

### KGATELOPELE PRIVATE EQUITY & VENTURE CAPITAL (PTY) LTD

## GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED MAREETSANE BATHO-BATHO SOLAR PV FARM

Job No.424-2012 November 2012

Prepared for:

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#### GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED MAREETSANE BATHO-BATHO SOLAR PV FARM

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#### GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED MAREETSANE BATHO-BATHO SOLAR PV FARM November 2012

#### 1. INTRODUCTION

#### 1.1 Background and Terms of Reference

Envitech Solutions (Pty) Ltd were appointed by Kgatelopele Private Equity and Venture Capital (Pty) Ltd to carry out a geotechnical investigation for the proposed Mareetsane Batho-Batho Solar PV Farm.

The proposed facility is bounded by the following co-ordinates as shown in Figure 1 in Appendix D:

- P1: 26° 13' 46.00" S 25° 22' 05.53" E
- P2: 26° 13' 25.46" S 25° 21' 24.60" E
- P3: 26° 13' 53.23" S 25° 21' 03.81" E
- P4: 26° 14' 15.66" S 25° 21' 43.90" E

The geotechnical investigation is required for the pre-feasibility study being carried out for the solar PV project.

This report describes the investigation carried out and makes recommendations for the construction of the project.

#### 1.2 Objectives

The objectives of the geotechnical investigation were as follows:

- To determine the nature, depth and extent of the different soils underlying the site,
- To determine the engineering properties of the soils,
- To determine if the soil materials are suitable for construction purposes,
- To assess founding conditions for the construction of the facility,
- To comment on shallow groundwater or seepage, if any, and



• To identify any other geotechnical aspects that may be relevant to the construction of the facility.

#### 2. SITE DESCRIPTION

The site is located about 39km south-west of Mafikeng near the village of Mareetsane. According to the topographic map of the area, the site is located on an area known as MOLOPO 2 next to the Mafikeng – Vryburg railway line, approximately 11 km south of Mareetsane (see Figure 1 below).



Figure 1: Site Locality Plan

The site is approximately 140 ha in size and located on an open area that is presently used for cattle grazing. The property is tribal land with farmland on the northern, western and southern boundaries and the railway line on the eastern boundary.



The site slopes gently to the south-west with a gradient varying from about 0.5% to 1%. The vegetation present on the site consists of thorn trees, succulents, and veldt grass. There are no existing services present on site.

There is a low lying area on the southern part of the site with indications that it could have been a non-perennial pan. This area is also indicative of very thick thorn bushes that made access very difficult.

#### 3. SITE INVESTIGATION

#### 3.1 Soil Profiling

Thirty five test pits were excavated on the site using a Komatsu TLB. The positions of the test pits were determined using a GPS. All test pits were excavated to refusal or the maximum reach of the machine. The positions of the Test Pits are indicated on Figure 2 below.

The test pits were profiled and logged according to Jennings, Brink and Williams (1973). The test pit profiles are included in Appendix A and the test pit photographs are included in Appendix B.

#### 3.2 Geotechnical Testing

Provision was made for the sampling of the soils of the different horisons in the test pits for subsequent geotechnical laboratory testing. The testing was predominantly aimed at classifying the soils and to determine the suitability of the soils for use as construction materials.





**Figure 2: Test Pit positions** 

#### 4. GEOLOGY AND SOILS

#### 4.1 General Geology

According to the available geological map, the site is underlain by Kalahari sands that consist predominantly of recent Aeolian deposits. During the field investigation it was found that the Aeolian sand is underlain by limestone that has progressed into Hardpan calcrete. The geological map also indicates that the Aeolian sand and limestone (Qw) are underlain by rhyolite (Ra) to the east and lavas and schist's (Zg) to the south. Figure 3 below indicates the regional geology of the area and the location of the site.

#### 4.2 Engineering Geology

The influence of climate on weathering is expressed by Weinert's N-value (H.H. Weinert, 1980). The most important is where N=5. Where N is more than 5, disintegration is dominant, and where N is less than 5, decomposition is dominant.



The Weinert N-value is 4.5 for this region, indicating that decomposition is the overriding process. Weinert also mentions that where N is between 2 and 5, weathering profiles develop from fresh rock to residual soil.



Figure 3: Geological Map

	00		n	4.
L	.eu	E	11	u.

- Aeolian sands, limestone
- Ra Rhyolite

Qw

Zg - Ultramafic and mafic lava and schist

#### 4.3 Site Soils

The soil profiles encountered on the site are as follows:

Table 4.1:	Test pit p	orofile summar	v showina	depths of the	e different soil horizons.
			,		

Test Pit No	Silty Sand Aeolian	Ferricrete	Clayey Sand	Calcrete	Residual Schist	Test pit depth (m)/ Refusal
MFK TP1	0.0 – 2.5	2.5 – 2.6				Partial Refusal
MFK TP2	0.0 – 2.6					EOH
MFK TP3	0.0 – 1.7	1.7 – 2.2				Partial Refusal
MFK TP4	0.0 – 1.8	1.8 – 2.0				Partial Refusal
MFK TP5	0.0 – 2.0	2.0 – 2.1				Partial Refusal
MFK TP6	0.0 – 2.2	2.2 – 2.6				Partial Refusal
MFK TP7	0.0 – 2.5					EOH
MFK TP8	0.0 – 2.2					EOH
MFK TP9	0.0 – 2.3	2.3 – 2.4				Partial Refusal
MFK TP10			0.0 – 1.0	1.0 – 2.1		Partial Refusal
MFK TP11	0.3 – 2.1	2.1 – 2.2	0.0 – 0.3			Partial Refusal



MFK TP12	0.0 – 1.5	1.5 – 2.1				Partial Refusal
MFK TP13	0.0 – 1.9				2.0 – 2.2	Refusal
MFK TP14	0.0 – 1.9				2.0 – 2.1	Refusal
MFK TP15			0.0 – 0.8	0.8 – 1.9		Refusal
MFK TP16			0.0 – 0.9	0.9 – 1.7		Partial Refusal
MFK TP17	0.0 – 1.7	1.7 – 1.9				Partial Refusal
MFK TP18	0.0 – 2.0					Partial Refusal
MFK TP19	0.0 – 1.7			1.7 – 1.8		Partial Refusal
MFK TP20	0.0 – 1.8			1.8 – 1.9		Partial Refusal
MFK TP21	0.0 – 2.1			2.1		Refusal
MFK TP22			0.0 - 0.9	0.9 – 2.2		Partial Refusal
MFK TP23			0.0 – 0.9	0.9 – 2.0		Partial Refusal
MFK TP24			0.0 - 0.8	0.8 – 2.1		Partial Refusal
MFK TP25			0.0 - 0.8	0.8 – 2.1		Partial Refusal
MFK TP26			0.0 – 0.7	0.7 – 2.1		Partial Refusal
MFK TP27			0.0 - 0.8	0.8 - 2.0		Partial Refusal
MFK TP28			0.0 - 0.4	0.4 – 1.8		Refusal
MFK TP29			0.0 – 0.9	0.9 - 2.1		Refusal
MFK TP30			0.0 – 0.5	0.5 – 2.0		Refusal
MFK TP31			0.0 – 0.6	0.6 – 1.8		Refusal
MFK TP32			0.0 - 0.8	0.8 – 1.2		Refusal
MFK TP33			0.0 - 0.7	0.7 – 2.0		Refusal
MFK TP34			0.0 – 1.1	1.1 – 2.1		Refusal
MFK TP35			0.0 - 0.8	0.8 – 2.0		Refusal

It is clear from the table above that two distinct profiles are present on site. The first is a silty sand (Aeolian) underlain by a nodular ferricrete and the second profile a clayey sand underlain by calcrete. See Figure 4 in the Appendix.

The Aeolian sand is characterised by a medium dense soil but as soon as it is excavated it forms a loose non-cohesive sand. This was confirmed by the California Bearing Ratio (CBR) test of TP 16 that indicated on the Mod Aashto test that the sample was too weak to test for a CBR value. The other test carried out on a sample from TP 1 indicated that the sand is a G7 material, i.e. natural gravel.

The two areas are also distinguished by the vegetation present on site in that the Aeolian sand has more scattered thorn trees and the area with the dark brown clayey sand is characterised by more thick thorn bushes and vaalbos.

Only two of the test pits revealed the presence of the residual schist. This was present in TPs13 and 14. No groundwater seepage was encountered in any of the test pits during the investigation.

A summary of the laboratory testing results is given in Table 4.2 below.



