PROPOSED FILLING STATION: GROBLERSDAL EXT 11, ERF 756 & 757: GEOTECHNICAL REPORT FOR E I A INPUT

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1 INTRODUCTION AND TERMS OF REFERENCE

As part of the Environmental Impact Assessment (E I A) for the rezoning of the erven 756 and 757 in Extension 11 of Groblersdal, Blue Rock Consulting (Pty) Ltd was appointed by Landmark Planning (PTY) Ltd, to conduct a geotechnical investigation at the site for the proposed filling station to be erected on the two erven. The proposed facility will be designed to accommodate a public garage, a convenience store of 300 m^2, a place of refreshment, a take-away facility, a car wash facility and an automatic teller machine.

The objectives of the investigation were to:

- Establish the site stratigraphy and the engineering properties of these rocks
- Identify any geological conditions that can contribute to a negative environmental impact if a filling station is erected and operated on the site.
- Identify potential problem soils
- Ascertain the founding conditions at the proposed development as an aid to appropriate civil engineering design of the project
- Provide preliminary information on the suitability of in situ materials for engineered fill and road pavement construction

This report details the work carried out, analyses the results and gives our conclusions and recommendations.

2 SITE LOCATION AND DESCRIPTION

The site chosen for the development is located in the eastern part of the town of Groblersdal and to the north of Van Riebeeck Street (R33). The sections of the two erven earmarked for the development occupy the southern third of both of the erven where they border onto Van Riebeeck Street. As indicated on the land use map presented in Appendix C of this report, the northern portion of Erf 756 is occupied by workshops, fitment centres and a scrap yard and the northern portion of Erf 757 is occupied by warehouses and storage facilities. The terrain of the southern portions of the two erven where the geotechnical investigation was carried out is virtually flat with a very gentle slope to the south and east towards van Riebeeck Street and the vineyards located on the southern side of this street. The road surface of this street is located about 1m higher than the ground surface on the two erven. Yellow to orange brown sandy gravelly fill material compacted to variable degrees of consistency has be dumped across the entire southern open areas of the two erven which were investigated. Veldt grasses and scattered shrubs and small trees grow along the southern western and eastern boundaries of the site. Elsewhere on the site, which is used for car parking purposes at present there is no vegetation. Access

to the site is at present along a narrow track located on the common boundary between Erf 756 and 757 leading off Eind Street to the north of the site. A poorly maintained fence separates the site from van Riebeeck Street.

3 INVESTIGATION PROCEDURE

3.1 FIELD INVESTIGATION

The site investigation was carried out on 26 February 2010 and besides a walkover site inspection, comprised the digging of 5 test pits with the aid of an ELB 860 SX TLB (tractor/loader/backactor). The holes were excavated to the maximum reach of the TLB. Except for test pit GFTP5 where the machine refused on very dense ferruginised gravelly residual granite at 1,5 m. Moderate to slow groundwater seepage occurred below 1,2 m and 1,5 m depths in all of the test pits excavated on the site. Each test pit was profiled by a professionally registered engineering geologist according to standard procedures prescribed for this type of work. Representative disturbed soil samples were collected from the various soil layers exposed in the test pits and submitted to a soils laboratory for foundation indicator tests.

The positions of the test pits were determined with the aid of a hand held GPS and are presented in Table 1 below. They are also indicated on a test pit locality plan included in Appendix C.

Table 1: TEST PIT CO-ORDINATES as determined by hand held GPS

Test Pit No	Latitude	Longitude
GFTP1	S25 09 53.8	E29 24 16.1
GFTP2	S25 09 54.4	E29 24 15.2
GFTP3	S25 09 55.0	E29 24 13.3
GFTP4	S25 09 54.4	E29 24 13.1
GFTP5	S25 09 54.2	E29 24 14.2

(Datum: WGS84; Grid: Lat/Lon Hddd° mm' ss.s")

The test pit profiles are presented in Appendix A of this report.

3.2 LABORATORY TESTING

The following tests were performed in order to determine the geo-mechanical properties of typical soil horizons encountered on the site.

- **Foundation Indicator Tests**
  These tests are used to establish the soil type; it's potential for heave and gives an indication of its suitability for use in pavement layers and engineered fills.

The depths of the samples are indicated on the relevant test pit profile sheets in Appendix A. The laboratory test results are included in Appendix C.

4 SITE GEOLOGY

4.1 BEDROCK

According to the 1: 250 000 scale geological map 2528 Pretoria, the entire town of Groblersdal and hence Erven 756 and 757 of Extension 11 is underlain by massive grey to pink coarse-grained Nebo Granite of the Lebowa Granite Suite, which forms part of the Bushveld Igneous Complex. In general these rocks are hard, unweathered and tight and their potential as primary water bearing aquifers is very low. The transported and residual soils covering these rocks tend to be sandy and thin (rarely more than 3m in thickness). Clayey and silty soils are relatively rare. Outcrops of Nebo Granite rock do not occur on the site occupied by the two erven. According to the geological map prominent faults or zones of fracturing in the rock do not occur in this area.

5 SOIL PROFILE

Descriptions of the various soil strata as encountered in the test pits are given in the sub-sections below.

5.1 IMPORTED SOILS (FILL)

These are the soils that comprise the soil mattress that has been constructed across the entire site. They are slightly moist and red brown to yellowish brown in colour and comprise a loose to medium dense clayey to silty sandy gravel. The mattress material extends to depths varying between 0,3 m and 1,0 m (average 1,0 m) below surface level.

5.2 ALLUVIAL SOILS

Moist becoming wet below 1,2 m depths red brown mottled grey brown medium dense clayey sandy gravel of alluvial origin underlies the soil mattress in the northern and eastern sections of the site (test pits GFTP1, GFTP2 and GFTP5). The layer extends to depths varying between 1,3 m and 2,2 m below surface level (average 2,0 m). A perched groundwater table is located in this layer and water seepage into the test pits occurred between 1,1 m and 1,5 m (average 1,2 m).

5.3 PEDOGENIC SOILS

The pedogenic layer on the site consists of residual granite soil with variable amounts of ferricrete nodules.

The pedogenic soils encountered on the site tend to be moist and comprise red brown to black medium dense to dense sandy to silty gravel. They tend to occur below the alluvial soils in test pits GFTP1, GFTP2 and GFTP5 where they extend to depths varying between 1,5 m and 3,0 m. In test pits GFTP3 and GFTP4, where the alluvium is absent, the ferruginised soils occur at shallower depths directly below the fill layer and extend to between 0,8 m and 1,6 m depths. In these two test pits groundwater seepage occurred either at the base of the layer or within it.

5.4 RESIDUAL SOILS

The residual soils encountered on the site are of granitic origin and comprise red brown to dark red mottled grey dense to medium dense gravelly clayey sand with small to medium sized soft rock granitic corestones in places. In general these soils extend to depths exceeding 3,0 m.

6 GROUNDWATER AND PERMEABILITY OF THE SOILS

The site investigation was carried out towards the end of a period during which extensive rains had fallen in the area. A perched groundwater table was encountered in all the test pits at depth varying between 1,1 m and 1,6 m below surface level. The zone of seepage (wet soils) occurred between 1,1 m and 2,2 m depths. Below this zone, the soils tended to be moist and no seepage occurred.

Due to the sandy and gravelly composition, the soils are anticipated to have coefficients of permeability that are in the order of k = 10^{-5} to 10^{-6}cm/sec which is fairly high. Ingress of surface water into the soil profile up to 2 m depths is expected to be rapid. The direction of flow of the groundwater is expected to follow the surface topography in an easterly and southerly direction.

Problems with shallow groundwater are therefore expected at the site.

7 GEOTECHNICAL EVALUATION

7.1 INDICATOR TEST RESULTS

The results of foundation indicator tests performed on representative soil samples are summarised in the table below. Detailed results of the tests are presented in Appendix C of this report.

Table 2: Summary of Foundation Indicator Tests

Sample No.	Hole No.	Depth (m)	Description	Percentage Passing:						LL	PI	LS (%)	G. M.	P.E.	Unified Class
				19.0	4,75	2,00	0,425	0,075	0,002						
0/620	GFTP 1	0-0.1	Sandy gravel	57	42	31	22	12	4	28	11	5.5	2.3 5	low	GC
0/621	GFTP 1	0.1-1.9	Sandy gravel	76	65	42	25	15	5	34	15	7.5	2.1 8	low	SC
0/622	GFTP 1	1.9-3.0	Sandy gravel	99	95	79	49	23	6	37	15	7.5	2.1 5	low	SC
0/623	GFTP 3	0.0-0.3	Sandy gravel	85	60	45	33	14	3	21	4	1.5	2.0 8	low	SM
0/624	GFTP 3	0.3-0.8	Sandy gravel	68	45	32	22	11	3	23	7	3.0	2.3 5	low	GM
0/625	GFTP 3	0.8-2.5	Gravelly silty sand	100	91	66	36	20	4	19	6	2.0	1.7 8	low	SM
0/626	GFTP 3	2.5-3.0	Gravelly clayey sand	100	97	82	61	41	18	39	16	7.0	1.1 6	low	SC
0/627	GFTP 5	1.3-1.5	Sandy gravel	61	37	26	18	9	1	18	3	1.0	2.4 7	low	GP

Where: LL = Liquid Limit
PI = Plasticity Index
LS = Linear Shrinkage
SP = Slightly Plastic
G.M. = Grading Modulus
P.E. = Potential Expansiveness
cbd = cannot be determined
NP = Non Plastic

The moderate to low clay content of the soils encountered on the site results in low plasticity indices and hence they have a low potential expansiveness. Heave problems attributable to swell of soils are not expected. This is confirmed by observation in the test pits where no signs of any textures commonly associated with shrinkage or swell of soils were noted.

According to the TRM classification the red brown to yellowish brown sandy gravels comprising the soil mattress placed at the site classify as A-1-b (0) and A-2-6 (0), which indicates a material suitable for sub-base and selected layers in road works (G6 to G7 material). These soils have been imported to the site.

The red brown mottled grey brown alluvial sandy clayey gravel deposits underlying the soil mattress have a grading modulus of about 2 and according to the TRM classification they classify as A-2-6 (0).

The pedogenic soils encountered below 0,3 m in some test pits and below 2,0 m depths in others have a grading modulus in the order of 2.2 and classify as A-2-6 (0) and in places as A-1-b (0).

The residual granite soils encountered on site below the pedogenic layer are variable in composition. Generally they classify as A-2-6 (0) and in places as A-1-b (0). In

test pit GFTP3 below 2,5 m depths very silty material was however encountered that classified as A-6 material, which is only suitable for subgrade type material in road layer works.

7.2 POTENTIALLY COLLAPSIBLE SOIL PROFILE

Voids or pinholes were not noted in the in the fill materials or in the insitu alluvial and residual gravels encountered in the test pits. Although not tested in the laboratory, the field observations indicate that the alluvial and the pedogenic soils encountered below the soil mattress are unlikely to have a collapse potential.

7.3 CORROSIVITY OF THE SOILS

In order to determine the chemical aggressiveness of the soils at the site, water extracts prepared from the red sandy aeolian soils and from the calcrete gavel soils were tested in the laboratory. The pH and the conductivity of these materials were tested according to the TMH A20 and TMH A21T methods. The results are as follows:

Table 3: Summary of pH and Conductivity Tests

Sample & Depth:	pH	Conductivity (S/m)
GFTP1 (0-1,0m)	8	0,251
GFTP1 (1,0-1,9m)	8,1	0,145
GFTP1 (1,9-3,0m)	7,82	0,087
GFTP3 (0-0,3m)	8,12	0,037
GFTP3 (0,3-0,8m)	7,35	0,031
GFTP3 (0,8-2,5m)	7,85	0,026
GFTP3 (2,5-3,0m)	7,45	0,216
GFTP5 (1,3-1,5m)	7,85	0,031

The materials comprising the soil mattress are low to moderately alkaline with pH values varying between 8 and 8,12 and tend to have a moderate conductivity varying between 31 mS/m and 251 mS/m. The alluvial soils and the pedogenic soils underlying the mattress are also moderately alkaline with pH values in the order of 8,1. They tend to have low conductivities that exceed 145 mS/m. The pedogenic soils have pH values of less than 8 and their conductivities are less than 40 mS/m.

The soils encountered at the site are expected to be corrosive to metals.

7.4 ERODABILITY OF THE SOIL PROFILE

Due to lack of slopes on the site, problems with erosion are not expected in spite of the absence of a vegetation cover. Erosion does however occur in the side slopes of excavations that extend to depth below the perched water table.

7.5 INSTABILITY OF AREAS OF SOLUBLE ROCK

Soluble rock, such as limestone or dolomite, was not found at the site and no instability associated with this rock type is expected.

7.6 AREAS SUBJECT TO FLOODING

We do not have any information regarding the location of the 1: 100 year flood lines in the vicinity of the site so cannot comment regarding the risk of flooding at the site.

It is recommended that the building platforms and access roads as well as parking areas at the site be landscaped to allow drainage of surface water away from the structures. Ponding of surface water adjacent to buildings, access roads and parking areas must be prevented. To avoid contamination of the environment by oil contaminated surface water runoff from the site should be channelled in lined canals and collected in lined ponds from which seepage into the ground is prevented. Water accumulated in these ponds should either be allowed to evaporate or it should be pumped and removed to a place of safe disposal.

8 RECOMMENDATIONS

8.1 FOUNDATIONS FOR SINGLE AND DOUBLE STOREY STRUCTURES

Variable consistencies encountered in the fill layer as well as the underlying alluvial deposits or pedogenic and residual granite soils comprising the soil profiles at the site present conditions that can result in differential movement of foundations, attributable to the normal settlement due to consolidation of the sandy gravelly soils. The total movement due to consolidation and/or collapse of the wetted loose soil layers is anticipated to be in excess 10 mm with probable differential movement of at least 50% of this value. It is obvious that if no precautions to deal with this problem effectively are implemented, structural crack damage to masonry structures of a moderate to severe nature is to be expected. Crack damage to paving can also be expected and removing loose materials and replacing and compacting them in layers beneath the paved areas required at the proposed site and around it must be considered.

In order to reduce consolidation and/or collapse settlement to tolerable levels, we recommend the following.

8.1.1 Precautions against collapse/consolidation settlement

The most effective solution to deal with the loose to medium dense sandy gravel is to remove portions of it from beneath a structure and replace it with dense inert compacted material. In the case of this site, the material removed from the

excavation is likely to be suitable for re-compaction. Imported inert materials should be placed in the excavations in layers not exceeding 150 mm in thickness and compacted to specifications given below. We recommend that the following be done for single and double storey masonry structures that exert no more than 50 kPa founding pressure and for areas occupied by access roads and parking areas.

- Excavate to a minimum of 0,9 m depth to remove all the existing loose to medium dense sandy gravel and roots, over the entire footprint of the structure and the access roads and parking areas, plus 1,5 m wider all round and replace it with material of the following specification. The majority of the removed material is likely to be suitable for re-compaction but should be tested to ensure that it meets the required standards prior to placing it back into the excavations.

- Compact the floor of the excavation to a depth of at least 150 mm to a density of 93% Modified AASHTO density.

- Next, backfill with imported material as specified below:

    - Minimum Grading Modulus: 1,2
    - Maximum Plasticity Index: 10%
    - Compacted layer thickness: 100 mm
    - Compaction standard: 95% of Modified AASHTO density
    - Compaction moisture 1% variation either side of optimum

- Continue backfilling and compacting in layers as described above until the level of the standard strip or pad concrete foundations or building platform is reached.

Thereafter normal shallow foundations may be used, with maximum bearing pressures limited to 50 kPa.

We recommend mechanical compaction over compaction with hand tools because experience has shown that obtaining even compaction to the required densities is very difficult with hand tools and generally produces a less uniform and inferior result to mechanical compaction.

8.1.2 Foundations for moderately heavy structures

In the case where founding pressures will be greater than 50 kPa and up to about 150 kPa, we recommend that the over excavations for the trenches for the strip and pad footings be increased to a minimum of 1,2 m below the building platform level

and that these be treated and backfilled with imported compacted materials as specified above.

Obviously, if part or all of the uppermost loose sand is left in place beneath the floors of structures, differential movement of the floors of buildings and between portions of floor slabs can take place. Movement joints between floor slabs and between floor slabs and walls, as well as between perimeter walls and internal walls founded on floor slabs, as appropriate to the structure, will need to be implemented. In addition, extensive incorporation of brickforce in all walls with wall ties at joints (the latter sealed with a durable flexible sealer and not a rigid medium like plaster) should be implemented where potentially compressible soil will cause differential movement of floors and foundations.

8.1.3 Foundations exerting in excess of 150 kPa

Where heavy foundations exerting between 150 kPa and about 230 kPa may be necessary, we recommend placing these on very soft to soft rock granite bedrock expected to be encountered between 3,0 m and 6,0 m depths.

8.1.4 Precautions if not all loose soil is eliminated below building footprints

To limit crack damage in masonry walls, movement joints with wall ties at every fourth brick course may be provided, as well as brickforce in every fourth course in walls. Such joints, in the case of residential structures, are normally implemented at about 5 m intervals at positions determined by an experienced structural or geotechnical engineer, taking into account the basic design of the structure. At openings such as doors and windows, it would be prudent to provide brickforce in the first four courses above such openings, and below windows, in the first four courses of the brickwork below windows. In all cases of additional brick force at windows and doors, the brickforce should be extended to 1,5 m either side of such openings, where feasible. All courses of plinth walls should be provided with brickforce up to floor slab level to provide additional stiffness.

8.1.5 Concrete raft foundations placed within the loose soil profile

If such a foundation is implemented, the following items must receive careful attention.

- The raft must be of high rigidity and capable of supporting the superstructure without undue deflection in a situation where 10 mm of settlement may occur at the centre of the structure and none at the perimeter.
- The floor slab should be integral with the foundation itself so as to avoid differential movement between floors and walls.
- Flexibility of buried cables, water and sewer connections should be ensured.

The medium dense consistency soil is expected to soften on wetting up and we would advise caution in terms of founding pressures and recommend that 50 kPa not be exceeded for the raft option.

8.1.6 Precautions against flooding

Stormwater flows towards low-lying areas to the east of the site. Although 1:100 year flood line data was not available at the time of the investigation, it is recommended that the building platforms as well as roads and parking areas on the site be raised to levels above the 1: 100 year flood line to prevent flood damage. In addition all buildings should be provided with adequate damp proofing and the grounds should be landscaped to prevent ponding of stormwater adjacent to structures. Run-off water from the site should be channelled in lined canals and accumulated in lined ponds to prevent contamination of the groundwater.

8.1.7 Deep excavations

Excavation conditions to between 3,0 m and 4,0 m depth are expected to be soft to intermediate. Intermediate and in localised places hard excavations are expected between 4,0 m and 6,0 m. Blasting is only expected to be required in occasional localised areas.

Excavations extending below 1,2 m depths will encounter the perched water table. Water seeping into the excavations will have to be accumulated in sumps from which it can be pumped. The sidewalls of the excavations will require shoring to prevent collapse.

8.1.8 Fuel Storage Tanks

Due to the presence of a shallow perched water table at the site, it is recommended that the underground fuel storage tanks be placed in water proof brick or concrete containers that prevent access of the groundwater to the outside of the fuel storage tanks. On the inside the containers should be equipped with water table monitoring equipment and facilities to allow the installation of pumping equipment to measure the presence and level of any seepage fluids within the container and to allow these fluids to be pumped from the container. After placing the fuel storage tanks into the containers the space between the fuel tank and the container can be filled with sand or gravel material.

8.2 PARKING AREAS AND ROAD PAVEMENTS

As indicated by the laboratory test results, the in situ materials are generally suitable for use as subgrade and fill layers material provided that the root content is not excessive. Higher quality materials will have to be brought to site.

The site is suitable for the proposed development. Provided that the recommendations elaborated on above are adhered to, there are no conditions of a geological nature that will result in a negative environmental impact of such severity that the proposed filling station cannot be erected and operated at this location.

A SCHULZE-HULBE, Pr Sci Nat
FOR BLUE ROCK CONSULTING (PTY) LTD

9 REFERENCES

1) Jennings, J E B, Brink A B A and Williams A A B, *Revised Guide to Soil Profiling for Civil Engineering Purposes in Southern Africa.* The Civil Engineer in SA, January 1973, pp 3 to 12.

2) Partridge TC, Wood CK and Brink ABA. *Priorities for urban expansion within the PWV metropolitan region: The primacy of geotechnical constraints.* South African Geographical Journal, Vol. 75, pp 9 – 13. . 1993.

3) Van der Merwe, D.H. *The Prediction of Heave from the Plasticity Index and Percentage Clay Fraction.* Trans. S.A. Ins. Civ. Eng. No. 6, 1964.

4) Jennings, J.E. and Knight, K. *A guide to construction on or with materials exhibiting additional settlement due to collapse of grain structure.* Proceedings, 6th Regional Conference for Africa SM and FE. Accra. 1980.

5) SABS 1200. *Standardised Excavation Classification for Earthworks.*

6) National Institute for Transport and Road Research, *"Guidelines for Road Construction Materials".* TRH 14, Pretoria, CSIR, 1987.

APPENDIX A

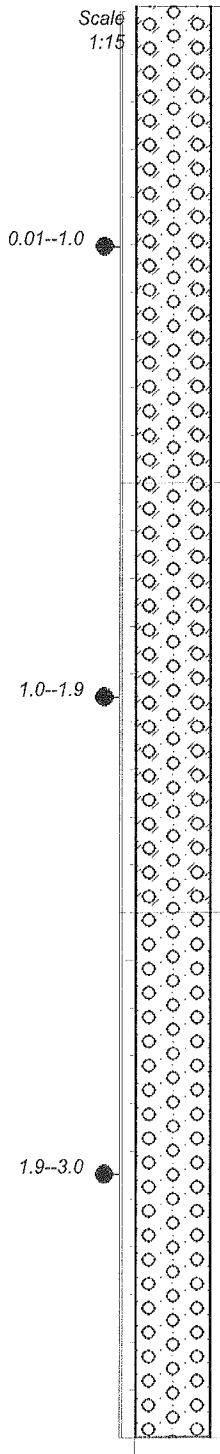
SOIL PROFILES

blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 1
Sheet 1 of 1

JOB NUMBER: 2010 0010



0.00 Slightly moist red brown loose to medium dense clayey sandy gravel; Fill.

1.00 Moist becoming wet below 1.2 m, red brown mottled grey medium dense clayey sandy gravel; Alluvium.

1.90 Moist red brown speckled black medium dense to dense sandy gravel; Slightly ferruginised intact residual granite.

3.00 End of hole.

NOTES

1) Hole excavated to maximum reach of machine.

2) Moderate ingress of water between 1.00 m and 1.9 m .

3) Sidewalls collapse between 1.0 and 1.9 m. Elsewhere sidewalls are stable.

4) Sample : F Ind 0.01--1.0 m.

5) Sample : F Ind 1.0--1.9 m.

6) Sample : F Ind 1.9--3.0 m.

7) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 1

REVISION :
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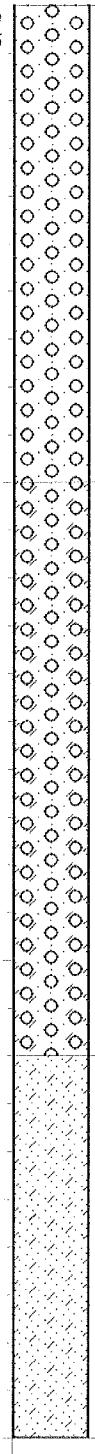
blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 2
Sheet 1 of 1

JOB NUMBER: 2010 0010

Scale 1:15



0.00 Slightly moist red brown spotted black medium dense ferruginised sandy gravel; Fill.

1.00 Moist becoming wet below 1.6 m red brown blotched grey and spotted black loose to medium dense clayey sandy gravel; Alluvium.

2.20 Moist red brown spotted black medium dense clayey ferruginised sand; Ferruginised residual granite.

3.00 End of hole.

NOTES

1) Hole excavated to maximum reach of machine.

2) Side walls of hole unstable between 1.2 m and 2.2 m.

3) Ingress of water into hole between 1.6 m and 2.2 m.

4) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe
REVISION :
SETUP FILE : BR_TP.SET

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010
DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

ELEVATION :
X-COORD :
Y-COORD :

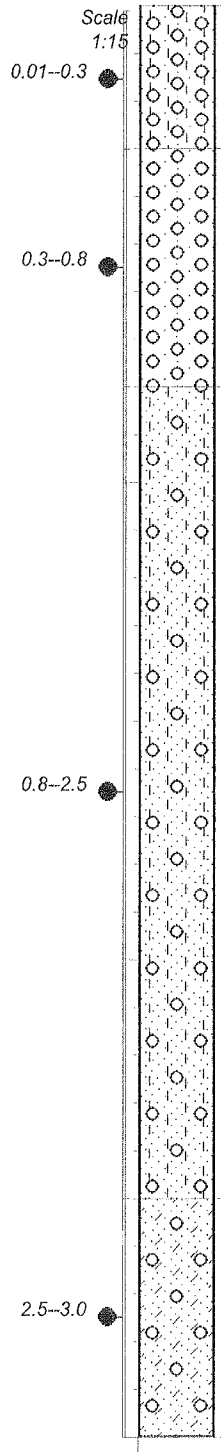
HOLE No: GFTP 2

blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 3
Sheet 1 of 1

JOB NUMBER: 2010 0010



0.00 Slightly moist yellowish to reddish brown loose to medium dense silty sandy gravel; Fill.

0.30 Slightly moist red brown mottled yellow and black medium dense ferruginised sandy gravel; Residual granite.

0.80 Moist becoming wet below 1.5 m yellowish mottled grey and red medium dense to dense silty gravelly sand with sporadic very soft rock rounded granite corestones; Residual granite.

2.50 Moist dark red mottled grey medium dense clayey gravelly sand; Residual granite.

3.00 End of hole.

NOTES

1) Hole excavated to maximum reach of machine.
2) Ingress of water below 1.5 m depth.
3) Hole unstable between 1.5 m and 3.0 m.
4) Sample : F Ind 0.01--0.3 m.
5) Sample : F Ind 0.3--0.8 m.
6) Sample : F Ind 0.8--2.5 m.
7) Sample : F Ind 2.5--3.0 m.
8) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 3

REVISION :
SETUP FILE : BR_TP.SET

DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

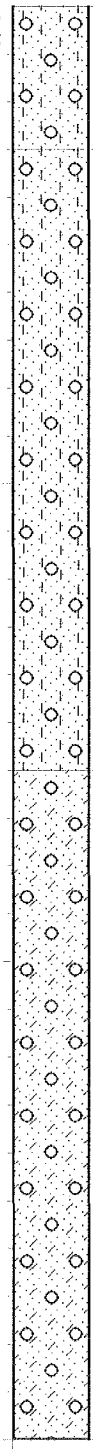
blue rock consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 4
Sheet 1 of 1

JOB NUMBER: 2010 0010

Scale 1:15



0.00 Slightly moist yellowish to reddish brown loose to medium dense gravelly silty sand; Fill.

0.30 Moist becoming wet below 1.5 m yellowish mottled grey and red medium dense to dense silty gravelly sand with sporadic very soft rock rounded granite corestones; Residual granite.

1.60 Moist dark red mottled grey medium dense clayey gravelly sand; Residual granite.

3.00 End of hole.

NOTES

1) Maximum reach of machine; No refusal.

2) Water intersected below 1.6 m.

3) Sidewall of hole unstable between 1.6 m and 2.3 m.

4) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe
REVISION :
SETUP FILE : BR_TP.SET

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010
DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 4

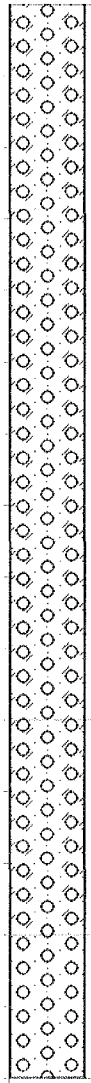
blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 5
Sheet 1 of 1

JOB NUMBER: 2010 0010

Scale 1:10



0.00 — Slightly moist red brown loose to medium dense clayey sandy gravel; Fill.

1.00 — Moist becoming wet below 1.1 m, red brown mottled grey dense clayey sandy gravel; Alluvium.

1.30 — Wet grey brown mottled orange and black very dense to very soft rock ferruginised sandy gravel.

1.3--1.5

1.50 — End of hole.

NOTES

1) Machine refuse at 1.6 m.

2) Water ingress in hole below 1.3 m.

3) Sidewall collapse below 1.3 m.

4) Sample : F Ind 1.3--1.5 m.

5) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 5

REVISION :
SETUP FILE : BR_TP.SET

DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

blue rock Consulting

Client: SEF
Groblersdal Filling Station

LEGEND
Sheet 1 of 1

JOB NUMBER: 2010 0010

	GRAVEL	{SA02}
	GRAVELLY	{SA03}
	SAND	{SA04}
	SANDY	{SA05}
	SILTY	{SA07}
	CLAYEY	{SA09}
Name	DISTURBED SAMPLE	{SA38}

CONTRACTOR :
MACHINE :
OPERATOR :
PROFILED BY :

INCLINATION :
DIAM :
DATE DRILLED :
DATE PROFILED :

ELEVATION :
X-COORD :
Y-COORD :

REVISION :
SETUP FILE : BR_TP.SET

DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

LEGEND
SUMMARY OF SYMBOLS

APPENDIX B

LABORATORY TEST RESULTS

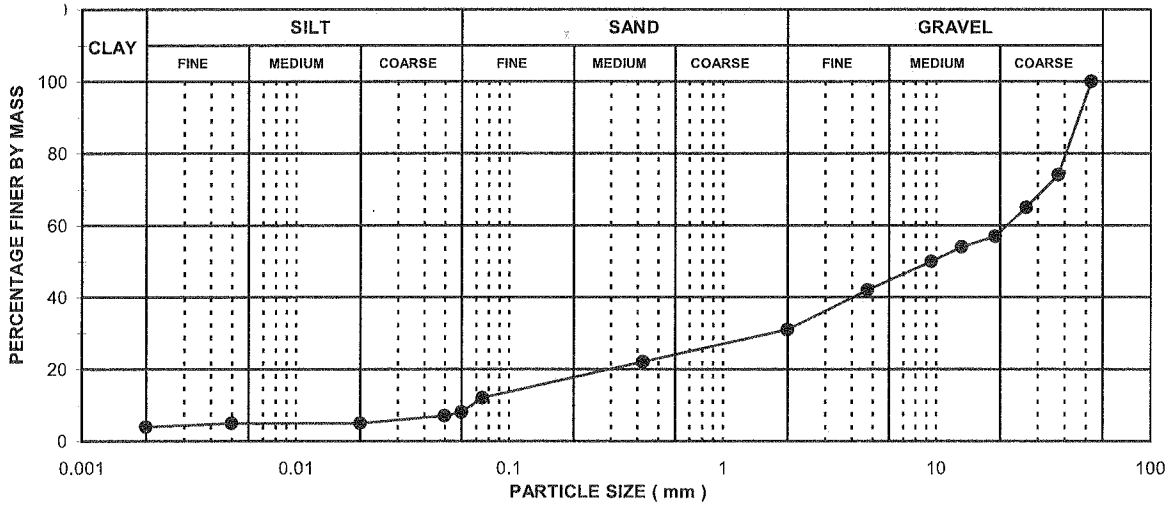
BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

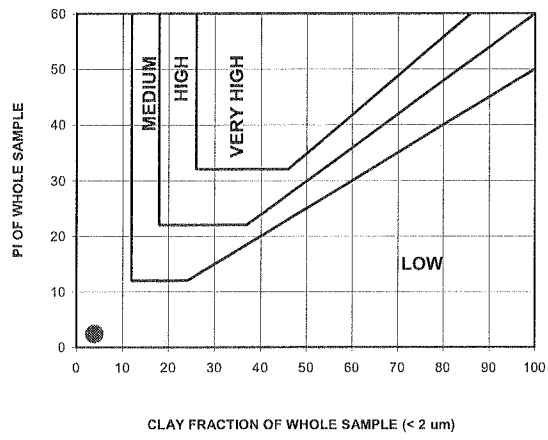
TEST LOCATION	GFTP 1	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/620	PROJECT NUMBER	2010 0010
DEPTH	0.0-1.0 m	SITE	Groblersdal Ext 11 Erven 756 & 757

SIEVE ANALYSIS				ATTERBERG LIMITS			SOIL CLASSIFICATION	
Sieve (mm)	% Passing	Sieve (mm)	% Passing					
53.000	100	0.425	22	Liquid limit	(%)	28	% Gravel	69
37.500	74	0.075	12	Plastic limit	(%)	17	% Sand	23
26.500	65	0.060	8	Plasticity Index	(%)	11	% Silt	4
19.000	57	0.050	7	Weighted PI	(%)	2	% Clay	4
13.200	54	0.020	5	Linear Shrinkage	(%)	5.5	Activity	2.8
9.500	50	0.005	5	Grading Modulus		2.35	Unified Classification	GC
4.750	42	0.002	4	Uniformity coefficient		314	TRB Classification	A - 2 - 6
2.000	31			Coefficient of curvature		2.2		

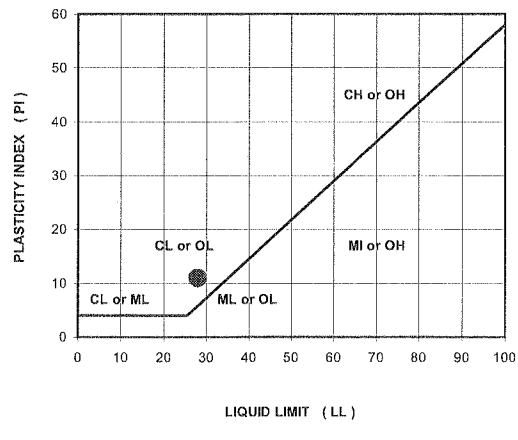
PARTICLE SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS
Van der Merwe's Activity Chart



CASAGRANDE 'A' LINE



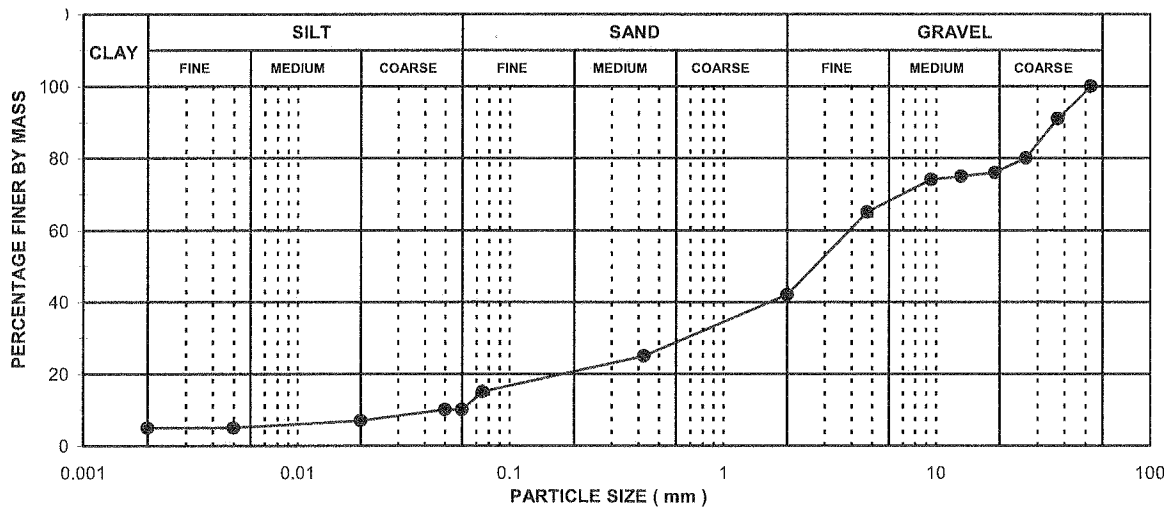
BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

TEST LOCATION	GFTP 1	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/621	PROJECT NUMBER	2010 0010
DEPTH	1.0-1.9 m	SITE	Groblersdal Ext 11 Erven 756 & 757

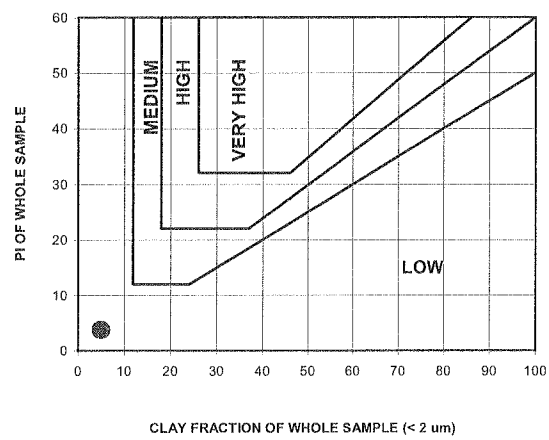
SIEVE ANALYSIS				ATTERBERG LIMITS			SOIL CLASSIFICATION	
Sieve (mm)	% Passing	Sieve (mm)	% Passing					
53.000	**100**	0.425	**25**	Liquid limit	(%)	**34**	% Gravel	**58**
37.500	**91**	0.075	**15**	Plastic limit	(%)	**19**	% Sand	**32**
26.500	**80**	0.060	**10**	Plasticity Index	(%)	**15**	% Silt	**5**
19.000	**76**	0.050	**10**	Weighted PI	(%)	**4**	% Clay	**5**
13.200	**75**	0.020	**7**	Linear Shrinkage	(%)	**7.5**	Activity	**3.0**
9.500	**74**	0.005	**5**	Grading Modulus		**2.18**	Unified Classification	**SC**
4.750	**65**	0.002	**5**	Uniformity coefficient		**67**	TRB Classification	**A - 2 - 6**
2.000	**42**			Coefficient of curvature		**3.1**		

PARTICLE SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS

Van der Merwe's Activity Chart



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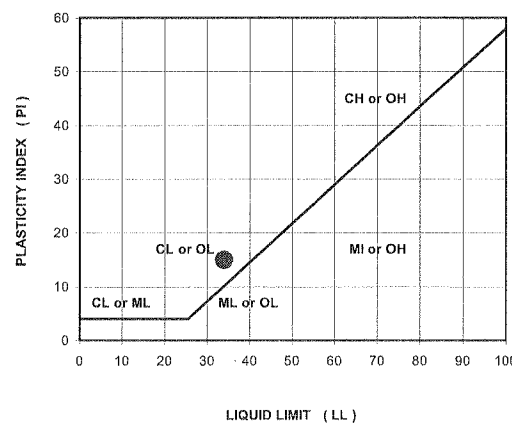


BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

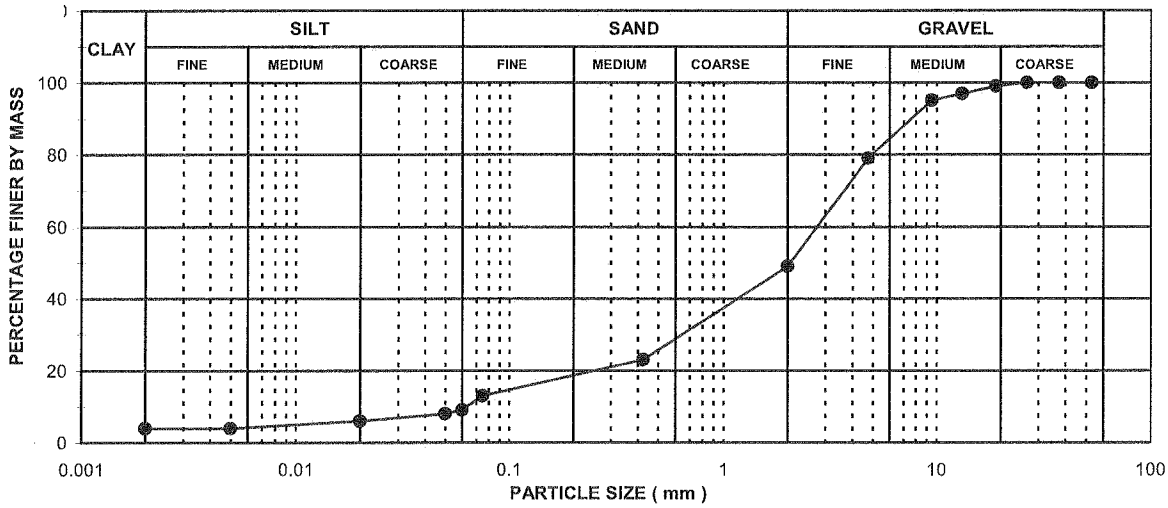
TEST LOCATION	GFTP 1	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/622	PROJECT NUMBER	2010 0010
DEPTH	1.9-3.0 m	SITE	Groblersdal Ext 11 Erven 756 & 757

SIEVE ANALYSIS			
Sieve (mm)	% Passing	Sieve (mm)	% Passing
53.000	**100**	0.425	**23**
37.500	**100**	0.075	**13**
26.500	**100**	0.060	**9**
19.000	**99**	0.050	**8**
13.200	**97**	0.020	**6**
9.500	**95**	0.005	**4**
4.750	**79**	0.002	**4**
2.000	**49**		

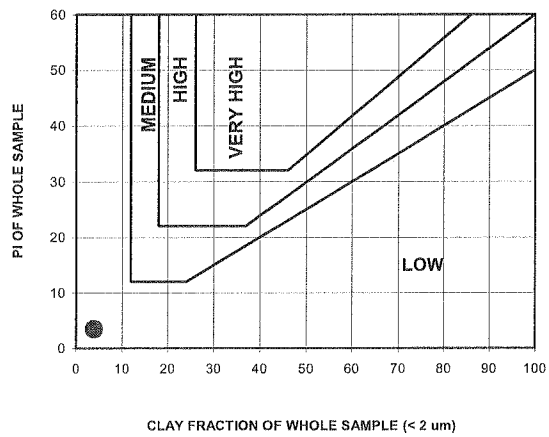
ATTERBERG LIMITS		
Liquid limit	(%)	**37**
Plastic limit	(%)	**22**
Plasticity Index	(%)	**15**
Weighted PI	(%)	**3**
Linear Shrinkage	(%)	**7.5**
Grading Modulus		**2.15**
Uniformity coefficient		**46**
Coefficient of curvature		**3.6**

SOIL CLASSIFICATION	
% Gravel	**51**
% Sand	**40**
% Silt	**5**
% Clay	**4**
Activity	**3.8**
Unified Classification	**SC**
TRB Classification	**A - 2 - 6**

PARTICLE SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS
Van der Merwe's Activity Chart



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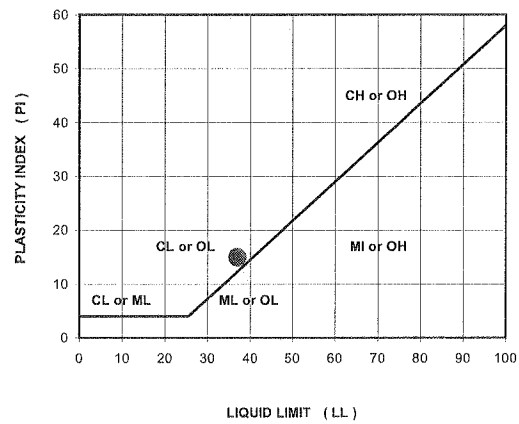


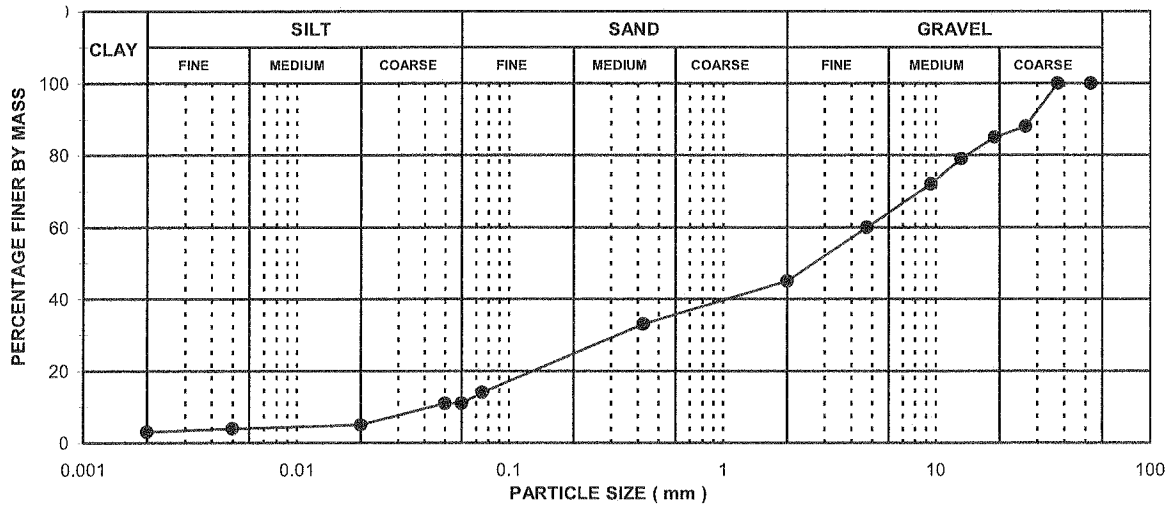
BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

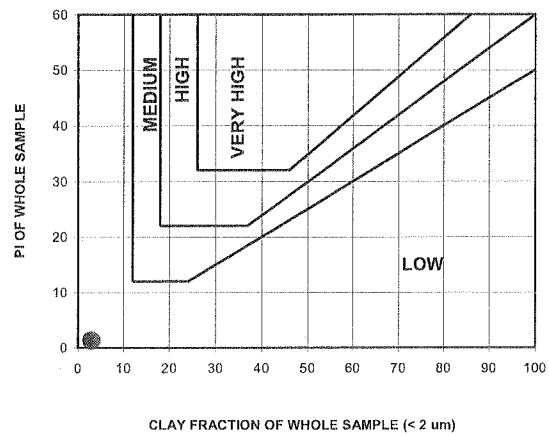
TEST LOCATION	GFTP 3	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/623	PROJECT NUMBER	2010 0010
DEPTH	0.0-0.3 m	SITE	Groblersdal Ext 11 Erven 756 & 757

SIEVE ANALYSIS				ATTERBERG LIMITS			SOIL CLASSIFICATION	
Sieve (mm)	% Passing	Sieve (mm)	% Passing					
53.000	**100**	0.425	**33**	Liquid limit	(%)	**21**	% Gravel	**55**
37.500	**100**	0.075	**14**	Plastic limit	(%)	**17**	% Sand	**34**
26.500	**88**	0.060	**11**	Plasticity Index	(%)	**4**	% Silt	**8**
19.000	**85**	0.050	**11**	Weighted PI	(%)	**1**	% Clay	**3**
13.200	**79**	0.020	**5**	Linear Shrinkage	(%)	**1.5**	Activity	**1.3**
9.500	**72**	0.005	**4**	Grading Modulus		**2.08**	Unified Classification	**SM**
4.750	**60**	0.002	**3**	Uniformity coefficient		**101**	TRB Classification	**A-- 1 - b**
2.000	**45**			Coefficient of curvature		**0.6**		

PARTICLE SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS
Van der Merwe's Activity Chart



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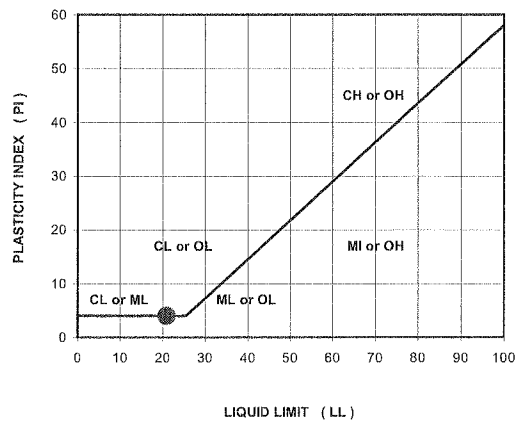


BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

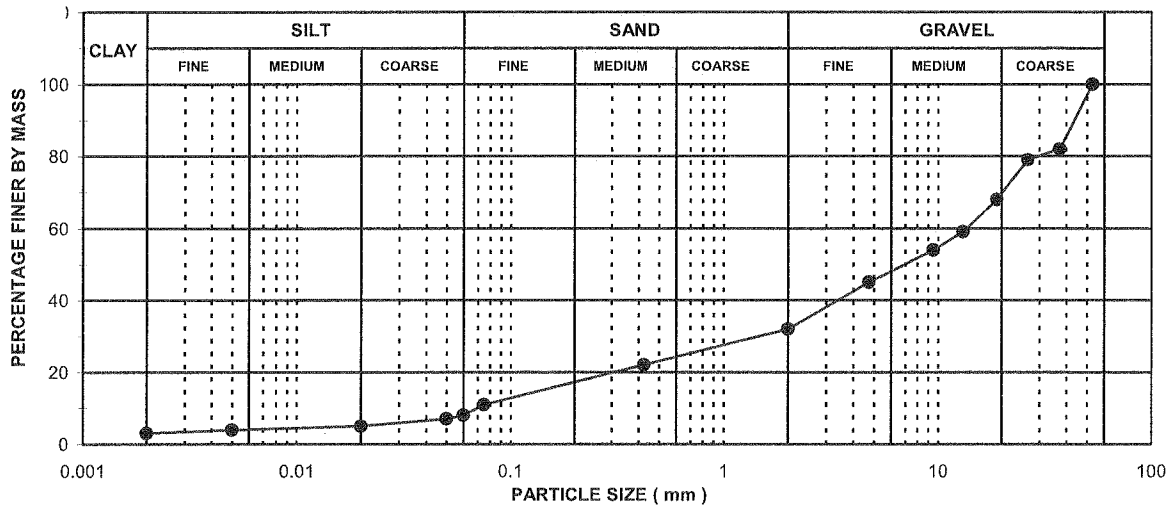
TEST LOCATION	GFTP 3	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/624	PROJECT NUMBER	2010 0010
DEPTH	0.3-0.8 m	SITE	Groblersdal Ext 11 Erven 756 & 757

SIEVE ANALYSIS			
Sieve (mm)	% Passing	Sieve (mm)	% Passing
53.000	100	0.425	22
37.500	82	0.075	11
26.500	79	0.060	8
19.000	68	0.050	7
13.200	59	0.020	5
9.500	54	0.005	4
4.750	45	0.002	3
2.000	32		

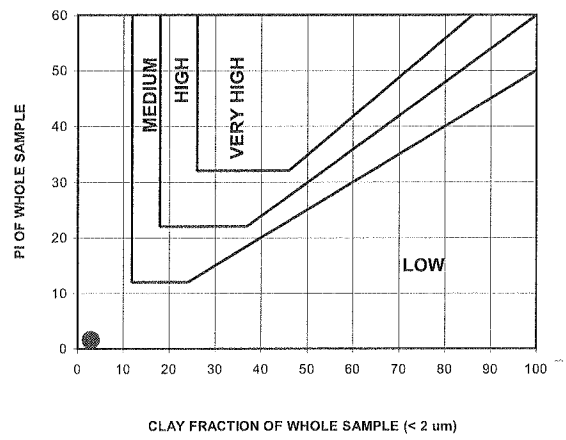
ATTERBERG LIMITS		
Liquid limit	(%)	23
Plastic limit	(%)	16
Plasticity Index	(%)	7
Weighted PI	(%)	2
Linear Shrinkage	(%)	3.0
Grading Modulus		2.35
Uniformity coefficient		192
Coefficient of curvature		2.8

SOIL CLASSIFICATION	
% Gravel	68
% Sand	24
% Silt	5
% Clay	3
Activity	2.3
Unified Classification	GM
TRB Classification	A - 2 - 4

PARTICLE SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS
Van der Merwe's Activity Chart



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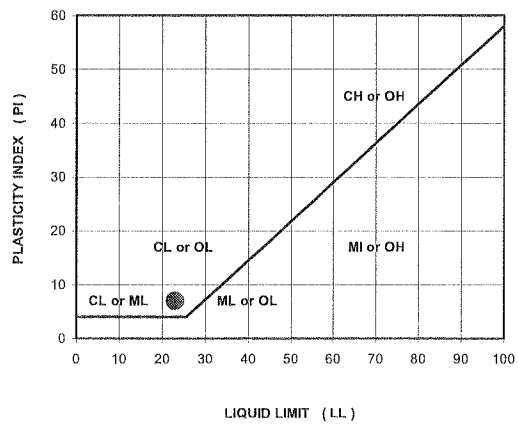


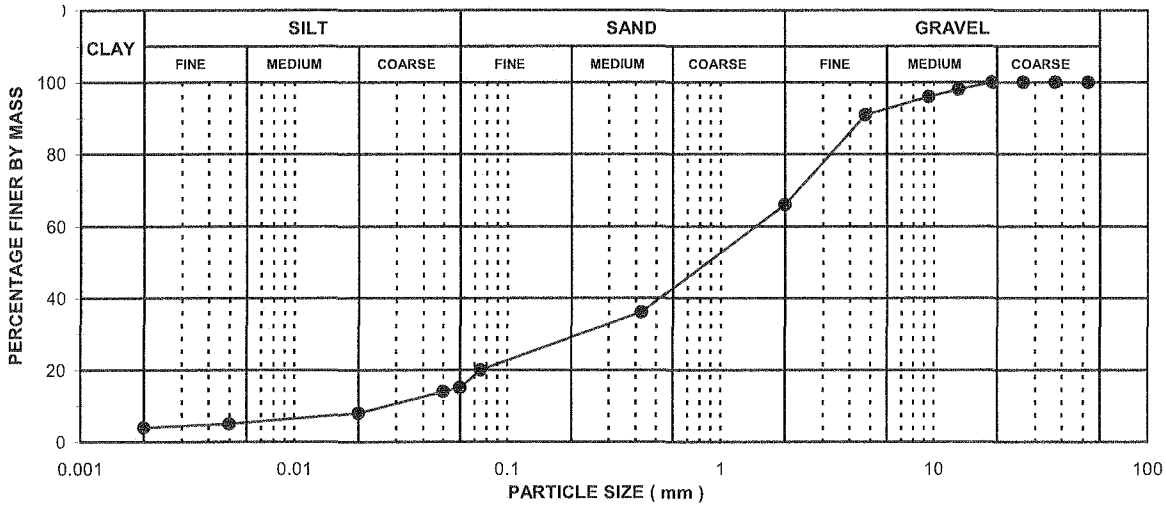
BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

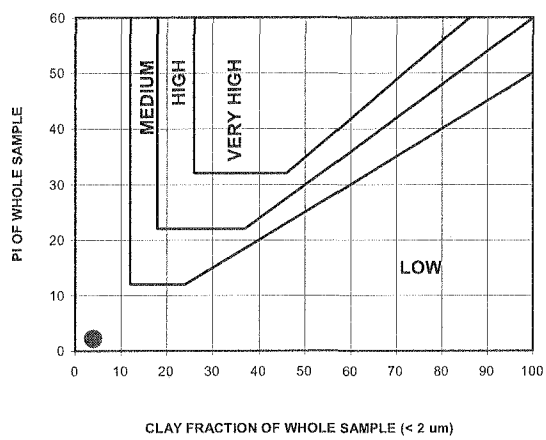
TEST LOCATION	GFTP 3	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/625	PROJECT NUMBER	2010 0010
DEPTH	0.8-2.5 m	SITE	Groblersdal Ext 11 Erven 756 & 757

SIEVE ANALYSIS				ATTERBERG LIMITS			SOIL CLASSIFICATION	
Sieve (mm)	% Passing	Sieve (mm)	% Passing					
53.000	100	0.425	36	Liquid limit	(%)	19	% Gravel	34
37.500	100	0.075	20	Plastic limit	(%)	13	% Sand	51
26.500	100	0.060	15	Plasticity Index	(%)	6	% Silt	11
19.000	100	0.050	14	Weighted PI	(%)	2	% Clay	4
13.200	98	0.020	8	Linear Shrinkage	(%)	2.0	Activity	1.5
9.500	96	0.005	5	Grading Modulus		1.78	Unified Classification	SM
4.750	91	0.002	4	Uniformity coefficient		53	TRB Classification	A-- 1 - b
2.000	66			Coefficient of curvature		1.6		

PARTICLE SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS
Van der Merwe's Activity Chart



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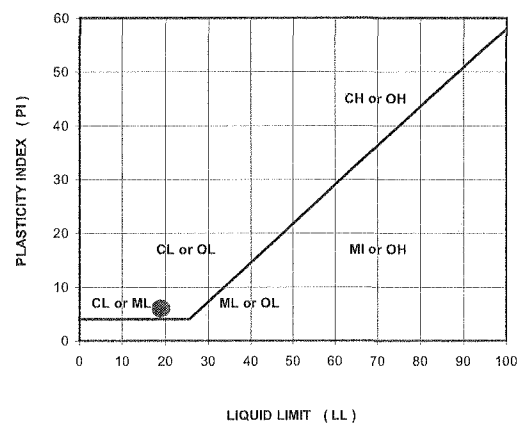


