



Final Scoping Report

002/15-16/E0203

**FINAL SCOPING REPORT FOR THE PROPOSED NIGEL EXT 6 INDUSTRIAL DEVELOPMENT AND FUEL DEPOT WITH A STORAGE CAPACITY OF APPROXIMATELY 20 000 000 LITRES ON PORTION 36 OF VARKENSFONTEIN 169 IR, EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE**

March 2016

Commissioned by: Econ Oil & Energy (Pty) Ltd  
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Compiled by: J.H. Botha



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# Final Scoping Report: Nigel Ext 6& Fuel Depot

Prepared by



# Final Scoping Report: Nigel Ext 6& Fuel Depot

## Final Scoping Report for the proposed Nigel Ext 6 Industrial development and a fuel depot with a storage capacity of approximately 20 000 000 litres on portion 36 of Varkensfontein 169 IR, Ekurhuleni Metropolitan Municipality, Gauteng Province

March 2016

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## Final Scoping Report: Nigel Ext 6& Fuel Depot

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**DETAILS OF ENVIRONMENTAL PRACTITIONER:**

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**Expertise:** (Also refer to attached CV)

Mr. J Botha has been employed at AGES Limpopo for the past 11 years and holds the position of Environmental Scientist.

During his employment period he has gained extensive knowledge and experience regarding the development of Environmental Impact Assessments for all types of developments as well as the development of environmental management plans, spatial development frameworks and strategic environmental assessments.

He was also employed at the Department of Finance and Economic Development, Environment and Tourism Limpopo as Senior Manager: Scientific Services where he also obtained extensive knowledge and experience (1994-2004) regarding Environmental Impact Management, Waste and Pollution management

## 1 GENERAL INFORMATION

AGES Limpopo (Pty) Ltd was appointed by **Econ Oil & Energy (Pty) Ltd** to conduct an Environmental Impact Assessment in order to obtain the necessary environmental authorisation for the proposed Nigel Ext 6 Industrial Development and Fuel Depot with a storage capacity of approximately 20 000 000 litres on Portion 36 of the farm Varkensfontein 169 IR, Ekurhuleni Metropolitan Municipality, Gauteng Province.

### 1.1 History of previous EIA applications

An EIA process was started in December 2013 for this specific project but was not completed. The reference number for that application was Gaut:002/13-14E0234.

### 1.2 Project Objective

This Final Scoping Report was done with the objective to supply the Gauteng Department of Agriculture and Rural Development (GDARD) with the necessary environmental information to make an informed decision regarding the approval of the Consultation Report and the Plan of Study for Environmental Impact assessment.

This Final Scoping Report was done to comply with the requirements of Regulation (43.1) of the regulations published in the Government Notice No R.982 promulgated on 4 December 2014 in terms of Chapter 5 of the National Environmental Management Act 107 of 1998.

The following activities require a full Environmental Impact Assessment (EIA) process in terms of Regulation No. R.984 promulgated on 4 Dec 2014 of the National Environmental Management Act, and authorization from the Gauteng Department of Agriculture and Rural Development (GDARD):

**Activity 4 :** *“The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres”*

**Activity 6:** *“The development 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”*

The proposed expansion also requires an Air Emission License (AEL) in terms of Subcategory 2.4 (storage of more than 1000 m<sup>3</sup> of petroleum products) of Notice 893 dated 22 November 2013 of the National Environmental Management: Air Quality Act (Act 39 of 2004), and authorization from the Ekurhuleni Metropolitan Municipality.

## 2 PROJECT DESCRIPTION

### 2.1 Project locality

The proposed development is situated on Portion 36 of the farm Varkensfontein 169 IR within the jurisdiction of the Ekurhuleni Metropolitan Municipality, Nigel Service Delivery Centre, situated in the north-eastern quadrant of the intersection between Provincial Road K174 (Heidelberg/Springs Road) and the Springs Road. The site is adjacent to and north of Nigel and Glenvarloch and separated by the Springs Road (See attached locality map – Appendix A).