TABLE 4.2 :	SUMMARY OF FOUNDATION INDICATOR TEST RESULTS
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SAMPLE No	TEST PIT No	SAMPLE Depth (m)	ORIGIN	DESCRIPTION	MAX DIAM (mm)	% <0,075	% CLAY	<sup>1</sup> GM	<sup>2</sup> LL	<sup>3</sup> PI	⁴LS %	HRB	⁵USCS
50800	MFK TP1	0.0-2.5	Transported	Silty sand	13.2	20	5	1.03	NP	NP	0	A-2-4(0)	SM
50801	MFK TP16	0.9-1.7	Pedogenic	Silty sandy clay	13.2	26	8	1.01	SP	SP	0.5	A-2-4(0)	SM
50802	MFK TP26	0.0-0.8	Transported	Clayey silty sand	2.0	41	20	0.67	35	11	5.5	A-6(2)	SC

#### TABLE 5.1 (cont.) SUMMARY OF MOD AASHTO AND CBR TEST RESULTS

SAMPLE	SAMPLE Depth	DESCRIPTION	MAX DIAMETER	% <0.075	<sup>1</sup> GM	<sup>2</sup> LL	<sup>3</sup> PI	<sup>4</sup> LS	<sup>8</sup> MOD MDD	°OMC	CBR			<sup>7</sup> TRH14			
NO.	(m)		(mm)	~0,075				/0	kg/m <sup>3</sup>	/0	90%	93%	95%	<b>9</b> 8%	100%		USAGE
50800	0.0-2.5	Silty sand	13.2	20	1.03	NP	NP	0	1945	7.7	20.4	29.7	37.5	38.6	39.4	G7	Fill

<sup>1</sup> GM	Grading modulus
<sup>2</sup> LL	Liquid Limit
<sup>3</sup> PI	Plasticity Index
⁴LS	Linear Shrinkage
⁵USCS	Unified soil classification

<sup>6</sup>CBR <sup>7</sup>TRH<sub>14</sub> <sup>8</sup>MOD MDD <sup>9</sup>OMC Californian Bearing Ratio MOD AASHTO density Technical Recommendations for Highways MOD AASHTO Maximum Dry Density Optimum Moisture Content



#### 5. GENERAL ASSESSMENT OF CIVIL ENGINEERING REQUIREMENTS

#### 5.1 Roads

The vertical alignment for all on-site roads can generally follow the existing site gradients and topography. Roads aligned to the contours on site will require limited side cut and fill.

Depending on the requirements for abnormal loads in terms of transporting materials and equipment onto site, the site roads may generally consist of gravel roads. The gravel roads may be constructed as follows:

- Grub and clear road width, removing all grass and vegetation and remove topsoil to a depth of 150mm,
- Roadbed treatment consisting of rip and compact insitu to 95% Mod AASHTO to a minimum depth of 200mm in the calcrete area,
- Roadbed treatment consisting of excavation of the Aeolian sands to a depth of 500mm and then rip and compact insitu to 95% Mod AASHTO to a minimum depth of 200mm, and replace sands compacted to minimum 95% Mod AASHTO, in the Aeolian sand area,
- Raise the road fill to the required levels using either on-site materials or imported fill, compacted to a minimum 95% Mod AASHTO,
- Place gravel wearing course (G7), minimum 150mm thick and compacted to 98% Mod AASHTO.

#### 5.2 PV/Substation Foundations

The founding conditions on site can be broadly divided into two areas as shown in Figure 4, namely the ferricrete and calcrete areas.

The ferricrete area is overlain by Aeolian sands with the ferricrete occurring at an average depth of 2 to 2.5m, whilst the calcrete area is overlain by clayey sands with the calcrete occurring at an average depth of 0.9m.

In the calcrete area, structural foundations can be located directly on the calcrete with a bearing capacity of 150kPa.

In the ferricrete area, structural foundations can be constructed on soil mattresses constructed within the Aeolian sands with a bearing capacity of 80kPa.



#### 5.3 MV Cables

In general, cable trenches may be constructed across the site with depths easily excavated up to 0.9m and 2.0m, respectively, in the calcrete and ferricrete areas.

Provision should be made for cable ducts beneath all internal site roads and should be placed at a depth with a minimum cover of 750mm. Cable ducts placed at shallower depths should be adequately encased in concrete.

#### 6. CONCLUSIONS

- The site is underlain by Aeolian sand that consists of silty and clayey sands that are underlain by either nodular ferricrete or calcrete,
- This test pits excavated on site varied in depth between 1.2 and 2.6m with partial refusal or refusal at depth,
- No groundwater seepage was encountered during the investigation,
- A perched water table could however be present in the drainage area during the rainy season,
- Excavation of the material on site should pose no problem as the material classifies as *medium* to *intermediate* in terms of earthworks excavation,
- The in-situ soil is not suitable as a road building material due to the non cohesive nature of the sand,
- Due to the collapsible nature of the Aeolian sands, on site pre-consolidation of the foundations should be carried out to prevent any potential subsidence, and
- The only major concern will be potential perched groundwater that could occur during the rainy season in the lower lying areas. However, this can be overcome by proper design of a stormwater and groundwater control system.

#### 7. RECOMMENDATIONS

In view of the above findings the following is recommended:

- The site would appear to be suited for the development of the proposed solar PV farm.
- Although the in-situ soils on site have a reasonable bearing capacity, the integrity of the soil structure will be compromised during excavations and



therefore the foundations will have to be strengthened to prevent any movement.

- Building foundations should be reinforced or earth mattresses should be used due to the collapse potential of the soils on site. An allowable bearing pressure of 80 kPa can be used in the design of structural foundations.
- The excavatability of the soils on site can be considered to be *medium* to *intermediate* in terms of earthworks excavations.
- Precautions should be taken in the design of the facility to accommodate the possibility of a perched groundwater table during the rainy season, and
- Site roads should be constructed with the wearing course consisting of imported gravel (minimum G7).

SM Jewaskiewitz PrEng Geotechnical Engineer Job No: 424-2012 Date: 26 November 2012

J Bloem PrSciNat Engineering Geologist

## FIGURE 4

Site Geology



## **APPENDIX A**

**Test Pit Profiles** 



	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP2 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30 - - -	<sup>0.00</sup> Dry, light orange mottled brown yellow orange, M SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	IEDIUM DENSE, voided,
- - - - - - - - -	2.60	
	NOTES	
	1) No groundwater seepage.	
	2) No reiusai.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY :	INCLINATION : DIAM : TRENCH DATE : 22.10.2012	ELEVATION : 1300 X-COORD : 2902216 Y-COORD : (25)036529
PROFILED BY : J Bloem TYPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 22.10.2012 DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	HOLE No: MFK TP2

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane Batho-Batho Solar PV facility	HOLE No: MFK TP3 Sheet 1 of 1 JOB NUMBER: JCB059
Scale 1.30 1.30 1.21 1.21 1.21 1.21 1.21 1.21 1.21 1.2	<sup>0.00</sup> Dry, light orange mottled brown yellow orange, N SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	JEDIUM DENSE, voided,
	1.70	itact, GRAVELLY SILTY
	Partial Refusal.	
	1) No Groundwater seepage. 2) Partial Refusal at 2.2m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem TYPE SET BY : JB	INCLINATION : DIAM : TRENCH DATE : 22.10.2012 DATE : 22.10.2012 DATE : 19/11/12 14:26	ELEVATION : 1297 X-COORD : 2902102 Y-COORD : (25)036366 HOLE No: MFK TP3
SETUP FILE : STANDARD.SET	TEXT :\MAREET~1\MFKTES~1.TXT	

	Kgatelopele Private and Venture Capital Proposed Mareetsa		atelopele Private Equity I Venture Capital (Pty) Ltd		HOLE No: MFK TP4 Sheet 1 of 1
		Pro Bat	posed Mareetsane ho-Batho Solar PV facility		JOB NUMBER: JCB059
Scale 1:30 - - - - - - - - - - - - - - - - - - -		Dry, light ora SILTY SANE Transported Exc=Soft.	ange mottled brown yellow ora ) with some roots. - Aeolian Sand.	nge, MEI	DIUM DENSE, voided,
-	1	.80			
-		Slightly Mois SAND with N Pedogenic. Exc=Interme Partial Refus	st, orange and yellow, DENS Nodules Ferricrete. Indiate. sal.	SE, intac	, GRAVELLY SILTY
		1) No Groundv	vater seepage.		
		2) Partial Refu	sal at 2.0m		
CONTRACTOR		INCI	LINATION :	FI	EVATION : 1300
MACHINE : DRILLED BY :	Komatsu TLB		<i>DIAM :</i> TRENCH DATE : 22.10.2012		x-coord : 2902004 Y-coord : (25)036192
PROFILED BY :	JBloem		DATE : 22.10.2012		HOLE No: MFK TP4
I YPE SET BY : SETUP FILE :	: JB : STANDARD.SET		DATE : 19/11/12 14:27 TEXT :\MAREET~1\MFKTES~1.1	ТХТ	

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane	HOLE No: MFK TP5 Sheet 1 of 1
	Batho-Batho Solar PV facility	JOB NUMBER: JCB059
$\begin{array}{c} Scale \\ 1.30 \\ 1.30 \\ 1.4 \\ 1$	Dry, light orange mottled brown yellow orange, ME SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	EDIUM DENSE, voided,
	Slightly Moist, orange and yellow, DENSE, inta SAND with Nodules Ferricrete. Pedogenic. Exc=Intermediate.	ct, GRAVELLY SILTY
2.10	Partial Refusal.	
	NOTES	
	1) No Groundwater seepage.	
	2) Partial Refusal at 2.1m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB	INCLINATION : DIAM : TRENCH	ELEVATION : 1300 X-COORD : 2901905
DRILLED BY : PROFILED BY : J Bloem	DATE : 22.10.2012 DATE : 22.10.2012	Y-COORD : (25)036017
TYPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 19/11/12	

		Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane Batho-Batho Solar PV facility	HOLE No: MFK TP6 Sheet 1 of 1 JOB NUMBER: JCB059
Scale 1:30 - - - - - - - - - - - - -	0.00	Dry, light orange mottled brown yellow orange, MEI SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	DIUM DENSE, voided,
-	_ 2.20	Slightly Moist, orange and yellow, DENSE, intac SAND with Nodules Ferricrete. Pedogenic. Exc=Intermediate.	t, GRAVELLY SILTY
	_ 2.60	Partial Refusal. NOTES	
	1	) No Groundwater seepage. 2) Partial Refusal at 2.6m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem		INCLINATION : E DIAM : TRENCH DATE : 22.10.2012 DATE : 22.10.2012	LEVATION : 1299 X-COORD : 2901809 Y-COORD : (25)035841 HOLE No: MFK TP6
SETUP FILE : STANDARD.SET		DATE : 19/11/12 14:27 TEXT :\MAREET~1\MFKTES~1.TXT	