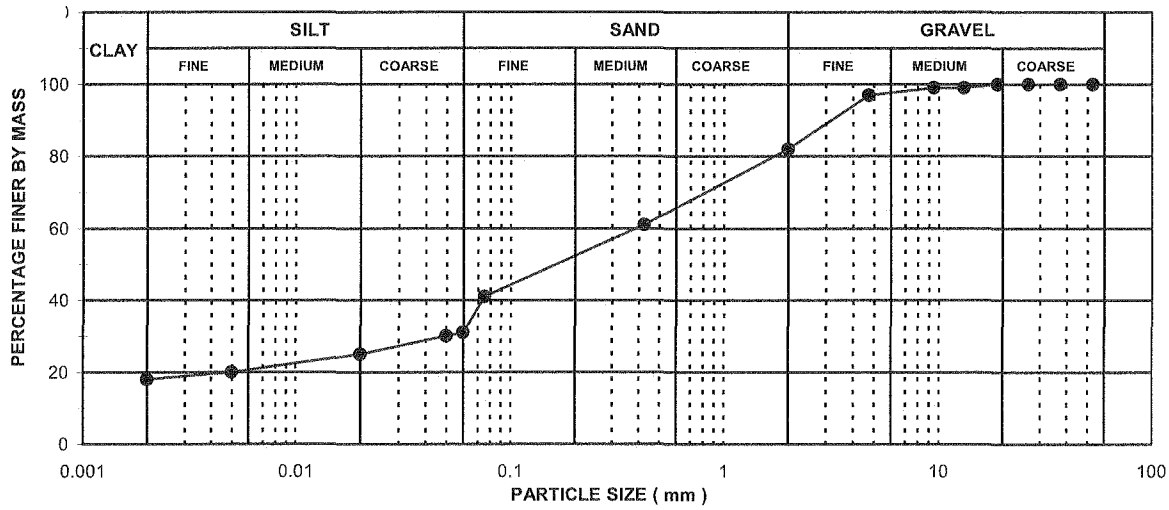
BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

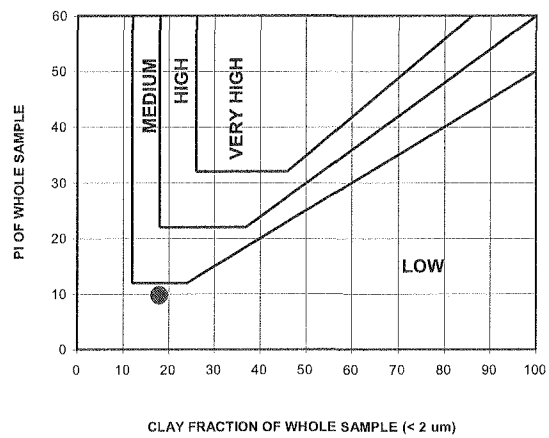
TEST LOCATION	GFTP 3	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/626	PROJECT NUMBER	2010 0010
DEPTH	2.5-3.0 m	SITE	Groblersdal Ext 11 Erven 756 & 757

SIEVE ANALYSIS				ATTERBERG LIMITS			SOIL CLASSIFICATION	
Sieve (mm)	% Passing	Sieve (mm)	% Passing					
53.000	100	0.425	61	Liquid limit	(%)	39	% Gravel	18
37.500	100	0.075	41	Plastic limit	(%)	23	% Sand	51
26.500	100	0.060	31	Plasticity Index	(%)	16	% Silt	13
19.000	100	0.050	30	Weighted PI	(%)	10	% Clay	18
13.200	99	0.020	25	Linear Shrinkage	(%)	7.0	Activity	0.9
9.500	99	0.005	20	Grading Modulus		1.16	Unified Classification	SC
4.750	97	0.002	18	Uniformity coefficient		204	TRB Classification	A - 6
2.000	82			Coefficient of curvature		3.1		

PARTICLE SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS
Van der Merwe's Activity Chart



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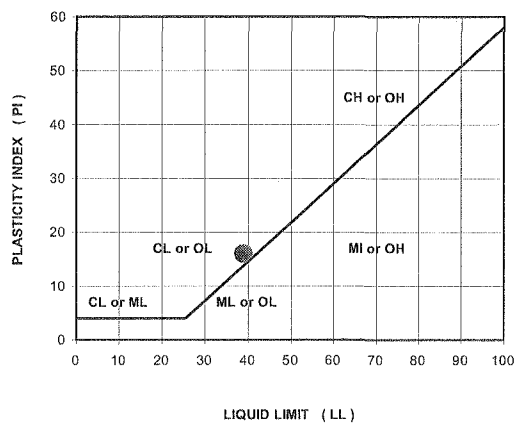


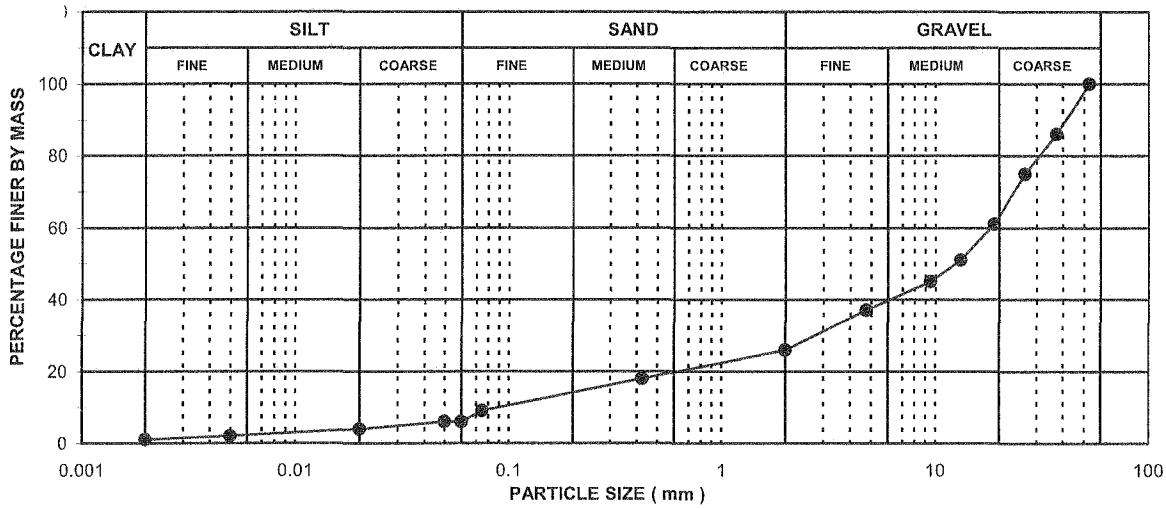
BLUE ROCK CONSULTING

FOUNDATION INDICATOR TEST RESULTS

TEST LOCATION	GFTP 5	PROJECT	Groblersdal Filling Station
SAMPLE NO.	0/627	PROJECT NUMBER	2010 0010
DEPTH	1.3-1.5 m	SITE	Groblersdal Ext 11 Erven 756 & 757

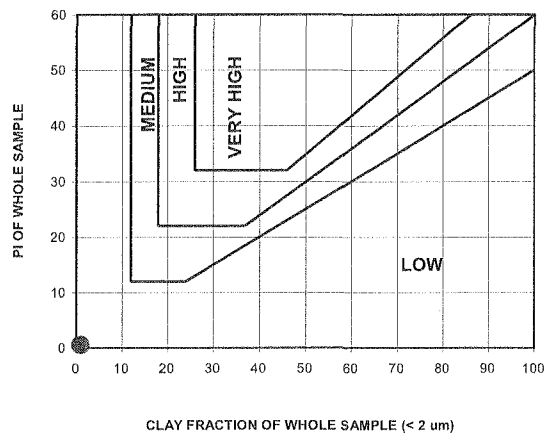
SIEVE ANALYSIS				ATTERBERG LIMITS			SOIL CLASSIFICATION	
Sieve (mm)	% Passing	Sieve (mm)	% Passing					
53.000	100	0.425	18	Liquid limit	(%)	18	% Gravel	74
37.500	86	0.075	9	Plastic limit	(%)	15	% Sand	20
26.500	75	0.060	6	Plasticity Index	(%)	3	% Silt	5
19.000	61	0.050	6	Weighted PI	(%)	1	% Clay	1
13.200	51	0.020	4	Linear Shrinkage	(%)	1.0	Activity	3.0
9.500	45	0.005	2	Grading Modulus		2.47	Unified Classification	GP
4.750	37	0.002	1	Uniformity coefficient		159	TRB Classification	A - 1 - a
2.000	26			Coefficient of curvature		4.2		

PARTICLE SIZE DISTRIBUTION

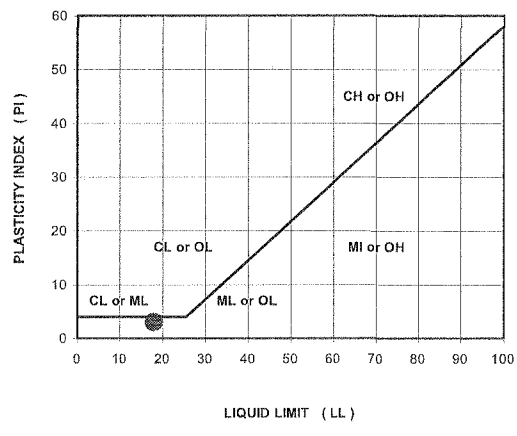


POTENTIAL EXPANSIVENESS

Van der Merwe's Activity Chart



CASAGRANDE 'A' LINE



GEOSTRADA
engineering materials laboratory

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PO Box 11126, Hatfield, 0028

Tel: +27 12 427 3071
Fax: +27 12 427 3050
email: lab@geostrada.co.za

Commercial Laboratories: Bloemfontein, Pretoria, Luanda, Windhoek

REPORT No: 103316-A3/2010-03-09/RDJ/km/1

Blue Rock Consulting	Our Reference:	103316/A3
P O Box 24614		
GEZINA	Your Reference:	
0031		
Att: Mr A Schulze-Hulbe	Report Date:	2010-03-09

RESULTS OF TESTS ON SOIL SAMPLES: GROBLERSDAL FILLING STATION

1. **SAMPLES:**
   - 1.1 **Sample Description :** Attached are the description and the results of the tests done on the soil samples submitted by the test sponsor to this laboratory, for the above mentioned contract.
   - 1.2 **Date received:** 26 February 2010
   - 1.3 **Date tested** 01- 06 March 2010

2. **NATURE OF TEST:** Refer to result page.

3. **METHOD OF TEST:** Refer to result page.

4. **REMARKS:** This report relates only to the samples tested.

R de Jong
TECHNICAL SIGNATORY
GEOSTRADA engineering materials

GEOSTRADA
engineering materials laboratory
Quality Assurance Services

SIEVE AND HYDROMETER ANALYSIS

Tests done according to TMH1& MT 1 Methods

☑ A1a ☑ A2 ☑ A3 ☑ A4 ☑ A5 ☑ A6

Client : BLUE ROCK CONSULTING **Contract :** GROBLERSDAL FILLING STATION **Job No :** 103316-A3

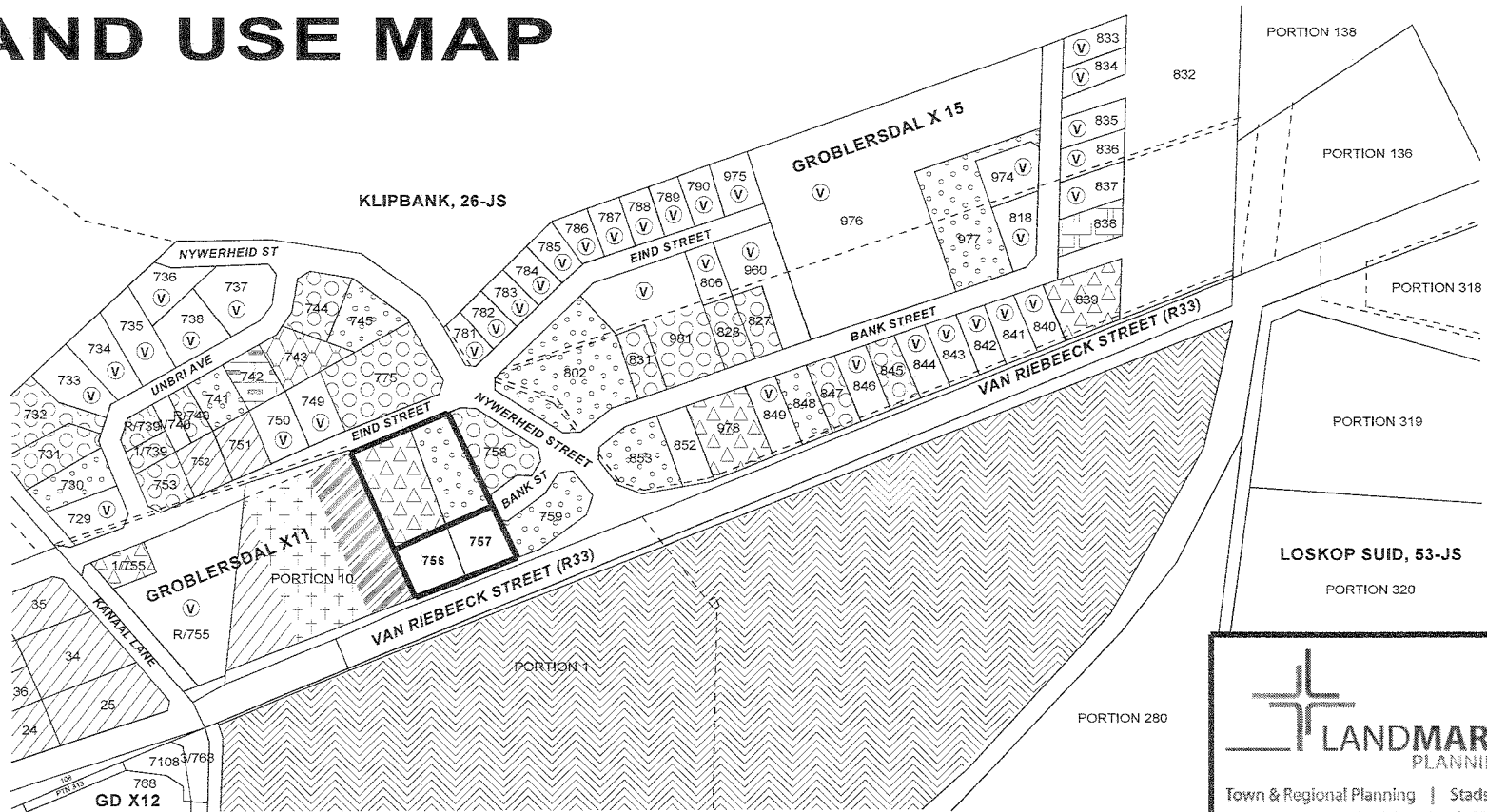
Date : 2010-03-09

Sample No	Hole No/km	Depth (m)	Description material	pH	Conductivity s/m	GM	Percentage passing sieves															Atterberg Limits		
							53,0 mm	37,5 mm	26,5 mm	19,0 mm	13,2 mm	9,5 mm	4,75 mm	2,00 mm	0,425 mm	0,075 mm	0.060 mm	0.050 mm	0.020 mm	0.005 mm	0.002 mm	Liquid limit	Plasticity index	Linear shrinkage
0/620	GFTP1	0-1.0	SILTY SAND	8.00	0.251	2.35	100	74	65	57	54	50	42	31	22	12	8	7	5	5	4	28	11	5.5
0/621	GFTP1	1.0-1.9	SILTY SAND	8.10	0.145	2.18	100	91	80	76	75	74	65	42	25	15	10	10	7	5	5	34	15	7.5
0/622	GFTP1	1.9-3.0	SAND	7.82	0.087	2.15			100	99	97	95	79	49	23	13	9	8	6	4	4	37	15	7.5
0/623	GFTP3	0.0-0.3	SILTY SAND	8.12	0.037	2.08		100	88	85	79	72	60	45	33	14	11	11	5	4	3	21	4	1.5
0/624	GFTP3	0.3-0.8	SILTY SAND	7.35	0.031	2.35	100	82	79	68	59	54	45	32	22	11	8	7	5	4	3	23	7	3.0
0/625	GFTP3	0.8-2.5	SILTY SAND	7.65	0.026	1.78				100	98	96	91	66	36	20	15	14	8	5	4	19	6	2.0
0/626	GFTP5	2.5-3.0	CLAY SAND	7.45	0.216	1.16				100	99	99	97	82	61	41	31	30	25	20	18	39	16	7.0
0/627	GFTP5	1.3-1.5	SILTY SAND	7.85	0.031	2.47	100	86	75	61	51	45	37	26	18	9	6	6	4	2	1	18	3	1.0

APPENDIX C

DRAWINGS

LAND USE MAP



LANDMARK PLANNING
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- APPLICATION SITE
- VACANT
- WAREHOUSE/STORAGE
- TRANSPORT COMPANY
- WORKSHOPS/FITMENT CENTRES/SCRAP YARDS
- OFFICES
- CEMETARY
- AGRICULTURE
- FUNERAL UNDERTAKER
- SHOPS
- VEHICLE TEST CENTRE
- MANUFACTURING

N

SCALE 1 : 5 000


N
GFTP1
GFTP4
GFTP5
GFTP2
GFTP3
149 m
© 2010 Cnes/Spot Image
© 2010 Tele Atlas
© 2010 Europa Technologies
©2009 Google
25°09'53.85" S 29°24'16.06" E elev 906 m
Eye alt 1.47 km

LANDMARK PLANNING (PTY) LTD

PROPOSED FILLING STATION
GROBLERSDAL EXT 11, ERF 756 & 757
GEOHYDROLOGICAL INVESTIGATION
FOR E I A INPUT

Report No.: 2010-0010-3

April 2010

LANDMARK PLANNING (PTY) LTD

PROPOSED FILLING STATION
GROBLERSDAL EXT 11, ERF 756 & 757
GEOHYDROLOGICAL INVESTIGATION
FOR E I A INPUT

REPORT 2010-0010-3 **APRIL 2010**

PREPARED BY:

Blue Rock Consulting (Pty) Ltd
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EXECUTIVE SUMMARY

As part of the Environmental Impact Assessment (E I A) for the rezoning of the erven 756 and 757 in Extension 11 of Groblersdal, Blue Rock Consulting (Pty) Ltd was appointed by Landmark Planning (PTY) Ltd, to conduct a geohydrological investigation at the site for the proposed filling station to be erected on portions of the two erven.

The report presents the results of desk study and a field investigation comprising the digging logging and sampling of five test pits as well as a hydrocensus of the area surrounding the site. Rocks of the Nebo Granite Suite underlie the site.

Our investigation led to the following conclusions and recommendations:

- The surface runoff at the Filling Station site is towards the east and south towards the Olifants River. Extensive agricultural activities occur between the site and the Olifants River.
- It has been established that the aquifers contained in the Nebo Granite are susceptible to infiltration of water into the soils and into the deep secondary aquifers and have a GQM index between 3 and 6 requiring a medium level of protection. It has also been noted that there is a prominent shallow perched water table in the area and that the water flow in this aquifer follows the surface topography.
- The water from the shallow aquifer and the deep aquifer is not at present used, as piped municipal water is available in the area. The roots of the crops planted in the area do however have access to the water in the shallow aquifer.
- It is recommended that a filling station be established within the confines of the present study area provided that the recommendations given in this report are applied.
- Run-off water from the site should be channelled in lined canals and accumulated in lined ponds to prevent contamination of the groundwater.
- It is also recommended that the underground fuel storage tanks be placed in water proof brick or concrete containers that prevent access of the groundwater to the outside of the fuel storage tanks. On the inside the containers should be equipped with water table monitoring equipment and facilities to allow the installation of pumping equipment to measure the presence and level of any seepage fluids within the container and to allow these fluids to be pumped from the container. After placing the fuel storage tanks into the containers the space between the fuel tank and the container can be filled with sand or gravel material.

PROPOSED FILLING STATION: GROBLERSDAL EXT 11, ERF 756 & 757: GEOHYDROLOGICAL REPORT FOR E I A INPUT

CONTENTS **PAGE**

APPENDICES: ***APPENDIX A:*** SOIL PROFILES

APPENDIX B: LABORATORY TEST RESULTS

APPENDIX C: DRAWINGS

1 INTRODUCTION AND TERMS OF REFERENCE

As part of the Environmental Impact Assessment (E I A) for the rezoning of the erven 756 and 757 in Extension 11 of Groblersdal, Blue Rock Consulting (Pty) Ltd was appointed by Landmark Planning (PTY) Ltd, to conduct a geohydrological investigation at the site for the proposed filling station to be erected on the two erven. The proposed facility will be designed to accommodate a public garage, a convenience store of 300 m^2, a place of refreshment, a take-away facility, a car wash facility and an automatic teller machine.

The main aims of the investigation were to:

- Describe the geology at the site and to highlight any geohydrological aspects that control existing environmental conditions and that may cause undesirable changes if not taken into consideration during proposed future developments of the site.
- Evaluate the geohydrology of the site and its sensitivity to the proposed development of the area.
- Ascertain the depth to the water table and determine whether temporary shallow water tables might present a problem of flooding of grave excavations.

This report details the work carried out, analyses the results and gives our conclusions and recommendations.

2 SITE LOCATION AND DESCRIPTION

The site chosen for the development is located in the eastern part of the town of Groblersdal and to the north of Van Riebeeck Street (R33). The sections of the two erven earmarked for the development occupy the southern third of both of the erven where they border onto Van Riebeeck Street. As indicated on the land use map presented in Appendix C of this report, the northern portion of Erf 756 is occupied by workshops, fitment centres and a scrap yard and the northern portion of Erf 757 is occupied by warehouses and storage facilities. The terrain of the southern portions of the two erven where the geohydrological investigation was carried out is virtually flat with a very gentle slope to the south and east towards van Riebeeck Street and the vineyards located on the southern side of this street. The road surface of this street is located about 1m higher than the ground surface on the two erven. Yellow to orange brown sandy gravelly fill material compacted to variable degrees of consistency has be dumped across the entire southern open areas of the two erven which were investigated. Veldt grasses and scattered shrubs and small trees grow along the southern western and eastern boundaries of the site. Elsewhere on the site, which is used for car parking purposes at present, there is no vegetation.

Access to the site is at present along a narrow track located on the common boundary between Erf 756 and 757 leading off Eind Street to the north of the site. A poorly maintained fence separates the site from van Riebeeck Street.

3 DESK STUDY INFORMATION

At the time of the investigation the following information was available:

The following information was available for the study:

- The 1:250 000 scale geological map (Sheet 2626 West Rand).
- A geotechnical report compiled by Blue Rock Consulting and entitled Proposed Filling Station on Erven 756 and 757: Extension 11 Groblersdal: Geotechnical Site Investigation for input for E I A : Report No 2010 0010 2, dated April 2010 with accompanying drawings.
- 1:500 000 *General Hydrogeological map Johannesburg 2526*
- A locality plan and a land use plan for the site.

4 INVESTIGATION PROCEDURE

4.1 SITE INVESTIGATION

The geohydrological investigation carried out on 26 February 2010 for the proposed filling station site is based on data obtained from 5 test pits excavated on the site during the geotechnical investigations. The positions of the test pits are indicated on the site plan in Appendix C.

The holes were excavated to the maximum reach of the ELB 860 SX TLB (about 3,2 m) except for test pit GFTP5 where the machine refused on very dense ferruginised gravelly residual granite at 1,5 m.

Moderate to slow groundwater seepage occurred below 1,2 m and 1,5 m depths in all of the test pits excavated on the site. Groundwater information was recorded in all five of the test pits.

The test pit profiles are included in Appendix A of this report. The co-ordinates of the test pits as determined with the aid of a hand held GPS, are listed in Table 1 below.

Table 1: TEST PIT CO-ORDINATES as determined by hand held GPS

Test Pit No	Latitude	Longitude
GFTP1	S25 09 53.8	E29 24 16.1
GFTP2	S25 09 54.4	E29 24 15.2
GFTP3	S25 09 55.0	E29 24 13.3

Test Pit No	Latitude	Longitude
GFTP4	S25 09 54.4	E29 24 13.1
GFTP5	S25 09 54.2	E29 24 14.2

(Datum: WGS84; Grid: Lat/Lon Hddd° mm' ss.s")

A hydrocensus to locate any existing boreholes within a 0,5 km radius of the site proved to be unsuccessful. No boreholes were located in the area surrounding the site.

4.2 LABORATORY TESTING

As part of the geotechnical survey of the site, laboratory tests to determine particle size distribution and Atterburg Limits of typical samples of the soil profile were executed by a soils laboratory. In addition insitu permeability tests were carried out on representative soils layers encountered in the test pits. The laboratory test results are included in the Blue Rock geotechnical report.

5 SITE GEOLOGY

5.1 BEDROCK

According to the 1: 250 000 scale geological map 2528 Pretoria, the entire town of Groblersdal and hence Erven 756 and 757 of Extension 11 is underlain by massive grey to pink coarse-grained Nebo Granite of the Lebowa Granite Suite, which forms part of the Bushveld Igneous Complex. In general these rocks are hard, unweathered and tight and their potential as primary water bearing aquifers is very low. The transported and residual soils covering these rocks tend to be sandy and thin (rarely more than 3m in thickness). Clayey and silty soils are relatively rare. Outcrops of Nebo Granite rock do not occur on the site occupied by the two erven. According to the geological map prominent faults or zones of fracturing in the rock do not occur in this area.

6 SOIL PROFILE

Descriptions of the various soil strata as encountered in the test pits are given in the sub-sections below.

6.1 IMPORTED SOILS (FILL)

These are the soils that comprise the soil mattress that has been constructed across the entire site. They are slightly moist and red brown to yellowish brown in colour and comprise a loose to medium dense clayey to silty sandy gravel. The mattress

material extends to depths varying between 0,3 m and 1,0 m (average 1,0 m) below surface level.

6.2 ALLUVIAL SOILS

Moist becoming wet below 1,2 m depths red brown mottled grey brown medium dense clayey sandy gravel of alluvial origin underlies the soil mattress in the northern and eastern sections of the site (test pits GFTP1, GFTP2 and GFTP5). The layer extends to depths varying between 1,3 m and 2,2 m below surface level (average 2,0 m). A perched groundwater table is located in this layer and water seepage into the test pits occurred between 1,1 m and 1,5 m (average 1,2 m).

6.3 PEDOGENIC SOILS

The pedogenic layer on the site consists of residual granite soil with variable amounts of ferricrete nodules.

The pedogenic soils encountered on the site tend to be moist and comprise red brown to black medium dense to dense sandy to silty gravel. They tend to occur below the alluvial soils in test pits GFTP1, GFTP2 and GFTP5 where they extend to depths varying between 1,5 m and 3,0 m. In test pits GFTP3 and GFTP4, where the alluvium is absent, the ferruginised soils occur at shallower depths directly below the fill layer and extend to between 0,8 m and 1,6 m depths. In these two test pits groundwater seepage occurred either at the base of the layer or within it.

6.4 RESIDUAL SOILS

The residual soils encountered on the site are of granitic origin and comprise red brown to dark red mottled grey dense to medium dense gravelly clayey sand with small to medium sized soft rock granitic corestones in places. In general these soils extend to depths exceeding 3,0 m.

7 GROUNDWATER AND PERMEABILITY OF THE SOILS

The site investigation was carried out towards the end of a period during which extensive rains had fallen in the area. A perched groundwater table was encountered in all the test pits at depth varying between 1,1 m and 1,6 m below surface level. The zone of seepage (wet soils) occurred between 1,1 m and 2,2 m depths. Below this zone, the soils tended to be moist and no seepage occurred.

The regional deep groundwater is confined to deeply weathered zones associated with joint and fracture zones in the granite bedrock. In the Nebo Granites these fractures that produce fractured and intergranular aquifers are not very common and occur relatively infrequently. According to the hydrogeological map, the groundwater

potential of the Nebo granites is low, based on the fact that 80% of the boreholes on record produce less than 2 ℓ/s (7 200 ℓ/hr).

Due to the sandy and gravelly composition, the soils comprising the fill and the alluvium have coefficients of permeability that are in the order of $k = 10^{-4}$ to 10^{-6} cm/sec which is fairly high. Ingress of surface water into the soil profile up to 2 m depths is expected to be rapid. The residual granite soils encountered below depths of 2 m below surface level are less permeable and have coefficients of permeability in the order of $k = 10^{-6}$ to 10^{-7} cm/sec. The very soft- to soft rock as well as the unweathered hard rock granitic bedrock is expected to be virtually impervious except in areas where the rock is fractured or jointed, such as fault zones. According to the geological map of the site, there are no faults or fractures at or in the vicinity of the site.

The direction of flow of the shallow (perched) groundwater is expected to follow the surface topography in an easterly and southerly direction.

8 AQUIFER CLASSIFICATION

In the town of Groblersdal the aquifer systems associated with the Nebo Granite do not have a high importance regarding water supply, as municipal water is available in the area. The high permeability of the sandy gravelly soils at surface makes the shallow perched groundwater vulnerable to polluted surface as well as seepage runoff from the site. The deep regional groundwater will also be affected with time as polluted water percolates along fracture zones from the shallow aquifer to the regional aquifer. Their location below the filling station makes them vulnerable. The aquifer system at the filling station site is therefore classed as HIGHLY VULNERABLE according to the definitions in Parson's Aquifer Vulnerability Classification.

8.1 RATING OF THE AQUIFER

Using Parson's rating system as set out in the report and summarised in Table 3 and Table 2, the Filling Station Aquifers form part of a MINOR AQUIFER SYSTEM with a HIGH VULNERABILITY and will qualify for MEDIUM LEVEL PROTECTION, based on the GQM INDEX.