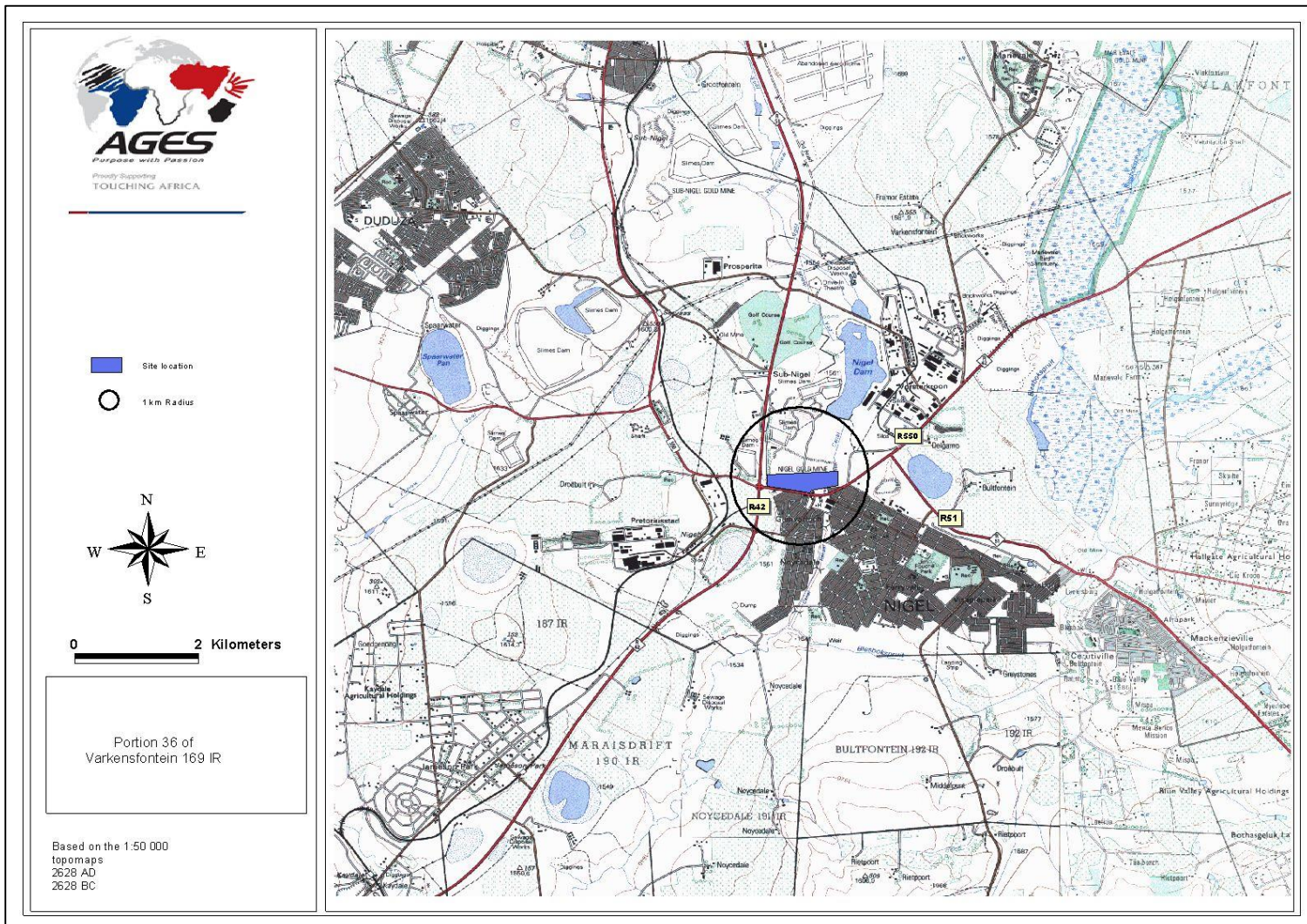
**The proposed development site is situated at the following coordinates:**

26.413703°S    28.462658°E

**Surveyor general 21 digit codes of the proposed development area.**



TOIR0000000016900036



**Figure 1. Location of the proposed Nigel Ext 6 (Industrial development and Fuel depot)**

## 2.2 Nature of activity

The project consists of the development of an industrial township and a fuel depot on Portion 36 of Varkensfontein 169 IR in Nigel.

Erf 1642 ( $\pm 2.38$  hectares) will be industrial with shops and fuel depot.

The fuel depot on erf 1641 ( $\pm 3.69$  hectares) will have a total storage capacity of approximately 20 million litres.

Erven 1640 ( $\pm 7.64$  ha), 1643 ( $\pm 4.40$  ha), and 1644 ( $\pm 3.83$  ha) will be private open space.

**A layout map is included in Appendix 2.**

### **3 CONSIDERATION OF ALTERNATIVES**

In the EIA process, the consideration of alternatives is always important, should the proposed site not fit into the parameters of the EIA framework. The alternatives can be categorised as follows.

- Location alternatives
- Process alternatives
- No-Go alternative

#### **3.1 Location alternatives**

The proposed site for the development is owned by the developer. The proposed site is located within the urban boundary (urban edge) and is a suitable portion of land which is supported by the municipality. This is a typical infill and densification type of development within the urban edge and close to an industrial hub. Several historical existing industrial land uses are situated on the site and this will be a formalization and extension of these activities. Equal consideration will however be given to heritage findings, the geotechnical characteristics of the site as well as inputs from Interested and Affected Parties.