		Kgatelopele Private Equity and Venture Capital (Pty) Ltd		HOLE No: MFK TP7 Sheet 1 of 1
		Batho-Batho Solar PV facility		JOB NUMBER: JCB059
Scale 1:30 - -	0.00	Dry, light orange mottled brown yellow oran SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	ge, MEI	DIUM DENSE, voided,
-				
	2 50			
	2.30	End of Hole.		
		NOTES		
		1) No groundwater seepage.		
		2) No refusal.		
CONTRACTOR : MACHINE : DRILLED BY :	LICHCRETE Komatsu TLB	INCLINATION : DIAM : TRENCH DATE : 22.10.2012	E	LEVATION : 1300 X-COORD : 2901725 Y-COORD : (25)035661
TYPE SET BY : SETUP FILE :	JB STANDARD.SET	DATE : 22.10.2012 DATE : 19/11/12 14:27 TEXT :\MAREET~1\MFKTES~1.TX	(T	HOLE №: MFK TP7

		Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane		HOLE No: MFK TP8 Sheet 1 of 1
		Batho-Batho Solar PV facility		JOB NUMBER: JCB059
Scale 1:30 - - - - - - - - - - - - -	<sup>0.00</sup> Dry, lig SILTY Transp Exc=Sc	ht orange mottled brown yellow oran SAND with some roots. orted - Aeolian Sand. oft.	ige, MEI	DIUM DENSE, voided,
-	_ 2.20 End of	Hole		
	NOTES	3		
	1) No gro	undwater seepage.		
	2) No refu	usal.		
CONTRACTOR : LICHCRETE		INCLINATION : DIAM · TRENCH	E	LEVATION : 1296 X-COOBD : 2901892
DRILLED BY : PROFILED BY : J Bloem		DATE : 22.10.2012 DATE : 22.10.2012		Y-COORD : (25)035552
TYPE SET BY : JB SETUP FILE : STANDARD.SET		DATE : 19/11/12	(T	

Kgatelopele Private Equity and Venture Capital (PV) Ltd Proposed Marcelsane Batho Solar PV facility       DCE.No.:MEKT TP9 Sheet 1 of 1         State       0.00       Dry, light orange mottled brown yellow orange, MEDIUM DENSE, voided, SLT Y SAND with some roots. Transported - Aeolian Sand. Exc=Soft         State       2.00       Slightly Moist, orange and yellow, DENSE, intact, GRAVELLY SILTY SAND with Nodeles Ferricrete. Periogenic. Exc=Intermediate.         2.40       2.40       Partial Refusal.         NOTES       1) No Groundwater seepage.       2) Partial Refusal at 2.4m.         Exc=Nitermediate is 2.10 Partial Refusal at 2.4m.       Disconse 2.200 Partial Refusal at 2.4m.         Partial Refusal at 2.4m.       2.00 Partial Refusal at 2.4m.         Partial Refusal at 2.4m.       Disconse 2.200 Partial Refusal at 2.4m.				
Scate     0.00     Dry, light orange motified brown yellow orange. MEDIUM DENSE, voided, SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.       2.00     Slightly Moist, orange and yellow, DENSE, intact, GRAVELLY SILTY SAND with Nodules Ferricrete. Pedogenic. Exc=Intermediate.       2.00     Partial Refusal.       NOTES     1) No Groundwater seepage.       1) No Groundwater seepage.     2) Partial Refusal at 2.4m.			Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane Batho-Batho Solar PV facility	HOLE No: MFK TP9 Sheet 1 of 1 JOB NUMBER: JCB059
2.30       Slightly Moist, orange and yellow, DENSE, intact, GRAVELLY SILTY SAND with Nodules Ferricrete. Pedgenic. Exo-Intermediate.         2.40       Partial Refusal.         NOTES       1) No Groundwater seepage.         2) Partial Refusal at 2.4m.       2) Partial Refusal at 2.4m.         ELEVATION: ELEVATION: 1297 X.COORD: 2901977         MOHNE: Komatsu TLB       DMM: TRENCH 2.10.2012         PROFILED BY: JB Brom       DATE: 22.10.2012         TYPE SET BY: JB       DATE: 1911/12.14.27	Scale 1:30 - - - - - - - - - - - - -	<sup>0.00</sup> Dry, lig SILTY S Transpo Exc=So	ht orange mottled brown yellow orange SAND with some roots. orted - Aeolian Sand. ft.	e, MEDIUM DENSE, voided,
NOTES         1) No Groundwater seepage.         2) Partial Refusal at 2.4m.         2) Partial Refusal at 2.4m.         CONTRACTOR: LICHCRETE         MACHINE: Komatsu TLB         DIAM: TRENCH         PROFILED BY: J Bloem         DATE: 22:10.2012         TYPE SET BY: JB         DATE: 19/11/12: 14:27         TYPE SET BY: JB		2.30	Moist, orange and yellow, DENSE, vith Nodules Ferricrete. nic. ermediate. Refusal.	intact, GRAVELLY SILTY
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1297         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2901977         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)035733         PROFILED BY : J Bloem       DATE : 19/11/12 14:27       HOLE No: MFK TP9         TYPE SET BY : JB       DATE : 19/11/12 14:27       HOLE No: MFK TP9		NOTES 1) No Gro 2) Partial	undwater seepage. Refusal at 2.4m.	
SETUP FILE : STANDARD.SET	CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem TYPE SET BY : JB SETUP FILE : STANDARD.SET		INCLINATION : DIAM : TRENCH DATE : 22.10.2012 DATE : 22.10.2012 DATE : 19/11/12 14:27 TEXT :WAREET~1 [MFKTES~1.TXT]	ELEVATION : 1297 X-COORD : 2901977 Y-COORD : (25)035733 HOLE No: MFK TP9

Setter 7.30       0.00 Transported.       Moist, Dark brown, MEDIUM DENSE, intact, CLAYEY SAND with roots. Transported. Exc=Intermediate.         1       1.00       As above but speckled white becoming a DENSE, slightly voided poorly developed Calcrete. Petigenic. Exc=Intermediate.         2:10       Partial Refusal of Machine.         NOTES       1) No groundwater seepage.         2) Partial refusal at 2.1m.       2) Partial refusal at 2.1m.         contractore: UCHCRETE Michaer Komatsu TLB pencicept : JB bloem       MicLawitrov: Dark: 22.10.2012 Dark: 22.10.2012 D				Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane		HOLE No: MFK TP10 Sheet 1 of 1
Contractor: LICHCRETE Machine: Komatsu TLB DRILED BY: J Bloem TYPE SET BY: JB SELUPERTY: JB Machine: JBC Machine: JBC Mach	Scale _ 1:30 _ - -	0.00	<sup>0</sup> Moist, D Transpo Exc=Int	Batho-Batho Solar PV facility Dark brown, MEDIUM DENSE, intac orted. ermediate.	t, CLAYE	JOB NUMBER: JCB059
CONTRACTOR: LICHCRETE MICHINE: Komatsu TLB PHONE Komatsu TLB PHONE Komatsu TLB PHONE Komatsu TLB DIME TRENCH DATE: 121/1021 1428 DATE: 121/1021 1428	- - - - - - - - - - - - - - - - - - -	1.00	As abo develop Pedoge Exc=Inte	ve but speckled white becoming a ed Calcrete. nic. ermediate.	DENSE,	slightly voided poorly
NOTES         1) No groundwater seepage.         2) Partial refusal at 2.1m.         2) Partial refusal at 2.1m.         Example 1         Discrete 1	-	2.10	0 Partial F	Refusal of Machine.		
1) No groundwater seepage. 2) Partial refusal at 2.1m. 2) Partial refusal at 2.1m. CONTRACTOR: LICHCRETE MACHINE: KOmatsu TLB DIALE DEVAIL PROFILED BY : JBloem TYPE SET BY : JB SETUP THE: STANDARD SET TEX:: MAREET: MARKETS-11 TAT			NOTES			
2) Partial refusal at 2.1m. 2) Partial refusal at 2.1m. CONTRACTOR: LICHCRETE INCLINATION: MACHINE: Komatsu TLB DAM: TRENCH DAM: TRENCH CONTRACTOR: LICHCRETE MACHINE: Source State SETUP (SETSY: JB) SETUP (FILE; STANDARD.SET TYPE SETSY: JB			1) No grou	undwater seepage.		
CONTRACTOR: LICHCRETE INCLINATION: MACHINE: KOMAISU TLB DAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH TYPE SET BY: JB SETUP 715 DATE: 12/11/12 14:26 SETUP 716 DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH MARGENT DIAM: TRENCH DIAM: TRENCH MARGENT DIAM: TRENCH MARGENT DIAM: TRENCH MARGENT DIAM: TRENCH MARGENT DIAM: TRENCH MARGENT MA			2) Partial	refusal at 2.1m.		
CONTRACTOR: LICHCRETE MACHINE: Komatsu TLB DIAM: TRENCH DRILED BY: PROFILED BY: JB DATE: 22.10.2012 TYPE SET BY: JB SETUP FILE: STANDARD.SET TEXT:						
CONTRACTOR:         LICHCRETE         INCLINATION:         ELEVATION: 1295           MACHINE:         Komatsu TLB         DIAM:         TRENCH         X.COORD:         2902073           DRILLED BY:         DATE:         22.10.2012         Y.COORD:         2902073           PROFILED BY:         DATE:         22.10.2012         Y.COORD:         (25)035909           PROFILED BY:         DATE:         19/11/12 14:26         HOLE NO:         MFK TP10						
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DIAM : TRENCH DIAM						
CONTRACTOR : LICHCRETE INCLINATION : ELEVATION : 1295 MACHINE : Komatsu TLB DIAM : TRENCH X-COORD : 2902073 DRILED BY : DATE : 22.10.2012 Y-COORD : (25)035909 PROFILED BY : J Bloem DATE : 22.10.2012 Y-COORD : (25)035909 TYPE SET BY : JB DATE : 19/11/12 14:26 SETUP FILE : STANDARD.SET TEXT						
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1295         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902073         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)035909         PROFILED BY : JB       DATE : 19/11/12 14:26       HOLE NO: MFK TP10         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE NO: MFK TP10						
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1295         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902073         DRILED BY :       DATE : 22.10.2012       Y-COORD : (25)035909         PROFILED BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP10         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP10						
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1295         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902073         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)035909         PROFILED BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP10         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP10						
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1295         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902073         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)035909         PROFILED BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP10         SETUP FILE : STANDARD.SET       TEXT :WAREET~11WFKTES~1.TXT       HOLE No: MFK TP10						
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1295         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902073         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)035909         PROFILED BY : J Bloem       DATE : 19/11/12 14:26       HOLE No: MFK TP10         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP10						
CONTRACTOR : LICHCRETEINCLINATION :ELEVATION : 1295MACHINE : Komatsu TLBDIAM : TRENCHX-COORD : 2902073DRILLED BY :DATE : 22.10.2012Y-COORD : (25)035909PROFILED BY : J BloemDATE : 22.10.2012HOLE No: MFK TP10TYPE SET BY : JBDATE : 19/11/12 14:26HOLE No: MFK TP10						
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1295         MACHINE : Komatsu TLB       DIAM : TRENCH       x-coord : 2902073         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)035909         PROFILED BY : J Bloem       DATE : 19/11/12 14:26       HOLE No: MFK TP10         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP10						
PROFILED BY : J DIOETT     DATE : 22.10.2012       TYPE SET BY : JB     DATE : 19/11/12 14:26       SETUP FILE : STANDARD.SET     TEXT :\MAREET~1\MFKTES~1.TXT	CONTRACTOR : MACHINE : DRILLED BY :	LICHCRETE Komatsu TLB		INCLINATION : DIAM : TRENCH DATE : 22.10.2012	EL	LEVATION : 1295 X-COORD : 2902073 Y-COORD : (25)035909
	TYPE SET BY : SFTUP FILE	JB STANDARD SFT		DATE: 22.10.2012 DATE: 19/11/12 14:26 TEXT: MAREET~1MEKTES~11	TXT	HOLE No: MFK TP10