AQUIFER SYSTEM MANAGEMENT CLASSIFICATION		AQUIFER VULNERABILITY CLASSIFICATION	
CLASS	POINTS	CLASS	POINTS
Sole Source Aquifer system	6	High	3

AQUIFER SYSTEM MANAGEMENT CLASSIFICATION		AQUIFER VULNERABILITY CLASSIFICATION	
CLASS	POINTS	CLASS	POINTS
Major Aquifer System	4	Medium	2
Minor Aquifer System	2	Low	1
Non-aquifer System	0		

FILLING STATION AQUIFER = 5

Table 3: Ratings for the Groundwater Quality Management (GQM) classification system for the Filling Station Aquifer

GQM INDEX	LEVEL OF PROTECTION
<1	Limited protection
1-3	Low level protection
3-6	Medium level protection
6-10	High level protection
>10	Strictly non-degradation

FILLING STATION AQUIFER = 5

Table 4: Appropriate Level of Groundwater Protection required for the Filling Station Aquifer based on the Groundwater Quality Management classification

9 CONCLUSIONS

The surface runoff at the Filling Station site is towards the east and south towards the Olifants River. Considerable agricultural activity occurs in the areas outside the town and between the town and the Olifants River. A vineyard is located opposite van Riebeeck Street directly south of the filling Station site (see Land Use Map in Appendix C).

It has been established in Section 8 above, that the aquifers contained in the in the Nebo Granite at Groblersdal are susceptible to infiltration of water into the soils and into the deep secondary aquifers and have a GQM index between 3 and 6 requiring a high level of protection. It has also been noted that there is a prominent perched shallow water table in the area and that the shallow aquifer, besides feeding the deep regional aquifer, enables easy lateral movement of water. The flow of water in the shallow aquifer follows the surface topography. Any polluted surface water, percolating into the shallow aquifer and originating from the filling station site is likely

to move in an easterly and southerly direction and will affect agricultural activities that occur between the site and the Olifants River. With time the deep regional aquifer will also be polluted.

10 RECOMMENDATIONS

It is recommended that a filling station be established at the site comprising the southern portion of Erven 756 and 757 located in Extension 11 of Groblersdal provided that adequate precautionary measures preventing the ingress of polluted surface runoff water and stormwater from entering the aquifer are taken.

Run-off water from the site should be channelled in lined canals and accumulated in lined ponds to prevent contamination of the groundwater.

It is also recommended that the underground fuel storage tanks be placed in water proof brick or concrete containers that prevent access of the groundwater to the outside of the fuel storage tanks. On the inside the containers should be equipped with water table monitoring equipment and facilities to allow the installation of pumping equipment to measure the presence and level of any seepage fluids within the container and to allow these fluids to be pumped from the container. After placing the fuel storage tanks into the containers the space between the fuel tank and the container can be filled with sand or gravel material.

A SCHULZE-HULBE, Pr Sci Nat
FOR BLUE ROCK CONSULTING (PTY) LTD

11 REFERENCES

1) Blue Rock Consulting: Geotechnical and dolomitic Stability Report: Extension Avalon Cemetery: Soweto. Report No 2009 0080 dated March 2010.

2 1:500 000 *General Hydrogeological map Johannesburg 2526*

5) Barnard H C (2000) *An Explanation of the 1:500 000 General Hydrogeological Map Johannesburg 2526*. DWAF, October 2000.

APPENDIX A

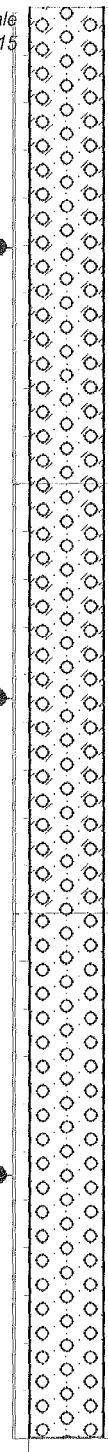
SOIL PROFILES

blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 1
Sheet 1 of 1

JOB NUMBER: 2010 0010



0.00 Slightly moist red brown loose to medium dense clayey sandy gravel; Fill.

1.00 Moist becoming wet below 1.2 m, red brown mottled grey medium dense clayey sandy gravel; Alluvium.

1.90 Moist red brown speckled black medium dense to dense sandy gravel; Slightly ferruginised intact residual granite.

3.00 End of hole.

NOTES

1) Hole excavated to maximum reach of machine.

2) Moderate ingress of water between 1.00 m and 1.9 m .

3) Sidewalls collapse between 1.0 and 1.9 m. Elsewhere sidewalls are stable.

4) Sample : F Ind 0.01--1.0 m.

5) Sample : F Ind 1.0--1.9 m.

6) Sample : F Ind 1.9--3.0 m.

7) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe
REVISION :
SETUP FILE : BR_TP.SET

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010
DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 1

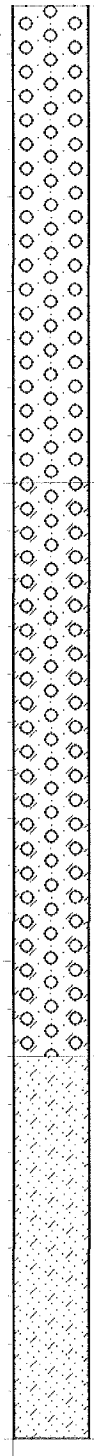
blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 2
Sheet 1 of 1

JOB NUMBER: 2010 0010

Scale 1:15



0.00 Slightly moist red brown spotted black medium dense ferruginised sandy gravel; Fill.

1.00 Moist becoming wet below 1.6 m red brown blotched grey and spotted black loose to medium dense clayey sandy gravel; Alluvium.

2.20 Moist red brown spotted black medium dense clayey ferruginised sand; Ferruginised residual granite.

3.00 End of hole.

NOTES

1) Hole excavated to maximum reach of machine.

2) Side walls of hole unstable between 1.2 m and 2.2 m.

3) Ingress of water into hole between 1.6 m and 2.2 m.

4) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 2

REVISION :
SETUP FILE : BR_TP.SET

DATE : 25/03/10 10:11
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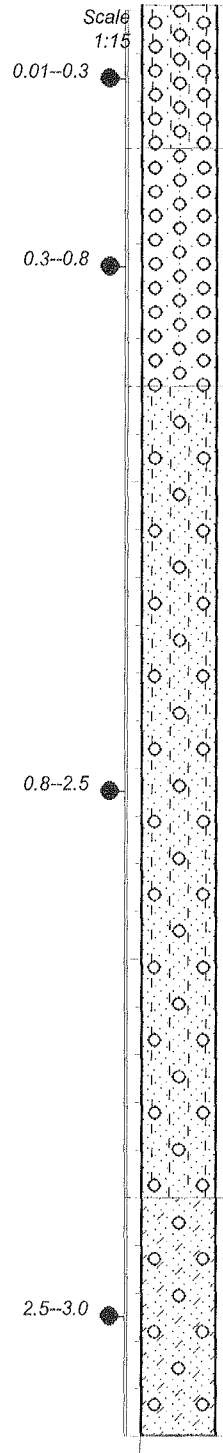
blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 3
Sheet 1 of 1

JOB NUMBER: 2010 0010



0.00 Slightly moist yellowish to reddish brown loose to medium dense silty sandy gravel; Fill.

0.30 Slightly moist red brown mottled yellow and black medium dense ferruginised sandy gravel; Residual granite.

0.80 Moist becoming wet below 1.5 m yellowish mottled grey and red medium dense to dense silty gravelly sand with sporadic very soft rock rounded granite corestones; Residual granite.

2.50 Moist dark red mottled grey medium dense clayey gravelly sand; Residual granite.

3.00 End of hole.

NOTES

1) Hole excavated to maximum reach of machine.

2) Ingress of water below 1.5 m depth.

3) Hole unstable between 1.5 m and 3.0 m.

4) Sample : F Ind 0.01--0.3 m.

5) Sample : F Ind 0.3--0.8 m.

6) Sample : F Ind 0.8--2.5 m.

7) Sample : F Ind 2.5--3.0 m.

8) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe
REVISION :
SETUP FILE : BR_TP.SET

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010
DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 3

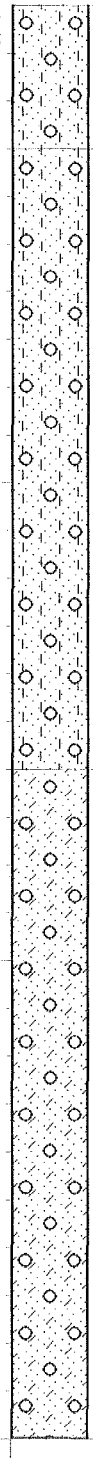
blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 4
Sheet 1 of 1

JOB NUMBER: 2010 0010

Scale 1:15



0.00 Slightly moist yellowish to reddish brown loose to medium dense gravelly silty sand; Fill.

0.30 Moist becoming wet below 1.5 m yellowish mottled grey and red medium dense to dense silty gravelly sand with sporadic very soft rock rounded granite corestones; Residual granite.

1.60 Moist dark red mottled grey medium dense clayey gravelly sand; Residual granite.

3.00 End of hole.

NOTES

1) Maximum reach of machine; No refusal.

2) Water intersected below 1.6 m.

3) Sidewall of hole unstable between 1.6 m and 2.3 m.

4) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe

REVISION :
SETUP FILE : BR_TP.SET

INCLINATION :
DIAM :
DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010

DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: GFTP 4

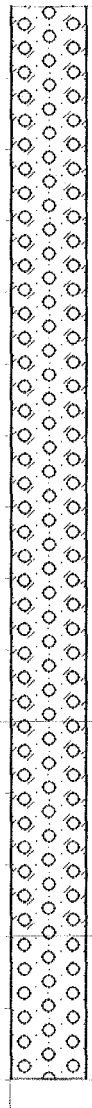
blue rock Consulting

Client: SEF
Groblersdal Filling Station

HOLE No: GFTP 5
Sheet 1 of 1

JOB NUMBER: 2010 0010

Scale 1:10



0.00 Slightly moist red brown loose to medium dense clayey sandy gravel; Fill.

1.00 Moist becoming wet below 1.1 m, red brown mottled grey dense clayey sandy gravel; Alluvium.

1.30 Wet grey brown mottled orange and black very dense to very soft rock ferruginised sandy gravel.

1.3--1.5

1.50 End of hole.

NOTES

1) Machine refuse at 1.6 m.

2) Water ingress in hole below 1.3 m.

3) Sidewall collapse below 1.3 m.

4) Sample : F Ind 1.3--1.5 m.

5) Coordinates and elevations were recorded using a hand held GPS. Map datum is WGS84.

CONTRACTOR : Gerrie Nel
MACHINE : ELB 860 SX
OPERATOR :
PROFILED BY : Andy Schulze -Hulbe
REVISION :
SETUP FILE : BR_TP.SET

INCLINATION :
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DATE DRILLED : 25/02/2010
DATE PROFILED : 25/02/2010
DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

ELEVATION :
X-COORD :
Y-COORD :

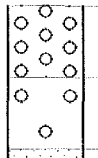
HOLE No: GFTP 5

blue rock Consulting

Client: SEF
Groblersdal Filling Station

LEGEND
Sheet 1 of 1

JOB NUMBER: 2010 0010

	GRAVEL	{SA02}
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	SAND	{SA04}
	SANDY	{SA05}
	SILTY	{SA07}
	CLAYEY	{SA09}
	DISTURBED SAMPLE	{SA38}

Name

CONTRACTOR :
MACHINE :
OPERATOR :
PROFILED BY :

INCLINATION :
DIAM :
DATE DRILLED :
DATE PROFILED :

ELEVATION :
X-COORD :
Y-COORD :

LEGEND
SUMMARY OF SYMBOLS

REVISION :
SETUP FILE : BR_TP.SET

DATE : 25/03/10 10:11
TEXT : ..C:\PROFILES\GFTP.TXT

APPENDIX B

LABORATORY TEST RESULTS

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GEOSTRADA
engineering materials laboratory

REPORT No: 103316-A3/2010-03-09/RDJ/km/1

Blue Rock Consulting		Our Reference:	103316/A3
P O Box 24614			
GEZINA		Your Reference:	
0031			
Att: Mr A Schulze-Hulbe		Report Date:	2010-03-09

RESULTS OF TESTS ON SOIL SAMPLES: GROBLERSDAL FILLING STATION

1. SAMPLES:

1.1 Sample Description : Attached are the description and the results of the tests done on the soil samples submitted by the test sponsor to this laboratory, for the above mentioned contract.

1.2 Date received: 26 February 2010

1.3 Date tested 01- 06 March 2010

2. NATURE OF TEST: Refer to result page.

3. METHOD OF TEST: Refer to result page.

4. REMARKS: This report relates only to the samples tested.

R de Jong
TECHNICAL SIGNATORY
GEOSTRADA engineering materials

GEOSTRADA
engineering materials laboratory
Quality Assurance Services

SIEVE AND HYDROMETER ANALYSIS

Tests done according to TMH1& MT 1 Methods

☑ A1a ☑ A2 ☑ A3 ☑ A4 ☑ A5 ☑ A6

Client : BLUE ROCK CONSULTING **Contract :** GROBLERSDAL FILLING STATION **Job No :** 103316-A3

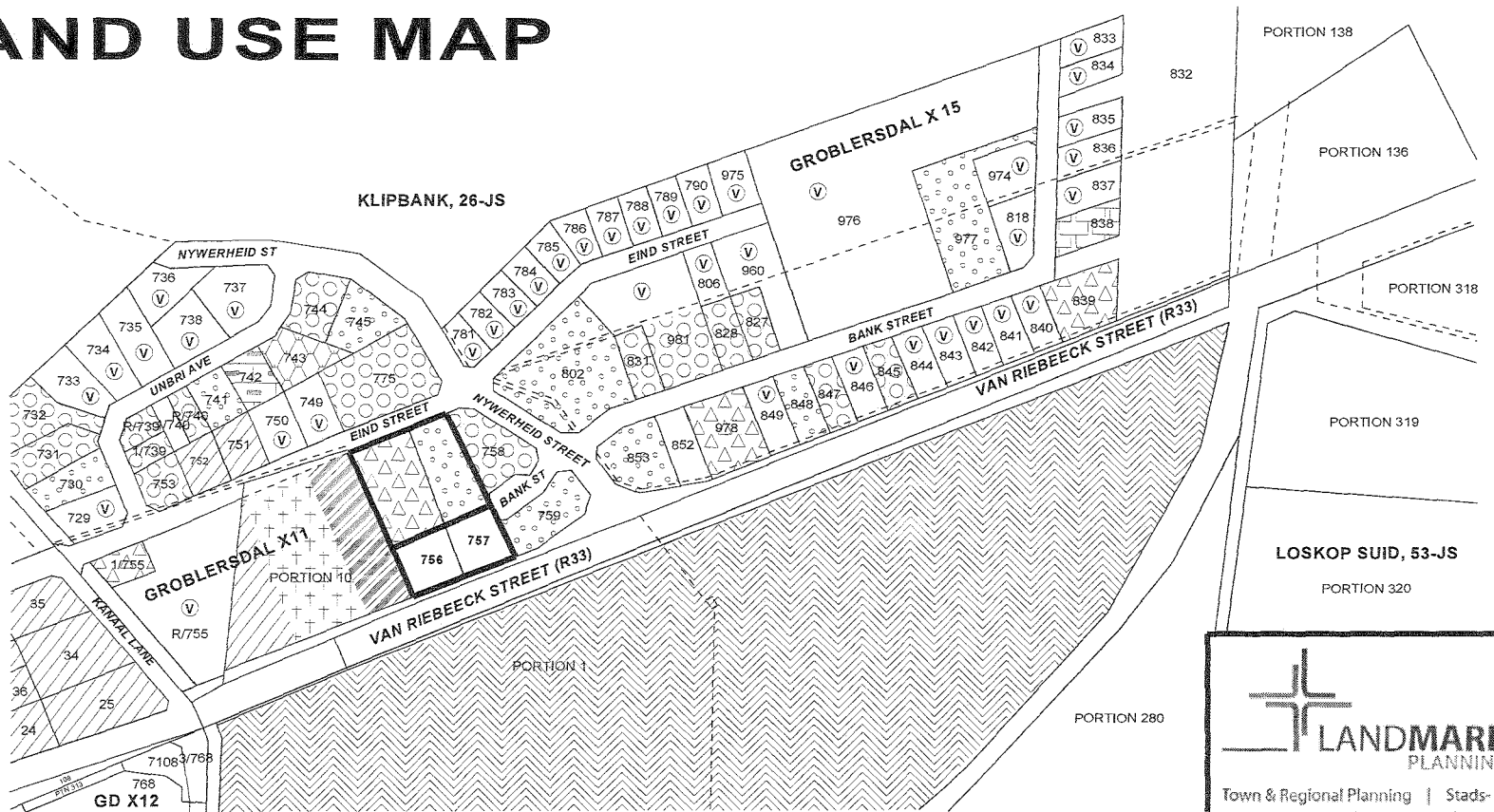
Date : 2010-03-09

Sample No	Hole No/km	Depth (m)	Description material	pH	Conductivity s/m	GM	Percentage passing sieves															Atterberg Limits		
							53,0 mm	37,5 mm	26,5 mm	19,0 mm	13,2 mm	9,5 mm	4,75 mm	2,00 mm	0,425 mm	0,075 mm	0.060 mm	0.050 mm	0.020 mm	0.005 mm	0.002 mm	Liquid limit	Plasticity index	Linear shrinkage
0/620	GFTP1	0-1.0	SILTY SAND	8.00	0.251	2.35	100	74	65	57	54	50	42	31	22	12	8	7	5	5	4	28	11	5.5
0/621	GFTP1	1.0-1.9	SILTY SAND	8.10	0.145	2.18	100	91	80	76	75	74	65	42	25	15	10	10	7	5	5	34	15	7.5
0/622	GFTP1	1.9-3.0	SAND	7.82	0.087	2.15			100	99	97	95	79	49	23	13	9	8	6	4	4	37	15	7.5
0/623	GFTP3	0.0-0.3	SILTY SAND	8.12	0.037	2.08		100	88	85	79	72	60	45	33	14	11	11	5	4	3	21	4	1.5
0/624	GFTP3	0.3-0.8	SILTY SAND	7.35	0.031	2.35	100	82	79	68	59	54	45	32	22	11	8	7	5	4	3	23	7	3.0
0/625	GFTP3	0.8-2.5	SILTY SAND	7.65	0.026	1.78				100	98	96	91	66	36	20	15	14	8	5	4	19	6	2.0
0/626	GFTP5	2.5-3.0	CLAY SAND	7.45	0.216	1.16				100	99	99	97	82	61	41	31	30	25	20	18	39	16	7.0
0/627	GFTP5	1.3-1.5	SILTY SAND	7.85	0.031	2.47	100	86	75	61	51	45	37	26	18	9	6	6	4	2	1	18	3	1.0

APPENDIX C

DRAWINGS

LAND USE MAP



LANDMARK PLANNING

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- APPLICATION SITE
- VACANT
- WAREHOUSE/STORAGE
- TRANSPORT COMPANY
- WORKSHOPS/FITMENT CENTRES/SCRAP YARDS
- OFFICES
- CEMETARY
- AGRICULTURE
- FUNERAL UNDERTAKER
- SHOPS
- VEHICLE TEST CENTRE
- MANUFACTURING

N

SCALE 1 : 5 000


N
GFTP1
GFTP2
GFTP3
GFTP4
GFTP5
149 m
© 2010 Cnes/Spot Image
© 2010 Tele Atlas
© 2010 Europa Technologies
©2009 Google
25°09'53.85" S 29°24'16.06" E elev 906 m
Eye alt 1.47 km

Appendix E: Environmental Management Plan

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

PRE-CONSTRUCTION & CONSTRUCTION

PREPARED FOR:

Gawie Labuschagne Trust
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0470
Bryanston
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Tel: 0113 262 3119
E-mail: ger@lantic.net

Submitted to:

Limpopo Department of Economic Development, Environment & Tourism

LEDET REF: 12/1/9/-7/S-GS16

COMPILED BY:

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S.E.F
STRATEGIC ENVIRONMENTAL FOCUS

DATE: October 2010

SEF Ref. 503307

TABLE OF CONTENTS

ANNEXURES

ABREVIATIONS

DEA ..... Department of Environmental Affairs
DWA ..... Department of Water Affairs
EA ..... Environmental Authorisation
EAP ..... Environmental Assessment Practitioner
ECO ..... Environmental Control Officer
EIA ..... Environmental Impact Assessment
EMP ..... Environmental Management Plan
EO ..... Environmental Officer
ESO ..... Environmental Site Officer
I&AP ..... Interested and Affected Parties
MRF ..... Material Recovery Facility

DEFINITIONS

Alien species - Plants and animals which do not arrive naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area.

Alternative - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives.

Auditing - A systematic, documented, periodic and objective evaluation of how well the environmental management plan is being implemented and is performing with the aim of helping to safeguard the environment by: facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems.

Aquifer - An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt, or clay).

Conservation - Protecting, using and saving resources wisely, especially the biodiversity found in an area.

Contamination - Polluting or making something impure.

Corrective (or remedial) action - Response required to address an environmental problem that is in conflict with the requirements of the EMP. The need for corrective action may be determined through monitoring, audits or management review.

Degradation - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

Environment - Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.

Environmental Impact Assessment (EIA) - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

Environmental Management System (EMS) - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Standards Organisation.

Environmental policy - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

E-waste – Electronic waste, including old computers, computer screens, TV's, cell phones and the like. Such waste is considered to be hazardous, as it contains significant amounts of toxic heavy metals and in some instances even flame retardant bromides (highly toxic neuro-toxins)

Hazardous waste – Waste, even in small amounts, that can cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, etc.

Impact - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Indigenous species - Plants and animals that are naturally found in an area.

Infrastructure - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

Integrated - Mixing or combining all useful information and factors into a joint or unified whole. See Integrated Environmental Management.

Integrated Environmental Management (IEM)- A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments.

Mitigation - Measures designed to avoid, reduce or remedy adverse impacts

Policy - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

Proponent – Developer/Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMP.

Recycling - Collecting, cleaning and re-using materials.

Resources - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

Scoping Report - A report presenting the findings of the scoping phase of the EIA. This report is primarily aimed at reaching closure on the issues and alternatives to be addressed in the EIA (in the case of a full EIA process).

Storm water management – Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

Waste Management – Classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

Water Table - The water table is the underground depth at which point the ground is totally saturated with water

Wetlands - An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g. vleis, swamps.

REFERENCES

DEAT (1992) Integrated Environmental Management Guideline Series, Volumes 1-6, Department of Environmental Affairs, Pretoria.

DEAT (2004a) Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs (DEAT), Pretoria.

CITY OF CAPE TOWN: ENVIRONMENTAL MANAGEMENT PROGRAMME (2002) Specification EM – 02/07: ENVIRONMENTAL MANAGEMENT, Ver 5 (03/2002)

Lochner, P. 2005.Guideline for Environmental Management Plans. CSIR Report No ENV-S-C 2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

National Environmental Management Act 107 of 1998 (NEMA)

1.1 INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF), as independent environmental managers and impact assessors, has been appointed by Gawie Labuschagne Trust to compile and submit an Environmental Management Plan (EMP) to the decision making authority; Limpopo Department of Economic Development, Environment & Tourism

This document is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992). IEM is a key instrument of the National Environmental Management Act [NEMA] (Act No. 107 of 1998) as amended on 2 August 2010. NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an EMP.

The IEM guidelines encourage a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels. The basic principles underpinning IEM are that there be:

- informed decision-making;
- accountability for information on which decisions are taken;
- accountability for decisions taken;
- a broad meaning given to the term environment (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- an attempt to ensure that the 'social costs' of development proposals (those borne by society, rather than the developers) be outweighed by the 'social benefits' (benefits to society as a results of the actions of the developers);
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of the proposals (i.e. from 'cradle to grave'); and
- the opportunity for public and specialist input in the decision-making process.

These principles are in line with NEMA, which has repealed a number of the provisions of the Environment Conservation Act, 1989 [ECA] (Act No. 73 of 1989), and is focussed primarily on co-operative governance, public participation and sustainable development. The Environmental Impact Assessment Regulations that took effect in July 2006 regulate the procedures and criteria for the submission, processing, consideration and decision on applications for environmental authorisation of listed activities. The above has, however, been repealed by the new Environmental Impact Assessment Regulations (Government Notice Regulation No's 543, 544, 545 and 546 of 2010) under the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended [NEMA], came into effect on the 2nd of August 2010. The underlying principles however remain in line with the previous NEMA.

1.2 SCOPE

The general principles contained within this document apply to all **PRE-CONSTRUCTION AND CONSTRUCTION** activities.

1.2.1 Principles of this EMP

This EMP is compiled using the following concepts and implementation requirements so that the higher principles of sustainable development are realised:

- Continuous improvement. The project proponent (or implementing organisation) must commit to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- Broad level of commitment. A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of this EMP to be successful and effective.
- Flexible and responsive. The implementation of the EMP must respond to new and changing circumstances, i.e. rapid short-term responses to problems or incidents. The EMP is a dynamic "living" document and thus regular planned review and revision of the EMP must be carried out.
- Integration across operations. This EMP must integrate across existing line functions and operational units such as health, safety and environmental departments in a company/project. This is done to change the redundant mindset of seeing environmental management as a single domain unit.
- Legislation. It is understood that any development project during its construction phase is a dynamic activity within a dynamic environment. The Developer, Engineer, Contractor and sub-contractor must therefore be aware that certain activities conducted during construction may require further licensing or environmental approval, e.g. river or stream diversions, bulk fuel storage, waste disposal, etc. The Contractor must consult the ER, EO and ECO on a regular basis in this regard.

1.2.2 Site specific information

1.2.2.1 Proposed activity and local context

The proposed site of the new filling station is located within ward 13 of the Elias Motsoaledi Local Municipality, along Jan van Riebeeck St (R33). The site is approximately 600m east of the intersection of Jan van Riebeeck St and Voortreker Rd (N11), within the industrial area on the eastern side of the town Groblersdal in the Limpopo Province. The proposed Groblersdal X 11 Filling Station will entail the construction of the following:

- Underground storage tanks for diesel, low sulphur diesel, lead replacement petrol (LRP), unleaded petrol 93 unleaded petrol 95 with a combined capacity of 80 m^2;
- Pumps and pump islands;
- A canopy covering an area;
- Access road widening on Jan van Riebeeck Street;
- Parking bays;
- Toilet facilities;
- Car wash facility;
- Place of refreshment and take-away facility;
- Service facilities;
- Automatic teller machine; and
- Convenience Store of 300m²

Services

Water

An existing municipal water pipe with a diameter of 150mm runs along Jan van Riebeeck Street. Water to the site will be provided through a water meter connected to the municipal pipe.

Sewage

An existing municipal sewer pipe with a diameter of 160mm runs along Jan van Riebeeck Street. An internal sewer network will collect sewerage and discharge it through a single point into the municipal pipe.

Electricity

The proposed filling station is located in an established industrial area with an existing electrical network. The site will be serviced by the existing network.

Access road

A new access is proposed from Jan van Riebeeck Street that will include dedicated slipways on both sides of the carriageway.

Storm Water Management

An existing municipal storm water channel runs along Jan van Riebeeck Street. All storm water will be collected by an internal storm water network and discharged into the municipal channel. To accommodate the storm water flow along Jan van Riebeeck Street the proposed access road will include a 600mm pipe that will act as a culvert beneath the access road.

1.2.2.2 Summary of impacts associated with the proposed activity

- Contamination of groundwater as a result of leaking contaminants during the construction phase or Volatile Organic Compounds (VOCs) from storage tanks during operational phase;
- Soil and surface water pollution from hazardous substances during construction and operational phase;
- Dust nuisance due to site clearance, heavy trucks and the use of other equipment on site during construction;
- Geotechnical suitability of the site in respect of the proposed filling station and the storage of underground tanks;
- Heritage and cultural disturbance through excavations and bulk earth works during the construction phase;
- Risk of fires and explosions due to the storage of hazardous substance on site
- Traffic congestion and access issues mainly on Jan van Riebeeck Street
- Visual Impact of the new filling station including light pollution and unsightly views during construction phase
- Noise pollution during the construction phase and operational phase of the project

1.2.3 Interpretations

The implementation of the EMP is not an additional or "add on" requirement. The EMP is legally binding through NEMA and the relevant EA. The proponent is to ensure that through the project tender process the EMP forms part of the Project Construction Contract Document to be incorporated in line with:

a) General project specifications; and
b) SANS 1200 A or SANS 1200 AA, as applicable.

1.2.4 Project phase

This EMP is specifically compiled for the period of time prior to commencement of, and activities associated with construction of the above mentioned activity.

1.2.5 Role players and responsibility matrix

In order for the EMP to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must clearly understand their roles and responsibilities in the project, must be professional, form respectful and transparent relationships, and maintain open lines of communication.

Potential role players or project teams will include the Authorities (A), Other Authority (OA), Developer/Proponent (D), Consulting Engineers (CE), Engineers Representative (ER), Environmental Officers (EO), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP). Further; landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.

