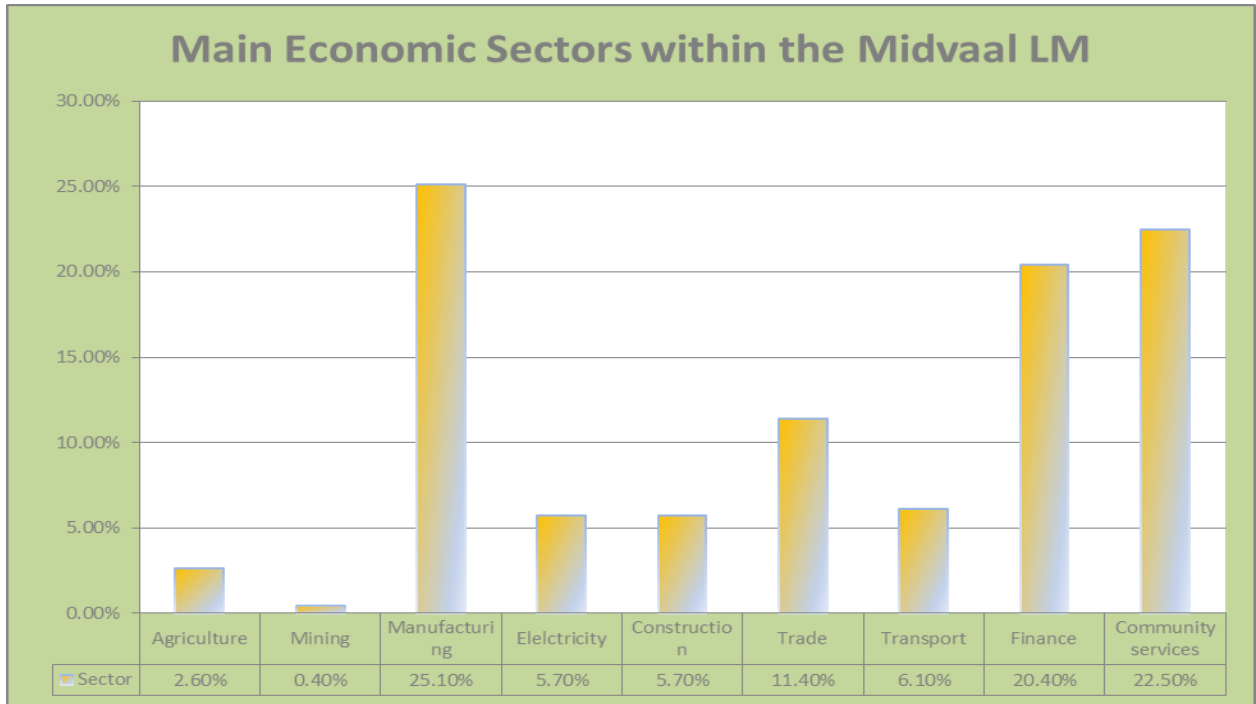


Figure 26: Main Economic activities in the Midvaal LM (Midvaal IDP 2012/2013)

### Unemployment and employment

According to statistics shown in the Midvaal Integrated Development Plan (IDP) of 2012/13, the Midvaal Municipality has the lowest poverty rate of approximately 17.2% in relation to the 41% of Emfuleni LM and the 37% of Lesedi LM (Refer to Figure 28).

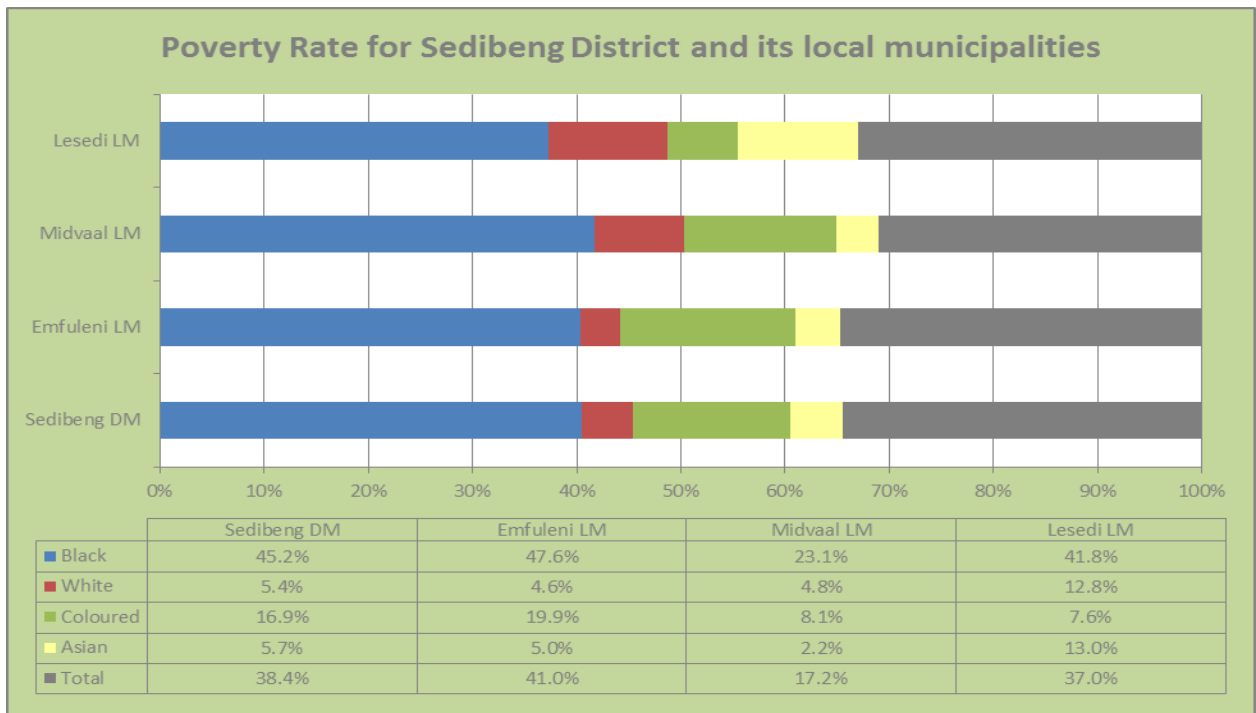


Figure 27: Poverty rate for Sedibeng and its local Municipalities (Midvaal IDP 2012/2013).



## Human Development Index

The Human development index for the Midvaal Local Municipality is the highest of all the local municipalities in the Sedibeng District Municipality (Refer to Figure 29).

