

**6.3.7 Revegetation**

Seed

The topsoiled areas shall be seeded with a suitable, site specific grass mix as shown in the in the discussions of recommendations of every specific borrow pit (Section 5) of this report.

Fertilizer

Standard 2:3:2 (N:P:K) at 0.6t/ha.

Maintenance

25mm of gentle irrigation each week until 70% groundcover has been obtained. Avoid livestock grazing during re-vegetation.

Hydroseeding (a contractor who is conversant with the method must be used). Cellulose pulp at 250kg/ha and compost at 5m<sup>3</sup>/ha (100 X 50kg bag/ha) should be added to the seed mix.

If seeds are utilised, in order to ensure that seeds have an opportunity to germinate, and to avoid erosion of exposed surfaces, organic mulch should be spread over the surface following seeding.

Grass seed mixes will be planted across the denuded topsoiled areas of the site. Grass sods shall be used on embankments exceeding 1:3 slope.

**6.3.8 Rehabilitation Schedule**

The following rehabilitation schedule should be followed;

**Rehabilitation schedule**

Activity	Description	Timing
Shape Borrow pit floor	Shape the borrow pit floor to a gradient of a min 2% to ensure that it is free draining	At site establishment, and on-going during borrow pit development
Clear product stockpiles	Ensure that only the quantity of material needed for the road rehabilitation contract is mined, so that no residual stockpiles are left	End of Road construction contract
Scarify access roads	Scarify access road if the borrow pit is not to be used again	At closure

Shape side slopes of borrow pit	The borrow pit side slopes shall be shaped to a maximum slope of 1:3	On going during operation and at closure
Use of overburden	Use any residual overburden material to fill in depressions and to create a smooth slope face	At closure
Place topsoil	Place topsoil from the designated topsoil stockpiles over the mined face at a thickness of min 150mm	At completion of each mined face and at closure
Hydroseed	Hydroseed the completed side slopes and borrow pit floor with the mix as specified above	At closure
Water	Water once per week, until 70% of ground cover has taken	At Closure

### 6.3.9 Monitoring and Reporting

Regular monitoring of all the environmental management measures and components should be carried out by an appointed independent consultant, in order to ensure that the provisions of this programme are adhered to.

Ongoing and regular reporting on the progress of implementing this programme shall be done.

Inspections and monitoring shall be carried out on both the implementation of the programme and the impact on plant and animal life.

Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

Annual reports confirming compliance with the Environmental Management Plan will be submitted to the Department of Minerals and Energy.

Any emergency or unforeseen impacts must be reported as soon as possible to DME.

Any assessment of environmental impacts that reveals impacts that were not properly addressed, or were unknown when this programme was compiled shall result in the carrying out of an assessment of the impact and the addition of a corrective action to address the impact.

Erosion control measures shall be inspected after occurrences of rainfall that measured more than 30mm in 24 hours. In addition, all erosion control measures shall be visually inspected once a month. Table on the overleaf presents the proposed monitoring timetable.

**Proposed Monitoring Timetable**

<b>ACTIVITY</b>	<b>MONITORING FREQUENCY</b>	<b>RESPONSIBILITY</b>
<b>PUBLIC PARTICIPATION</b>		
Public participation	Prior to moving onto site	Engineer / Contractor
Notification of I&AP prior to Construction phase	Ongoing during life of the mine at least 48 hours prior to activity	Engineer/ Contractor
Complaints Record	Ongoing (to be tabled during monthly meetings)	Engineer
<b>ROADS AND ASSOCIATED SERVICES</b>		
Routing and haulage	Prior to moving onto site and ongoing during life of mine (weekly)	Engineer / Contractor
Formal drainage (roads and site)	Prior to moving onto site and ongoing during life of mine (weekly)	Engineer / Contractor
Run-off, sheet erosion, scour checks	Prior to moving onto site and ongoing during life of mine (monthly and every time rainfall measures more than 30mm in 24 hours)	Engineer / Contractor
<b>STAFF EDUCATION AND AWARENESS</b>		
Risks associated with materials being stockpiled on site	On staff induction and ongoing (monthly)	Contractor
Environmental education of staff	On staff induction	Contractor
Noise control (by staff)	On staff induction and ongoing (monthly)	Contractor
General Housekeeping	On staff induction and ongoing (monthly)	Contractor



ACTIVITY	MONITORING FREQUENCY	RESPONSIBILITY
Worker conduct	On staff induction and ongoing (monthly)	Contractor
Control of fire arms	On staff induction and ongoing (monthly)	Contractor
Control of alcohol and drugs on site	On staff induction and ongoing (monthly)	Contractor
Control of speed limits	On staff induction and ongoing (monthly)	Contractor / Engineer
<b>CONSTRUCTION PHASE</b>		
Demarcation of the mining area	During site set up	Contractor
Placing of chemical toilet	During site set up	Contractor
Demarcation of sensitive areas (if any; archaeological, biodiversity, etc)	During site set-up	Engineer / Contractor
Emergency procedures	During site set up and ongoing (monthly)	Engineer / Contractor
Appropriate drainage design and monitoring	During site set up and ongoing (monthly and every time rainfall measures more than 30mm in 24 hours)	Contractor
Waste Management	During site set up and ongoing (monthly)	Contractor
Bins/skips should be regularly emptied	On a weekly basis	Contractor
Visual impact of mining areas	During site set up and ongoing during the mine life (monthly)	Engineer / Contractor
Run-off sheet erosion and scour check	Ongoing during the life of the mine (monthly and every time rainfall measures more than 30mm in 24 hours)	Engineer / Contractor
Dust Control	Daily/ weekly/ monthly	Contractor
General Housekeeping	On a daily basis	Contractor
Safety of the site at the end of each day	On a daily basis	Contractor