		Kgatelopele Private Equity	HOLE No: MFK TP11
		and Venture Capital (Pty) Ltd	Sheet 1 of 1
		Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale	0.00	-	
1:30 -	- U.UU	Moist, Dark brown, MEDIUM DENSE, intact, CLA Transported. Exc=Intermediate.	YEY SAND with roots.
		Dry, light orange mottled brown yellow orange, M SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	1EDIUM DENSE, voided,
	2.10	Slightly Moist, orange and yellow, DENSE, in SAND with Nodules Ferricrete. Pedogenic. Exc=Intermediate.	act, GRAVELLY SILTY
	2.20	Partial Refusal.	
		NOTES	
		1) No Groundwater seepage.	
		2) Partial Refusal at 2 2m	
CONTRACTOR		INCLINATION :	ELEVATION : 1295
MACHINE	Komatsu TLB	DIAM : TRENCH	X-COORD : 2902172
PROFILED BY .	JBloem	DATE : 22.10.2012	
TYPE SET BY :	: JB • STANDARD SET	DATE: 19/11/12 14:26	
D039 JD GE	OTECHNICAL SERVICES	SCC	dotPLOT 6008 PBp

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP12 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30 - - - - - - - - - - - - -	<ul> <li>Dry, light orange mottled brown yellow orange, MI SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.</li> </ul>	EDIUM DENSE, voided,
- - - - - -	2.20	ct, GRAVELLY SILTY
	Exc=Intermediate.	
	Partial Refusal.	
	NOTES	
	1) No Groundwater seepage.	
	2) Partial Refusal at 2.6m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB	INCLINATION : DIAM : TRENCH	ELEVATION : 1296 X-COORD : 2902270
PROFILED BY : PROFILED BY : J Bloem	DATE : 22.10.2012 DATE : 22.10.2012	HOLE No: MFK TP12
I YPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	

			Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Margetsane	HOLE No: MFK TP13 Sheet 1 of 1
			Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30 - - - - - - - - - - - - - - - - - - -		<sup>0.00</sup> Drj Sil Tra Ex	y, light orange mottled brown yellow orange, N _TY SAND with some roots. ansported - Aeolian Sand. c=Soft.	/IEDIUM DENSE, voided,
-		1.90 As 2.00 SA Re Ex	Above but with Gravel - Pebble Marker ghtly Moist, orange and yellow, DENSE, in ND with Nodules Ferricrete. worked Residual - Pedogenic. c=Intermediate.	tact, GRAVELLY SILTY
		2.20 Pa	rtial Refusal.	
		NC	DTES	
		1) No	o Groundwater seepage.	
		2) 1 6		
CONTRACTOR			INCLINATION :	ELEVATION : 1296
MACHINE : DRILLED BY : PROFILED BY :	J Bloem		DIAM : I DENOR DATE : 22.10.2012 DATE : 22.10.2012	Y-COORD : (25)036423
TYPE SET BY . SETUP FILE	: JB : STANDARD.SET		DATE : 19/11/12	HOLE No: MFK 1P13

			Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Marcetsane	HOLE No: MFK TP14 Sheet 1 of 1
			Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30 -		0.00	Dry, light orange mottled brown yellow orange, ME SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	DIUM DENSE, voided,
	· · · · ·			
-	X o X	1.90	As Above but with Gravel - Pebble Marker	
		2.00	Slightly Moist, orange and yellow, DENSE, inta SAND with Nodules Ferricrete. Reworked Residual - Pedogenic. Exc=Intermediate.	ot, GRAVELLY SILTY
		2.10	Partial Refusal.	
		-	NOTES	
		1)	No Groundwater seepage.	
		2)	Partial Refusal at 2.2m.	
CONTRACTOR : MACHINE :	LICHCRETE Komatsu TLB		INCLINATION : ITRENCH	ELEVATION : 1298 X-COORD : 2902468
DRILLED BY . PROFILED BY .	: J Bloem		DATE : 22.10.2012 DATE : 22.10.2012	Y-COORD : (25)036604
TYPE SET BY : SETUP FILE :	: JB : STANDARD.SET		DATE : 19/11/12	
D000 /D 05			<u>^</u>	datBLOT COOR DB-

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP15 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 0.00 1:30	Moist, Dark brown, MEDIUM DENSE, intact, CLA roots. Transported. Exc=Soft.	YEY SILTY SAND with
<u>L<sup>a</sup> (0.80</u> - - - - - - - - - - - - - -	As above but speckled white becoming VERY DEN Pedogenic. Exc=Intermediate.	SE Hardpan Calcrete.
2.00	Refusal of Machine.	
	NOTES	
	1) No groundwater seepage.	
	2) Refusal at 2.0m.	
		1906
MACHINE : Komatsu TLB	DIAM : TRENCH DATE : 22.10.2012	X-COORD : 2902659 Y-COORD : (25)036543
PROFILED BY : J Bloem TYPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 22.10.2012 DATE : 19/11/12	HOLE No: MFK TP15