Table 1: Functions and Responsibilities of the Project Team

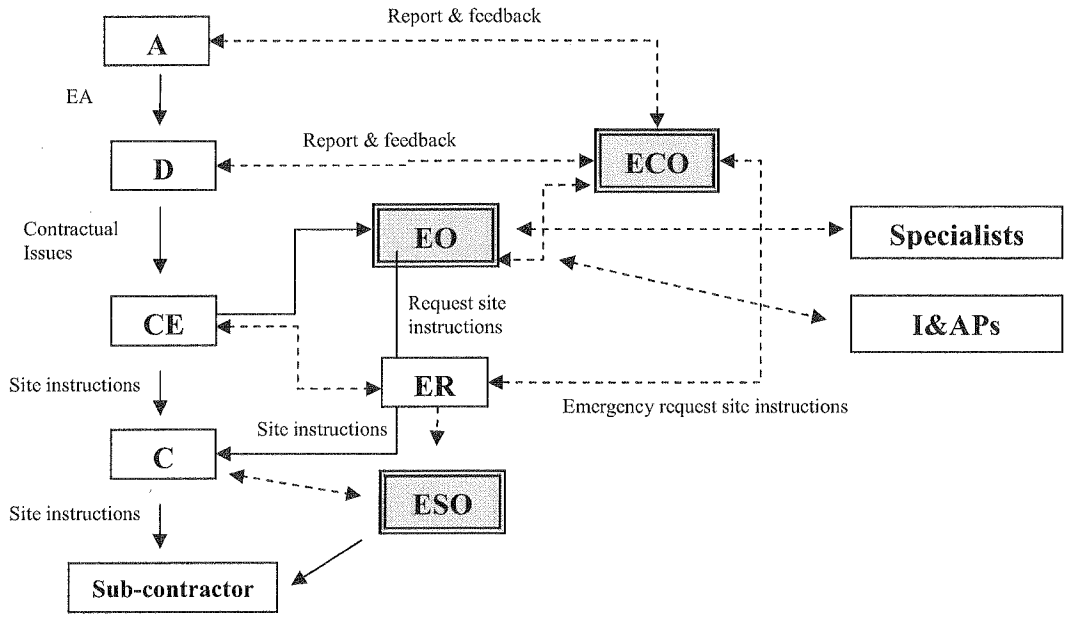
KEY	FUNCTION	RESPONSIBILITY
D	Developer	Proponent ultimately accountable for ensuring compliance to the EMP and conditions contained in the Environmental Authorisation (EA). The ECO must be contracted by the developer (full time) as an independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMP for the project. The developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities. The developer must ensure that the ECO is integrated as part of the project team.
CE	Consulting Engineer	Contracted by the developer to design and specify the project engineering aspects. Generally the engineer runs the works contract. The CE may also fulfil the role of Project Manager on the proponent's behalf (See PM).
PM	Project Manager	The Project manager has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements are met. The CE may also act as the PM. All decisions regarding environmental procedures must be approved by the PM. The PM has the authority to stop any construction activity in contravention of the EMP in accordance with an agreed warning procedure.
ER	Engineers Representative	The consulting engineer's representative on site. Has the power/mandate to issue site instructions and in some instances, variation orders to the contractor, following request by the EO or ECO. The ER oversees site works, liaison with Contractor and ECO.

KEY	FUNCTION	RESPONSIBILITY
EO/EM	Environmental Officer /Environmental manager	Appointed by the Consulting Engineers as their environmental representative on site. The EO is not independent but must rather act on behalf of the consulting engineers with the mandate to enforce compliance under the project contract, which must include the EMP. The EO has the directive to issue non-conformance and hazard certificates. Further, in terms of accepted industry practice the EO could issue the equivalent of a "cease works" instruction only in exceptional circumstances where serious environmental harm has been or is about to be caused i.e. in cases of extreme urgency and then only when the ER is absent. The EO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. On certain types of projects, such as linear developments (fences, pipelines, etc), the EO must also be the liaison between the contractor and landowners. The EO must attend relevant project meetings, conduct daily inspections to monitor compliance with the EMP, and be responsible for providing reports and feedback on potential environmental problems associated with the development to the project team and ECO. The EO must convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce. The EO must be suitably experienced with the relevant qualifications and preferably competent in construction related methods and practices.
ECO	Environmental Control Officer	An independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMP for the project. The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the project team. The ECO must be proactive and have access to specialist expertise as and when required, these include botanist's ecologists etc. Further the ECO must also have access to expertise such as game capture, snake catching, etc. The ECO must conduct audits on compliance to relevant environmental legislation, conditions of EA, and the EMP for the project. The size and sensitivity of the development, based on the EIA, will determine the frequency at which the ECO will be required to conduct audits. (A minimum of a monthly site inspection must be undertaken). The ECO must be the liaison between the relevant authorities and the project team. The ECO must communicate and inform the developer and consulting engineers of any changes to environmental conditions as required by relevant authoritative bodies. The ECO must ensure that the registration and updating of all relevant EMP documentation is carried out. The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices. The ECO must handle information received from whistle blowers as confidential and must address and report these incidences to the relevant Authority as soon as possible.
C	Contractor	The principle contractor, hereafter known as the 'Contractor', is responsible for implementation and compliance with the requirements of the EMP and conditions of the EA's, contract and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMP. The contractor is required, where specified, to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.

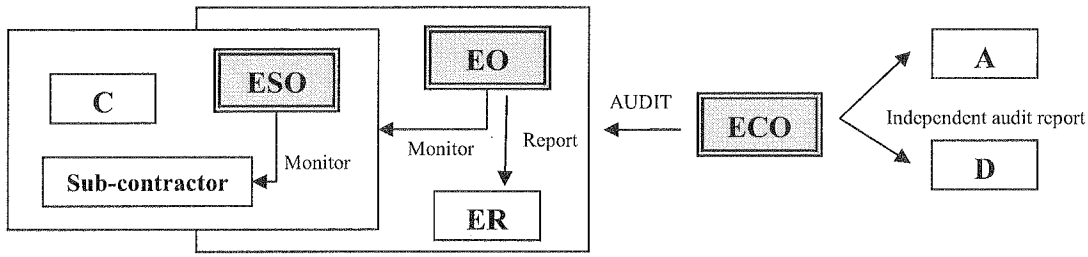
KEY	FUNCTION	RESPONSIBILITY
ESO	**Environmental Site Officer**	The ESO is employed by the Contractor as his/her environmental representative to monitor, review and verify compliance with the EMP by the contractor. This is not an independent appointment; rather the ESO must be a respected member of the contractor's management team. Dependent on the size of the development the ESO must be on site one week prior to the commencement of construction. The ESO must ensure that he/she is involved at **all phases** of the constriction (from site clearance to rehabilitation).
A	**Lead Authority**	The authorities are the relevant environmental department that has issued the Environmental Authorisation. The authorities are responsible for ensuring that the monitoring of the EMP and other authorisation documentation is carried out, this will be achieved by reviewing audit reports submitted by the ECO and conducting regular site visits.
OA	**Other Authority**	Other authorities are those that may be involved in the approval process of an EMP. Their involvement may include reviewing EMP's to ensure the accuracy of the information relevant to their specific mandate. Other authorities may be involved in the development, review or implementation of an EMP. For example if a specific development requires a water use licence for the relevant national authority then that authority should review and comment on the content of the particular section pertaining to that mandate.
EAP	**Environmental Assessment Practitioner**	The definition of an environmental assessment practitioner in section 1 of NEMA is "the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations".

Figure 1 Recommended lines of communication, reporting and monitoring

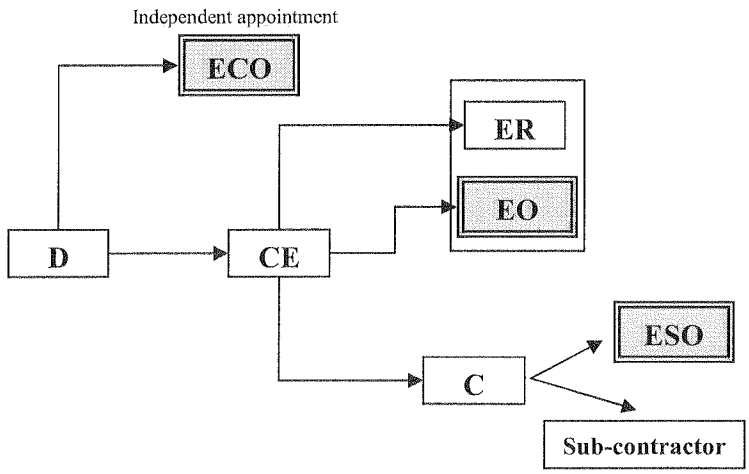
FORMAL ENVIRONMENTAL COMMUNICATION CHANNELS (Pre-EA)



MONITORING, AUDITING AND REPORTING (Pre-EA)



ENVIRONMENTAL APPOINTMENTS (Pre-EA)



1.2.6 Enforcement, monitoring and auditing

The independent ECO is responsible on projects approved under NEMA for regular audits on compliance to relevant environmental legislation, conditions of the Environmental Authorisation (EA), and the EMP for the project.

The ECO must conduct, at a frequency as determined by the Department and stipulated in the relevant Environmental Authorisation (EA) for the project, independent environmental audits. The audits are to verify the projects compliance with the EMP and conditions of the Environmental Authorisation (EA). It is recommended, on a project of this nature, that the appointed ECO conduct weekly site visits and compile monthly ECO Audit Reports for submission to LEDET. Before any construction activities commence, the ECO must compile, for the approval by the Department, an audit checklist based on the contents of this EMP and conditions of the Environmental Authorisation (EA).

Evidence of the following as **key performance indicators,** must be included in the audit reports where required:

1. Complaints received from landowners and actions taken.
2. Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
3. Incidents leading to litigation and legal contraventions.
4. Environmental damage that needs rehabilitation measures to be taken.

A copy of all ESO and EO monitoring reports, contractor method statements and pro forma documentation must be held by the ESO and/or the EO on site and be made available to the Department and or the ECO upon request.

1.2.7 Measurement and payment

It is understood that environmental requirements included in this EMP will entail costs over and above those of the civil requirements. These include provision for: mitigation and enhancement actions; training and environmental awareness requirements; monitoring; auditing; and corrective actions. The proponent must recognise this and make provision for it in the tender. Costing for management action should be done with inputs and advice from appropriate technical members of the project team and relevant EAP who have knowledge of the management actions being recommended as well as practical experience in implementing similar measures and techniques.

A lump sum must be allocated for the management of Environmental Specifications where it is not possible to cost requirements of the EMP.

1.2.8 General guidelines

The following measures provide guideline solutions to frequently anticipated issues on most development activities.

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase, illegal activities, delays caused by archaeological finds etc. is ultimately the responsibility of the applicant/developer. Section 28, National Environmental Management Act [NEMA] (Act No. 107 of 1998)
- The study area must be clearly defined, surveyed and marked according to the project authorisation. All workforce members and other construction personnel are not to go beyond the fenced footprint. Landowners are not comfortable when strangers come on to their properties. They will look for reasons to interfere with the construction process and may therefore cause delays in the process that can be very costly to the Contractor.
- The Contractors must adhere to agreed and approved access points and haul roads.
- No camping is allowed on any private property.
- Damage to private or public property such as fences, gates and other infrastructure may occur at any time. All damage to be repaired immediately and to the satisfaction of the owner.
- Relevant landowners and businesses must be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract including this EMP.
- Proper planning of the construction process must be undertaken to allow for disruptions due to rain and very wet conditions.
- All private and public manmade structures near the project site must be protected against damage at all times and any damage must be rectified immediately.
- Proper site management and regular monitoring of site works.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections and good control over the construction process throughout the construction period.
- A positive attitude towards Environmental Management by all site personnel must be motivated through regular and effective awareness and training sessions (see 1.2.10 below).
- An ESO, on behalf of the Contractor, is to be appointed to implement this EMP. The EO and not the Contractor or his/her ESO is to deal with any landowner related matters (see figure 1)
- Environmental Audits to be carried out during and upon completion of construction.
- A single, central, contractors' yard should be established for the development. The contractors' yard, by virtue of the high impact activities that take place in such an area has the potential to cause significant environmental damage unless appropriately located and effectively managed. It is recommended that the

contractor's yard be located within the structural footprint of the proposed filling station. Activities to be housed within the yard include *inter alia* the following:

- Workshops and wash bays for plant and construction vehicles;
- Site offices;
- Material storage areas;
- Eating and sanitation facilities for site workforce;
- Bulk fuel storage for construction purposes;
- Waste skips (incl. Provision of area for waste separation); and
- Lay down areas.

- By confining the above mentioned activities to a single area, the potential impacts associated therewith become easier to manage and the subsequent rehabilitation of the said area too, becomes easier to manage and effect.

1.2.9 Awareness training

The ECO are responsible for ensuring everyone on site is given an environmental awareness induction session which not only clearly defines what the environment is and gives specifics detailing the local environment but outlines the requirements of the EMP as a management tool to protect the environment. Refresher courses must be conducted as and when required. The ECO must ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area/habitat in which they are working. Awareness posters and a hand out must be produced to create awareness throughout the site.

1.2.10 Contractor environmental Method Statements

Method Statements are written submissions to the Engineer by the Contractor in collaboration with his/her ESO, in response to a request by the EO and or Engineer. The Method Statements set out the plant, materials, labour and method that the contractor proposes using to carry out an activity, identified by the EO and/or Engineer. The Method Statements contain the appropriate detail such that the EO and Engineer are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMP. The contractor must sign each Method Statement along with the EO and Engineer to formalise the approved Method Statement.

All Method Statements including those which may be required as *ad hoc* or emergency construction method statements must be submitted to the Engineer for approval prior to the commencement of the activity.

Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the EO and Engineer on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMP.

The *pro forma* Method Statements attached must be used and method statements for the following activities must be submitted to the EO, ECO and Engineer for approval before construction commences. These include *inter alia:*

- Solid waste management;
- Crew camps and construction lay down areas;
- Workshop and maintenance/cleaning of plant;
- Cement and concrete batching;
- Dust control;
- Hydrocarbon and emergency spills procedures;
- Diesel tanks and refuelling procedures;
- Sourcing, excavating, transporting and dumping of fill and spoil material;
- Topsoil management;
- Fire; and
- Rehabilitation of crew camp and other disturbed areas.

1.2.11 Site documentation

The following is a list of documentation that must be held on site and must be made available to the ECO and/or Approving Authority on request.

- Site daily diary /instruction book/ Incident reports;
- Records of all remediation / rehabilitation activities;
- Copies of EO reports (management and monitoring);
- Environmental Management Plan (EMP);
- Complaints register; and
- Method statements.

1.2.12 Pro forma documentation

1.2.12.1 Prior to the commencement of construction activities

The following attached *pro forma* documentation is to be filled out and is binding to the EMP and project contract and includes *inter alia*:

- Declaration of understanding by the Developer;
- Declaration of understanding by the Engineer;
- Declaration of understanding by the Contractor;
- Method statements;
- ECO / Engineer approval for method statements; and

1.2.12.2 During construction activities

The following attached pro forma documentation is to be filled out and maintained. These are binding to the EMP and project contract. They include *inter alia*:

- Amended Method Statements;
- ECO / Engineer approval for amended method statements;
- Environmental incidents; and
- Records of all remediation / rehabilitation activities.

1.2.13 National and Provincial Acts and guidelines

The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principals of this document.

Advertising on Roads and Ribbon Development Act No. 24 of 1940
Regulates the display of adverts at places visible from public roads. Also controls the depositing of machinery or refuse, and the construction or laying of structures, near public roads.

Atmospheric Pollution Prevention Act No. 45 of 1965
Control of noxious and offensive gases, smoke, dust and vehicular emissions.
DEAT: Regional Air Pollution Control Office

Environment Conservation Act No. 73 of 1989
National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended [NEMA]
Control/prevention of pollution; combating of noise; activities which may have a detrimental effect on the environment, preparation and contents of environmental impact reports.
Department of Environmental Affairs and Tourism

Hazardous Substances Act No. 15 of 1973
Provides for the control of substances, which may cause injury or ill health to, or the death of human beings.*National Department of Health. Local Authorities may be authorized*

Health Act No. 63 of 1977
Control of solid, liquid and gaseous wastes that may pose a health hazard.
Department of Health and Local Authorities

Minerals and Petroleum Resources Development Act No. 28 of 2002

National Building Regulations and Standards Act 103 of 1977 (SABS 0400)

National Heritage Resources Act No. 25 of 1999

National Road Traffic Act No. 93 of 1996
Provides for road traffic matters which apply uniformly throughout South Africa.
Department of Transport.

National Water Act No. 36 of 1998
Water Services Act No. 108 of 1997
Diversion or impoundment of rivers. Conservation and use of water. Treatment and disposal of waste, wastewater and effluent. Pollution and pollution emergencies. Water Users & Associations. Dam safety. Registration of boreholes.
Department of Water Affairs and Forestry

Occupational Health and Safety Act No. 85 of 1993

Controls the exposure of employees and the public to dangerous and toxic substances or activities.
Department of Labour

Road Transportation Act No. 74 of 1977
Department of Transport

1.3 PREAMBLE

The point of departure for this EMP is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed during the construction phase of the project. Therefore, the purpose of an EMP is to provide management measures that must be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of a proposed development are minimised. It must also be ensured that the EMP is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances, the approving authority may authorise the ECO to make such changes.

The following tables (see page 22) form the core mitigation measures appropriate to the pre-construction and construction phase. The tables present the objectives to be achieved and the management actions that need to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria/targets and timeframes are clearly specified.

The ***'pre-construction'*** section of this EMP, refers to the period of time leading up to and prior to commencement of construction activities, and is included to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the contingency plans identified in the pre-construction phase.

The bulk of environmental impacts will have immediate effect during the ***'construction'*** phase (e.g. noise, dust, and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the project team.

The "***construction***" section refers to all construction and its operation-related activities that will occur within the approved area and access roads, until the project is completed. This "construction" section is divided into three functional areas, namely "materials"; "plant"; and "construction". Each of these functional areas within the EMP contains specific mitigation requirements and requested contractor method statements stipulated where required.

1.4 STRUCTURE AND CONTENTS OF TABLES

The table consists of seven parts as follows:

"Phase of development" - This row will identify either pre-construction (planning) or actual construction phase.

"Impact / issue" - This row will identify the issue being addressed, e.g. Materials, site demarcation, heritage, etc.

Mitigation Measure - This column will include all the necessary mitigation measures for each impact/issue'.

Management objectives - This column will indicate what the management objectives to be achieved for each mitigation measure are.

Measurable targets - This column will indicate what evidence is to be used as an indication to whether or not the 'Management objectives' have been implemented and hence achieved.

Frequency of action - These columns provide time guidelines for the 'Responsible party' by which he/she is to action or manage the required mitigation.

Phase of development	PRE-CONSTRUCTION
Impact / issue	GENERAL PLANNING (A)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
A1 Project contract and programme i. The EMP must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract. ii. A copy of this EMP must be available on site. The Contractor must ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMP.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase • Ensure environmental awareness and formalise environmental responsibilities and implementation	• Contract records • Signed declaration pro forma's	-	
A2 Appointments and duties of project team i. The contact details for the ECO and Contractor must be completed on the attached *pro-forma* and a copy kept on site. This document must be made available to the approving authority on request. ii. Before construction activities commence, role players must have a clear indication of to their role in the implementation of this EMP as indicated in 1.2.6 Table 1. iii. Subcontractor(s) contracts with the principle contractor must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Contract records • Signed declaration pro forma's	-	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
A3 Method statements i. As required in 1.2.10 certain method statements must be provided by the contractor. All activities which require method statements may only commence once the method statements have been approved by the engineer and or ECO as applicable. ii. Where applicable, the contractor will provide job-specific training on an ad hoc basis when workers are engaged in activities, which require method statements.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Approved method statements and relevant pro forma documents • Training records	As and when required	
A4 Site demarcation and development i. The surveys for the overall project area and construction footprint as approved in the Environmental Authorisation (EA) must be complete and clearly demarcated and fenced before the contractors set up their crew camps or begin construction. ii. A single primary contractors' yard must be established in accordance with recommendations made in section 1.2.9 of this EMP. This yard must be effectively fenced of and screened with shade netting to reduce the visual intrusion thereof. All members of the workforce should report directly to the said yard upon arrival at the site. The yard should thus be placed adjacent to one of the proposed temporary access points on the western side of the development. Satellite yards can be established closer to active work areas by the primary contractor and these yards should be managed in the same manner as the primary contractor's yard. The satellite yards should not house any potentially high impact activities such as bulk fuel storage, cement batching, wash bays, workshops or storage of hazardous materials, but should be limited to the overnight lay down of construction vehicles and plant. Limited quantities of building materials (those required for imminent construction activities) can also be stored in a controlled manner in such satellite yards.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Demarcated area's • Filled in section of this document	As and when required	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
A5 Emergencies, non-compliance and communication i. The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following potential incidents before construction may begin: Contamination of natural water resources from spills; contamination of soils from spills; and fire. ii. Communication in emergencies must follow the suggested lines of communication as stipulated Section 1.2.6, figure 1. iii. The contractor understands that failure to adhere to the requirements of the EMP will result in fines as stipulated in Section 1.2.8 'Tolerances', over and above the costs incurred for any remediation required as result of the specific non-compliance.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Method statements	As and when required	

Phase of development	CONSTRUCTION
Impact / issue	Materials (C)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
Handling				
C1 Stockpiles i. All stockpiled material must be easily accessible without any environmental damage. ii. All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised. iii. The stockpiles may only be placed within the demarcated areas the location of which must be approved by the ER, EO or ECO. iv. The contractor must avoid vegetated areas that will not be cleared. v. Storm water run-off from the stockpile sites and other related areas must be directed into the storm water system with the necessary pollution prevention measures such as silt traps and may not run freely into the immediate and surrounding environments. vi. Stockpiles are to be stabilised if signs of erosion are visible. vii. Soils from different horizons must be stock piled such that topsoil stockpiles do not get contaminated by sub-soil material. viii. Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the EO, ER and ECO. ix. No plant, workforce or any construction related activities may be allowed onto the topsoil stockpiles. x. Topsoil stockpiles must be clearly demarcated as no-go areas. xi. Stock piles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil's for landscaping and rehabilitation • Containment of invasive plant growth • Minimise contamination of storm water run-off	• No visible erosion scars once construction is completed • The footprint has not exceeded the agreed site in terms of EA, etc. • Minimal invasive weed growth • No signs of sedimentation and erosion	Daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
C2 Oil and chemicals i. The contractor must provide method statements for the "handling & storage of oils and chemicals", "fire", and "emergency spills procedures". ii. These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall. These areas must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks iii. Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. iv. The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. v. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. vi. Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practice (SUNSORB is a recommended product that is environmentally friendly). vii. All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material).	• Prevention of pollution of the environment • Minimise chances of transgression of the acts controlling pollution	• No pollution of the environment • No litigation due to transgression of pollution control acts • No complaints from I&APs • Method statements	Daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
C3 Cement i. The contractors must provide and maintain a method statement for "cement and concrete batching". The method statement must provide information on proposed storage, washing & disposal of cement, packaging, tools and plant. ii. The mixing of concrete must only be done at specifically selected sites on mortar boards or similar structures to contain run-off into soils rocky outcrops, streams and natural vegetation. iii. Cleaning of cement mixing and handling equipment must be done using proper cleaning trays. iv. All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility. v. Any spillage that may occur must be investigated and immediate remedial action must be taken. vi. The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a registered landfill site. *vii.* Cement batching areas must be located in consultation with the ER, EO or ECO to ensure residues are contained and that the proposed location does not fall within sensitive areas such as drainage lines, storm water channels, etc. It is recommended that cement batching plants be located within the future structural footprint of the filling station building.	• Minimise the possibility of cement residue entering into the surrounding environment • Minimise pollution of soil, surface and ground water resources	• No evidence of contaminated soil on the construction site • No evidence of contaminated water resources • Method statement	Monitored daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
C4 DANGEROUS AND TOXIC MATERIALS **(Provision of storage facilities)** i. Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas. ii. Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction. iii. In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs (DWA) must be informed immediately. iv. Storage areas must display the required safety signs depicting "no smoking", No Naked lights" and "Danger" containers must be clearly marked to indicate contents as well as safety requirements. v. The contractor must supply a method statement for the storage of hazardous materials at tender stage. vi. Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required.	• Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution	• No visible signs of pollution • No litigation due to transgression of pollution control acts	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
C5 Bulk storage of fuels and oils i. The contractors must provide and maintain a method statement for "Diesel tanks and refuelling procedures". ii. Bulk fuel storage tanks on the site must be on an impervious surface that is bunded and able to contain at least 110% of the volume of the tanks. The filler tap must be inside the bunded area where possible and the bund wall must not have a tap or valve. iii. A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres. iv. Bulk fuel storage tanks must be located in a portion of the construction camp where they do not pose a high risk in terms of water pollution (i.e. they must be located away from water courses). No fuel tanks should be located within 30m of any of the existing irrigation furrows or within 50m of any of the two dams located on site. v. Bulk fuel storage tanks must be placed so that they are out of the way of traffic, so that the risk of the tanks being ruptured or damaged by vehicles is minimised. vi. Bulk fuel storage areas should be covered with an impermeable corrugated iron roof during the rainy season	• Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution	• No visible signs of pollution • No litigation due to transgression of pollution control acts • Method statement	Once off, as required	
C6 Use of dangerous and toxic materials i. The contractor must keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur. ii. The contractor must set up a procedure for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. These procedures must be developed with consultation and approval by the appointed EO. iii. A record must be kept of all spills and the corrective action taken.	• Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution	• No pollution of the environment • No litigation due to transgression of pollution control acts	As required	

Phase of development	CONSTRUCTION
Impact / issue	PLANT (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
D1 Eating areas and camp followers i. The contractors must provide and maintain a method statement for "Crew camps and construction lay down areas". ii. The Contractor must, in conjunction with the EO, designate restricted eating areas for eating during normal working hours. Adequate closed refuse bins must be provided and cleaned on a daily basis. iii. No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the EO and ECO. iv. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited. v. Camp followers/informal traders must not be allowed to congregate on pavements or outside the construction site. However, at the contractors discretion facilities can be made available within the designated eating area. vi. Litter (even if originating outside the camp) and concrete bags, etc. must be picked up daily and put into suitably closed bins.	• Control potential influx of vermin and flies • Neat work place and hygienic environment • Minimise negative social impacts to local residents and businesses	• No visual sign of vermin and flies • No complaints from I&APs	Once off, monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
D2 Toilets and ablution facilities i. The contractor is responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet must be provided per 15 persons. ii. Sanitary arrangements must be to the satisfaction of the ECO and the local authority. Toilets must be of the chemical type. The contractor must keep the toilets in a clean, neat and hygienic condition. The contractor must supply toilet paper at all toilets at all times. Toilet paper dispensers must be provided in all toilets. iii. Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilised. All toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the ER, EO or ECO. iv. The contractor (who must use reputable toilet-servicing company) must be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) must ensure that all toilets are cleaned and emptied before the builders' or other public holidays. v. Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times.	• Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat • Minimise potential of diseases on site • Minimise potential to pollute soils, water resources and natural habitats	• Workforce use toilets provided • No complaints received from I&APs as well as members of the workforce • No visible or measurable signs pollution of the environment (soils, ground and surface water)	As and when required	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
D3 Waste management i. The contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. ii. Waste must be separated into recyclable and non-recyclable waste, and must be separated as follows: · Hazardous waste: including (but not limited to) old oil, paint, etc, · General waste: including (but not limited to) construction rubble, · Reusable construction material. · Recyclable waste must preferably be deposited in separate bins. The contractor is advised that "Collect-a-Can" collect tins, including paint tins, chemical tins, etc. and "Consol" collect glass for recycling. iii. Any illegal dumping of waste must not be tolerated, this action will result in a fine and if required further legal action will be taken. This aspect must be closely monitored and reported on; proof of legal dumping must be able to be produced on request. iv. Bins must be clearly marked for ease of management. v. All refuse bins must have a lid secured so that animals cannot gain access. vi. Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, wastes, rubbish, debris, and builder's wastes generated on the site. vii. Subcontractor(s) must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP. Proof of this undertaking must be issued to the ECO. viii. All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The contractor is to provide proof of such to the EO and ECO. ix. Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site.	• Sustainable management of waste by recycling • To keep the site neat and tidy • Minimise litigation and complaints by I&APs • Reduce visual impact • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment • Minimise potential to pollute soils, water resources and natural habitats	• Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site • Site is neat and tidy • No complaints from surrounding residents and businesses • Sufficient containers available on site • No visible or measurable signs of pollution of the environment (soils, ground and surface water) • Method statement	Daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
x. A skip, with a cover, must be used to contain refuse from campsite bins, rubble and other construction material.				