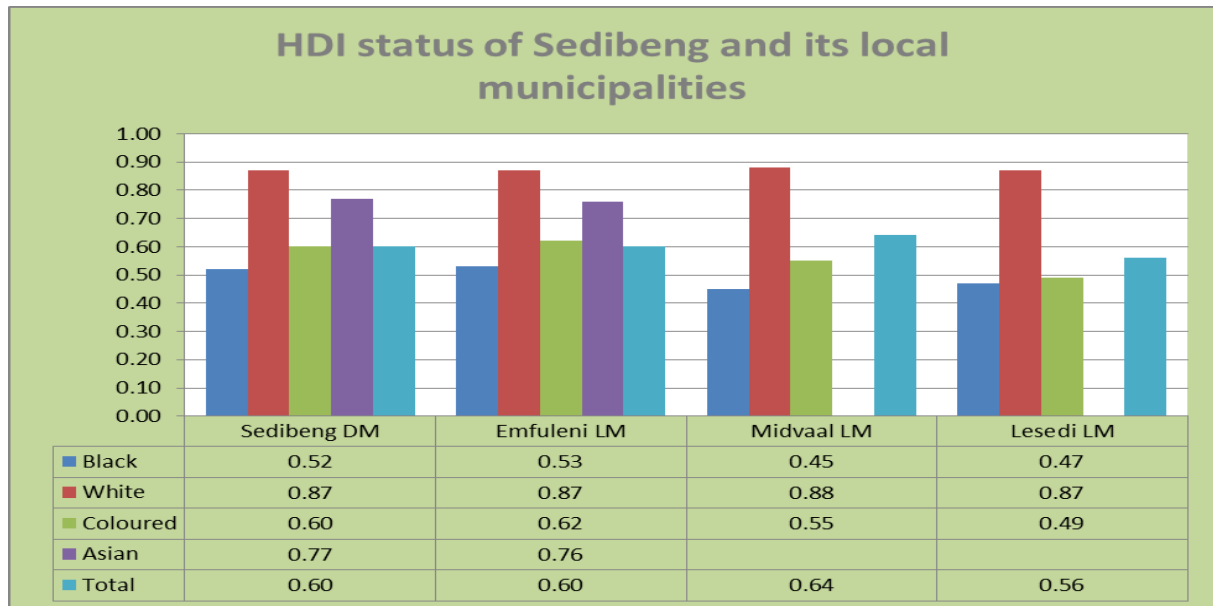
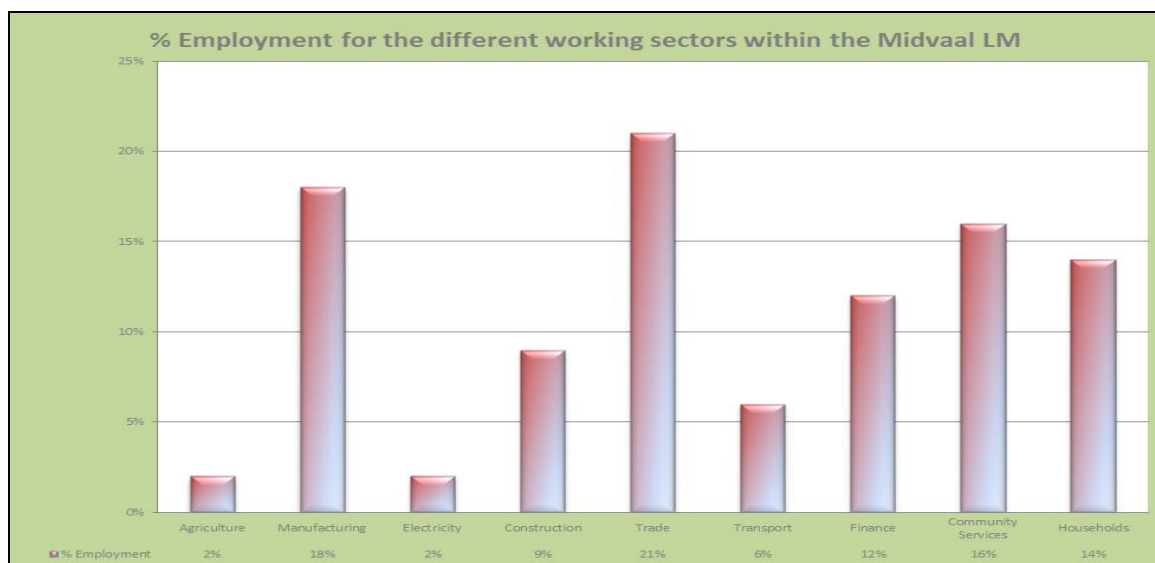


Figure 28: HDI status of Sedibeng and its local municipalities (Midvaal IDP 2012/2013).

## Employment per Economic Sectors

The three main employment opportunities are within the trade, manufacturing and the community services sector within the Midvaal Local Municipality. The agricultural sector only employs approximately 2% and the transport sector only 6% of the economically active population. (Refer to Figure 30 below)



*Figure 29: Percentage employment for the different working sectors within the Midvaal LM (Midvaal IDP 2012/2013)*



## 3. LEGISLATION, BYLAWS & GUIDELINES

### 3.1 Laws of general application

The list below forms part of the general legislation within the Republic of South Africa:

- Constitution of the RSA, 1996 (Act No 108 of 1996)
- National Environmental Management Act, 1998 (Act No 107 of 1998)
- Environment Conservation Act, 1989 (Act No 73 of 1989 as amended)
- Promotion of Access to Information Act, 2000 (Act No 2 of 2000 as amended)

### 3.2 Atmospheric emissions

The National Environmental Management: Air Quality Act (Act No 39 of 2004) was promulgated on in 2004 and this act repealed the old Atmospheric Pollution Prevention Act, Act No 45 of 1965. Together with the new act is a list of activities that indicates what standard needs to be complied with by the different industry types.

The documents listed below are strategic planning documentation related to the Vaal Triangle Airshed Priority Area:

- Vaal Triangle Airshed Priority area Air Quality Management Plan, 29 May 2009, Government Notice No 613, Government Gazette No 32263 of 28 May 2009
- Proposed regulations to provide for the application for atmospheric emission license and matter pertaining to the implementation of the atmospheric emission licensing system, General Notice No 141, Government Gazette No 32962 of 17 February 2010
- Gauteng Province Air Quality Management Plan, GDARD, Aug 2009
- Declaration of the Vaal Triangle Air-shed Priority area in terms of Section 18(1) of the National Environmental Management: Air Quality Act 2004, Act 39 of 2004), Government Notice No 365, Government Gazette No 28732 of 21 April 2006
- Regulation for implementing and enforcing the Vaal triangle Air-shed Priority Area Air Quality Management Plan, Government Notice 614, Government Gazette No 32254 of 29 May 2009.
- Vaal Triangle Air-shed priority Area (VTAPA) Implementation Report one, DEAT, September 2011

### 3.3 Water Management

- National Water Act, 1998 (Act No 36 of 1998)
- Government Gazette Notice No 1199 of 2009, Department of water affairs and forestry – Replacement of general authorisations in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998)



### **3.4 Waste Management**

- National Environmental Management: Waste Act (Act No 59 of 2008)
- Government Notice 718 of 3 July 2009, Waste Management activities in respect of which a waste management license is required in accordance with section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008)

### **3.5 Planning of new activities**

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

### **3.6 Biodiversity**

- National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004)
- Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983)
- National Veld and Forest Fire Act, 1998 (Act No 101 of 1998)
- Agricultural Pest Act, 1983 (Act No 36 of 1983 as amended) – GN R276 of 5 March 2004
- National Fencing Act, 1963 (Act No 31 of 1963 as amended)
- National Forest and Fire Laws Amendment Act (Act No 12 of 2001)

### **3.7 Land and Soil Management**

- National Environmental Management Act, 1998 (Act No 107 of 1998)
- Environmental Conservation Act, 1989 (Act No 73 of 1989)

### **3.8 Heritage resources**

- National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999 as amended)

### **3.9 Protected areas**

- National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003 as amended)

During the course of the development, the developer and contractors must comply with all other relevant legislation (including the bylaws of the Local Municipality).