Converting of the state basis of the state in the state of t			Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Marcotropo	HOLE No: MFK TP16 Sheet 1 of 1
Scale 130     0.00 0.9     Moist, Dark brown, MEDIUM DENSE, intact, CLAYEY SILTY SAND with roots. Transported. Exc=Soft.       0.9     0.90 As above but speckled white becoming VERY DENSE Hardpan Calcrete. Pedogenic. Exc=Intermediate.       0.9-1.7m     Perfusal of Machine.       1.70     Refusal of Machine.       NOTES     1) No groundwater seepage.       2) Refusal at 1.7m.     3) Disturbed Sample at 0.9-1.7m.       3) Disturbed Sample at 0.9-1.7m.     Sturbed Sample at 0.9-1.7m.			Batho-Batho Solar PV facility	JOB NUMBER: JCB059
CONTRACTOR: LICHCRETE Machine: Machine: 1.70 As above but speckled white becoming VERY DENSE Hardpan Calcrete. Pediogenic. Exc=Intermediate. 1.70 Refusal of Machine. NOTES 1) No groundwater seepage. 2) Refusal at 1,7m. 3) Disturbed Sample at 0.91.7m. ELEVATION: 1290 Machine: Komatsu TLB DISturbed Sample at 0.91.7m. ELEVATION: 1290 Machine: Komatsu TLB DISturbed Sample at 0.91.7m. ELEVATION: 1290 XCOOM: 2002575 DATE: 1210/212 DATE: 1210/212 DATE: 1210/212 DATE: 1210/212 DATE: 1210/212 DATE: 1210/212 DATE: 1210/212 DATE: 1210/212 Machine: Machine. ELEVATION: 1290 XCOOM: 2002575 YCOOM: 2002575 Y		0.00	Moist, Dark brown, MEDIUM DENSE, intact, CLAY roots. Transported. Exc=Soft.	EY SILTY SAND with
CONTRACTOR:       LICHCRETE         MACHNE:       No groundwater seepage.         2) Refusal at 1,7m.       3) Disturbed Sample at 0.91.7m.         3) Disturbed Sample at 0.91.7m.       3) Disturbed Sample at 0.91.7m.         CONTRACTOR:       LICHCRETE         MACHNE:       Konatsu TLB         DIMUTINE STATUS       DIMUTINON:         MACHNE:       Komatsu TLB         DIMUTINE STANDARDSET       DATE:         TYPE SETEY::       BIO         SETUP ILE:       STANDARDSET	0.91.7m	0.90	As above but speckled white becoming VERY DENS Pedogenic. Exc=Intermediate.	SE Hardpan Calcrete.
NOTES         1) No groundwater seepage.         2) Refusal at 1,7m.         3) Disturbed Sample at 0.91.7m.         3) Disturbed Sample at 0.91.7m.         CONTRACTOR: LICHCRETE MACHINE: Komatsu TLB DIMIL: TENCH MACHINE: Komatsu TLB DIMIL: TENCH PROFILED BY: JBloem         DATE: 12/10.2012 TYPE SET BY: JB         DATE: 12/10.2012 TYPE SET BY: JB         DATE: 19/11/12 14:28 SETUP HE: STANDARD.SET	L.	<u>.1.70</u> 1.70	Refusal of Machine.	
1) No groundwater seepage.         2) Refusal at 1,7m.         3) Disturbed Sample at 0.91.7m.         3) Disturbed Sample at 0.91.7m.         Biggin at 0.91.7m.         CONTRACTOR: LICHCRETE MACHINE: Komatsu TLB DIMM: TRENCH DIMM: TRENCH DIMM: TRENCH DATE: 22.10.2012 PROFILE: STANDARD.SET         TYPE SET BY : JB         DATE: 1911/12.14.26 SETUP FLE: STANDARD.SET			NOTES	
2) Refusal at 1,7m. 3) Disturbed Sample at 0.91.7m. 3) Disturbed Sample at 0.91.7m. ELEVATION : 1290 MICHINE: Komatsu TLB DIAM: TRENCH MICHINE: Komatsu TLB DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH DIAM: TRENCH MICHINE: Komatsu TLB DIAM: TRENCH MICHINE: Komatsu TLB DIAM: TRENCH MICHINE: Komatsu TLB DIAM: TRENCH DIAM: TRENCH MICHINE: Komatsu TLB DIAM: TRENCH DIAM: TRENCH MICHINE: Komatsu TLB DIAM: TRENCH MICHINE: Komatsu TLB MICHINE: Komatsu TLB MICHI			1) No groundwater seepage.	
3) Disturbed Sample at 0.91.7m. CONTRACTOR: LICHCRETE INCLINATION: MACHINE: Komatsu TLB INCLINATION: DIALED BY: PROFILED BY: PROFILED BY: PROFILED BY: PROFILED BY: PROFILED BY: PROFILED BY: PROFILED BY: DATE: 22.10.2012 DATE: 22.10.2012 DATE: 22.10.2012 DATE: 22.10.2012 DATE: 22.10.2012 DATE: 22.10.2012 DATE: 22.10.2012 DATE: 22.10.2012 DATE: 22.10.2012 PROFILED SY: JB DATE: 22.10.2012 PR		2	2) Refusal at 1,7m.	
CONTRACTOR: LICHCRETE INCLINATION: ELEVATION: 1290 MACHINE: Komatsu TLB DIAM: TRENCH 2:000000000000000000000000000000000000		;	3) Disturbed Sample at 0.91.7m.	
CONTRACTOR: LICHCRETE INCLINATION: ELEVATION: 1290 MACHINE: Komatsu TLB DIAM: TRENCH X-COORD : 2902575 DRILLED BY: DATE: 22.10.2012 Y-COORD : 2902575 PROFILED BY: JB DATE: 22.10.2012 Y-COORD : (25)036361 PROFILED BY: JB DATE: 19/11/12 14:26 SETUP FILE: STANDARD.SET TET:MARET-11MFKTES-1.TXT				
CONTRACTOR: LICHCRETE INCLINATION: ELEVATION: 1290 MACHINE: Komatsu TLB DIAM: TRENCH x-coord: 2902575 DRILED BY: DATE: 22.10.2012 Y-coord: (25)036361 PROFILED BY: JB DATE: 1291/12 14:26 TYPE SET BY: JB DATE: 1911/12 14:26 SETUP FILE: STANDARD.SET TEXT: JMAREET-11MFKTES-1.TXT				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       X-CORD : 2902575         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)036361         PROFILED BY : JB       DATE : 19/11/12 14:26       Y-COORD : (25)036361         TYPP SET BY : JB       DATE : 19/11/12 14:26       HOLE NO: MFK TP16				
CONTRACTOR: LICHCRETE       INCLINATION:       ELEVATION: 1290         MACHINE: KOmatsu TLB       DIAM: TRENCH       x.coord: 2902575         DRILLED BY:       DATE: 22.10.2012       Y.coord: 2902575         PROFILED BY: J Bloem       DATE: 22.10.2012       Y.coord: (25)036361         TYPE SET BY: JB       DATE: 19/11/12 14:26       HOLE No: MFK TP16				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       x.cooRD : 2902575         DRILLED BY :       DATE : 22.10.2012       y.cooRD : 2902575         PROFILED BY : J Bloem       DATE : 22.10.2012       y.cooRD : 2902566         TYPE SET BY : JB       DATE : 19/11/12 14:26       y.cooRD : (25)036361         FUOR FILE : STANDARD.SET       TEXT :MAREET-11MFKTES-1.TXT       HOLE No: MFK TP16				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       x.ccoRb : 2902575         DRILED BY :       DATE : 22.10.2012       Y.COORD : 250036361         PROFILED BY : JB       DATE : 19/11/12 14:26       Y.COORD : 0.0012         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP16				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902575         DRILED BY :       DATE : 22.10.2012       Y-COORD : 2902575         PROFILED BY : J Bloem       DATE : 22.10.2012       Y-COORD : (25)036361         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE NO: MFK TP16         SETUP FILE : STANDARD.SET       TEXT :MAREET-11MFKTES-1.TXT       Hole No: MFK TP16				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902575         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)036361         PROFILED BY : JB       DATE : 19/11/12 14:26       HOLE NO: MFK TP16         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE NO: MFK TP16				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902575         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)036361         PROFILED BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP16         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP16				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902575         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)036361         PROFILED BY : J Bloem       DATE : 22.10.2012       Y-COORD : (25)036361         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP16         SETUP FILE : STANDARD.SET       TEXT :WAREET~11MFKTES~1.TXT       Hole No: MFK TP16				
CONTRACTOR : LICHCRETE       INCLINATION :       ELEVATION : 1290         MACHINE : Komatsu TLB       DIAM : TRENCH       X-COORD : 2902575         DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)036361         PROFILED BY : J Bloem       DATE : 22.10.2012       HOLE No: MFK TP16         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP16				
CONTRACTOR : LICHCRETEINCLINATION :ELEVATION : 1290MACHINE : Komatsu TLBDIAM : TRENCHX-COORD : 2902575DRILLED BY :DATE : 22.10.2012Y-COORD : (25)036361PROFILED BY : J BloemDATE : 22.10.2012HOLE No: MFK TP16TYPE SET BY : JBDATE : 19/11/12 14:26HOLE No: MFK TP16SETUP FILE : STANDARD.SETTEXT :WAREET~11WFKTES~1.TXTHOLE No: MFK TP16				
CONTRACTOR : LICHCRETEINCLINATION :ELEVATION : 1290MACHINE : Komatsu TLBDIAM : TRENCHX-COORD : 2902575DRILLED BY :DATE : 22.10.2012Y-COORD : (25)036361PROFILED BY : J BloemDATE : 22.10.2012HOLE No: MFK TP16TYPE SET BY : JBDATE : 19/11/12 14:26HOLE No: MFK TP16SETUP FILE : STANDARD.SETTEXT :WAREET~11WFKTES~1.TXTHOLE No: MFK TP16				
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLBINCLINATION : DIAM : TRENCHELEVATION : 1290 X-COORD : 2902575 Y-COORD : 2902575 Y-COORD : (25)036361DRILLED BY : PROFILED BY : J BloemDATE : 22.10.2012 DATE : 22.10.2012Y-COORD : (25)036361TYPE SET BY : JB SETUP FILE : STANDARD.SETDATE : 19/11/12 14:26 TEXT :WAREET~11WFKTES~1.TXTHOLE No: MFK TP16				
DRILLED BY :       DATE : 22.10.2012       Y-COORD : (25)036361         PROFILED BY : J Bloem       DATE : 22.10.2012       HOLE No: MFK TP16         TYPE SET BY : JB       DATE : 19/11/12 14:26       HOLE No: MFK TP16         SETUP FILE : STANDARD.SET       TEXT :WAREET~1WFKTES~1.TXT       HOLE No: MFK TP16	CONTRACTOR : MACHINE :	LICHCRETE Komatsu TLB	INCLINATION : EL	LEVATION : 1290 X-COORD : 2902575
TYPE SET BY : JB       DATE : 19/11/12 14:26         SETUP FILE : STANDARD.SET       TEXT :WAREET~1\WFKTES~1.TXT	DRILLED BY : PROFILED BY :	J Bloem	DATE : 22.10.2012 DATE : 22.10.2012	Y-COORD : (25)036361
	TYPE SET BY : SETUP FILE :	JB STANDARD.SET	DATE : 19/11/12	HULE NO: WITH IT ID