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
D4 Dust i. The contractors must provide and maintain a method statement for "dust control". The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage. ii. The contractor will be responsible to source this water and iii. The construction camp must be watered during dry and windy conditions to control dust fallout. iv. Dust production must be controlled by regular watering of roads and works area, should the need arise. NB: Concrete dust is toxic and damages soil properties. Therefore watering to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust. v. In addition to the standard dust suppression measures and where these measures are not sufficient, main access roads and site camps must be surfaced with a temporary surface such as gravel to assist with dust suppression. vi. At the end of construction, the site camp must be fully rehabilitated by removing the temporary surface, ripping the area to loosen the soil and the area must be re-vegetated with locally indigenous vegetation only, according to the landscape development plan for the project. vii. All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to. viii. Excessive dust conditions must be reported to the ECO. ix. Regular monitoring of dust fallout must be carried out and the records kept on site. Baseline dust measures must be sampled and approved by the ER and ECO prior to the commencement of construction activities. **x.** All forms of dust pollution must be managed in terms of the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965)	• Reduce dust fall out • Reduce visual impact • Minimise loss of valuable soil material	• No visible signs of dust • No complaints from interested and Affected parties • No incidences reported to ECO • No visible evidence of dust contamination on the surrounding environment • Method statement • Baseline targets not exceeded during regular monitoring of dust counts	Monitored daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
D5 Workshop equipment, maintenance and storage i. The contractors must provide and maintain a method statement for "workshop maintenance and cleaning of plant". ii. All maintenance and washing of vehicles and equipment must take place in the workshop area that is equipped with a bund wall and grease trap oil separator. During servicing of vehicles or equipment, a suitable drip tray must be used to prevent spills onto the soil, especially where emergency repairs are done outside the workshop area. Leaking equipment must be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste must be collected and removed to a registered waste site. iii. A method statement is required from the Contractor, tendering for the project to show procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage. iv. The Contractor must be in possession of an emergency spill kit that is complete and available at all times on site. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits. i. The following must be applied: • All contaminated soil / yard stone shall be removed and disposed of as hazardous waste at a registered facility or placed in containers to be taken to one central point where bio-remediation can be done. (Bio-remediation should only be an option if an Environmental Authorisation has been issued) • A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site. • All spills of hazardous substances must be reported to the ESO, EO, ER or ECO. • The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	• Prevent pollution of the environment • Minimise chance of transgression of the acts controlling pollution • Disposal of hazardous substances in an appropriate manner	• No pollution of the environment • No litigation due to transgression of pollution control acts • Method statement	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
D6 Noise i. In terms of noise impact for various increases over the ambient, the National Noise Regulations define an increase of 7dB as "disturbing". Noise levels during construction must therefore be kept within 7dB of the baseline data. ii. Regular monitoring of noise levels must conducted during construction and the records kept on site. iii. All construction vehicles must be in a good working order to reduce possible noise pollution. iv. Work hours during the construction phase must be strictly enforced unless permission is given. Permission must not be granted without consultation with the local residents and businesses by the EO. v. Noise reduction is essential and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement. vi. Noisy activities must take place only during working hours. The EO must inform the residents of houses and businesses adjacent to the development in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to, blasting, piling, use of pneumatic jack-hammers and compressors, bulk demolitions, etc.	• Maintain noise levels below "disturbing" as defined in the National Noise Regulations • Minimise the nuisance factor of the development	• No complaints from surrounding landowners or I&APs	As and when required	

Phase of development	CONSTRUCTION
Impact / issue	Construction (E)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
E1 Crew camps i. The contractors must provide and maintain a method statement for "Crew camps and construction lay down areas". ii. Accommodation for members of the workforce is not permitted on site iii. Dedicated wash areas must be situated away from watercourses and areas of shallow groundwater. iv. The contractor's camp must be monitored for dust fallout and dust suppression applied as required. This may include the laying of gravel. The use of grey water can be considered as an option if the required permits have been acquired. v. The contractor's camp, offices and storage facilities must be located within the site boundaries. No person must be allowed to stay on neighbouring sites, unless it is cleared with the owner. In such an event all requirements contained herein for the contractor's camps will apply. vi. The contractor must provide labourers plastic bags to clean up the contractor's camp and construction site on a daily basis. These areas must then be inspected by the contractor or his/her ESO to ensure compliance with this requirement. vii. The contractor is responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period and, the topsoil restored in areas where landscaping is to take place.	• Minimise water pollution • Minimise dust fallout • Minimise unwarranted environmental damage outside the footprint • Maintain a clean and healthy working environment • Minimise impact to surrounding environment	• No signs of water or soil pollution • No complaints from surrounding landowners or I&APs • No visible signs of litter • Method statements	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
E2 Fires i. The contractors must provide and maintain a method statement for "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised ii. Absolutely no burning of waste is permitted. iii. Fires will only be allowed in facilities especially constructed for this purpose within fenced Contractor's camps. Wood, charcoal or anthracite are the only fuels permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose. iv. Fires within the designated areas must be small in scale so as to prevent excessive smoke being released into the air. v. No wood is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive areas within the site and any surrounding natural vegetation.	• Minimise risk of veldt fires • Minimise destruction of natural fauna and flora • Maintain safety on site	• No veldt fires started by the contractor' s workforce • No claims from landowners for damages due to veldt fires • Method statement	Monitor daily	
E3 Erosion and sedimentation i. To reduce the loss of material by erosion, the contractor must ensure that disturbance on site is kept to a minimum. The contractor is responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed. ii. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas.	• Minimise erosion damage • Minimise impeding the natural flow of water • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Re-growth of disturbed areas	• No erosion scars • No loss of topsoil • No interference with the natural flow of water • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated	As and when required	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
E4 Fauna i. All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962 ii. All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake, a specialist must be called in to safely relocate the animal if the EO or ECO is not able to. iii. Environmental induction training and awareness must include aspects dealing in safety with wild animals into and on site. Focus on animals such as snakes and other reptiles that often generate fear by telling workers how to move safely away and to whom to report the sighting. Workers should also be informed where snakes most often hide so that they can be vigilant when lifting stones, etc.	• Minimise disturbance to animals • Minimise interruption of breeding patterns of birds • Minimise destruction of habitat	• No complaints from Nature Conservation • No litigation concerning applicable animal protection acts • No measurable or visible signs of habitat destruction	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
E5 Flora i. Predominantly locally indigenous plants must be used in the landscaping of the site. Plants that are proclaimed as problem plants or noxious weeds must be excluded from the landscaping plan and these must be removed immediately, should they occur on site. These plants, as well as any other problem plants within a specific region as stipulated by a qualified and experienced botanist, must be included in an alien management programme for the site. Eradication must occur every 6 months. ii. No open fires shall be allowed on site under any circumstances, fires will only be permitted in adequate facility within the crew camp, Forest Act, 1984 (Act No. 122 of 1984).	• Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority • Prevent litigation concerning removal of vegetation • Encourage natural habitat fauna • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Minimise risk of veldt fires • Minimise risk of fauna and flora destruction	• No litigation due to removal of vegetation without necessary permission • No exotic plants used for landscaping • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated • No veldt fires started by contractors work force • No claims from landowners for damages due to veldt fires • Method statement	As and when required	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
E6 Heritage i. In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), construction personnel must be alert and must inform the local heritage agency should they come across any findings of heritage resources within 24 hours. ii. Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found must cease immediately and the ECO must be notified within 24 hours. iii. Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist. iv. Under no circumstances must archaeological artefacts be removed, destroyed or interfered. v. Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the South African Heritage Resources Agency on the appropriate provincial heritage resource agency.	• Limit the destruction of the country's heritage resources • The preservation and appropriate management of new archaeological finds should these be discovered during construction	• No destruction of or damage to known archaeological sites	Monitor Daily	
E8 Access route/haul roads i. Access to the site will be gained off Jan van Riebeeck Street and Eind Street. ii. No unauthorised access is permitted. Any authorised clearing for access roads must be done under the supervision of the ECO. iii. Any damaged or degradation will be investigated and fines issued, the affected areas must be immediately rehabilitated. iv. Access roads for earthmoving-equipment must be clearly designated and be positioned as close as possible to the proposed development site. No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage. v. Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require application for a water use licence.	• Minimise loss of topsoil and enhancement of erosion • Minimise fauna and flora displacement by destruction of natural habitats	• No erosion on access roads after completion of construction • No loss of topsoil due to run-off water on access roads	As required, monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
vi. Neither the site nor its access roads must be allowed to be utilised for recreational activities, this includes but is not limited to quad bikes, 4x4's and dirt bikes. Security personnel must be informed and ensure that this is enforced.				

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
E9 Crime, safety and security i. No site staff, other than security personnel and skeleton staff will be housed on site unless otherwise stipulated in the Environmental authorisation. Security personnel and skeleton staff must be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities, facilities for cooking and heating so that open fires are not necessary. ii. A boundary fence must be erected; this will serve to prevent public access to the site, for public safety and security reasons. The access to the site must be controlled so as to restrict unauthorised personnel from entering the site. The workers on site must retain some means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on site at all times. iii. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations. iv. The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc. v. The contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site. vi. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.	• Reduce the risk of potential incidences • Minimise the potential impact on the environment	• No incidences reported	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
E10 Visual impact i. Landscaping must enhance the aesthetic appeal of the development. ii. The buildings that are to be erected must be aesthetically pleasing and blend into the area as far as possible. iii. Rubble and litter must be removed every two weeks or more often as the need arises and be disposed of at a registered landfill.	• Minimise visual impact	• No complaints from I&APs	Monitor daily	
E11 Geotechnical i. Founding conditions for individual structures must be confirmed by a qualified Geotechnical Engineer / Structural Engineer / Geologist. ii. All trenches and excavation works must be properly backfilled and compacted according to specifications given in sub-clause 5.2.4. Of SABS 1200DA. iii. Mechanical methods of rock breaking will have noise and dust impacts that must be managed. Method Statements for chemical breaking must be provided by the ER. iv. All recommendation as set out geotechnical investigation report must strictly be adhered to.	• Minimise potential structural faults • Minimise trench collapse	• No visible signs of backfill deterioration or trench collapse	As and when required	

E12 Hydrology i. Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced; this must be done in consultation with the Resident engineer as well as the ECO. Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell e.g. retention ponds ii. In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) is be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas. iii. The contractor must ensure that excessive quantities of sand, silt and silt-laden water do not enter the storm water system. Design of the storm water drainage system must ensure that the local and surrounding natural systems are not negatively impacted. Appropriate measures, e.g. erection of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken. These measures must be reviewed and audited by the ECO. iv. No wastewater may run freely into any of the surrounding streets or naturally vegetated areas. Runoff containing high sediment loads must not be released into natural or municipal drainage systems. If this becomes a problem it is recommended that an attenuation pond be constructed to allow solids to settle prior to runoff leaving the site. v. It must be ensured that all equipment to be used is not the cause irreparable damage to wet areas. The contractor must, where required, use alterative methods of construction in such areas.	• Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise impeding the natural flow of water • Minimise the impact on natural water flow dynamics • Minimise scarring of the soil surface and land features • Minimise damage to river and stream embankments • Minimise erosion of embankments and subsequent siltation of rivers and streams • Minimise damage to riverine habitats	• No visible signs of pollution • No signs of siltation of water courses • No visible erosion scaring once construction is completed • Minimum loss of topsoil • No access roads through river and stream banks • No visible erosion scars on embankments once construction is completed • No erosion or siltation downstream • No deviation from baseline data during regular sampling	As and when required, monitor daily	

E13 Soil i. The contractors must provide and maintain a method statement for "management of topsoil". ii. Topsoil must be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include the permanent works, pipeline trenches, stockpiles, access roads, construction camps and laydown areas. Topsoil must be stripped after search and rescue (Fauna and Flora) has been conducted and clearing of woody vegetation and before excavation or construction commences. iii. Topsoil must be deemed to be the top layer of soil containing organic material, nutrients and plant seeds. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas. iv. Ripping must be done to a depth of 250 mm in two directions at right angles. Topsoil must be placed in the same soil zone from which it has been stripped. v. At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 150 mm and stockpiled on the demarcated topsoil stockpile areas. vi. All topsoil must be removed and stockpiled on the site. vii. However, the use of topsoil for rehabilitation contaminated by the seed of alien vegetation (e.g. blackjacks, etc.) must not be permitted unless a programme to germinate the seed and eradicate the seedlings is drawn up and approved, or some other mitigatory feature is found. This must be approved by the ECO. viii. Single handling is recommended. Stock piles must not be higher than 2m to avoid compaction. ix. Dust suppression is necessary for stockpiles older than a month – with either water or a biodegradable chemical binding agent. x. Backfilling must be undertaken in such a way that the final contours blend with the surrounding environment. xi. Slopes can then be capped with topsoil. This requires a minimum layer of 100 mm in most areas.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil's for future landscaping and rehabilitation • Containment of invasive plant growth	• No visible erosion scars once construction is completed • The footprint has not exceeded the agreed site in terms of EA, etc. • Minimal invasive weed growth • No signs of sedimentation and erosion • Method statement	Daily	

ANNEXURE 1 (SAMPLE)

DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 2 (SAMPLE)

DECLARATION OF UNDERSTANDING BY THE ENGINEER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 3 (SAMPLE)

DECLARATION OF UNDERSTANDING BY THE CONTRACTOR

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 4 A

METHOD STATEMENT: Solid Waste Management

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? [give a brief description of the works to be undertaken on site that will generate waste (hazardous and non-hazardous wastes)]: * Note: please attach extra pages if more space is required.

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated plan and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT: Solid Waste Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:..... **End Date:**.....

HOW IS WASTE TO BE MANAGED ON SITE? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement **Solid Waste Management (contd.)**

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____

(Signed) (Print name)

Dated:._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

_____ _____

(Signed) (Print name)

Dated: _____

ANNEXURE 5

INCIDENT AND ENVIRONMENTAL LOG

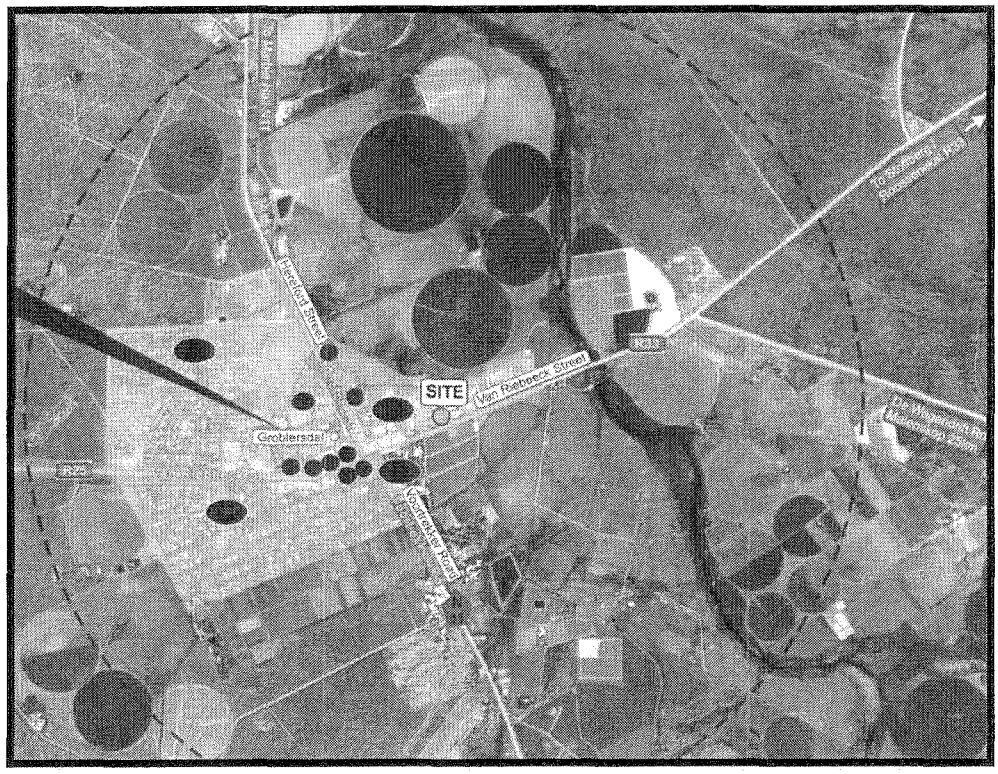
ENVIRONMENTAL INCIDENT LOG				
Date	**Env. Condition**	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** *(Give details and attach documentation as far as possible)*	**Signature**

Appendix F: Township Memorandum

MEMORANDUM IN SUPPORT OF THE APPLICATION FOR THE ESTABLISHMENT OF A LAND DEVELOPMENT AREA IN TERMS OF THE DEVELOPMENT FACILITATION ACT, 1995 (Act 67 of 1995)

- ERVEN 756 & 757, GROBLERSDAL X 11 –

(FEBRUARY 2010)



APPLICANT:

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TOWN & REGIONAL PLANNING | STADS- & STREEKBEPLANNING

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MEMORANDUM IN SUPPORT OF THE APPLICATION FOR THE ESTABLISHMENT OF A LAND DEVELOPMENT AREA ON ERVEN 756 AND 757, GROBLERSDAL EXTENSION 11

1. THE APPLICATION

The **Gawie Labuschagne Trust**, being the registered owner of **Erven 756 and 757, Groblersdal Extension 11** (hereafter referred to as the ***"application site"***), instructed the firm **Landmark Planning cc** to apply to the Limpopo Development Tribunal in terms of the provisions of Section 31 of the Development Facilitation Act, 1995 (Act 67 of 1995) and Regulation 21 of the Development Facilitation Regulations, 2000 (hereafter be referred to as the "***DFA***" and "***DFA Regulations***"), for:

i. the amendment of the Greater Groblersdal (Elias Motsoaledi) Town-planning Scheme, 2006 by the **rezoning of Erven 756 and 757, Groblersdal Extension 11** from "Industrial 3" to "Industrial 3" with the inclusion of a public garage, convenience store of 300m², place of refreshment, take-away facility, car wash facility and automatic teller machine, subject to certain proposed conditions; and

ii. the **consolidation** of Erven 756 and 757, Groblersdal Extension 11.

2. PURPOSE OF THE APPLICATION

The purpose of the application is to develop a Public Garage and related/ancillary land uses on part of the consolidated application site, in addition to the existing industrial land uses and zoning, in order to provide a service to the transient traffic travelling on Road R33 to Stoffberg, Tafelkop, Motetema, Monsterlus, etc. as well as to the local traffic generated by the Elias Motsoaledi Central Business District (CBD) and surrounding industrial area.

It is proposed that the application site be rezoned from ***"Industrial 3"*** to ***"Industrial 3" with the inclusion of a public garage, convenience store of 300m², place of refreshment, take-away facility, car wash facility and automatic teller machine, subject to the conditions as contained in the proposed schedules.***

3. GENERAL & LEGAL INFORMATION

3.1 Introduction:

This section of the Motivating Memorandum contains summarized information on all pertinent issues relating to the application and the land in question. Throughout this section, and in compliance with the requirements of the DFA Regulations, continuous reference will be made to supportive documentation, such as Title Deeds and various specialist studies and reports. The supportive documents are attached as annexures to this report and include the following:

ANNEXURE A:	TITLE DEEDS
ANNEXURE B:	SPECIAL POWER OF ATTORNEY AND RESOLUTION
ANNEXURE C:	SURVEYOR-GENERAL DIAGRAMS
ANNEXURE D:	CONVEYANCE'S CERTIFICATE
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ANNEXURE H:	ZONING MAP
ANNEXURE I:	LAND USE MAP
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ANNEXURE P:	PRELIMENARY SITE DEVELOPMENT PLAN
ANNEXURE Q:	PROPOSED AMENDMENT SCHEME CONDITIONS/ DEVELOPMENT CONTROL MEASURES

The objective of this section of the application is to provide a summary and overview of the information provided and therefore to assimilate the information for ease of creating a better understanding of the relevant issues at hand that have been taken into consideration in the extensive planning

phases of the development of a Public Garage and related/ancillary land uses on part of the consolidated application site, in addition to the existing industrial land uses and zoning of Erven 756 and 757, Groblersdal Extension 11.

3.2 Registered Property Owners (refer to Annexure A – Title Deeds):

Both properties representing the application site are registered in the name of the **Gawie Labuschagne Trust** in terms of Deed of Transfers No's. T58924/1987 (Erf 756, Groblersdal Extension 11) and T8544/2003 (Erf 757, Groblersdal Extension 11).

3.3 Power of Attorney and Resolution (refer to Annexure B):

The *applicant* for the establishment of a land development area is the **Gawie Labuschagne Trust**. The applicant/owner of the relevant properties duly authorized **Landmark Planning cc** by granting the firm a Special Power of Attorney and Resolution in accordance with Sections 31 (B) and/or (C) of the DFA.

3.4 Property Descriptions and Size (refer to Annexure C – Surveyor General-Diagrams):

According to the relevant title deeds and SG-diagrams the areas of the two erven representing the application site are as follows:

• Erf 756, Groblersdal Extension 11:	9 042 m²
• Erf 757, Groblersdal Extension 11:	7 237 m²
Consolidated Area:	**16 279m²**
	(i.e. 1, 6279 ha)

3.5 Surveyor General Diagrams (refer to Annexure C):

The relevant Subdivision and Servitude Diagrams that represent and affect the erven are listed below:

Portion/Servitude:	*SG Diagram:*	*Extent (ha):*
Erf 756, Groblersdal Extension 11	A7841/1985	9 042m²
Erf 757, Groblersdal Extension 11	A7842/1985	7 237m²
Right-of-way servitude over Portion 10 of the farm Klipbank, 26-JS (functions as an extension of Eind Street's 20m road reserve)	A2501/1985	N/a
Total Area:		**16, 279m² (i.e. 1, 6279ha)**

The Public Garage and related/ancillary uses will be developed on the southern extent of the consolidated property, bordering unto Road R33 (Van Riebeeck Street).

3.6 Title Conditions and Servitudes (refer to Annexures A & D – Title Deeds and Conveyance's Certificate):

Although the properties are not affected by any restrictive title conditions/servitudes, which will hamper the application or future development of the site, reference should be made of the following conditions/servitudes:

i. Condition no.3 in Deed of Transfer No. T58924/1987:

> *"3. Kragtens Notariele Akte K 376/1980-S is die hierinvermelde eiendom onderworpe aan 'n serwituut van verbod op vervreemding ten gunste van METRO MANAGEMENT SERVICES (PROPRIETARY) LIMITED vir 'n periode van 10 (tien) jaar vanaf 17 April 1979 en verdure periode van 5 (vyf) of 'n verdure 10 (tien) jaar, afhangende of die reghebbende opsies om die huur te hernu uitoefen vir 'n verdere tydperk van 5 jaar en daarna 'n verdere vyf jaar, of nie."*

ii. Condition no. 4 in Deed of Transfer No. T8544/2003:

> *"4. Daardie gedeelte van die eiendom hiermee getransporteer aangedui deur die figuur AfghCDEA op die Kaart LG A7842/1985 is onderworpe aan 'n serwituut van verbod op vervreemding ten gunste van METRO MANAGEMENT SERVICES (PROPRIETARY) LIMITED vir 'n periode van 5 (VYF) jaar of 'n verdere 10 (TIEN) jaar afhangende of die reghebbende opsies om die huur te hernu uitoefen vir 'n verdere tydperk van 5(VYF) jaar en daarna vir 'n verdere 5 (VYF) jaar of nie soos meer ten volle sal blyk uit Notariele akte K376/1980S."*

As confirmed by the Conveyance's Certificate, it is evident that the timeframes stipulated by the two servitudes of prohibition of alienation of the relevant parts of the application site have already expired/lapsed. Although the mentioned title conditions/servitudes are not restrictive with regard to the land development area application, the conditions will be cancelled by the conveyance attorneys and will therefore not be transferred to the new consolidated erf.

iii. Condition no.4 in Deed of Transfer No. T58924/1987 and Condition no. 5 in Deed of Transfer No. T8544/2003:

In accordance with the information contained in the Title Deeds and as indicated by Servitude Diagram (S.G. No. A 2501/1984 - Notarial Deed of Servitude No. K3809/1985S) the subject properties are entitled to a right-of way servitude over the neighbouring Portion 10 of the farm Klipbank, 26-JS. The mentioned right-of-way servitude functions as an extension of the existing 20m wide road reserve of Eind Street to the north of the site. The mentioned servitude will therefore also not hamper the application or future development of the Public Garage.

3.7 Bonds:

No bonds are currently registered over the properties.

3.8 Legal and Town Planning Status:

The two erven, representing the application site, form part of a proclaimed and developed township and are currently not subject to any known application processes, with the exception of this application in terms of the DFA. The following status is noted:

- **Town Planning Status** – Erven 756 and 757, Groblersdal Extension 11 is currently zoned **"Industrial 3"** in terms of the Elias Motsoaledi (Greater Groblersdal) Town-planning Scheme, 2006.

- **Environmental Status** - According to the information at the disposal of the applicant at the time of the drafting of this Memorandum, the land does not fall within any protected terrestrial reserves, nor has it been designated as land forming part of any formal conservation-related urban, rural, archaeological or natural area. The erven are situated within an established township and industrial-zoned area.

3.9 Mineral Rights (refer to Annexures A and D):

With reference to the attached Title Deeds as well as the Conveyance's Certificate, the mineral rights in respect of Erven 756 and 757, Groblersdal Extension 11 are severed from the ownership of the properties.

- The ownership of all rights to minerals in respect of Erf 756, Groblersdal Extension 11 is reserved to Johanna Magdalena Besaans (born Grobler) by virtue of Certificate of Mineral Rights No. 209/69 R.M.

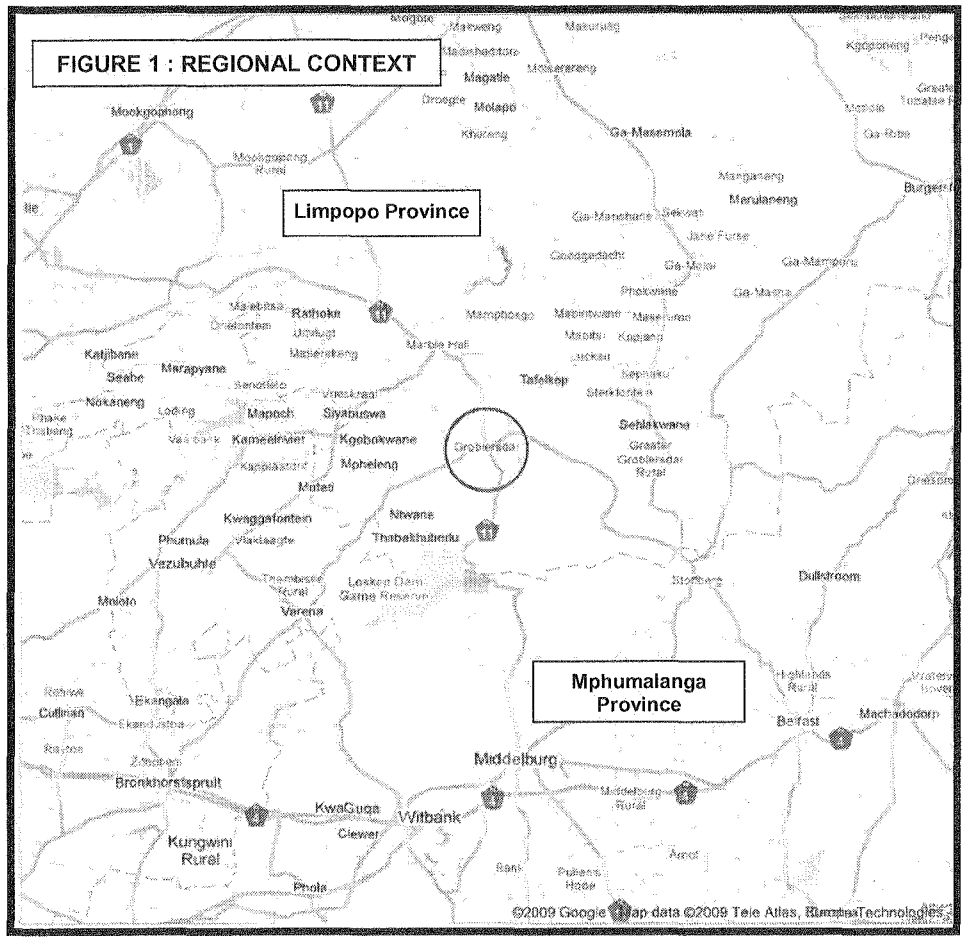
- The ownership of all rights to minerals in respect of Erf 757, Groblersdal Extension 11 is held by Linbri Ontwikkelaars (Pty) Ltd and Johanna Magdalena Besaans (born Grobler) by virtue of Certificates of Mineral Rights No's. K240/1985 and K241/1985.

Considering the provisions of the Amendment Act of the Registration of Mining Titles, 2003 (Act 24 of 2003) and the Mineral and Petroleum Resources Act, 2002 (Act 28 of 2002), these so-called 'old mineral rights' have lapsed and reverted back to the State. The necessary confirmation from the Department of Minerals and Energy will be obtained during the application process.

4. LOCALITY AND SITE CONTEXT

4.1 Regional and Local Context (refer to Annexures E & F):

On a **regional scale** Groblersdal/Elias Motsoaledi Local Municipality is situated in the south-eastern extent of the Limpopo Province, relatively close to the provincial boundaries of Mpumalanga and Gauteng, approximately 80km north-east of Bronkhorstspruit (Kungwini), 80km north of Witbank (Emalahleni) and 25km south of Marble Hall. The N1-freeway is located approximately 80km to the north-west and the N4-freeway approximately 80km to the south.