## 4. PUBLIC PARTICIPATION PROCESS

### 4.1 Introduction

A Public Participation Process (PPP) is a requirement in terms of the 2010 EIA Regulations of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and it forms an integral part of any EIA process.

This section provides information pertaining to the PPP that was conducted by Shangoni Management Services during this particular assessment.

The purpose of this process is to gather information from the community and relevant Stakeholders that could ultimately affect the decision-making process concerning the Planning & Design, Construction, Operational and Closure Phases of the proposed DMS Powders project. The community and public have been identified as I&APs and have been given the opportunity to participate in this process. Their comments, whether positive or negative, will influence the decision of the Authorities and the developer's final actions.

### 4.2 Objectives of the PPP

The PPP has the following objectives:

- To inform I&APs as well as all Stakeholders of the proposed development;
- To provide an opportunity for I&APs and Stakeholders to raise environmental issues or concerns and make suggestions;
- To promote transparency and an understanding of the project and its consequences;
- To serve as a structure for liaison and communication with I&APs and Stakeholders.

To summarise, the objective of the on-going PPP is to promote openness and transparency concerning the proposed upgrading of the storm water control infrastructure for the duration of the project. The process should by no means be regarded as a vehicle to temper opposition or objections. Any conclusions agreed upon must be socially, financially and technically acceptable and feasible in order to meet the requirements of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), and the vision of DMS Powders.

### 4.3 The Guidelines Followed for the PPP

The PPP for this project was conducted by Shangoni Management Services and undertaken strictly according to the guidelines in terms of the National Environmental Management Act (NEMA), No. 107 of 1998, Chapter 6.



## 4.4 Public Participation Process

54. (1) This regulation only applies in instances where adherence to the provisions of this regulation is specifically required.
- (2) The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by-
- (a) fixing a notice board at a place conspicuous to the public at the boundary or on the fence of -
- (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- (b) giving written notice to -
- (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in –
- (i) one local newspaper; or
  - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in sub regulation (c) (ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to
- (i) illiteracy;
  - (ii) disability;
  - (iii) or any other disadvantage.
- (3) A notice, notice board or advertisement referred to in sub regulation (2) must



- (a) give details of the application which is subjected to public participation; and
- (b) state-
  - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
  - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
  - (iii) the nature and location of the activity to which the application relates;
  - (iv) where further information on the application or activity can be obtained; and
  - (vi) the manner in which and the person to whom representations in respect of the application may be made.
  
- (4) A notice board referred to in sub regulation (2) must-
  - (a) be of a size at least 60cm by 42cm; and
  - (b) display the required information in lettering and in a format as may be determined by the competent authority.
  
- (5) Where deviation from sub regulation (2) may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub regulation to the extent and in the manner as may be agreed to by the competent authority.
  
- (6) Where a basic assessment report, scoping report or environmental impact assessment report as contemplated in regulations 22, 28 and 31 respectively is amended because it has been rejected or because of a request for additional information by the competent authority, and such amended report contains new information, the amended basic assessment report, scoping report or environmental impact assessment report must be subjected to the processes contemplated in regulations 21, 27 and 31, as the case may be, on the understanding that the application form need not be resubmitted.
  
- (7) When complying with this regulation, the person conducting, the public participation process must ensure that-
  - (a) information containing all relevant facts in respect of the application is made available to potential interested and affected parties; and
  - (b) participation by potential interested and affected parties is facilitated in such a manner that all potential interested and affected parties are provided with a reasonable opportunity to comment on the application.
  
- (8) Unless justified by exceptional circumstances, as agreed to by the competent authority, the applicant and EAP managing the environmental assessment process must refrain from conducting any public participation process during the period of 15 December to 2 January.





## 4.5 Register of interested and affected parties

### Register of interested and affected parties

55. (1) An EAP managing an application must open and maintain a register which contains the names, contact details and addresses of -
- (a) all persons who, as a consequence of the public participation process conducted in respect of that application in terms of regulation 54, have submitted written comments or attended meetings with the applicant or EAP;
  - (b) all persons who, after completion of the public participation process referred to in paragraph (a), have requested the applicant or the EAP managing the application, in writing, for their names to be placed on the register; and
  - (c) all Organs of State which have jurisdiction in respect of the *activity* to which the application relates.
- (2) An EAP managing an application must give access to the register to any person who submits a request for access to the register in writing.

### Registered interested and affected parties entitled to comment on submissions

56. (1) A registered interested and affected party is entitled to comment, in writing, on all written submissions, including draft reports made to the competent authority by the applicant or the EAP managing an application, and to bring to the attention of the competent authority any issues which that party believes may be of significance to the consideration of the application, provided that-
- (a) comments are submitted within-
    - (i) the timeframes that have been approved or set by the competent authority; or
    - (ii) any extension of a timeframe agreed to by the applicant or EAP;
  - (b) a copy of comments submitted directly to the competent authority is served on the EAP; and
  - (c) the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.
- (2) Before the EAP managing an application for environmental authorisation submits a final report compiled in terms of these Regulations to the competent authority, the EAP must give registered interested and affected parties access to, and an opportunity to comment on the report in writing.
- (3) The report referred to in sub regulation (2) include-
- (a) basic assessment reports;
  - (b) basic assessment reports amended and resubmitted in terms of regulation 24 (4);
  - (c) scoping reports;
  - (d) scoping reports amended and resubmitted in terms of regulation 30(3);



- (e) specialist reports and reports on specialised processes compiled in terms of regulation 32;
  - (f) environmental impact assessment reports submitted in terms of regulation 31;
  - (g) environmental impact assessment reports amended and resubmitted in terms of regulation 34(4); and
  - (h) draft environmental management programmes compiled in terms of regulation 33.
- (4) The draft versions of reports referred to in sub regulation (3) must be submitted to the competent authority prior to awarding registered interested and affected parties an opportunity to comment.
- (5) Registered interested and affected parties must submit comments on draft reports contemplated in sub regulation (4) to the EAP, who should record it in accordance with regulations 21, 28 or 31.
- (6) Registered interested and affected parties must submit comments on final reports contemplated in sub regulation (3) to the competent authority and provide a copy of such comments to the applicant or EAP.
- (7) The competent authority must, in order to give effect to section 24O of the Act, on receipt of the draft reports contemplated in sub regulation (5), request any State department that administers a law relating to a matter affecting the environment to comment within 40 days.
- (8) The timeframe of 40 days as contemplated in sub regulation (7) must be read as 60 days in the case of waste management activities as contemplated in the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), on which the Department of Water Affairs must concur and issue a record of decision in terms of section 49(2) of the National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008)
- (9)(a) When a State department is requested by the competent authority to comment, such State department must, within 40 days or in the case of Department of Water Affairs, 60 days for waste management activities, of being requested to comment by the competent authority, provide comments to the competent authority.
- (b) If a State department fails to submit comments within 40, or 60 days for waste management activities, from the date on which the Minister, MEC, Minister of Mineral Resources or identified competent authority requests such State department in writing to submit comment, it will be regarded that there are no comments.