#### **3.2 Process alternative**

Process alternatives will be discussed in the EIAR.

#### **3.3 No go alternative**

This option would only come into effect if the assessment reveals a fatal flaw in the process.

### **4 DESCRIPTION OF THE AFFECTED ENVIRONMENT**

#### **4.1 Land Use**

The application site is divided into two portions by a huge rock dump. The one portion to the west is approximately 10ha in extent of which approximately half is undermined. The site is currently partially developed with old, existing structures situated on it. These buildings are mainly used for industrial related offices and commercial uses. Approval has been obtained from Department of Mineral Resources that erven 1640 and 1461 can be developed.

Erven 1641 and 1642 are not affected by mining rights. Erf 1642 has a servitude specified for a railway line siding in favour of the local municipality registered against it. The applicant will apply for the cancellation of these servitudes. A GASKOR servitude is also present.

The eastern portion is mainly undermined and subject to flooding. The land is vacant and not used for any activities. The surrounding land uses include derelict mining land under reclamation and rehabilitation, as well as commercial, business, service, industrial and agricultural land uses.

#### **4.2 Topography**

The relief of the site is low with a very gentle cross -fall of about 2m from west to east. A steep drop of about 4 - 5m occurs where end-tipping of rubble has ceased.

The site is mainly characterised by existing structures, roads and mining activities, which contributes to the irregularity of the site.

The topography is suitable for the development, although the layout of the property had to be designed in such a way as to take the disturbed areas as well as the servitudes in consideration.

### **4.3 Climate**

The annual average surface temperature varies between a minimum of 4 degrees Celsius during June and July and a maximum of 26 degree Celsius recorded during January, with the lowest and highest recorded as -8 degrees and 35 degrees Celsius respectively. Frost in winter is the rule rather than the exception. Fog occurs frequently during March and April. The annual average rainfall is approximately 700mm occurring mostly from November to March in the form of thunderstorms and heavy showers.

### **4.4 Regional geology**

The site is underlain by sediments of the Ecca Group of the Karoo Supergroup. The Karoo sediments provide a thin cover over older sediments of the Central Rand Group of the Witwatersrand Supergroup.

The hard rock geology is mantled by a variable layer of imported fill and tailings overlying a thin horizon of sandy colluvium and residual soil. No rock crops out on the site.

A geo-technical investigation report will be attached to the EIAR.

### **4.5 Soil characteristics**

The site is characterised by a highly irregular soil cover of imported rubble. The fill material varies significantly from builder's waste to tailings with mixtures of both in places. More detail regarding soil types are contained in the Geo Technical study which will be attached to the EIAR.

### **4.6 Vegetation**

Vegetation on site varies from exotic trees on the eastern end near the rock dump to grass and weeds along the northern and southern boundaries. A large section of the site is devoid of vegetation particularly at the vicinity of the small diesel depot and where rubble has been end-tipped in the not so distant past.

### **4.7 Surface drainage**

The study area is located within the quaternary drainage region C21 E. A canal is located east of the waste rock dump.

Surface runoff, in the form of sheet wash occurs towards the east. The imported cover of fill has masked the natural ground level.

### **4.8 Visual environment**

The visual environment will undergo changes in terms of the presence of construction vehicles, the removal of soil and vegetation during construction activities and an increase in lighting.

The construction of the fuel depot will also change the current visual characteristics of the site.

### **4.9 Air quality and noise**

An air quality impact study will be conducted and an application for an Air Emissions License submitted to Ekurhuleni Metropolitan Municipality. These impacts and mitigation measures will be addressed in the EIAR.

During the construction and operational phases of the proposed project noise and dust will be a factor. Impacts and mitigation measures of these impacts will be addressed in the EIAR.

Increased traffic will add to impacts on air quality and noise.

#### **4.10 Solid waste management**

The Ekurhuleni Metropolitan Municipality, Nigel Service Centre is responsible for solid waste removal and disposal in this area. A services agreement between the developer and the municipality must be obtained in this regard.

#### **4.11 Archaeological and historical attributes**

A Phase 1 Heritage assessment will be needed to confirm the status of any historical buildings or heritage remains. The report will be included in the EIAR.

#### **4.12 Road and rail infrastructure**

Currently there is limited formal infrastructure on site. However the site is highly accessible since it abuts the two main roads, namely the Springs Road (R42) which is the main access road into Nigel centre and the Nigel-Springs Road (R51) which forms the main linkage between Springs and Nigel. The R42 forms the southern boundary of the site and the R51 lies to the west of the site. Accessibility to the site is therefore good. A traffic impact study has been conducted and will be attached to the EIA report. Approval will also be obtained from the Ekurhuleni Municipality.