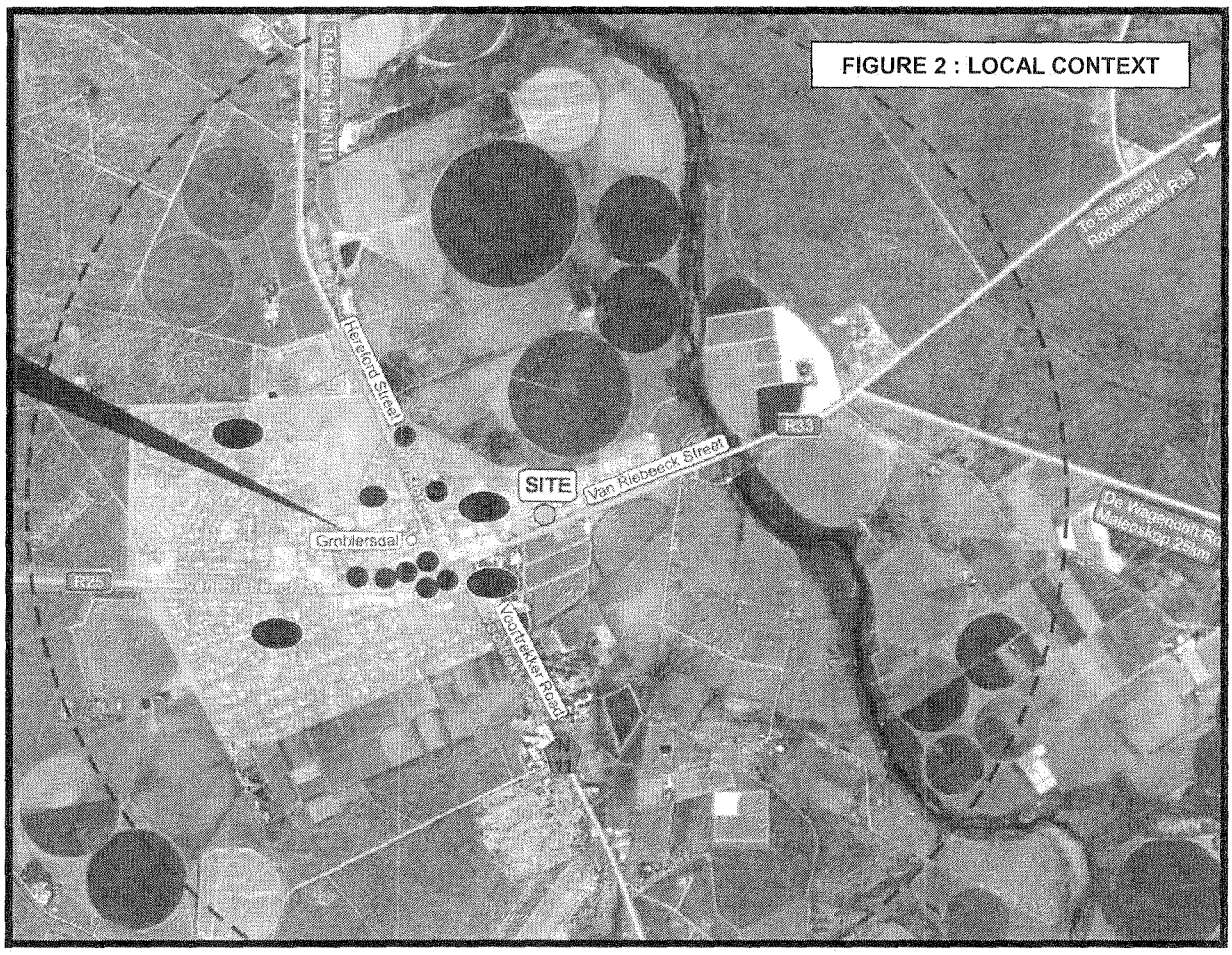


The Elias Motsoaledi Municipality is one of 6 local municipalities located within the jurisdiction of the Sekhukhune District Municipality. Groblersdal is known as the "Cultural Heartland" of the province. Access to the municipal area is mainly via the following main routes which intersects in the town centre:

- ***North-south link***: the N11 connects with Marble Hall in the north and Middleburg and Witbank in the south; and

- ***East-West link***: R25 to Dennilton and Bronkhorstspruit in the west and south-west and the R33-east and north-east towards Stoffberg, Tafelkop, Motetema, Monsterlus and various other rural settlements.

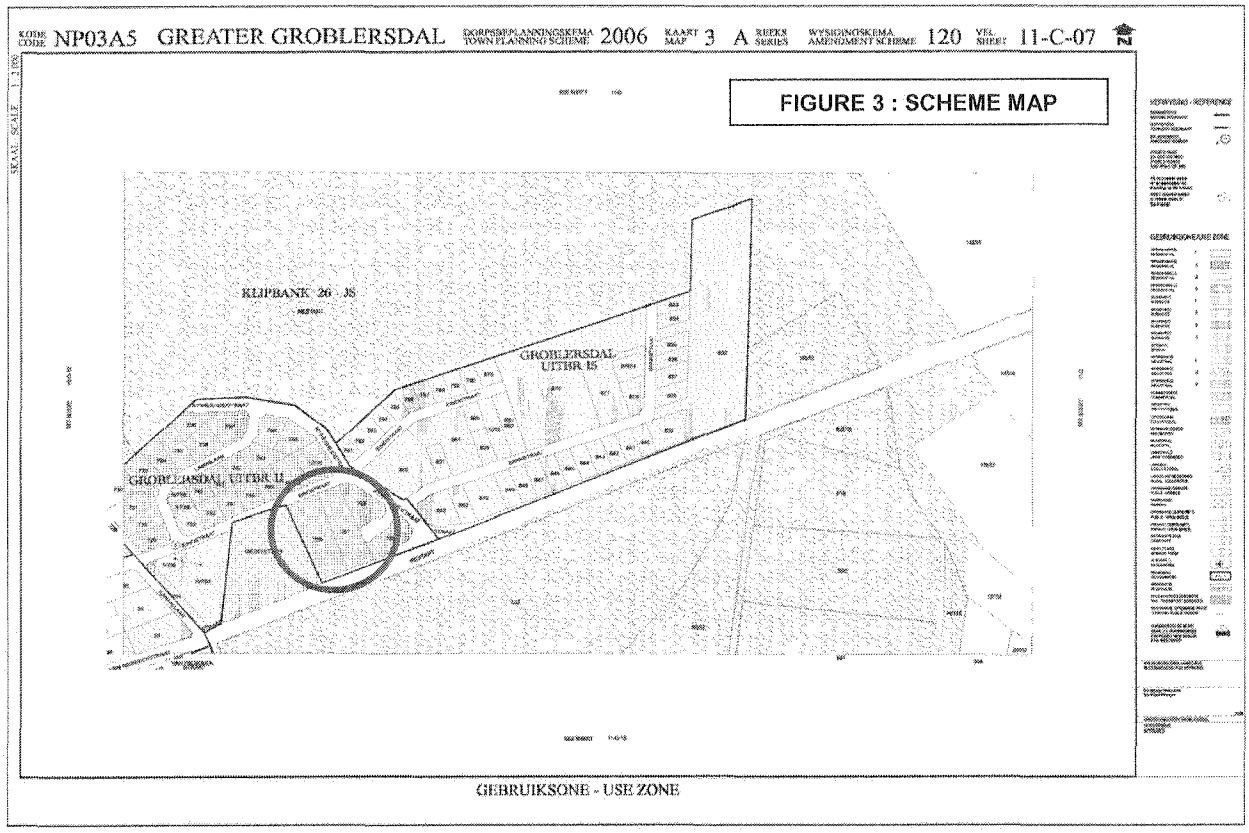
With regard to the application site's **local context**, the site is located in the north-eastern quadrant of Groblersdal's built-up area formed by the intersection of the above-mentioned main roads. The site forms part-and-parcel of the industrial area and is located directly north of Van Riebeeck Street (Road R33 to Stoffberg, Tafelkop, Motetema, Monsterlus, etc).



The intersection between Voortrekker Road/Herreford Street (R35/N11) and Jan van Riebeeck Street (R25 - R33) is located approximately 600m to the west of the application site.

4.2 Existing Zoning (refer to Annexure G – Zoning Certificates and Schedules):

In terms of the Greater Groblersdal Town-planning Scheme, 2006, Erven 756 and 757, Groblersdal Extension 11 are zoned "Industrial 3".

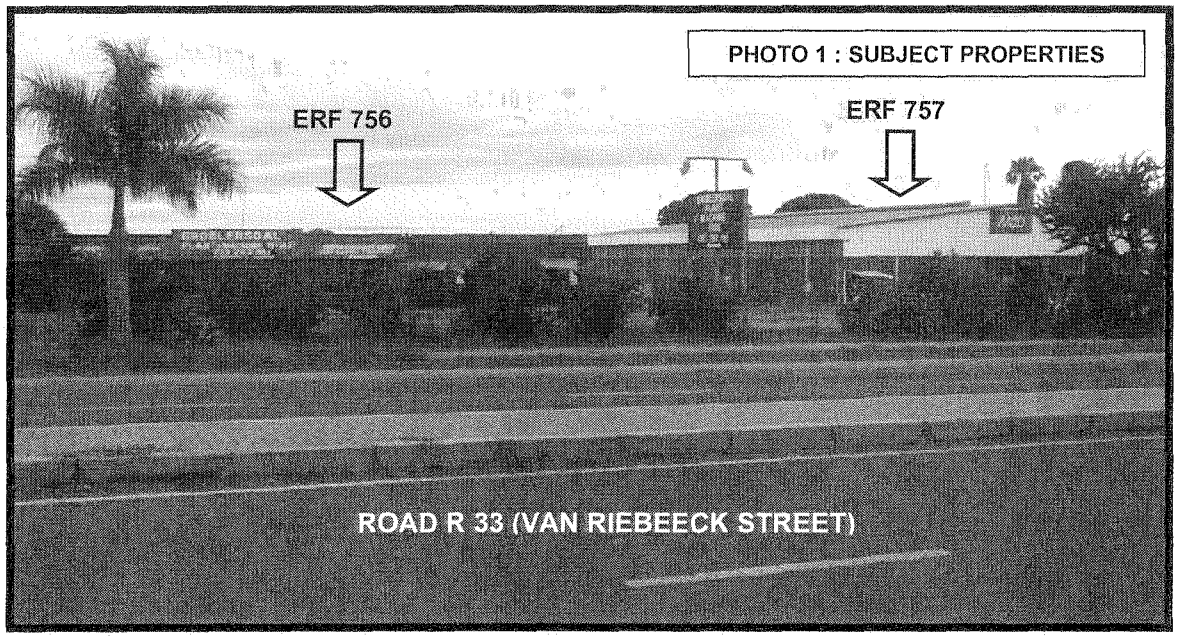


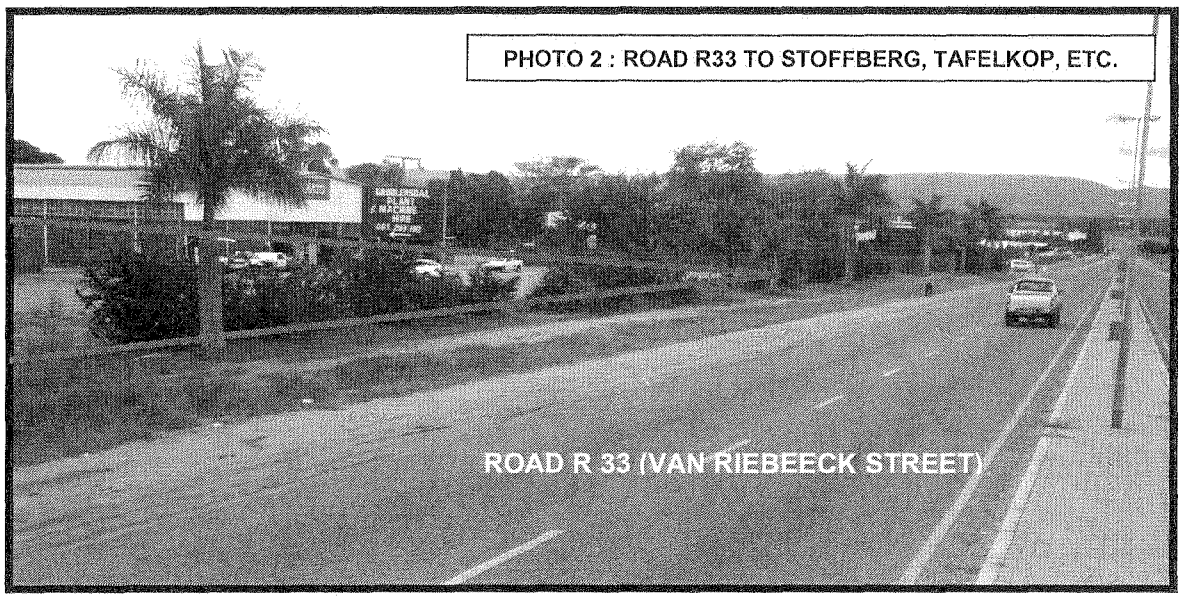
In terms of the current "Industrial 3"-zoning, the primary and secondary land uses as well as the development control measures prescribed by the town planning scheme are tabled below:

Use Zone:	*Uses Permitted:*	*Uses Permitted only with Consent:*	*Maximum Density:*		*Maximum FAR:*	*Parking Spaces:*
			Existing Right:	*Relaxation To:*		
12. **"Industrial 3"** (non-noxious industries)	Industries		80%	100%	2.0	1/100m² GLA plus 1/100m² office floor area
	Warehouse		80%	100%	2.0	1/100m² GLA plus 1/100m² office floor area
	Commercial Use		80%	100%	2.0	1/100m² GLA plus 1/100m² office floor area
	Service Industry		80%	100%	2.0	1/100m² GLA plus 1/100m² office floor area
		Public Garage	80%	100%	2.0	40% of the uncovered site area paved
		Place of refreshment for own employees only	80%	100%	2.0	1/100m² GLA plus 1/100m² office floor area
		Scrap yard	80%	100%	2.0	1/100m² GLA plus 1/100m² office floor area
		Dwelling unit related to, but subordinate to the main use	80%	100%	2.0	
		Special use				In accordance with local authority's policy

4.3 Existing and Surrounding Land Use (refer to Annexure I – Land Use Map)

The Groblersdal Plant and Machine Hire is currently situated on Erf 756, Groblersdal Extension 11 and Metro warehousing and paraffin sales are situated on Erf 757, Groblersdal Extension 11. The proposed public garage will be developed on the southern part of the site bordering unto Road R33 (Van Riebeeck Street). The surrounding area is characterised by warehouses, depots and manufacturers of various goods. The area has a typical industrial character.





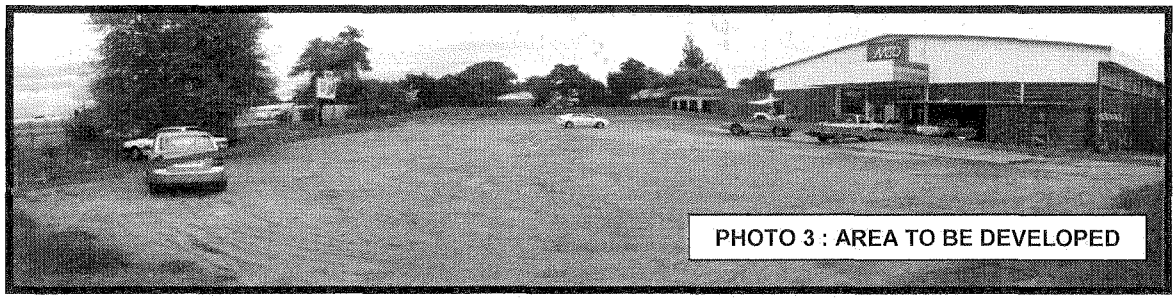


PHOTO 3 : AREA TO BE DEVELOPED

As mentioned previously, the application site is located in the north-eastern quadrant of Groblersdal's built-up area in an established industrial zone. The Land-use survey that was conducted during November 2009, indicated that the following land-uses form part of the area within which the application site is situated:

Description	*Land-use*
Erf 732, Groblersdal Extension 11	Storage warehouses
Erf 731, Groblersdal Extension 11	Steel frames and steel works
Erf 744, Groblersdal Extension 11	Laduma Biscuits
Erf 745, Groblersdal Extension 11	Laduma Warehouses
Erf 743, Groblersdal Extension 11	Martins Funeral Parlour
Erf 742, Groblersdal Extension 11	Transport facilities/warehouses
Erf 741, Groblersdal Extension 11	Warehouses
Erf 775, Groblersdal Extension 11	Gear Spares/Insurance company/Funeral Home
Erf 751, Groblersdal Extension 11	Afrovert
Erf 752, Groblersdal Extension 11	Motor Spares/Battery Centre/Duroc Foods
Erf 753, Groblersdal Extension 11	Steel Works
Erf 1/739, Groblersdal Extension 11	Coffin Manufacturers
Erf 739, Groblersdal Extension 11	Wood Works
Erf 1/740, Groblersdal Extension 11	Lifestyle Interior
Erf 740, Groblersdal Extension 11	Lifestyle Interior
Erf 741, Groblersdal Extension 11	Warehouses
Erf 35, Groblersdal Extension 11	MICA
Erf 34, Groblersdal Extension 11	Fruit and Veg City
Erf 25, Groblersdal Extension 11	Art zone
Erf 1/755, Groblersdal Extension 11	Glass Fit
Portion 10, Groblersdal Extension 11	Cemetery and CTM
Erf 758, Groblersdal Extension 11	Engineering Works

Erf 759, Groblersdal Extension 11	SAB
Erf 848, Groblersdal Extension 11	Depot
Erf 802, Groblersdal Extension 11	Depot
Erf 853, Groblersdal Extension 11	Warehousing and Brick Manufacturers
Erf 852, Groblersdal Extension 11	Agripack
Erf 978, Groblersdal Extension 11	Panel beater
Erf 847, Groblersdal Extension 11	Panel beater
Remainder of the farm Klipbank 26-JS	Agricultural

It is evident from the land-uses that are located in the immediate vicinity of the application site, that a Public Garage would not only fit in with the surrounding land uses but also provide a convenient service to the delivery vehicles travelling to and from the industrial area, various warehouses, depots, manufacturers, etc.

5. SUPPORTING STUDIES (refer to Annexures J to O)

What sets the Development Facilitation Act, 1995 (Act 67 of 1995) apart from most other town-planning legislation, is the fact that the necessary information and supporting studies need to be completed before an application may be circulated and considered. The **Gawie Labuschagne Trust** appointed a comprehensive project team to complete the following studies / investigations in order to confirm the viability and sustainability of the proposed land development area to be developed:

- ***Civil Services Report***, prepared by WSP SA Civil and Structural Engineers (Pty) Ltd. attached as Annexure J.
- ***Electrical Services Report***, prepared by WSP SA Civil and Structural Engineers (Pty) Ltd. attached as Annexure K.
- ***Geo-hydrological Investigation Report***, prepared by Blue Rock.... attached as Annexure L.
- ***Traffic Impact Assessment***, prepared by WSP SA Civil and Structural Engineers (Pty) Ltd. attached as Annexure M.
- ***Feasibility Study and Impact on Surrounding Sites***, prepared by WSP SA Civil and Structural Engineers (Pty) Ltd. attached as Annexure N.
- ***Environmental Impact Assessment/Scoping Report in terms of Regulation 31 of the DFA***, by S.E.F. (Strategic Environmental Focus (Pty) Ltd.) attached as Annexure O.

5.1 **Civil Services Report (refer to Annexure J):**
Roads:
Stormwater Drainage:
Sewerage:
Water:
Fire Protection:

5.2 **Electrical Services Report (refer to Annexure K):**

5.3 **Geo-hydrological Investigation Report (refer to Annexure L):**

5.4 **Traffic Impact Assessment (refer to Annexure M):**

5.5 **Feasibility Study and Impact on Surrounding Sites (refer to Annexure N):**

WSP SA Civil and Structural Engineers (Pty) Ltd launched an investigation into the feasibility of developing a new Public Garage on the subject erven and the impact of such a development on the existing filling stations within the Groblersdal area. The purpose of the study is to determine if the proposed site would be viable for the purposes of a Public Garage.

A traffic count was conducted on 21 September 2009. The information obtained with this count was used to estimate the traffic demand and traffic volume for the study area. According to the findings, the **Average Daily Traffic (ADT)** that the site is exposed to is approximately **12 392 vehicles per day**. Approximately 5 500 vehicles per day travel in an eastbound direction and approximately 5 600 vehicles per day travel in a westerly direction. For the purposes of this study a **conservative traffic growth rate of 2.0% per annum** was estimated over the next five years.

Ten competitor sites in the greater Groblersdal area were surveyed to determine the average fill per vehicle at a specific station, facilities provided and estimated current monthly sales. High average fill rates are generally encountered for sites exposed to mainly transient traffic, while lower average fill rates are generally encountered for sites exposed to local traffic. The **average fill** for these ten sites was calculated at **...20.4 litres per vehicle**.

The Feasibility Study indicated that there is a relationship established between the number of sales of a **convenience store** and the fuel sales at any specific station. This relationship is founded on the logic that a customer purchasing fuel will also make purchases from the convenience store (40% - 60% of the time). It could be assumed that if the site has a branded convenience store, with a minimum of an in store food offer, the Public Garage should generate approximately R1.25 for every litre of fuel sold. The estimated **shop sales** is therefore calculated at **approximately R300 000.00 per month in year 3**, which is estimated as the year in which a Public Garage

has reached optimal growth.

The turn-in percentage (interception rate) is determined by factors such as convenience, visibility, amount of passer-by traffic, type of traffic, other Public Garages in the vicinity, services provided, access, location and site layout. It is expected that the proposed development will have an **interception rate of 5.0%** from Jan van Riebeeck Street's eastbound traffic. An interception rate of **6.5%** is assumed for local traffic due to the relatively high competitor density in Groblersdal.

Jan van Riebeeck Road is a provincial road maintained by the Limpopo Roads Agency. WSP found that the proposed site, alongside the provincial road, **complies with the minimum standards** of the frequently used design manual for filling stations/public garages (Gautrans, 2002.BB2: Guidelines for Public Garage Accesses. May 2002 Revised Draft Edition). The site is also **large enough** to comply with the required minimum distances as recommended in the manual. **Sight distance is satisfactory** at the proposed sites due to the geometry of the existing road; this is a key factor when determining traffic safety. The site can accommodate adequate entrance lane widths (5m) and would therefore be able to accommodate delivery vehicles.

The proposed Public Garage has a potential to pump approximately 190 000 litres per month in year 1 (80% of potential reached), 230 000 litres per month in year 2 (95% of potential reached) and approximately **247 000 litres of fuel per month in year three** (100% of potential reached).

Of the ten sites that were surveyed only two sites (Caltex - Jan van Riebeeck Street and Excel - Jan van Riebeeck Street), will have a significant loss in fuel sales as a result of the impact of the application site. Last-mentioned two sites have little or no modern amenities, are less noticeable and are not well-maintained or in good outward appearance. It is estimated that the operation of the proposed Public Garage will not irreparably jeopardise the business of any of the Public Garages in the study area.

The feasibility study by WSP concludes that the **proposed Public Garage is viable** and has the support from a traffic engineering point of view.

5.6 Environmental Impact Assessment (Annexure O):

6. MOTIVATION

6.1 Introduction:

This section contains a documented motivation of the need and desirability of the proposed development in terms of the proposed zoning and development control measures, marketing dynamics and the following town-planning policies: Greater Groblersdal Integrated Development Plan (IDP) 2009/2010; Greater Sekhukhune District Municipality Integrated Development Plan (IDP) 2006/2007; Elias Motsoaledi Local Municipality Spatial Development Framework (SDF) 2007; and the General Principals of the Development Facilitation Act, 1995 and the Development Facilitation Regulations, 2000.

6.2 Proposed development, zoning and development control measures (refer to Annexures....)

Proposed Zoning:	Permitted Land Use: (i.e. Primary Land Use Rights)	Erf Numbers:
"Industrial 3" with the inclusion of a public garage, convenience store of 300m², place of refreshment, take-away facility, car wash facility and automatic teller machine.	(1) Industries; (2) Warehouse; (3) Commercial Use; (4) Service Industry; (5) Public Garage; (6) Convenience Store of 300m²; (7) Place of Refreshment and take-away facility; (8) Car wash facility; and (9) Automatic teller machine.	Erf 756 and 757, Groblersdal Extension 11 (to be consolidated)

Apart from the **primary land uses included under an "Industrial 3"-zoning**, provision is also made for a **public garage, convenience store of 300m², place of refreshment, take-away facility, car wash facility and automatic teller machine**. With reference to the definition of a "public garage" (quoted below for ease of reference), it should be noted that provision is made for an enlarged **convenience store of 300m²** (instead of the scheme's provision for 200m²).

"PUBLIC GARAGE – means land used or a building designed or used for the carrying on of the business of maintaining, repairing or refuelling motor vehicles and related purposes, excluding panel beating and spray painting, but which may include one or more of the following; parking or storage of motor vehicles, sales of spare parts, accessories, fuel and lubricants for vehicles, a café subservient to the main use, as well as sales of new or used vehicles. Included is a convenience store which shall not exceed 200m²" (page 8).

The following is a list of conditions contained in the GGTPS, 2006 that are relevant to all erven zoned "Public Garage". These conditions have been incorporated in the attached development control measures:

- *No material or equipment of any nature may be stored or stacked to a height greater than the height of the screen wall;*
- *No repair work to motor vehicles or equipment of any nature, shall be performed outside the garage building, except in an area screened for that purpose, to the satisfaction of the local government; and*
- *No material or equipment of any nature whatsoever shall be stored or stacked outside the garage building, except in an area screened for that purpose* (page 26).

Kindly refer to the proposed amendment scheme conditions/schedules attached as Annexure O, which list all the relevant development control measures to be complied with in terms of the Greater Groblersdal Town-planning Scheme, 2006.

6.3 Market Dynamics

Demacon Market Studies conducted a comprehensive specialist potential assessment **during July 2009** to determine the capacity of the local market to sustain a new commercial and social node in Groblersdal. The study is of importance for this application due to the valuable information it provides with regard to the area's economic overview, demographic indicators, consumer survey, modelling results and space economy analysis.

According to the findings of the study, there is a general expectation that domestic growth will moderate during 2009 due to weaker economic conditions before improving in 2010. In terms of the **SARB Leading Indicator**, the economy has a positive outlook on the short to medium term due to indicators such as job advertisements, the number of residential building plans passed, index prices of all classes of shares, the number of new passenger vehicles sold and business confidence, growth trends within the SA domestic economy correlates with economic growth in the regional economy (and sub-economies).

In order to determine when the turnaround in the poor performing residential property market will commence, Demacon applied the **Property Conditions Indicator**. The Property Conditions Indicator represents an indicator comprising of real economic growth, interest rates and transfer duty series to pick up major relief as recorded in 2006. This indicator began to **rise steadily from the second quarter of 2008**.

This **domestic growth** in the economy is a good indication of the viability of the public garage in Groblersdal. The economic growth is also indicative that a need/demand is emerging in the area that will be balanced by supply through the provision of additional services such as the public garage.

The results of the study concluded that there were four **dominant contributors to the Sekhukhune economy in 2007**:

i. Community, social and other personal services – 28.9%;
ii. Mining – 21.5%;
iii. Trade sector – 17.3%; and
iv. Transport and communication – 11.7%.

The four **dominant contributors to the Elias Motsoaledi economy in 2007**:

i. Community, social and other personal services – 37.6%;
ii. Trade sector – 20.4%;
iii. Transport and communication – 16.5%; and
iv. Finance and business services – 11.1%.

As previously mentioned, economic growth in the regional economy (and sub-economies) reflects a similar cycle trend that correlates with growth trends experienced in the SA domestic economy over the same period of time. **Local economic growth** in recent years stabilised and averaged on **4.3% in the Sekhukhune District Municipality** and **6.2% in the Elias Motsoaledi Local Municipality**.

The report's **demographic information of Groblersdal (within a 20km radius)** could be summarized as follows:

- In 2003 there were a total of **22 103 households** within the Groblersdal area;
- The average size of these households are 3.8 people per household;
- Of the 22 103 households 61.1% are economically active;
- **72.7% are employed**;
- The occupation profile is predominantly characterized by elementary occupations and skilled agricultural workers;
- The weighted average monthly household income (all Living Standard Measurement's or LSM) is R2 707.00 and R11 637 for the 4-10+ LSM; and
- 24.1% of the population within the Groblersdal area have a LSM of 4-10+.

The above-mentioned demographic information indicates that there is a ***large work-force within Groblersdal and the surrounding rural settlements***. This work-force ***commutes on a daily basis from the surrounding rural areas situated to the north-east of Groblersdal along the R33 to Stoffberg to their respective work places within Groblersdal***. The proposed public garage along Jan van Riebeeck Street (R33) will intercept these commuters. The proposed public garage will also be the first garage on the commuter's way in from the rural areas and the last as they leave Groblersdal to return home.