**Comments of interested and affected parties to be recorded in reports submitted to competent authority**



57(1) The EAP managing an application for environmental authorisation must ensure that the comments of interested and affected parties are recorded in reports and that such written comments, including records of meetings, are attached to the report, submitted to the competent authority in terms of these Regulations.

(2) Where a person is desiring but unable to access written comments as contemplated in sub regulation (1) due to-

- (i) a lack of skills to read or write;
- (ii) disability; or
- (iii) any other disadvantage;

reasonable alternative methods of recording comments must be provided for.

## 4.6 Public Participation Process Followed

### 4.6.1 Identification & Registration of I&APs on a Database

Through networking and advertising, I&APs were registered on a database. Shangoni ensured that individuals or organisations from an institutional as well as a geographical point of view were identified.

Geographically, Shangoni focused on nearby or adjacent landowners, communities and structures that represents them. Institutionally, the focus was on those organisations or individuals that may influence policies and decisions or make a contribution to the project. Not all of these organisations were necessarily in the direct project sphere of impact.

### 4.6.2 Information to I&APs

The interested and affected parties which included the adjacent land owners as well as certain Organs of State were informed of the project via newspaper advertisements, notice boards and registered notification letters. A period of 30 days were allowed for any person who feels that he or she is a interested and affected party can register as such.

### 4.6.3 Information to Stakeholders

The stakeholders received a background information document that was accommodated by a map as well as a stakeholder form this information pack was send via registered mail on the 11<sup>th</sup> of March 2013 (Refer to Table 14 for stakeholders identified).

*Table 14: Stakeholders identified.*

Name of Department	Contact Person	Contact details
Gauteng Department of Community Safety	Advocate Mongezi Tshongweni / Ms Nonhlanhla Faith	Tel: (011) 689 3618 Fax: (011) 689 3660 Postal address: PO Box 62440, Marshalltown,



	Mazibuko	2107
Gauteng Department of Economic Development	Mr Khulu Radebe	Tel: (011) 355 8705 Fax: (011) 355 8289 Email: Khulu.radebe@gauteng.gov.za Postal address: Private Bag X091, Marshalltown, 2107
Gauteng Department of Finance	Mr. Mandla Nkomfe / Mr Stewart Lumka	Tel: (011) 689 8001 Fax: (011) 355 2005 Email: Stewart.lumka@gauteng.gov.za Postal address: Private Bag X112, Marshalltown, 2107
Gauteng Department of Health	Dr Nomonde Xundu	Tel: (011) 355 3513 Fax: (011) 355 3512 Email: nomonde.xundu@gauteng.gov.za Postal address: Private Bag X085, Marshalltown, 2107
Gauteng Department of Infrastructure Development	Ms Maggie Modipa / Mr Stewart Lumka (Acting)	Tel: (011) 355 7438 / 5002 Fax: (011) 355 7457 Email: Stewart.lumka@gauteng.gov.za Postal address: Private Bag X83, Marshalltown, 2107
Gauteng Department of Local Government and Housing	HOD: Mr Mongezi Mnyani	Tel: (011) 355 4230 Fax: (011) 355 8973 Email: Mongezi.mnyani@gauteng.gov.za Postal address: Private Bag X79, Marshalltown, 2107
Gauteng Department of Roads and Transport	Ms Margaret-Ann Diedricks	Tel: (011) 355 7301 Fax: (011) 355 7509 or 086 720 3011 Email: Margaret-ann.Diedricks@gauteng.gov.za Postal address: Private Bag X88, Marshalltown, 2107
Department of Water Affairs	Ms Florah Mamabolo	Tel: (012) 392-1361 Fax: (012) 336 8664 Email: MamaboloF@dwa.gov.za Postal address: Private Bag X313, Pretoria, 0001
South African Heritage Resource Agency	Mr. Andrew Salomon	Tel: (021) 462 4502 Fax: (021) 462 4509 Postal address: P.O. Box 4637, Cape Town, 8000
Midvaal Local Municipality	Mr. Henry Human	Tel: 016 360 7422 Fax: 016 360 7538 Email: henryh@midvaal.gov.za Postal address: P.O. Box 9, Meyerton, 1960
Sedibeng District Municipality	Mr. Ziez van Zyl	Tel: 016 450 3259 Fax: 016 427 1014/016 455 2573 Email: ziesvz@sedibeng.gov.za Postal address: PO Box 471, Vereeniging, 1930

#### 4.6.4 Registering Stakeholders

A contact database was opened for all registered interested and affected parties. The register includes the name of the I&AP, Postal Address, Physical Address, E-mail, Tel, Cell and Fax numbers as well as designation and the company name (Refer to Table 15).



Table 15: I&AP Register.

Name	Organisation/Farm	Postal Address	Contact details
Mr. Avhaphani Justice Fhedzisani	Department of Water Affairs	Private Bag X313 Pretoria 0001	Tel: 012 392 1388 Cell: 072 732 6287 Email: FhedzisaniA@dwa.gov.za
Mr. Jako Verster	Midvaal Local Municipality	PO Box 9 Meyerton 1960	Tel: 016 360 5860 Cell: 082 783 0057 Email: jakov@midvaal.gov.za
Mr. Deon du Plessis	BHP Billiton	Metalloys PO Box 66 Meyerton 1960	Tel: 016 360 2313 Cell: 072 103 1549 Email: deon.duplessis@bhpbilliton.com
Mrs. Tania Dunne	BHP Billiton	Metalloys PO Box 66 Meyerton 1960	Tel: 016 360 2552 Cell: 082 316 8690 Email: tania.dunne@bhpbilliton.com
Mr. Sfiso Ngwenya	BHP Billiton	Metalloys PO Box 66 Meyerton 1960	Tel: 016 360 2326 Cell: 083 683 0514 Email: sifiso.ngwenya@bhpbilliton.com
Mr. Heiko Stoelting	BHP Billiton	BHP Billiton PO Box 61820 Marshalltown 2107	Tel: 011 376 2195 Cell: 082 662 4685 Email: heiko.stoelting@bhpbilliton.com
Mr. Andrew Salomon	South African Heritage Resources Agency	PO Box 4637 Cape Town 8000	Tel: 021 462 4502 Email: asalomon@sahra.org.za
Loza Lulama	Gauteng Department of Infrastructure Development	Private Bag X83 Marshalltown 2107	Cell: 082 887 0130 Email: Lulama.Loza@gauteng.gov.za

#### 4.6.5 Press Notices

Newspaper advertisements were placed in the Beeld and the Vaal Ster on the 12<sup>th</sup> of March 2013. (Refer to Appendix E6).