#### **4.13 Water and Sewer**

It is estimated that the average water demand for the proposed development is 480 kl/day. The existing Dunnottar low level reservoir has sufficient capacity to accommodate the proposed development and a bulk water connection can be made in Springs road.

A bulk water connection can be made in Springs Road to the south of the development site to the existing Vosterkroon outfall sewer draining through the development site from the north. All effluent will be treated by the Bickley Waste Water Treatment Works. A services agreement must be obtained from the municipality stating that sufficient capacity exists at the mentioned waste water treatment works for the proposed development and that waste will be treated at the mentioned waste water treatment works.

#### **4.14 Electricity**

Detail pertaining to the provision of electricity will be provided in the EIA.

### **5 LEGAL AND POLICY REQUIREMENTS**

The following is a broad overview of the relevant policy and legal requirements, but not limited to, applicable to the proposed project.

#### **Constitution of South Africa (Act 108 of 1996)**

Section 24 of this Act recognised not only that everyone has a right to an environment that is not harmful to our health or well-being, but it also recognises the notion of sustainable development and its supporting principles.

#### **National Environmental Management Act (Act no 107 of 1989)**

This Act defines the concept of sustainability, to ensure that any social or economic development will take place in such a way as to preserve the Environment for present and future generations. This Act also takes into account the pollution principles.

**National Water Act (Act no 36 of 1998)**

Section 19 of the National Water Act, Act 36 of 1998 requires that all reasonable measures be taken to prevent any water pollution from occurring, continuing or recurring. The Act further describes a number of water uses and requires that a water use License have to be obtained for the specified water uses.

**National Heritage Resources Act (Act 25 of 1999)**

The Act makes provision for the undertaking of heritage resources impact assessments for various categories of development as determined by Section 38. It also provides for the grading of heritage resources and the implementation of a three-tier level of responsibilities and functions for heritage resources to be undertaken by the State, Provincial authorities and Local authorities, depending on the grade of the Heritage resources. The Act defines cultural significance, archaeological and paleontological sites and material (Section 35), historical sites and structures (Section 34), graves and burial sites (Section 36) that falls under its jurisdiction. Archaeological sites and material are generally those resources older than a hundred years, while Section 34 also protects structures and cultural landscapes older than 60 years, including gravestones. Procedures for managing grave and burial grounds are clearly set out in Section 36 of the NHRA. Graves older than 100 years are legislated as archaeological sites and must be dealt with accordingly.

Section 38 of the NHRA makes provision for developers to apply for a permit before any heritage resource may be damaged or destroyed.

**Minerals and Petroleum Resources Development Act (Act 28 of 2002)**

This act provides for the regulation and management of minerals and also the petroleum industry in the RSA and the Department of Minerals and Energy is the Lead Agent for applying this legislation.

**Environmental Impact assessment regulations (Act 107 of 1998) – 4 December 2014**

Regulations and guidelines for the implementation of Environmental Impact Assessments.

## 6 KEY ENVIRONMENTAL IMPACTS

The following possible environmental impacts were identified:

<b>ENVIRONMENTAL ISSUES</b>	<b>POSSIBLE CAUSE</b>	<b>POTENTIAL IMPACTS</b>
<b>Air Pollution and noise</b>		
Dust	During construction and vehicle operation on road.	Public nuisance
Smoke	Vehicle emissions and fires	Health problems Air pollution
Fumes	Fumes from fuel storage tanks and from vehicles	Impact negatively on air quality
Noise	Construction noise and noise from delivery and collection tankers	Nuisance
<b>Water quality</b>		
Pollution of water sources (Surface and groundwater)	Spillage of diesel & oil from vehicles	Lower water quality
	Infiltration of pollutants into soils	Water pollution and Soil degradation
	Possible spillage of fuel from storage tanks	Water pollution
<b>Water quantity</b>		
Water use during construction	Over utilisation of water	Impacting negatively on a scarce resource
<b>Land/soil degradation</b>		
Soil contamination  Soil degradation	Spillage of fuel and oil from vehicles	Effect soil ecology/ground water
	Solid waste accumulation	Soil contamination
	Cleaning of sites for construction purposes Erosion	Loss of topsoil
	Possible spillage of oil or fuel from storage tanks	Soil pollution
<b>Cultural Heritage</b>		
Possible loss of heritage sites	Damage during construction	Possible loss of cultural heritage
<b>Visual impact</b>		
Visual impact	Buildings & fuel silo's Construction sites	Visual intrusion
<b>Health</b>		
Safety and security	Construction activities Fires	Accidents Deaths/injuries to people on site as well as neighbours