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP17 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
$\begin{array}{c} Scale \\ 1:30 \\ 1:4 \\ 1:$	<ul> <li>Dry, light orange mottled brown yellow orange, SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.</li> </ul>	MEDIUM DENSE, voided,
	70 Slightly Moist, orange and yellow, DENSE, i SAND with Nodules Ferricrete. Pedogenic. Exc=Intermediate.	ntact, GRAVELLY SILTY
1.	Refusal of Machine.	
	1) No Groundwater soopage	
	2) Refusal at 1 9m	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY :	INCLINATION : DIAM : TRENCH DATE : 22.10.2012	ELEVATION : 1293 X-COORD : 2902460 Y-COORD : (25)036199
PROFILED BY : J Bloem TYPE SET BY : JB SETUR EILE : STANDARD SET	DATE : 22.10.2012 DATE : 19/11/12 14:26 TEXT : MAREET : 1MEKTES : 1 TYT	HOLE No: MFK TP17
D039 JD GEOTECHNICAL SERVIC	ES CC	dotPLOT 6008 PBp

	Kgatelopele Private Equity and Venture Capital (Ptv) Ltd	HOLE No: MFK TP18 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	
Scale 22 0.00 1:30 1 21 121 121 121 121 121 121 121	Dry, light orange mottled brown yellow orange, ME SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	DIUM DENSE, voided,
2.00	Slightly Moist, orange and yellow, DENSE, intac SAND with Nodules Ferricrete. Pedogenic. Exc=Intermediate.	t, GRAVELLY SILTY
	Refusal of Machine.	
	NOTES	
	1) No Groundwater seepage.	
	2) Refusal at 2.1m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB	INCLINATION : E DIAM : TRENCH	LEVATION : 1296 X-COORD : 2902363
DRILLED BY : PROFILED BY : J Bloem	DATE : 22.10.2012 DATE : 22.10.2012	HOLE No: MFK TP18
SETUP FILE : STANDARD.SET	DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	

		Kastalanala Driveta Fauity	
		and Venture Capital (Pty) Ltd	HOLE NO: WIFK 1P19 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility		
		Batho-Batho Solar PV facility	JOB NOMBER. JCD039
Scale $1 \cdot \frac{1}{2} \cdot \frac{1}$	0.00	Dry, light orange mottled brown yellow orange, MEI SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	DIUM DENSE, voided,
	1.70	Moist, brown speckled white, VEBY DENSE Hardpa	an Calcrete.
		Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	
	1.80	Refusal of Machine.	
		NOTES	
	1	) No Groundwater seepage.	
	2	?) Refusal at 1,8m.	
CONTRACTOR : LICHCRETE		INCLINATION : E	LEVATION : 1296
MACHINE : Komatsu TLE	3	DIAM : TRENCH DATE : 22.10.2012	X-COORD : 2902264 Y-COORD : (25)035850
PROFILED BY : J Bloem		DATE : 22.10.2012	HOLE No: MFK TP19
TYPE SET BY : JB SETUP FILE : STANDARD.SET	Г	DATE : 19/11/12	

		Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Margetsane	HOLE No: MFK 1P20 Sheet 1 of 1
	Batho-Batho Solar PV facility	JOB NUMBER: JCB059	
Scale 1:30 1:30 1:4 1:4 1:4 1:4 1:4 1:4 1:4 1:4	<sup>0.00</sup> Dry, li SILTY Transp Exc=S	ght orange mottled brown yellow orange SAND with some roots. oorted - Aeolian Sand. oft.	, MEDIUM DENSE, voided,
	1.80		
	Moist, Pedog Exc=Ir Pedog Exc=Ir	brown speckled white, VERY DENSE H enic. ntermediate. enic. ntermediate.	ardpan Calcrete.
	<i>1.90</i> Refusa	al of Machine.	
		5	
	1) No Gr	oundwater seepage.	
CONTRACTOR : LICHCRET MACHINE : Komatsu TL DRILLED BY : PROFILED BY : J Bloem TYPE SET BY : JB	Е .В	INCLINATION : DIAM : TRENCH DATE : 22.10.2012 DATE : 22.10.2012 DATE : 19/11/12 14:26 TEXT : MADEET : 19/172 4:275	ELEVATION : 1293 X-COORD : 2902167 Y-COORD : (25)035676 HOLE No: MFK TP20
SETUP FILE : STANDARD.SE	= 1	IEXI:\MAREET~1\MFKTES~1.TXT	

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP21 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
$\begin{array}{c} Scale \\ 1:30 \\ 1:30 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	Dry, light orange mottled brown yellow orange, ME SILTY SAND with some roots. Transported - Aeolian Sand. Exc=Soft.	DIUM DENSE, voided,
2.10	Refusal on moist, brown speckled white, VERY DEI Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	NSE Hardpan Calcrete.
	NOTES	
	1) No Groundwater seepage.	
	2) Refusal at 2,1m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem TYPE SET BY : JB SETUP FILE : STANDARD.SET	INCLINATION : E DIAM : TRENCH DATE : 22.10.2012 DATE : 22.10.2012 DATE : 19/11/12 14:26 TEXT :WAREET~1\WFKTES~1.TXT	ELEVATION : 1292 X-COORD : 2902083 Y-COORD : (25)035494 HOLE No: MFK TP21

		Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane	HOLE No: MFK TP22 Sheet 1 of 1
		Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30  	0.00	Moist, Dark brown, MEDIUM DENSE, intact, CLA roots. Transported. Exc=Soft.	YEY SILTY SAND with
	_ 0.90	Moist, brown speckled white, VERY DENSE Hardp Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	an Calcrete.
-	_ 2.20		
		Refusal of Machine.	
		NOTES	
	1	) No Groundwater seepage.	
	2	2) Refusal at 2.2m.	
ONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY :		INCLINATION : DIAM : TRENCH DATE : 23.10.2012	ELEVATION : 1286 X-COORD : 2902249 Y-COORD : (25)035380
PROFILED BY : J Bloem		DATE : 23.10.2012	HOLE No: MFK TP22
SETUP FILE : STANDARD.SET		DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	

Kgatelopele and Venture		Kgatelopele Private Equity and Venture Capital (Pty) Ltd		HOLE No: MFK TP23 Sheet 1 of 1	
	Proposed Mareetsane Batho-Batho Solar PV facility			JOB NUMBER: JCB059	
Scale 1:30		0.00 ro Ti E:	loist, Dark brown, MEDIUM DENSE, intact, C oots. ransported. xc=Soft.	LAY	EY SILTY SAND with
-		0.90 M P( E; P( E;	loist, brown speckled white, VERY DENSE Hai edogenic. xc=Intermediate. edogenic. xc=Intermediate.	rdpa	n Calcrete.
-		2.00R	efusal of Machine.		
		N	OTES		
		1) N	lo Groundwater seepage.		
		2) F	Refusal at 2.0m.		
CONTRACTOR			INCLINATION :	EL	EVATION : 1290
MACHINE DRILLED BY PROFILED BY	: Komatsu TLB : :J Bloem		DIAM : TRENCH DATE : 23.10.2012 DATE : 23.10.2012	ſ	x-coord : 2902333 y-coord : (25)035563
TYPE SET BY SETUP FILE	: JB : STANDARD.SET		DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT		HOLE No: MFK TP23

		Kgatelopele Private Equity and Venture Capital (Pty) Ltd		HOLE No: MFK TP24 Sheet 1 of 1
		Proposed Mareetsane Batho-Batho Solar PV facility		JOB NUMBER: JCB059
Scale 1:30	0.00 Moist roots. Trans Exc=\$	, Dark brown, MEDIUM DENSE, intact, sported. Soft.	CLAYE	EY SILTY SAND with
-	Moist Pedo Exc=l Pedo Exc=l	, brown speckled white, VERY DENSE H genic. Intermediate. genic. Intermediate.	lardpar	a Calcrete.
-	2.10Refus	al of Machine.		
	NOTE	ES		
	1) No G	aroundwater seepage.		
	2) Refu	sal at 2.1m.		
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY :		INCLINATION : DIAM : TRENCH DATE : 23.10.2012	ELE X Y	-valion : 1292 -coord : 2902430 -coord : (25)035737
PROFILED BY : J Bloem TYPE SET BY : JB		DATE : 23.10.2012 DATE : 19/11/12 14:26		HOLE No: MFK TP24
SETUP FILE : STANDARD.SET		TEXT :\MAREET~1\MFKTES~1.TXT	L	

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP25 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30 1:30 1:30	<ul> <li>Moist, Dark brown, MEDIUM DENSE, intact, C roots.</li> <li>Transported.</li> <li>Exc=Soft.</li> </ul>	LAYEY SILTY SAND with
- - - - - - - - - - - - - - -	Moist, brown speckled white, VERY DENSE Hat Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	rdpan Calcrete.
2	.10Refusal of Machine.	
	NOTES	
	1) No Groundwater seepage.	
	2) Refusal at 2,1m.	
MACHINE : Komatsu TLB	DIAM : TRENCH DATE : 23.10.2012	x-coord : 2902528 Y-coord : (25)035911
PROFILED BY : J Bloem TYPE SET BY : JB	DATE : 23.10.2012 DATE : 19/11/12 14:26	HOLE No: MFK TP25
SETUP FILE : STANDARD.SET	TEXT :\MAREET~1\MFKTES~1.TXT	