#### 4.6.6 Placement of Public Notices

Two Notice boards were placed in and around the project site at strategic locations to be as visible as possible. (Refer to Figure 31 and Figure 32).

#### 4.6.7 Minutes of public meeting

No public meetings have been held during the Public Participation Phase.

#### 4.6.8 Issuing I&APs and Stakeholders with a Draft Scoping Report

This draft Scoping Report will be sent to all Departments and Organs of State as well as all registered I&APs in order to obtain their comments and notices. The report will also be submitted to the Gauteng Department of Agriculture and Rural Development for review.



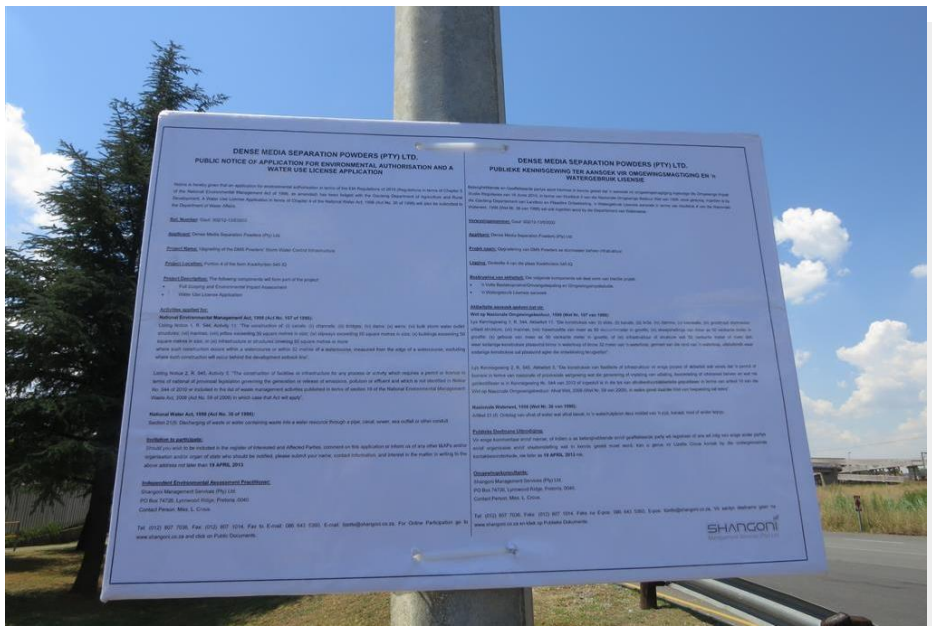


Figure 30: Photograph of first notice board.

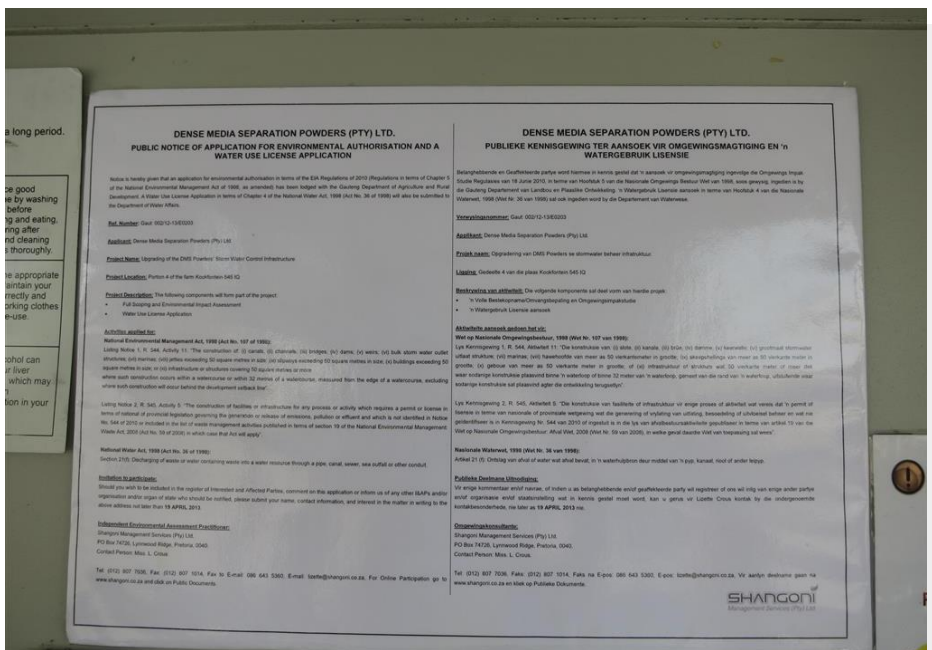


Figure 31: Photograph of second notice board.



#### 4.6.9 Comments and response report

Table 16: Comments / Concerns received from Department and or Organs of State.

Date received	Received from	Comment/Concern received	Responses sent
10 April 2013	Loza Lulama Gauteng Department of Infrastructure Development	<p>The Department of Infrastructure Development is concerned with the lack of progress on the above mentioned matter.</p> <p>According to our understanding you're supposed to have submitted a draft scoping report to the Department of Agriculture and Rural Development by now.</p> <p>If no submission made kindly indicate when do you intend doing so?</p>	<p>Thank you for your comments. They have been noted and will be included in the reports for this project. The draft Scoping Report will be submitted in due course.</p>
17 April 2013	Andrew Salomon South African Heritage Resources Agency	<p>Thank you for your notification regarding this development.</p> <p>In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites</p>	<p>I hereby acknowledge receipt of SAHRA's comments on the application for environmental authorisation of the following project: Upgrading of the DMS Powders Storm Water Control Infrastructure (EIA Reference number: Gaut: 002/12-13/E0203).</p> <p>Thank you for your inputs.</p>



		<p>that are to be destroyed, must be done as required.</p> <p>The quickest process to follow for the archaeological component is to contract an accredited specialist (see the web site of the Association of Southern African Professional Archaeologists <a href="http://www.asapa.org.za">www.asapa.org.za</a>) to provide a Phase 1 Archaeological Impact Assessment Report. This must be done before any large development takes place.</p> <p>The Phase 1 Impact Assessment Report will identify the archaeological sites and assess their significance. It should also make recommendations (as indicated in section 38) about the process to be followed. For example, there may need to be a mitigation phase (Phase 2) where the specialist will collect or excavate material and date the site. At the end of the process the heritage authority may give permission for destruction of the sites.</p> <p>Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in potentially fossiliferous superficial deposits, a Palaeontological Desk Top study must be undertaken to assess whether or not the development will impact upon palaeontological resources - or at least a letter of exemption from a Palaeontologist is needed to indicate that this is unnecessary. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment</p>	
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		<p>will be required and if necessary a Phase 2 rescue operation might be necessary.</p> <p>If the property is very small or disturbed and there is no significant site the heritage specialist may choose to send a letter to the heritage authority to indicate that there is no necessity for any further assessment.</p> <p>Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes must also be assessed.</p> <p>Should you have any further queries, please contact the designated official using the case number quoted above in the case header.</p>	
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## 5. NEED AND DESIRABILITY

### 5.1 Developer

By licensing the discharge of the treated affected storm water into the pollution control, DMS Powders will reduce its current legal liability. Conditions subject to the licensing will ensure maintenance of facilities and monitoring of treated affected storm water discharge. This will in effect result in a more accurate representation of the operations impact on the BHP Billiton storm water control dam and possible impact on the Fouriespruit and promote early problem identification and corrective action implementation.