ENVIRONMENTAL ISSUES	POSSIBLE CAUSE	POTENTIAL IMPACTS
<b>Socio Economic</b>		
Construction and operational phases	Increased traffic	Impact on adjoining residents and motorists using the R42
Construction and operational phases	Use of local labour	Socio economic benefit

**These key areas of impacts will be further explored and described in the environmental impact assessment report to detail the impacts, the impact ratings and mitigation measures.**

The following specialist investigations have been or will also be conducted and used in assessing the environmental impacts of the different activities that form part of the development:

- A Phase 1 Heritage Impact Assessment by Cultural Resource Consultants.
- A Geotechnical Study (already completed)
- Traffic Impact Assessment (already completed)
- Air Quality Impact Assessment by Ehrcon
- Services report that will address water supply, storm water management, sanitation, roads on the site, fire protection and electricity supply (a feasibility Civil Engineering Report have been compiled)
- Detailed layout plan & visual presentation of the proposed depot.

## 7 ENVIRONMENTAL IMPACT DETERMINATION AND EVALUATION

An environmental impact is defined as a change in the environment, be it the physical/chemical, biological, cultural and or socio-economic environment. Any impact can be related to certain aspects of human activities in this environment and this impact can be either positive or negative. It could also affect the environment directly or indirectly and the effect of it can be cumulative.

### 7.1 Methodology to assess the impacts

To assess the impacts on the environment, the process will be divided into two main phases namely the Construction phase and the Operational phase. The activities, products and services present in these two phases will be studied to identify and predict all possible impacts.

In any process of identifying and recognising impacts, one must recognise that the determination of impact significance is inherently an anthropocentric concept. Duinker and Beanlands, (1986) in DEAT 2002. Thompson (1988), (1990) in DEAT 2002 stated that the significance of an impact is an expression of the cost or value of an impact to society.

However, the tendency is always towards a system of quantifying the significance of the impacts so that it is a true representation of the existing situation on site. This will be done by using where ever possible, legal and scientific standards which are applicable

The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The *consequence matrix* use parameters like *severity*, *duration* and *extent* of impact as well as *compliance* to standards. Values of 1-5 are assigned to the parameters that are added and

averaged to determine the overall consequence. The same process is followed with the *likelihood* that consists of two parameters namely *frequency* and *probability*. The overall consequence and the overall likelihood are then multiplied to give values ranging from 1 to 25. These values as shown in the following table are then used to rank the significance. It must be said however that in the end, a subjective judging of an impact can still be done, but the reasons for doing so must be qualified.

**Table 1: Significance ratings (Plomp 2004)**

Significance	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X Overall Likelihood	1-4.9	5-9.9	10-14.9	15-19.9	20-25

### Description of the parameters used in the matrixes

#### Severity:

Low	Low cost/high potential to mitigate. Impacts easily reversible, non-harmful insignificant change/deterioration or disturbance to natural environments
Low-medium	Low cost to mitigate Small/ potentially harmful Moderate change/deterioration or disturbance to natural environment.
Medium	Substantial cost to mitigate. Potential to mitigate and potential to reverse impact. Harmful Significant change/ deterioration or disturbance to natural environment
Medium-high	High cost to mitigate. Possible to mitigate Great/Very Harmful Very significant change/deterioration or disturbance to natural environment
High	Prohibitive cost to mitigate. Little or no mechanism to mitigate. Irreversible. Extremely Harmful Disastrous change/deterioration or disturbance to natural environment

#### Duration:

Low	Up to one month
Low-medium	One month to three months
Medium	Three months to one year
Medium-high	One to ten years
High	Beyond ten years

#### Extent:

Low	Development areas
Low-medium	Within site boundary
Medium	Surrounding farms and erven
Medium-high	Within Nigel area
High	Within the region

#### Frequency:

Low	Once/more a year or once/more during operation
Low-medium	Once/more in 6 months
Medium	Once/more a month
Medium-high	Once/more a week
High	Daily



**Probability:**

Low	Almost never/almost impossible
Low-medium	Very seldom/highly unlikely
Medium	Infrequent/unlikely/seldom
Medium-high	Often/Regularly/Likely/Possible
High	Daily/Highly likely/definitely

**Compliance:**

The following criteria are used during the rating of possible impacts:

Low	Best Practise
Low-medium	Compliance
Medium	Non - compliance/conformance to Policies etc-Internal
Medium-high	Non-compliance/conformance to Legislation etc-External
High	Directive, prosecution of closure or potential for non-renewal of licences or rights

**8 PUBLIC PARTICIPATION PROCESS****8.1 Process followed****8.1.1 Newspaper Advertisement**

The proposed project was advertised in the "Heidelberg/Nigel Heraut on the 2<sup>nd</sup> of December 2015 to inform people about the project and request them to identify environmental issues of concern. An example of this advertisement is attached in Appendix 3.