		Kaatelopele Private Equity		HOLE NO: MEK TP26
	and Venture Capital (Pty) Ltd Proposed Mareetsane		Sheet 1 of 1	
	Batho-Batho Solar PV facility			JOB NUMBER: JCB059
Scale	0.00 r E 0.70	Moist, Dark brown, MEDIUM DENSE, intact, oots. Fransported. Exc=Soft.	CLAY	EY SILTY SAND with
	F E F	Moist, brown speckled white, VERY DENSE H Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	lardpa	n Calcrete.
	<i>2.10</i>	Refusal of Machine.		
	1	NOTES		
	1)	No Groundwater seepage.		
	2)	Refusal at 2,1m.		
CONTRACTOR : LICHC MACHINE : Komat	CRETE tsu TLB	INCLINATION : DIAM : TRENCH	El	EVATION : 1291 X-COORD : 2902626 X-COORD : (25)036085
PROFILED BY : J Bloe	m	DATE : 23.10.2012		HOLE No: MFK TP26
SETUP FILE : STAND	ARD.SET	DATE : 19/11/12 14:26 TEXT :WAREET~1\WFKTES~1.TXT		

and Venture Capital (Pty) Ltd Proposed Mareetsane	HOLE No: MFK TP27 Sheet 1 of 1
Batho-Batho Solar PV facility Scale 1:30 0.00 Moist, Dark brown, MEDIUM DENSE, intact, CLAN roots. Transported. Exc=Soft.	JOB NUMBER: JCB059
0.80         Moist, brown speckled white, VERY DENSE Hardpa         Pedogenic.         Exc=Intermediate.         Pedogenic.         Exc=Intermediate.         Exc=Intermediate.         Exc=Intermediate.	an Calcrete.
2.00	
NOTES 1) No Groundwater seepage. 2) Refusal at 2,0m.	
CONTRACTOR : LICHCRETE       INCLINATION :       E         MACHINE : Komatsu TLB       DIAM : TRENCH       E         DRILLED BY :       DATE : 23.10.2012       E         PROFILED BY : J Bloem       DATE : 23.10.2012       E         TYPE SET BY : JB       DATE : 19/11/12 14:26       E         SETUR FULE : STANDARD SET       TEXT : IMADEET - 11MENTES - 1 TYT	ELEVATION : 1293 X-COORD : 2902742 Y-COORD : (25)036250 HOLE No: MFK TP27

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK 1P28 Sheet 1 of 1
	Batho-Batho Solar PV facility	
Scale 0. 1:30	<ul> <li>Moist, Dark brown, MEDIUM DENSE, intact, CLAY roots.</li> <li>Transported.</li> <li>Exc=Soft.</li> </ul>	YEY SILTY SAND with
	Moist, brown speckled white, VERY DENSE Hardpa Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	an Calcrete.
- 1.	80	
	Refusal of Machine.	
	NOTES	
	1) No Groundwater seepage.	
	2) Refusal at 1.8m.	
	INCLINATION : E	LEVATION : 1290
DRILLED BY : PROFILED BY : I Bloem	DATE : 23.10.2012 DATE : 23.10 2012	Y-COORD : (25)036432
TYPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	HOLE No: MFK TP28

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP29 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30 - - - -	<sup>0.00</sup> Moist, Dark brown, MEDIUM DENSE, intact, Cl roots. Transported. Exc=Soft.	AYEY SILTY SAND with
	0.90 Moist, brown speckled white, VERY DENSE Har Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	dpan Calcrete.
	2.10 Refusal of Machine.	
	NOTES	
	1) No Groundwater seepage.	
	2) Refusal at 2,1m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem TYPE SET BY : JB	INCLINATION : DIAM : TRENCH DATE : 23.10.2012 DATE : 23.10.2012 DATE : 19/11/12 14:26	ELEVATION : 1290 X-COORD : 2902992 Y-COORD : (25)036140 HOLE No: MFK TP29
SETUP FILE : STANDARD.SET	TEXT :\MAREET~1\MFKTES~1.TXT	

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP30 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 0.00	<ul> <li>Moist, Dark brown, MEDIUM DENSE, intact, CL/ roots. Transported. Exc=Soft.</li> <li>Moist, brown speckled white, VERY DENSE Hard Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.</li> </ul>	AYEY SILTY SAND with pan Calcrete.
	Refusal of Machine.	
	NOTES 1) No Groundwater seepage. 2) Refusal at 2.2m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY :	INCLINATION : DIAM : TRENCH DATE : 23.10.2012	ELEVATION : 1292 X-COORD : 2902907 Y-COORD : (25)036140
PROFILED BY : J Bloem TYPE SET BY : JB	DATE : 23.10.2012 DATE : 19/11/12 14:26	HOLE No: MFK TP30
OLIOI TILL . STANDARD. SET	ILAIWWARLLI~IWWFKIE3~I.IAI	

		Koatelopele Private Equity	HOLF No: MFK TP31
		and Venture Capital (Pty) Ltd Proposed Mareetsane	Sheet 1 of 1
		Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 1:30	<sup>0.00</sup> Mo roo Tra Ex	bist, Dark brown, MEDIUM DENSE, intact, C ots. ansported. cc=Soft.	CLAYEY SILTY SAND with
	0.60 Ma Pe Ex Pe Ex	bist, brown speckled white, VERY DENSE Ha edogenic. cc=Intermediate. edogenic. cc=Intermediate.	ardpan Calcrete.
	<i>1.80</i> Re	fusal of Machine.	
	NC	DTES	
	1) N	o Groundwater seepage.	
	2) R	efusal at 1.8m.	
<i>CONTRACTOR :</i> LICHCRET <i>MACHINE :</i> Komatsu T	Ë LB	INCLINATION : DIAM : TRENCH	ELEVATION : 1290 X-COORD : 2902793
DRILLED BY : PROFILED BY : J Bloem		DATE : 23.10.2012 DATE : 23.10.2012	Y-COORD : (25)035975 HOLE No: MFK TP31
TYPE SET BY : JB SETUP FILE : STANDARD.S	ΈT	DATE : 19/11/12  14:26 TEXT :\MAREET~1\MFKTES~1.TXT	

		Kgatelopele Private Equity and Venture Capital (Pty) Ltd		HOLE No: MFK TP32 Sheet 1 of 1
		Proposed Mareetsane Batho-Batho Solar PV facility		JOB NUMBER: JCB059
Scale 1:30	0.00 Mois roots Tran Exc= 0.80 Mois Pedo Exc= Pedo Exc= 1.20 Refu	et, Dark brown, MEDIUM DENSE, ir sported. =Soft. et, brown speckled white, VERY DEN ogenic. =Intermediate. ogenic. =Intermediate.	ISE Hardpa	EY SILTY SAND with
		ES Groundwater scenage		
	1) NO ( 2) Refi	usal at 1.2m.		
CONTRACTOR : LICHC MACHINE : Komat	RETE su TLB	INCLINATION : DIAM : TRENCH	EL	EVATION : 1286 X-COORD : 2902700 X-COORD : (25)035808
PROFILED BY : J Bloe	m	DATE: 23.10.2012 DATE: 23.10.2012		HOLE No: MFK TP32
SETUP FILE : STANDA	ARD.SET	TEXT :\MAREET~1\MFKTES~	1.TXT	

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP33 Sheet 1 of 1		
	Proposed Mareetsane Batho-Batho Solar PV facility			
Scale C 1:30 	.00 Moist, Dark brown, MEDIUM DENSE, intact, CL roots. Transported. Exc=Soft.	AYEY SILTY SAND with		
	.70 Moist, brown speckled white, VERY DENSE Hard Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	Jpan Calcrete.		
	.00Refusal of Machine.			
	NOTES 1) No Groundwater seepage. 2) Refusal at 2.0m.			
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem	INCLINATION : DIAM : TRENCH DATE : 23.10.2012 DATE : 23.10.2012	ELEVATION : 1286 X-COORD : 2902600 Y-COORD : (25)035634		
TYPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	HOLE NO: MFK TP33		

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd	HOLE No: MFK TP34 Sheet 1 of 1
	Proposed Mareetsane Batho-Batho Solar PV facility	JOB NUMBER: JCB059
Scale 0.00 1:30	Moist, Dark brown, MEDIUM DENSE, intact, CL roots. Transported. Exc=Soft.	AYEY SILTY SAND with
- - - - - - -	Moist, brown speckled white, VERY DENSE Hard Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	lpan Calcrete.
2.10	Refusal of Machine.	
	NOTES	
1	1) No Groundwater seepage.	
2	2) Refusal at 2.1m.	
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem	INCLINATION : DIAM : TRENCH DATE : 23.10.2012 DATE : 23.10.2012	ELEVATION : 1285 X-COORD : 2902503 Y-COORD : (25)035458
TYPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	HOLE No: MFK TP34