The wider site area is not owned or controlled by DMS Powders limiting the control over upstream storm water runoff. The improved storm water control system will allow the quality and quantity of storm water runoff to be more effectively regulated by DMS Powders as well as reduce the risk of property damage during floods and their liability associated with unmitigated downstream impacts.

### 5.2 Local Community

Hydrocarbons and heavy metals picked up in the storm water (refer to section 2.2.5) are persistent environmental pollutants with severe human health impacts, such as carcinogenesis. By reducing the quantity and extent of the storm water contamination, the resultant potential impact on the community is also reduced.

## 6. IDENTIFIED ALTERNATIVES

### 6.1 No-Go option

The potential impact of the preferred project option on environmental and socio-economic attributes – identified during the assessment phase – is evaluated against the potential impact of the no-go option on the same attributes. The summary of this assessment is provided in Table 17 below.

Table 17: Development vs. No-Go Option.

Attribute	Development Option	No-go Option 2
<b>Physical environment</b>		
Air Pollution	0	0
Noise Pollution	0	0
Water Quality	1	-1
Water Quantity	1	-1



Visual Aesthetics	0	0
Biophysical environment		
Fauna and Flora	0	0
Sensitive Environments	0	0
Social environment		
Community health	1	-1
Infrastructure	1	-1
Impact on property values	0	0
Safety and security	0	0
National and regional economy	0	0
<b>Total</b>	<b>4</b>	<b>-4</b>

The no-go alternative is the option wherein the storm water infrastructure is not upgraded. The positive environmental and social impacts of the proposed upgrade outweigh the potential negative impacts and the consideration of the “no-go” option can be justifiably dismissed as a sustainable alternative.

## 6.2 Alternatives to site selection

The property on which the proposed upgrading of the storm water control infrastructure will take place belongs to BHP Metalloys Samancor; DMS Powders have been leasing the property from Metalloys for the past 10 years. Relocating is not foreseen in the near future thus no site alternatives could be considered

## 6.3 Storm water control infrastructure design and location alternatives:

For practical reasons the steel shavings stockpile area will remain unroofed. A Storm Water Management Plan (SWMP), based on extreme weather conditions and the footprint limitations, will be developed for DMS Powders to address the treatment of affected, first flush storm water, segregation of clean water from dirty water on the site and better regulation of DMS’s impact on storm water runoff. The SWMP will be conceptual in its design and should be used as an action strategy to address shortfalls. It is the responsibility of DMS Powders to ensure that storm water control measures are designed and constructed to be capable of withstanding the maximum designed flood volume (Refer to Appendix F).



# 7. IDENTIFICATION OF ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This part of the document focuses on the identification of the major potential impacts the activities, processes and actions may have on the surrounding environment. It indicates the major impacts that these activities have on the environmental components associated with the site, as required in terms of Regulation 28 (g) of R.543 of the EIA Regulations, 2010, under the NEMA, 1998. Furthermore, it describes the processes to be undertaken to ensure that the identified impacts are mitigated.

## 7.1 Activities to be undertaken

The activities associated with the proposed upgrading of the storm water control infrastructure- will impact on the surrounding environment throughout the different project phases. All activities relevant to the proposed project that may cause pollution or environmental degradation, if not suitably mitigated or managed, have been identified and categorised. The relevant activities, listed per life cycle phase, are given below.

### 7.1.1 Planning and Design

- Examine alternatives;
- Determine location of storm water control infrastructure;
- Initiate the development of appropriate maintenance, monitoring and management plans (such as a storm water management plan); and
- Initiate appropriate specialist studies.

### 7.1.2 Construction

- Removal of topsoil in areas where the storm water control infrastructure is to be implemented;
- Removal of topsoil and subsoil in areas where the collection sump is to be constructed; and
- Use of cement and concrete.

### 7.1.3 Operation

- Maintenance of the storm water control infrastructure;
- Extreme weather conditions may lead to an overflow of the collection sump and the Wastewater Treatment Works exceeding its treatment capacity;
- Extreme weather conditions may lead to an overflow of the reservoir exceeding its holding capacity; and



- Incorrect disposal of brine from the Wastewater Treatment Works.

#### **7.1.4 Closure**

It is unlikely that DMS Powders will be decommissioned and closed in the foreseeable future. However, if closure is considered, an extensive closure and rehabilitation plan will be drafted and sent to the Department prior to the event.

## **7.2 Impact Assessment in Scoping Phase**

For the purpose of the Scoping Phase it is required by Regulation 28 (g) of R.543 of the EIA Regulations, 2010, that major potential impacts on the surrounding environment, as a result of the proposed activity, are identified.

Identification of the major potential impacts has therefore been included as part of the requirements for the compilation of the Scoping Report. The prediction of the nature of each impact, the evaluation of each impact by rating its significance and the management and mitigation measures adopted to address each impact, will be assessed during the EIR using the criteria presented in section 8.1.3 – Methodology of assessing the environmental issues.

## **7.3 Impacts Identified**

A number of potential impacts were identified within the draft Scoping study. These impacts are listed below.

### **7.3.1 Planning and Design**

- Ineffective upgrading of the storm water control infrastructure as a result of failing to identify suitable alternatives based on extreme weather conditions and location may lead to structure failure, flooding and property damage;
- The wider site area is not owned or controlled by the applicant, thus limiting the control over upstream storm water runoff;
- Siltation of existing trenches significantly reduces the drainage capacity, emphasising that maintenance is crucial;
- An inadequate maintenance and monitoring/inspection plan can result in the inability to identify and rectify environmental aspects and potential impacts and may lead to structure failure, flooding and property damage; and
- Hard surfaces within the plant area limit draining opportunities that can lead to ponding.



### 7.3.2 Construction

- Incorrect disposal of topsoil and subsoil removed from the area where the storm water control infrastructure and the Wastewater Treatment Works (containment sump and treatment plant) is to be installed; and
- Soil-, surface water- and groundwater pollution due to wash water runoff, contaminated by cement and concrete.

### 7.3.3 Operation

- Equipment and associated infrastructure failure as a result of poor maintenance and monitoring/inspection of the storm water control measures;
- Flooding and property damage as a result of structures such as the collection sump and reservoir exceeding their holding capacity during extreme weather conditions;
- Soil-, surface water- and groundwater pollution as a result of overflow of the storm water control dam into the receiving environment to the south of DMS Powders and BHP Metalloys;
- Health impact on down-gradient groundwater users as a result of the discharge of poorly treated affected storm water into an unlined storm water control dam;
- Soil-, surface water- and groundwater pollution as a result of incorrect disposal of brine from the Wastewater Treatment Works; and
- Soil-, surface water- and groundwater pollution as a result of incorrect monitoring of the quality and quantity of treated wastewater discharged into the pollution control dam.