**8.1.2 Site Notice**

A site advertisement in English was put up on site on the 26<sup>th</sup> of November 2015. An example of this notice as well as photographs proving this are attached in Appendix 3.

**8.1.3 Background Information Notices.**

Background Information Documents (BID's) were provided to the following registered interested and affected parties:

- Ekurhuleni Metro Municipality.
- Ward Councilor – Ward 88 (Ekurhuleni).
- Department of Water Affairs.
- Department of Minerals and Energy (DMR)
- Mr. A. Grobler (Nigel Auto City and Sasol Garage)
- Mr. C. Jansen (Boat Caravan and Camping)
- Mr. E. Hodgkinson (Erf 50 and Remainder of 41 Varkensfontein 169 IR – Portion 23 – Remainder)
- Mr. M. Omar (Epson Motors)
- Mr. J.A. Vermaak (Andrew Vermaak Properties (Pty) Ltd

An example of the background information document is included in Appendix 3 as well of proof of the distribution thereof.

#### **8.1.4 Issues and Responses**

A background information document was provided to governmental departments and adjacent land owners. A commenting period of 30 days was provided for any environmental feedback. Comments were received from Mr A. Grobler regarding the background information document as well as the consultation scoping report. (Refer to Appendix 3 for detail).

#### **8.1.5 FURTHER STEPS IN THE PUBLIC PARTICIPATION PROCESS**

**The following steps are still to be undertaken during the public participation process:**

- The final scoping and plan of study for EIA report will be submitted to the Department on the 4<sup>th</sup> of March 2016. Registered Interested and Affected Parties will be notified that the final scoping report which contains comments and responses thereto can again be made available for comments.
- Once the final report has been approved by Gauteng Department of Agriculture and Rural Development (GDARD) the consultation EIA report will be distributed to I and AP's for commenting purposes.
- Comments received will be incorporated into the final EIA report that will be submitted to Gauteng Department of Agriculture and Rural Development (GDARD) Registered I&AP's will be notified that the final EIA report which contains comments and responses thereto can again be made available for comments.
- Registered I&APs and governmental organizations will be notified about the final decision from the Gauteng Department of Agriculture and Rural Development (GDARD) whether environmental authorization was granted or not.

### **9 SCOPING REPORT AND PLAN OF STUDY FOR EIA**

The consultation scoping report and plan of study for EIA has been made available for comments to all registered I&AP's for a period of 30 days from the 3<sup>rd</sup> of February up and until 4<sup>th</sup> of March 2016. All comments and responses thereto have been included in the final scoping report. The final scoping report will be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) for review and decision making.

The environmental impact assessment process will be based on the actions and findings of the scoping phase as well as the comments and reviews by authorities and from interested and affected parties.

All documentation lists and proof of the Public Participation process is included in Appendix 3 of this report.

### **10 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASESMENT**

The environmental impact assessment process will be based on the actions and findings of the scoping phase.

## 10.1 Tasks to be undertaken

The physical, biological, social, economic and cultural aspects that were identified in the scoping process will be addressed in detail in the Environmental Impact Assessment report.

The following specialist investigations have been or will also be used to aid in the description of the environment as well the identification and rating of impacts:

- A Phase 1 Heritage Impact Assessment by Cultural Resource Consultants.
- A Geotechnical Study (already completed)
- Traffic Impact Assessment (already completed)
- Air Quality Impact Assessment by Ehrcon
- Services report that will address water supply, storm water management, sanitation, roads on the site, fire protection and electricity supply (a feasibility Civil Engineering Report have been compiled)
- Detailed layout plan & visual presentation of the proposed depot.

A detailed rating of impacts will be undertaken according to the methodology described in section 7. Mitigation measures for all identified impacts will also be given.

A consultation Environmental Impact Assessment Report will be written and made available to the registered Interested and Affected parties for comments. It will include proof of all the public participation processes as well as copies of all the specialist reports.

A final Environmental Impact Assessment Report will be submitted to Gauteng Department of Agriculture and Rural Development (GDARD) for review and decision making

## 10.2 Specialist studies

### 10.2.1 Heritage

**Specialist:** Mr Neels Kruger (Exigo Sustainability (Pty) Ltd)

**Level of expertise:** Mr Kruger holds BHCS Hons. (Archaeology) and MA (Archaeology) degrees. He is an accredited Professional Archaeologist & CRM Practitioner by the Association for South African Professional Archaeologists (ASAPA) and working as archaeologist since 2005.