	Kgatelopele Private Equity and Venture Capital (Pty) Ltd Proposed Mareetsane	HOLE No: MFK TP35 Sheet 1 of 1
Scale 0.0	Batho-Batho Solar PV facility Moist, Dark brown, MEDIUM DENSE, intact, CL roots. Transported. Exc=Soft.	JOB NUMBER: JCB059
- - - - - - - - -	Moist, brown speckled white, VERY DENSE Hard Pedogenic. Exc=Intermediate. Pedogenic. Exc=Intermediate.	lpan Calcrete.
2.0	<ul> <li>Refusal of Machine.</li> </ul>	
	NOTES 1) No Groundwater seepage. 2) Refusal at 2.0m.	
		100F
CONTRACTOR : LICHCRETE MACHINE : Komatsu TLB DRILLED BY : PROFILED BY : J Bloem	INCLINATION : DIAM : TRENCH DATE : 23.10.2012 DATE : 23.10.2012	ELEVATION : 1285 X-COORD : 2902420 Y-COORD : (25)035276
TYPE SET BY : JB SETUP FILE : STANDARD.SET	DATE : 19/11/12 14:26 TEXT :\MAREET~1\MFKTES~1.TXT	HOLE No: MFK TP35

## **APPENDIX B**

**Test Pit Photographs** 





#### MAREETSANE BATHO-BATHO SOLAR PV FARM TEST PIT PHOTOGRAPHS (October 2012)



MFK TP1



MFK TP 2



MFK TP3



MFK TP 4





MFK TP5



MFK TP6



MFK TP7



MFK TP8





MFK TP9



MFK TP10



MFK TP11



MFK TP12







MFK TP14



MFK TP15



MFK TP16







MFK TP18



MFK TP19



MFK TP20







MFK TP22



MFK TP23



MFL TP24





MFK TP25



MFL TP26



MFK TP27



MFK TP28









MFK TP30



MFK TP31



MFK TP32







MFK TP34



MFK TP35

## APPENDIX C

Laboratory Test Results

**F** 



**Civil Engineering Testing Laboratories** 

Project	ι 		wankeng				0010			
Project	t No.	HP/B 348-39			Date 8 November 2012					
-		•	T			-		1		
Sample	e No.	50800	50801	50802	Sample No.	50800	50801	50802		
Field F	Ref. No.	MFKTP 1	MFKTP 16	MFKTP 26	%Gravel	3	5	0		
Depth	0.0-2.5 0.9-1.7 0.0-0.8		0.0-0.8	%Sand	81	74	62			
Siev	/e size	%Passing	% Passing	% Passing	%Silt	11	11 13			
7	'5.00	100	100	100	%Clay	5	8	20		
6	3.00	100	100	100	NMC %	Not Tested	Not Tested	Not Tested		
5	3.00	100	100	100	Liquid Limit	NP	SP	35		
3	7.50	100	100	100	Plasticity		<u>e</u> p	11		
2	6.50	100	100	100	Index	INP .	56	11		
1	9.00	100	100	100	Linear Shrink.	0.	0.5	5.5		
1	3.20	100	100	100	Overall P.I.	NP	SP	10		
	4.75	99	98	100	Grading					
<u> </u>	2.00	97	95	100	Modulus	1.03	1.01	0.67		
	0.85	88	86	97	HRR	A-2-4 (0)	A-2-4 (0)	A-6 (2)		
0	425	80	78	92	L Inified	SM	SM	SC		
0	25	71	69	85	Weston swell		Olvi	00		
0	15	56	56	73	(%) at 1 kPa					
0.075 20 26			/1	Analysis as n	er method D/	22 of ASTM	of 1985			
0.075 20 20			33	The results re	The regults reported relate only to the					
0	0.02 8 13			20	samples tested					
		20	Documente r	ou.	produced or					
		Ducuments n	lay only be re							
0	.002	5	0	20						
100			5	50800	50801 5	0802		<b></b>		
00										
90										
% %										
lass 00	_									
4 50 Aq										
<b>10</b> June 40	-									
<b>L</b> 30										
20	_									
10										
		•								
0	+	 	1	0 1	 1		10	100		
0.		0.0		Particle	size (mm)		10	100		
	Class	Fine Me	dium Coarse	Fine	Medium Coarse	Fine	Medium Co	arse		
	Clay	Ś	,	-	Sand		Gravel			

### **Foundation Indicator Test Data**

Remarks:



### Activity Diagram After D H van der Merwe



<b>Plotted Va</b>	lues:	
<u>Sample</u>	<u>Clay Frac</u>	<u>PI</u>
50800	5.0	#VALUE!
50801	8.0	#VALUE!
50802	20.0	10.1



### **Moisture Density Relationship**

Project:	JB Consult - Mafikeng								
Project No.:	HP/B 348-39			Date: 3			1 October 2012		
Field Reference:	MFKTP 1			Laboratory Ref.: 50800					
Depth (m):	0.0-2.5			Remarks:					
Description:	-								
Compactive Effort: Mod. AASHTO									
Percent Water Content (%):	7.5 8.6 6.6 5.6				9.6				
Dry Density (kg/m <sup>3</sup> ):	1944	1929	1921	1882	1885				

i		
	Maximum Dry Danaity	1045
	maximum Dry Density:	1945

**Optimum Moisture Content:** 

7.7 %



Analysis according to Method A7 of TMH1 of 1986. The results relate only to the samples tested. This report may only be reproduced or published in its full context. Remarks:



### **Moisture Density Relationship**

Project:	JB Consult - Mafikeng									
Project No.:	HP/B 348	HP/B 348-39					31	31 October 2012		
Field Reference:	MFKTP 1	MFKTP 16				Laboratory Ref.: 50801				
Depth (m):	0.9-1.7	0.9-1.7					No	CBR Rea	ding	
Description:										
Compactive Effort: Mod. AASHTO										
Percent Water Content (%):	9.3	10.0	11.3	12.2	7.5					
Dry Density (kg/m <sup>3</sup> ):	1919	1951	1926	1879	1880					

Μ	laximum Di	v Density:	1955
IV	iaximum Di	v Density:	13

**Optimum Moisture Content:** 

10.4 %



Analysis according to Method A7 of TMH1 of 1986. The results relate only to the samples tested. This report may only be reproduced or published in its full context. Remarks:



## **California Bearing Ratio Results**

Project:	JB Consult - Mafil	keng	
Project No.:	HP/B 348-39	Date:	31 Oct 2012
Field Reference:	MFKTP 1	Lab. Sample Ref:	50800
Depth (m):	0.0-2.5	Remarks:	
Description:	-	-	

CBR at		Final		Mod AASHTO Data		CBR Compaction Data			
2.54	5.08	7.62	Swell	Moisture	Max Dry	Optimum	Dry	Com-	Moisture
2.54	5.00	7.02		Content	Density	Moisture	Density	paction	Content
(mm)	(mm)	(mm)	(%)	(%)	(kg/m³)	(%)	(kg/m³)	(%)	(%)
39	38	33	0.0	12.5			1943	99.9	
37	36	30	0.0	14.0	1945	7.7	1844	94.8	7.5
20	22	20	0.0	15.2			1744	89.7	

Internelated Data	Compaction	90%	93%	95%	98%	100%
Interpolated Data	CBR	20.4	29.7	37.5	38.6	39.4



The samples were tested in accordance with Method A8 of TMH1 of 1990.

The results reported relate only to the samples tested.

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## APPENDIX D

**Additional Information** 

### MAREETSANE BATHO-BATHO SOLAR PV PROJECT

### ADDITIONAL INFORMATION

#### 1. Site boundary co-ordinates:

P1: 26° 13' 46.00" S 25° 22' 05.53" E P2: 26° 13' 25.46" S 25° 21' 24.60" E P3: 26° 13' 53.23" S 25° 21' 03.81" E P4: 26° 14' 15.66" S 25° 21' 43.90" E

#### 2. Site map:

Refer Figure 1 below.

#### 3. Site access:

Does access to site exists? (Yes/No) Yes – various gravel roads. If no, what is the distance over which a new access road will be built? N/A

# 4. Will the land use / development have any benefits for the local communities where it will be located?

Except for short term job opportunities during construction, the site does not appear to have long term benefits in terms of agriculture either for crop farming or animal grazing. Current land use is non-existent.

5. Can you indicate the gradient of the site? Is it flat, steep, etc.?

The site topography is reasonably flat and is divided into two planes with a gradient of approximately 0.5% in the southern half of the site, dipping from east to west. The northern half of the site dips at some 1.1% from north-east to south-west.

#### 6. Location of the site? Can you indicate the landforms that best describe the site:

- i. Ridgeline?
- ii. Plateau?
- iii. Side slope of hill/mountain?
- iv. Closed Valley?
- v. Open Valley? X

7. **Groundwater, soil and geological stability of the site** (Analysis of the Geotechnical maps)

Groundwater, soil and geological stability of the site	Comment (Yes/No)
Shallow water table (less than 1.5m deep)?	No
Dolomite, sinkhole or doline areas?	No
Unstable rocky slopes or steep slopes with loose soil?	No
Dispersive soils (soils that dissolve in water)?	No
Soils with high clay content (clay fraction more than 40%)	No
Any other unstable soil or geological	Collapsible
feature	Aeolian sands
An area sensitive to erosion	No
Any additional comments	No

#### 8. Land use character of surrounding area:

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description:

Land characteristic	Please
	tick
Natural area	✓
Low density residential	
Medium density residential	
High density residential	
Informal residential	
Retail commercial &	
warehousing	
Light industrial	
Medium industrial	
Heavy industrial	
Power station	
Office/consulting room	
Military or police	
base/station/compound	
Spoil heap or slimes dam	
Quarry, sand or borrow pit	
Dam or reservoir	
Hospital/medical centre	
School	
Tertiary education facility	
Church	
Old age home	
Sewage treatment plant	
Train station or shunting	
yard	
Major road (4 lanes or	



FIGURE 1:

### MAREETSANE SOLAR PV FACILITY GOOGLE MAP – SITE LOCATION