### 7.3.4 Closure

It is unlikely that DMS Powders will be decommissioned and closed in the foreseeable future. However, if closure is considered, an extensive closure and rehabilitation plan will be drafted and sent to the Department prior to the event.

## 7.4 Process to ensure impacts are mitigated

Mitigation measures need to be identified to ensure that impacts from the proposed activity are reduced as far as possible. The following mitigation objectives will be kept in mind while mitigation measures are identified:

- To find more environmentally sound ways of undertaking specific activities;
- To enhance any environmental and social benefits of a proposed activity;
- To avoid, minimise or remedy negative environmental impacts; and
- To ensure that any residual negative environmental impacts are environmentally acceptable.

Identifying appropriate mitigation measures will be conducted in a hierarchal manner:

1. Preventative measures will be identified to avoid, where possible, negative impacts that may arise as a result of the proposed activity;



2. Measures will be identified to minimise and/or reduce the negative impacts to “as low as practicable” levels; and
3. Measures will be identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced.

Proposed mitigation measures will be communicated to the applicant for review. The applicant will comment on the feasibility and practicability of implementing the mitigation measures. The mitigation measures may be adjusted based on the applicant’s comments.

## **7.5 Specialist Studies Identified**

The following key specialist studies have been identified as part of the EIA

- Heritage Impact Assessment
- Hydrocensus
- Hydrogeological assessment
- Groundwater quality analyses of boreholes
- Storm Water Management Plan

## **8. PLAN OF STUDY FOR EIA**

In this part of the document a description is given of the steps to be taken as part of the Environmental Impact Assessment process. This section is written in accordance with Regulation 28 of R. 543 of the EIA Regulations of 18 June 2010.

### **8.1 Plan of Study**

#### **8.1.1 Tasks to be undertaken as part of the EIA process**

An application for environmental authorisation in terms of the EIA Regulations of 2010 (Regulations in terms of Chapter 5 of the National Environmental Management Act 1998, as amended) was lodged.

The Environmental Impact Assessment process will be conducted subsequent to the Scoping process and will be undertaken in accordance with the Regulation 31 of the EIA Regulations of 18 June 2010. The Environmental Impact Report (EIR) for the proposed project will include detailed information relating to the potential or anticipated impacts that may arise as a result of the proposed activity.

The EIR and draft EMP in accordance with NEMA (1998) and as per the EIA Regulations R.543 of 18 June 2010, will include, but is not limited, to the following:

- Details of the Environmental Assessment Practitioner (EAP).
- Expertise of the EAP to carry out an EIA.



- A detailed description of the proposed activity.
- A description of the property on which the activity is to be undertaken and the location of the activity on the property.
- A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.
- Details of the public participation process followed.
- A description of the need and desirability of the proposed activity.
- A description of the identified alternatives to the proposed activity, including advantages and disadvantages that the proposed activity may have on the environment and the community that may be affected by the activity.
- An indication of the methodology used in determining the significance of potential environmental impacts.
- A description and comparative assessment of all alternatives identified during the environmental impact assessment process.
- A summary of the findings and recommendations of any specialist report or report on a specialised process (no specific requests have been received from the competent authorities to date).
- A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures.
- An assessment of each identified potentially significant impact, including cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources, and the degree to which the impact can be mitigated.
- A description of any assumptions, uncertainties and gaps in knowledge.
- A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.
- An environmental impact statement.
- A draft environmental management programme containing the aspects contemplated in regulation, including, but not limited to, environmental management objectives and goals, mitigation measures and management of significant impacts, a description of persons responsible for mitigation implementation, description of time periods applicable to mitigation implementation, and monitoring and performance assessment.
- Inclusion of technical and supporting information.
- Copies of any specialist reports and reports on specialised processes complying with regulation.
- Any specific information that may be required by the competent authority.
- Any other matters required in terms of sections 24(4)(a) and (b) of the Act.





Compilation of the EIR and draft EMP will be conducted according to the EIA Regulations of 18 June 2010 (R.543) as per NEMA, 1998, and will include, but is not limited to, the following:

- The compilation of the EIR as stipulated in Regulation 31 of R.543 (18 June 2010), as per NEMA, 1998.
- The draft EIR and EMP will be submitted to the applicant for input prior to its submission for public and competent authority comment.
- Public Participation will be conducted in accordance with the EIA Regulations of 18 June 2010 (R.543). This will include submission of the draft EIR and EMP to the competent authority and the public in order to obtain their comments for a period of 40 days [R543(56)].
- All comments, objections and/or representations received during the Public Participation Process will be included and addressed in the final EIR and this document will be finalised.
- The final EIR and draft EMP will be submitted to the client to obtain their inputs.
- Registered Interested and Affected Parties will be given an opportunity to comment on the final EIR as stipulated in R543(56)(6). Their comments will be submitted directed to the competent authority and the EAP or applicant will be copied.
- The final EIR and draft EMP will be submitted to the competent authority for consideration. The competent authority will have 14 days to acknowledge receipt of the final EIR. Thereafter, the competent authority has 60 days to consider the report and in writing accept the report, reject the report, or ask for additional information or amendments to the document [R.543(34)(2)]. Once the report has been accepted, the competent authority has 45 days to grant or refuse authorisation [R.543 (35)(1)].
- Continued consultation with the relevant authority until issuing of the decision.

### **8.1.2 Stages at which the competent authority will be consulted**

The stages, at which the competent authority will be consulted in the process of compiling the EIR and draft EMP as per the EIA Regulations R.543 (2010), will include amongst other, the following:

- During the Public Participation Process in accordance to EIA Regulations R.543 (2010), the draft EIR will be submitted to the competent authority for a period of 40 days to obtain their comments [R543 (56)].
- The final EIR will be submitted to the competent authority. They will have 60 days, after acknowledging receipt of the final EIR, to consider the report and in writing accept the report, reject the report or request additional information or amendments to the document [Regulation 543(34)(2)].
- Continued consultation with the competent authority until the decision is issued.

On receipt of authorisation (positive or negative) for the project, I&APs on the project database will be informed of this environmental authorisation and its associated terms and conditions by registered post.



### 8.1.3 Methodology of assessing the environmental issues

Regulation 31 of R.543 of the EIA Regulations (2010), under the NEMA (1998), requires that an EIR includes an assessment of the status, extent, duration, probability, reversibility, replaceability of resources and mitigatory potential of the major potential environmental impacts of the proposed activity.

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication and evaluation;
- Specification of the impact identification techniques;
- Criteria to evaluate the significance of impacts;
- Design of mitigation measures to lessen impacts;
- Definition of the different types of impacts (indirect, direct or cumulative); and
- Specification of uncertainties.

In broad terms, the impact assessment for this project will include the following:

- All potential impacts of the proposed activity will be identified and assessed;
- The nature, extent, magnitude and duration of all potentially significant impacts will be predicted;
- A range of mitigation measures that could diminish the impacts will be identified; and
- The significance of residual impacts that remain after the proposed mitigation measures are implemented will be evaluated.