**Objective of study:** The objective is to undertake a heritage scoping survey of the proposed industrial development and fuel depot on portion 36 of the farm Varkensfontein 169 IR

The aim is to determine the presence or not of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

**Scope of study:** The heritage study provides an overview of the heritage resources that may occur in the demarcated area where development is intended.

**Methodology of study:**

- Provide a description of archaeological artefacts, structures (including graves) and settlements which may be expected along the project area;
- Provide a cultural context and provenience for archaeological artefacts, structures (including graves) and settlements, in the project area and in the surrounding landscape by means of a detailed desktop background study;
- Assess the nature and degree of significance of such resources within the area;
- Establish heritage informants/constraints through establishing thresholds of impact significance;
- Assess any possible developmental impacts, present and future, on the archaeological and historical remains within the larger landscape;
  
- Propose possible heritage management measures for following phases of heritage mitigation and management.
- Liaise and consult with the relevant Heritage Resources authority with regards to the site investigation.

**10.2.2 Geo-Technical**

**Specialist:** E. Shedden (Relly Milner and Shedden)

**Level of expertise:** Mr Sheddan is an Engineering Geologist and registered as Professional Scientist at SACNASP.

**Objective of study:** The purpose of the investigation was to provide information on the nature and geotechnical properties of the shallow soils encountered on the site. This information has been obtained so that areas may be delineated where similar geotechnical problems occur. Prospective developers may assess the suitability of certain types of development within specific areas.

**Scope of study:** This Geo-Technical report presents the results of a geotechnical investigation undertaken for the proposed township of Nigel Extension 6 on portion of Portion 36 of the farm Varkensfontein 169-IR.

**Methodology of study:**

- The subsoil conditions for this project were investigated by means of ten shallow test pits.
- The test pits were excavated using a JCB 3CX TLB supplied by the Nigel Plumbing Supplies.
- Detailed soil profiles were drawn up from a visual examination of the in situ material observed in the test pits by an engineering geologist according to recommended standard.

**10.2.3 Traffic Impact**

**Specialist:** J.A.C Botha (Route <sup>2</sup> transport strategies)

**Level of expertise:** Mr Botha is a Professional Technical Engineer (200870051) that practises since 2008.

**Objective of study:** The objective of the study is to determine whether the proposed development traffic can be accommodated with the proposed upgrades and intersections controls.

**Scope of study:** Route 2 – Transport Strategies have been appointed to undertake a Traffic Study for the proposed Industrial 3 development on Portion 36 of the farm Varkensfontein 169 IR or to be called Nigel Ext 6. The scope of the study includes traffic flows and trip generation as well as traffic impact and capacity analyses.

**Methodology of study:**

**Traffic flows and trip generation:** Peak morning and afternoon traffic counts were conducted while trip generations was derived using the South African Trip Generation Rates Manual.

**Traffic Impact and Capacity Analyses:** The intersections have been analysed using aaSIDA traffic analyses software.

#### 10.2.4 Air Quality Impact Assessment

**Specialist:** Mr U Neveling (EHRCON)

**Level of expertise:** Mr Neveling holds a M.Sc. degree in Industrial Physiology. He is practicing as an Air Quality Specialist since 2003.

**Objective of study:** To determine whether the process will significantly impact on local air quality.

**Scope of study:** The investigation will comprise two components, viz. a baseline air quality study and a preliminary air quality impact investigation.

**Methodology of study:**

In addressing the baseline air quality for the project, emphasis will be placed on the following aspects:

- Description of the regional climate and atmospheric conditions impacting on the dispersion potential at the project site.
- Review of ambient air quality guidelines or standards and exposure criteria on the basis of which the predicted impact of the activity may be evaluated.
- Assessment of classical ambient air pollutant concentrations in the vicinity of the process.

The preliminary impact assessment component of the study will include:

- Compilation of an emissions inventory classified per category i.e. line, area or point. The inventory will also include basic source parameterisation and emission rate estimation.
- Dispersion simulations of ground level concentrations for various classical pollutants over various averaging periods (e.g. highest daily and annual averaging periods).
- Analysis of dispersion modelling results, including:
  - an assessment of the predicted spatial distributions of ground level concentrations; and
  - preliminary health and environmental risk analysis, based on the comparison of simulated concentrations to ambient air quality guidelines and standards.
- Dispersion simulation using air quality models will be in accordance with the guidelines prescribed in the South African National Standard SANS 1929:2009 “Ambient air quality – Limits for common pollutants”.

## **11 ADVANTAGES AND DISADVANTAGES OF ALTERNATIVES**

In the EIA process, the consideration of alternatives is always important, should the proposed site not fit into the parameters of the EIA framework. The alternatives can be categorised as follows.