The study furthermore indicated the following **retail preferences after household surveys** were performed within the market areas: *"Respondents in the various market areas indicated their general support in terms of commercial development within the Groblersdal area."* Considering the retail preferences of the residents and the **vast rural communities located to the north-east of Groblersdal**, it is evident that many of them will be required to refill their vehicles in Groblersdal before returning home.

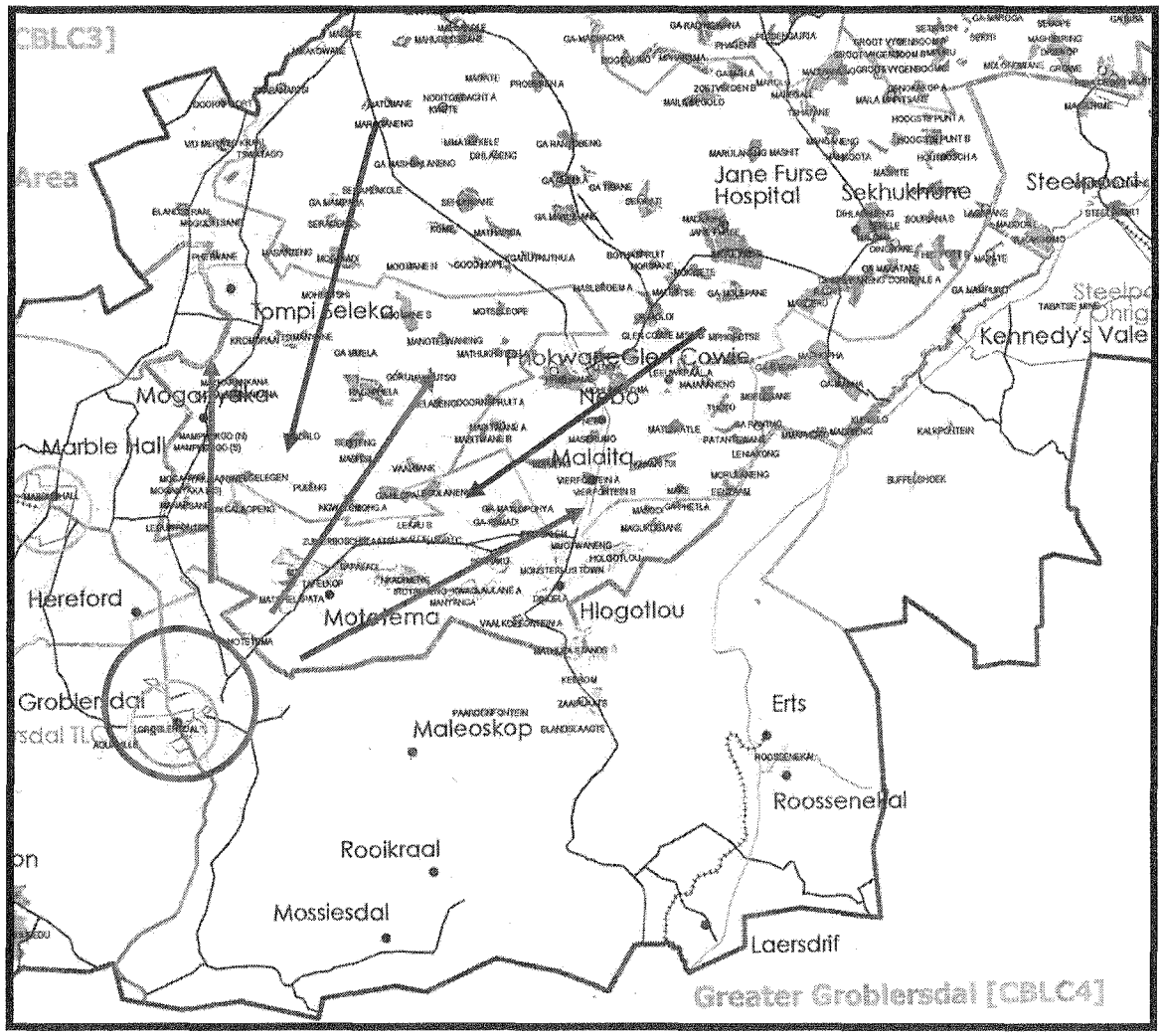
The **land take-up forecast** that can be made from the data acquired for this study indicates that the total additional land required over the **next 10 to 15 years** within the Sekhukhune area is **approximately 69 hectares**. The area has the potential to sustain **3 000 additional residential units per annum** according to the building activity, however, **90% of this would be rural growth** and it is estimated that Groblersdal would attract 5%-10% of this growth. Increased rural development has had a direct impact on the Groblersdal economy. Serious consideration needs to be afforded to an appropriate urban growth management strategy for Groblersdal.

Although rural development had an impact on the Groblersdal economy the entrepreneurs in the rural areas need to buy goods and supplies within Groblersdal, this in turn will provide the public garage with a greater scope of clientele.

The economic areas surrounding Groblersdal (approximately 50km radius) houses between **600 000 to 700 000 people**, no more than 10 000 are employed within Groblerdal itself. This, coupled to the aforementioned strong socio-cultural location preferences, causes a market that is a two-fold (daily or monthly, as well as between the rural areas and Groblersdal, and the rural areas and Gauteng) **migration pattern** in the market area, as people choose to reside in Groblersdal, whilst being employed elsewhere.

The Market Research indicates that there is a large existing supply dynamic which is balanced by the large demand (600 000 – 700 000 people) **all commuting to reach the various shopping centres etc. within Groblersdal.** This again reiterates the fact that there are more than enough consumers that will make use of the public garage and its subservient facilities/services (i.e. branded convenience store, take away, etc.).

The areas indicated on the following map situated to the **north-east of the application site** (i.e. Motetema, Tafelkop, Sekhukhune, Monsterlus, etc.) are identified by the IDP as having the **largest part of the EMLM's population**. The residents of these areas commute on a daily basis to and from Groblersdal.



6.4 Groblersdal Local Municipality Integrated Development Plan (IDP) 2009/2010:

6.4.1 Overview of the Groblersdal Local Municipality IDP, 2009/2010:

The level of development within the municipal area is presented by the IDP to provide a clear picture of the development goals that have been reached and areas where development is still gravely needed. The IDP 2009/2010 indicates that the Groblersdal Magisterial District is mostly located within the

Elias Motsoaledi Municipality and accounts for the largest portion of the central parts of the municipality.

The EMLM is predominantly rural in nature and has a high unemployment rate that results in high poverty levels. The EMLM has many shared environmental, social and economic systems and structures, the most apparent of these are with the neighbouring and nearby municipalities that are also situated within the Greater Sekhukhune District. The EMLM is integral to the Provinces of Limpopo and Mphumalanga and has **significant development potential specifically in the agricultural and tourism sectors.**

The development of strategies and interventions that are aimed at fulfilling the municipality's vision of *"a better life for all through service excellence" (page 1)* is presented in the IDP.

6.4.2 Spatial Profile:

A settlement hierarchy was identified by the Limpopo Province Spatial Rationale, 2002, the GSDM area is described in terms of this hierarchy. The classification of individual settlements usually form the base of a settlement hierarchy. The relevant settlement's hierarchy in terms of the Limpopo Province Spatial Rationale is tabled below:

Settlement Order:	*Make up:*	*Area:*
First order settlements	**Provincial growth points, district growth points and municipal growth points**	**Groblersdal**, Monsterlus, and Motetema/Tafelkop

These settlement orders are used as a guideline to determine if and what type of services are to be provided in a specific area. It would logically be more sustainable and economically viable to develop shopping malls and accompanying community services, such as a public garage, in a first order settlement.

The EMLM Spatial Development Framework, 2007 has identified Strategic Development Areas (SDAs). These areas would require coordinated interventions that would stimulate the realization of their full potential. These areas of development as well as type of area are listed below (page 53):

- ***Groblersdal (Provincial Growth Point);***
- ***Motetema- Tafelkop (Municipal Growth Point);***
- ***Monsterlus (Municipal Growth Point);***
- *Ntwane (Population Concentration Point);*
- *Elandslaagte (Population Concentration Point);*
- *Sephaku (Population Concentration Point);*

- *Moteti (Population Concentration Point); and*
- *Moteti (Local Service Point).*

(writer's own accentuation)

From the information contained in the Limpopo Province Spatial Rationale, 2002 as well as the EMLM SDF, 2007 it is evident that Groblersdal is identified as a ***first settlement order*** that is made up of provincial-, district- and municipal growth points. This information is important for the proposed development of the public garage as it indicates that there is a demand created in the area for additional development.

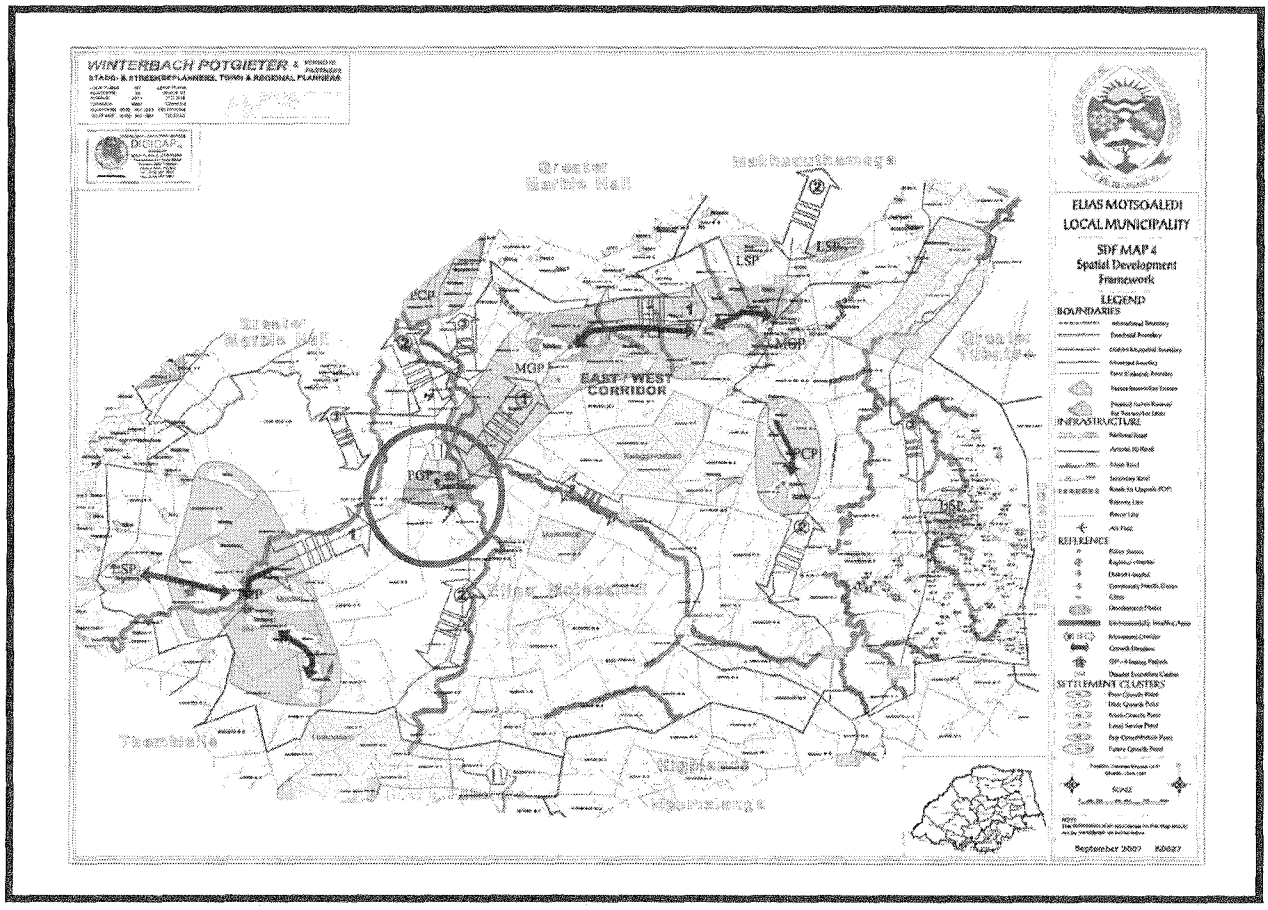
6.5 Elias Motsoaledi Local Municipality (EMLM), Spatial Development Framework, September 2007

According to the EMLM Spatial Development Framework, 2007 Groblersdal forms part of a nodal area and has the highest potential for development according to the nodal hierarchy. **Groblersdal** is earmarked as a **provincial growth point** and priority is given to residential development.

According to the SDF the EMLM **encourages densification** of stands and strive to prevent the wastage of land. The proposed development of the application site is in line with this proposal of the SDF as the development of the application site is an example of **in-fill development** where the wastage of land is curbed.

The main business nodes within the EMLM are **Groblersdal**, Dennilton, **Monsterlus** and **Tafelkop**. Other business development occurs mainly along arterial routes or within settlement areas. Some of the suggestions contained in the SDF with regard to business development within the EMLM are:

- Business developments should move to **central accessible localities** and be concentrated as to provide **viable local service points** that provide an array of commodities and services to the surrounding community;
- The LED strategy will **encourage the development of vacant business erven**;
- The requirements of the National or Provincial Roads Agency should be adhered to with the development of businesses adjacent provincial roads;
- The **proposals of the relevant Town Planning Scheme should be adhered to** with the development of businesses within townships; and
- The **central business areas within towns should not be replaced, duplicated or negatively affected** by rural community centres.



The proposed development of the application site as a public garage is in line with the above-mentioned proposals as it represents **in-fill development** and is **located in a Development Node along a First Order Movement Corridor on route to two Municipal Growth Points (i.e. Tafelkop and Monsterlus).**

It is of importance to note that Groblersdal is regarded as a **primary industrial node**. The industrial land uses attract investors and these land uses should be marketed through the LED Strategy, in conjunction with stakeholders. The following plan indicates the position of the **Groblersdal Industrial Area and Future Expansion Areas** in relation to the Mixed-use Town Core and Community Nodal Zone.

With regard to roads and public transport the EMLM suggests that priority be given to the **upgrading of the main road between Groblersdal, Tafelkop and Monsterlus** as well as to the construction, upgrading and rehabilitation of link roads between the CBD, community centres, municipal service centres, school, hospitals, etc.

The SDF (September 2007) concludes that the **EMLM has considerable inherent development potential** and many natural and physical resources as well as attributes which present the opportunity for the achievement of the spatial development goals as detailed in the report over a medium to long term timeline, provided that these resources are judiciously applied.

6.6 On a macro-scale basis, the need and desirability for the proposed "Public Garage" use could be argued in terms of the following aspects:

The locality of the application site and proposed garage will provide improved accessibility, uncomplicated manoeuvring, convenience and safety from a traffic point of view. The closest other public garage with regard to the application site, is the Total garage situated on the south-western corner of the intersection of Voortrekker Road and Jan van Riebeeck Street. Last mentioned Public Garage is located on the western side of Voortrekker Road

and therefore intercepts the traffic travelling from Middelburg to Groblersdal. It is an old site with no modern amenities and several low-income orientated retail businesses are located adjacent to the site.

The locality of the application site within the industrial area and **existing three access points** (i.e. from Eind Street in the north; Bank Street in the east; and Van Riebeeck Street in the south) attributes to the convenience of the proposed Public Garage. As discussed in detail in the Traffic Impact Study and indicated on the preliminary Site Development Plan, it is also proposed that an **additional right turn lane** be incorporated within the existing median on Van Riebeeck Street to enable the traffic travelling in a westerly direction to also make use of the services provided at the proposed Public Garage.

The Public Garage will not only contribute towards the needs of the residents of the neighbouring residential area, industrial area and Groblersdal CBD, but mainly targets and intercepts the transient traffic commuting to the various rural settlements to the north-east of Groblersdal, as well as to Stoffberg, Tafelkop, Monsterlus and Maleoskop's mines.

The large number of commuters and labour force passing through Groblersdal, the mining industries to the east and south-east of the application site as well as the general increase in motor ownership all contributes to a higher demand for fuel and therefore the provision of public garages.

According to the traffic counts and feasibility study (based on an interception rate of 5% for eastbound traffic), it is expected that ±190 000 litres of fuel will be sold per month, within the first year and ±247 000 by the third year of operation, which confirms the viability and feasibility of the Public Garage based on fuel sales only.

The desirability of a public garage and ancillary uses is normally determined by market forces. The locality of the site and site layout is in line with the character of the area, needs of the resident community, transient traffic and affected parties.

The following aspects address the desirability of the application site:

- The application site is in Groblersdal's industrial area earmarked as a Provincial Growth Point, and alongside a first order movement corridor on route to Municipal Growth Points (i.e. Tafelkop and Monsterlus) in terms of the Elias Motsoaledi Local Municipality SDF, 2007.

- The traffic light controlled intersection approximately 600m to the west of the site, increases the visibility of the site and controls the speed of passing traffic.

- The consolidated site provides for three existing access points (potential of 4) and is large enough to enable functional design, sufficient on-site

parking and uncomplicated manoeuvring areas.

- Considering the locality of the site and context with regard to the neighbouring industries (located to the north, east and west), it is evident that the proposed development is reconcilable with the character of the area and it is not expected to have any negative impact with regard to the generation of additional traffic, noise, pollution, etc.

The proposed zoning and development of the application site will thus correlate with the contextual characteristics and existing development pattern of the surrounding area and will only strengthen the urban fabric of the area.

The proposed development controls contained in the scheme documents as well as the consideration of the formal site development and building plans will furthermore ensure a desirable and controlled development of the application site.

6.7 Motivation in terms of the General Principals of the Development Facilitation Act, 1995:

In this section, several of the General Principles of the **Development Facilitation Act, 1995 (DFA)** will be listed and compliance with those principles will be discussed. It is apparent from all documentation on the Development Facilitation Act Principles that not all principles will apply in all cases and that motivation in terms of the General Principles requires a holistic view. Secondly, the resource documentation of The Development and Planning Commission (February 1999) clearly states that the General Principles of the Development Facilitation Act cannot be considered mechanically and are not considered a fixed set of rules, norms and standards. Every attempt will be made to creatively translate the selected General Principles in accordance with the intentions of the developer and the establishment of the Development Area.

Principle 3(1)(c): *"Policy, administrative practice and laws should promote efficient and integrated land development in that they-*

(i) "Promote the integration of the social, economic, institutional and physical aspects of land development."

The first sub-Principle calls for a holistic approach to land development and the fact that broad consultation and input is required to prepare development plans. The proposed development is motivated by the relevant studies of a multi-disciplinary team and in terms of regional and local planning frameworks/policies. The specific process followed to secure Land Development Rights in this instance, is the **Development Facilitation Act, 1995 (DFA)**. The process followed to date is considered by the developer as the most suitable

route to ensure that the social, economic, institutional and physical aspects of land development are integrated.

(ii) *"Promote Integrated Land Development in rural and urban areas in support of each other."*

This sub-Principle stresses the need for new urban development to be done in such a manor that it considers the influence and impact of the development on adjacent land.

The land use survey indicated that the area is characterised by Industrial land uses. The proposed Public Garage will integrate with the existing industrial, wholesale, depots and warehouse land uses.

(iii) *"Promote the availability of residential and employment opportunities in close proximity to or integrated with each other"*

This sub-Principle calls for a reversal of the suburban and dormitory neighbourhoods that are currently existing in South Africa due to apartheid-related settlement planning, thereby ensuring that developments are not only based on singular land uses. Although the development is predominantly a Public Garage with subservient services such as the convenience store and car wash, etc, it will ensure additional employment opportunities in close proximity to the residential areas, due to its strategic location with regard to the CBD of Groblersdal.

(iv) *"Optimise the use of existing resources including such resources relating to agricultural, land, minerals, bulk infrastructure, roads, transportation and social facilities."*

This Principle calls for the optimisation of investments already made in terms of existing development of services infrastructure. As already mentioned, the site is located within the industrial area of Groblersdal and Groblersdal's built-up area therefore the existing infrastructure will be utilized for the development.

(v) *"Promote a diverse combination of land uses, also at the level of individual erven or subdivision of land."*

It is the view of the applicant that this development will responsibly provide a service to the diverse combination of industrial land uses that are also prevalent in the area. It will therefore support the creation of a diverse combination of land uses in that it provides a convenient service to the area and that it is through such land use development that the character of the area and the quality of life of existing and future residents will be encouraged and protected.

(vi) *"Discourage the phenomenon of "urban sprawl" in urban areas and contribute to the development of more compact towns and cities."*

and

(vii) *"Contribute to the correction of historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs."*

In many instances, the legacy of Apartheid and planning practices of the past have resulted in sprawling urban areas characterized as being uneconomical and offering one-dimensional opportunities to residents. The proposed Public Garage will contribute to the optimisation and use of existing resources by representing in-fill development.

(viii) *"Encourage environmentally sustainable land development practices and processes.*

The last sub-principle of General Principle 3(1)(c) relates to the establishment and sustaining of good relationships between settlements and the natural environment surrounding it. Although the development will be situated within an Industrial area, the proposed development will be environmentally sensitive with due consideration of the existing natural features, thereby mitigating the impact that this development will have on its surroundings.

Principal 3(1)(d): *"Members of communities affected by land development should actively participate in the process of land development."*

This principle of the Development Facilitation Act stresses the importance of public participation. Property owners surrounding the application site are informed of the proposed development by registered post, notices are published in local and provincial newspapers and interested and affected parties were also consulted during the open day as part of the Environmental Assessment Process in order to give them opportunity to contribute and generate ideas prior to this application for the establishment of a land development area being submitted. It is however anticipated that the surrounding community will continue to contribute to the support and successful implementation of this project.

Principal 3(1)(f): *"Policy, administrative practices and laws should encourage and optimise the contributions of all sectors of the economy (government and non-government) to land development so as to maximize the Republic's capacity to undertake land development and to this end, and without derogating from the generality of this principle*

(i) National, provincial and local governments should strive

clearly to define and make known the required functions and responsibilities of all sectors of the economy in relation to land development as well as the desired relationship between such sectors; and

(ii) A competent authority in national, provincial or local government responsible for the administration of any law relating to land development shall provide particulars of the identity of legislation administered by it, the posts and names of persons responsible for the administration of such legislation and the addresses and locality of the offices of such persons to any person who requires such information."

The DFA strives to encourage contributions from all sectors of the economy through the above principle. The objective thereof is to increase the resources and capacity of various sectors of the national, provincial and local economy. Various consultations with the provincial and local authorities as well as various external departments/bodies were considered a pre-requisite in the preparation of the application.

It is the view of the applicant that extensive interaction was achieved between developer and government, and that this principle of the DFA has been adequately addressed.

Principal 3(1)(g): *"Laws, procedures and administrative practice relating to land development should-*

(i) Be clear and generally available to those likely to be affected thereby;
(ii) In addition to serving as regulatory measures, also provide guidance and information to those affected thereby;
(ii) Be calculated to promote trust and acceptance on the part of those likely to be affected thereby; and
(iv) Give further content to the fundamental rights set out in the Constitution."

Through the application of this principle, a move towards more user-friendly, democratic and facilitative land development is proposed. By utilizing the Development Facilitation Act, the developer commits itself to the most transparent and community consultation-based town planning approval procedure currently available in the Limpopo Province. In the spirit of providing as much information as possible to affected residents and land owners and to protect the fundamental rights of all involved, the applicant has consulted widely and will continue to do so to the benefit of the surrounding area and district as a whole.

Principal 3(1)(h): *"Policy, administrative practice and laws should promote sustainable land development at the required scale in that they should*

(i) Promote land development, which is within the fiscal, institutional and administrative names of the Republic;

(ii) Promote the establishment of viable communities;
(iii) Promote sustained *protection of the environment;*
(iv) Meet the basic needs *of all citizens in an affordable way, and*
(v) Ensure the safe utilization of land by taking into consideration factors such as geological formations and hazardous undermined areas."

Fundamentally, the application to establish the land development area is an attempt to make the region more sustainable. The development is clearly an economic development by the private sector, which will increase the tax basis of the Municipality and create jobs, both during the construction and operational phases.

In terms of the first two sub-principles and considering the fact that the development will be partially self-sustainable and privately managed, the concerned public authorities will not be strained on a local authority administration level.

The third sub-principle is aimed at promoting the sustained protection of the environment. With reference to the detailed Environmental Impact Assessment/Scoping Report and EMP (**Annexure M**), the development is a direct attempt to address to the above-mentioned sub-principle.

The fourth sub-principle is aimed at affordability of development and appropriate standards of services for different development types. The mentioned basic services will therefore be necessary in order to maximize on the economic opportunities that such a private sector development initiative can offer. The proposed service station will serve the local commuting community.

The last sub-principle of General Principle 3(1)(h) stresses the need to support sustainable land development through intensive investigation of physical conditions. In this regard, it is confirmed that prior to any planning activities being undertaken and in preparation of this application, experts were appointed to investigate all physical aspects relating to the site and its surrounds. Earlier sections in this report described the detailed geo-hydrological and geotechnical soils assessment that was completed, the determination of flood levels and an extensive Environmental Scoping Process involving many specialists. The objectives of this principle are therefore satisfied through the extensive investigations into the physical environment to ensure that the appropriate detail was available in the design process to make the development sustainable in the long term.

Principal 3(1)(i): *"Policy, administrative practice and laws should promote speedy land development."*

The law-makers clearly recognize the importance of time influencing the cost of land development. In short, it is acknowledged that the development of a Public Garage is a private investment. Too often, other planning legislative

routes result in long delays in the processing of applications especially as it relates to environmental authorization. By using the DFA land approval process, the applicant could hopefully be sure of a relatively quick approval procedure, thereby maximizing the positive impact that capital investment could have.

Principal 3(1)(j): *"Each proposed land development area should be judged on its own merits and no particular use of land, such as residential, commercial, conservational, industrial, community facility, mining, agricultural or public use, should in advance or in general be regarded as being less important or desirable than any other use of land."*

The applicant acknowledges the principle that no single land use is more important than any other. In compliance with the principle 3(1)(j), the development should receive the favourable support of the community, local municipality and provincial authorities.

Principal 3(1)(l): *A competent authority at national, provincial and local government level should co-ordinate the interests of the various sectors involved in or affected by land development so as to minimize conflicting demands on scarce resources.*

Within the framework of the mentioned policy documents it could be argued that the Provincial Government took the initiative to ensure that all affected parties realise the development potential of the area and dire need for economic investment.

Principal 3(1)(m): *"Policy, administrative practice and laws relating to land development should stimulate the effective functioning of a land development market based on open competition between suppliers of goods and services."*

Principle 3(1)(m) recognizes the need for land development to be based on open competition and the principle of a competitive economy. Clearly, the proposed development will contribute to economic growth of Groblersdal. The proposed Public Garage is a private sector initiative planned and applied for in the context of such open market competition.

Considering the above-mentioned arguments and factors, it is evident that the proposed Land Development Area will ensure controlled development, which will be an asset to the industrial area where it is located by providing a service and in accordance with the DFA, Integrated Development Plan, SDF and relevant Town Planning Scheme.

7. CONCLUSION

Application is hereby made to the Limpopo Development Tribunal in terms of Section 31 of the Development Facilitation Act, 1995 (Act 67 of 1995) and Regulation 21 of the Development Facilitation Regulations, 2000 for:

i. the amendment of the Greater Groblersdal (Elias Motsoaledi) Town-planning Scheme, 2006 by the **rezoning of Erven 756 and 757, Groblersdal Extension 11** from "Industrial 3" to "Industrial 3" with the inclusion of a public garage, convenience store of 300m², place of refreshment, take-away facility, car wash facility and automatic teller machine, subject to certain proposed conditions; and

ii. the **consolidation** of Erven 756 and 757, Groblersdal Extension 11.

The purpose of the application is to develop a Public Garage and related/ancillary land uses on part of the consolidated application site, in addition to the existing industrial land uses and zoning, in order to provide a service to the transient traffic travelling on Road R33 to Stoffberg, Tafelkop, Motetema, Monsterlus, etc. as well as to the local traffic generated by the Elias Motsoaledi Central Business District (CBD) and surrounding industrial area.

The highly accessible application site is strategically situated within an industrial area, in close proximity to the Groblersdal CBD and along a first order movement corridor. The proposed development can be regarded as a response to the expected growth and importance of the immediate area, complimentary to the existing development pattern. The proposal is in sympathy with the existing context and development, complies with current planning policies and principles and will enable the property owner to utilise the property to its full potential.

The memorandum provided details with regard to the legal aspects of the application, location and context characteristics of the subject land as well as with regard to the layout and land uses in the vicinity of the application site. Lastly, the proposed development of Public Garage was motivated in terms of both need and desirability and the General Principles of the Development Facilitation Act in compliance with the DFA and DFA Regulations. Not only was a need proven but also was it shown that the proposed development is desirable in terms of a range of planning, environmental and development criteria.

It is the conviction of the applicant that the Public Garage represents a well-planned land development opportunity which will provide a convenient service to the many commuters travelling north-east to the rural settlements within the GSDM, and that it should therefore receive the favourable consideration of neighbouring industries as well as the local and provincial authorities.

LANDMARK PLANNING