After all impacts have been identified, the nature of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined and appropriate mitigation measures can be developed. The impact prediction will take into account the following parameters (Refer to Table 18):

- The extent of the impact. This refers to the physical or geographical size that is affected by the impact and is divided into the following categories:
  - Onsite: Within the specific site boundary;
  - Local: Within the municipal boundary; and
  - Regional: Outside of the municipal boundary.
- The duration of the impact. This refers to the time span associated with the impact and is divided into the following categories:
  - Short term: An impact lasting for one year or less;
  - Medium term: An impact lasting for one to five years; and
  - Long term: An impact lasting for more than five years.
- The intensity and reversibility of the impact. This refers to the severity of the impact on the receiving environment and is divided into the following categories:



- Low: Natural and/or cultural processes continue in a modified way and the impact is reversible;
- Medium: Natural and/or cultural processes stop and the impact is partially reversible; and
- High: Natural and/or cultural processes are disturbed to an irreversible state.

A weighting value is assigned to each parameter category, with the value increasing as the impact becomes higher. For example, an impact that is of short duration will have a lower weighting value than one that is of longer duration.

To determine the significance of an impact, the weighting values for its extent, duration and intensity are added together (Extent + Duration + Intensity = High / Medium / Low Impact). Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment (the “environmental risk”). To determine the probability or likelihood of an impact occurring, the following categories are used:

- Unlikely: There is a 0% - 45% chance of the potential impact occurring;
- Possible: There is a 46% - 75% chance of the potential impact occurring; and
- Likely: There is a greater than 75% chance of the potential impact occurring.

The environmental risk of an impact is plotted in a matrix, shown in Table 19. Assigning a colour to the environmental risk provides a clear and immediate visual representation of the magnitude of the risk of an impact on the environment.

Table 18: Environmental impact assessment parameters.

Parameters	Description
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: <ul style="list-style-type: none"> <li>• Onsite – Within specific site boundary (weight value – 1)</li> <li>• Local – Within municipal boundary (weight value – 2)</li> <li>• Regional – Outside municipal boundary (weight value – 3)</li> </ul>
Duration	Time span associated with impact: <ul style="list-style-type: none"> <li>• Short term – 1 Year or less (weight value – 1)</li> <li>• Medium term – 1-5 Years (weight value –2)</li> <li>• Long term – Longer than 5 Years (weight value – 3)</li> </ul>
Intensity and reversibility	The severity of an impact on the receiving environment: <ul style="list-style-type: none"> <li>• Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1)</li> <li>• Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2)</li> <li>• High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)</li> </ul>
Significance of Impact / Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). <b>Extent + Duration + Intensity = High/Medium/Low Impact</b>



Probability	<p>The likelihood of an impact occurring:</p> <ul style="list-style-type: none"> <li>• Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1)</li> <li>• Possible – 46% - 75% chance of the potential impact occurring (weight value – 2)</li> <li>• Likely - &gt;75% chance of the potential impact occurring (weight value – 3)</li> </ul>
Environmental Risk Refer to Table 19 below	<p>Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment.</p> <p><b>High/Medium/Low Impact X Probability = High/Medium/Low Environmental Risk</b></p>



Table 19: Environmental Risk Matrix

		Significance of Impact		
		Low Impact (3 → 5)	Medium Impact (6 → 8)	High Impact (9)
Probability	Definite / Very Likely 3	9 - 15 L - M	18 - 24 M - H	27 H
	Possible 2	6 - 10 L - M	12 - 16 M	18 M - H
	Unlikely 1	3 - 5 L	6 - 8 L	9 L
ENVIRONMENTAL RISK		Guidelines for Control Strategies		
(H) - High		Proactively reduce risk level, short term response.		
(M- H) Medium to High		Proactively reduce risk level, short term response.		
(M) – Medium		Management strategies to reduce risk level, short to medium term response.		
(L – M) Low to Medium		Management strategies to reduce risk level, short to medium term response, operational control and housekeeping.		
(L) - Low		Operational control and housekeeping.		

Table 20 provides an example of the environmental impact assessment that will be done for every issue and potential impact identified.



Table 19: Environmental risk assessment: Environmental Awareness and Training.

Activity: Construction activities required.	
Aspect: Lack of environmental knowledge among employees.	
Nature of Environmental Impact: Harm to the environment due to employees or contractors being unaware of how their activities may impact the environment or due to unauthorised access to the site.	
<b>Before Mitigation</b>	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	2
<b>Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact</b>	<b>5</b>
Probability	2
<b>Environmental Risk = Significance of Impact X Probability</b>	<b>10</b>
<b>Objective of Mitigation Measures</b>	
To prevent harm to the environment through the actions of uneducated employees or contractors.	
<b>Proposed Mitigation</b>	
<ul style="list-style-type: none"> <li>The contractor is to ensure that all employees, including sub-contractors and their employees, are required to attend onsite Environmental Awareness/Training prior to commencing work on site.</li> <li>Follow-up Environmental Awareness/Training may be required from time to time as new subcontractors or crews commence work or for specific activities that may potentially impact the environment.</li> <li>The contractor is to maintain accurate records of any training undertaken.</li> <li>The ECO shall monitor the contractor's compliance with the requirement to provide sufficient environmental awareness training to all site staff.</li> <li>Training is to cover all aspects of the EMP and procedures to be followed.</li> </ul>	
<b>After Mitigation</b>	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
<b>Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact</b>	<b>3</b>
Probability	1
<b>Environmental Risk = Significance of Impact X Probability</b>	<b>3</b>

#### 8.1.4 Public participation during the EIA process

The compilation of the EIR and draft EMP as per R.543 will include, but is not limited to, the following public participation:

- The draft EIR and draft EMP will be provided to the client for review prior to public and competent authority comment.
- The Public Participation Process will be conducted in accordance with the EIA Regulations R.543 (2010). This will include submitting the draft EIR to the competent authority and public for a review period of 40 days [Regulation 543(56)].
- All comments, objections and/or representations received during the Public Participation Process will be included and addressed in the final EIR and this document will be finalised.
- The final EIR and draft EMP will be submitted to the client to obtain their inputs.



- Registered Interested and Affected Parties (I&APs) will be given an opportunity to comment on the final EIR as stipulated in R543 (56) (6). Their comments will be submitted directed to the competent authority and the EAP or applicant will be copied.

### **8.1.5 Alternatives**

Alternatives have and will continue to be investigated and the “No-Go/No Project Option” will be included in the assessment. The EIA document will discuss the alternatives identified and investigated for the proposed project as well as the advantages and disadvantages of each.



## 9. CONCLUSION

Major environmental concerns of the proposed project, include equipment and structure failure, the wrongful re-use and/or disposal of contaminated soil, topsoil and subsoil, as well as soil-, surface water- and groundwater pollution.

Appropriate mitigation measures will assist in minimising the potential impacts on the surrounding environment during the planning, construction, operational and closure phases of the development. The positive environmental and social impacts of the proposed development outweigh the negative impacts.

The Public Participation exercise has provided adequate information to enable an understanding of what the proposed project would entail and also to address the concerns and comments of this Environmental Assessment.

Based on the above-mentioned information and the identification of the potential environmental impacts as a result of the proposed project it is concluded that a full Environmental Impact Assessment may commence.