- Location alternatives
- Process alternatives
- No-Go alternative

### **11.1 Location alternative**

#### **11.1.1 Advantages:**

- By carrying out a geo-technical study prior to development, the positioning of certain parts of the development can be based on the ideal or most suitable soil conditions.
- By carrying out a heritage assessment prior to development, the re-positioning of certain parts of the development can be based on the occurrence of heritage aspects. Areas can also be avoided if necessary due to the presence of heritage characteristics.
- By carrying out a traffic impact assessment the safest and most suitable accesses to the site can be determined.

#### **11.1.2 Disadvantages:**

- There will be possible health implications (fuel and gasses)
- Possible air, water, soil and noise pollution.

All negative and positive impacts will be evaluated and reported on in the EIAR.

### **11.2 Process Alternative**

#### **11.2.1 Advantages**

The project consists of the development of an industrial township and a fuel depot on Portion 36 of Varkensfontein 169 IR. The most suitable development processes will be implemented in terms of safety (fuel storage and delivery), environmental aspects (air, soil, water) and socio-economic benefits (jobs).

#### **11.2.2 Disadvantages**

- Incorrect process followed will result in undue negative impacts to the environment.

All negative and positive impacts will be evaluated and reported on in the EIAR.

### **11.3 No go alternative**

This option would come into effect if the abovementioned assessments reveal fatal flaws in the process.

**12 IMPACTS TO BE EVALUATED**

<b>IMPACT</b>	<b>ASSESSMENT</b>	<b>REFERENCE</b>
<b>AIR POLLUTION AND NOISE</b>		
Smoke	Impacts will be evaluated and mitigation measures provided	EMPr and EIR
Dust	Impacts will be evaluated and mitigation measures provided	EMPr and EIR
Fumes	Impacts will be evaluated and mitigation measures provided	EMPr and EIR
Noise	Impacts will be evaluated and mitigation measures provided	EMPr and EIR
<b>WATER QUALITY</b>		
Pollution of water sources (Ground and surface water pollution)	Impacts will be evaluated and mitigation measures provided	EMPr and EIR
<b>WATER QUANTITY</b>		
Water uses during construction	Impacts will be assessed with the aid of the Services Report	EMPr and EIR
<b>LAND/SOIL DEGRADATION</b>		
Soil contamination and degradation	Impacts will be assessed with the aid of the geotechnical report	EMPr and EIR
<b>CULTURAL/HERITAGE</b>		
Impact on Archaeological / cultural / social features	<ul style="list-style-type: none"> <li>A phase I Heritage Impact Assessment will be conducted by a qualified archaeologist</li> </ul>	EMPr and EIR
<b>VISUAL IMPACT</b>		
Visual impact	<ul style="list-style-type: none"> <li>Impacts will be evaluated and mitigation measures provided</li> </ul>	EMPr and EIR
<b>SOCIO-ECONOMIC</b>		
Job creation	<ul style="list-style-type: none"> <li>Impacts will be evaluated and mitigation measures provided</li> <li></li> </ul>	EMPr and EIR

HEALTH		
Impact on Health (Fires and Traffic)	<ul style="list-style-type: none"> <li>Traffic - Impacts will be assessed with the aid of the Traffic Impact Assessment Report.</li> <li>Fires - Impacts will be evaluated and mitigation measures provided</li> </ul>	EMPr and EIR

### 13 TIME TABLE FOR TASKS

Submit consultation scoping report and the plan of study for EIA	1 February 2016
Submit final scoping report	4 March 2016
Submit Consultation EIA report	May 2016
Submit final EIA report	June 2016
Site visit with all relevant Departments	To be arranged
A Heritage Impact Assessment by an approved archaeologist / cultural resources consultant	February 2016
Geo-Technical Study	Completed
Traffic Impact Assessment Report	Completed
Public meetings	To be arranged if necessary

#### 13.1 Consultation with the competent authority

The competent authority has been consulted at the following stages:

- Submission of application

The competent authority will also be consulted at the following stages:

- Submission of consultation and final scoping report and plan of study for EIA
- Site visit.
- Submission of EIAR (consultation & final).



## 14 CONCLUSIONS AND RECOMMENDATIONS

The purpose of this report is to provide the Gauteng Department of Agriculture and Rural Development (GDARD) with sufficient information regarding the potential impacts of the development to make an informed decision regarding the approval of the Plan of Study for Environmental Impact Assessment.

Other potential impacts that may be identified during consultation with the Interested and Affected Parties will be included in the EIA report.

The GDARD is therefore respectfully requested to evaluate and comment on this report of which the comments will be included in the EIA report for approval, as part of an application that has been lodged in terms of Regulation R 984 of 4 December 2014 of the National Environmental Management Act, 1998 (Act 107 of 1998).

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