ACTIVITY	MONITORING FREQUENCY	RESPONSIBILITY
<b>OPERATIONAL PHASE</b>		
Speed level adherence	Ongoing during life of the mine (monthly)	Contractor
Dust Management (dampening of roads and denuded areas)	Ongoing during life of the mine (daily/ weekly/ monthly)	Contractor
Fumes Management (vehicles to be serviced regularly)	Ongoing during life of the mine (monthly)	Contractor
Time that areas are stripped before mining takes place	Ongoing during life of the mine (monthly)	Engineer / Contractor
Erosion control measures to prevent topsoil loss	Ongoing during life of the mine (monthly)	Engineer / Contractor
Conservation of topsoil by revegetation	Ongoing during life of the mine (monthly)	Engineer / Contractor
Fencing of sensitive areas	Ongoing during life of the mine (monthly)	Engineer / Contractor
Hunting, snaring and other forbidden activities	Ongoing during life of the mine (monthly)	Contractor
Prevention of using other types of toilets (Long drops & surrounding vegetation)	Ongoing during the life of the mine (monthly)	Contractor
Noise Management (equipment maintenance)	Ongoing during life of the mine (monthly)	Contractor
Denuded areas must be protected against erosion	Ongoing during life of the mine (monthly and every time rainfall measures more than 30mm in 24 hours)	Engineer / Contractor
Ensuring that natural water pathways are maintained	Ongoing during life of the mine (monthly)	Engineer / Contractor
Alien invader management plan	Twice monthly	Engineer / Contractor
<b>DECOMMISSIONING</b>		
Rehabilitation of access/haulage roads	On mine completion	Contractor
Clearing of all materials	On mine completion	Contractor
Disposal of all waste (including general, hazardous, contaminated soils,	On mine completion	Contractor

ACTIVITY	MONITORING FREQUENCY	RESPONSIBILITY
etc to appropriate facilities)		
Reshaping of all disturbed areas	On mine completion	Contractor
Scarifying of all disturbed areas	On mine completion	Contractor
Topsoiling of all disturbed areas	On mine completion	Contractor
Revegetation of all the topsoiled areas	On mine completion	Contractor
Alien vegetation control	On mine completion	Contractor
Monitoring vegetation growth until a 70% coverage is achieved	On mine completion	Engineer / Contractor
Inspection by relevant Authority	On mine completion	Engineer

## 6.4 CLOSURE

When the applicant intends closing down the operation, an environmental risk report shall be compiled. The requirements of such a report are contained in Regulation 60 of the Regulations promulgated in terms of the Minerals & Petroleum Resources Development Act.

### Financial Provisions

The determination of the Financial Provisions for the borrow pits were conducted according to the Department of Minerals and Energy's *GUIDELINE DOCUMENT FOR THE EVALUATION OF THE QUANTUM OF CLOSURE-RELATED FINANCIAL PROVISION PROVIDED BY A MINE*. This guideline is the official guideline as contemplated in Regulation 54(1) to the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

The determination was conducted according to the "Quick Method" and is as follows:

- Step 1: Determine the primary mineral
- Step 2: Determine the risk class
  - Class A (High risk)
  - Class B (Medium risk)
  - Class C (Low risk)
- Step 3: Identify the minimum rates per hectare
- Step 4: Determine the overall size of the mine

The calculation for each borrow pit is as follows:

Steps	BP01	BP05	BP06	BP07	BP08	BP09	BP10	BP11	BP13	BP14	BP15	BP16	BP17	BP18
1	Dec dol, sand and mudstone	Dec dolerite and sandstone	Dec dol, sand and mudstone	Dec dol and sandstone	Dec dol, sand and mudstone	Dec dol	Dec dol	Sand and mudstone	Dec dol	Sand and mudstone	Mudstone	Dec dol	Mud and sandstone	Dec dol
2	Class C	Class C	Class C	Class C	Class C	Class C	Class C	Class C	Class C	Class C	Class C	Class C	Class C	Class C
3	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000	R20 000
4	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha	1.5ha
Sub-total (excl. VAT)	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000	R30 000
VAT @ 14%	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200	R 4 200
Grand Total	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200	R34 200

**Total Financial Provision for all the Borrow pits**

<b>Borrow pit no.</b>	<b>Grand Total (incl. VAT)</b>
BP01	R 34 200.00
BP05	R 34 200.00
BP06	R 34 200.00
BP07	R 34 200.00
BP08	R 34 200.00
BP09	R 34 200.00
BP10	R 34 200.00
BP11	R 34 200.00
BP13	R 34 200.00
BP14	R 34 200.00
BP15	R 34 200.00
BP16	R 34 200.00
BP17	R 34 200.00
BP18	R 34 200.00
<b>TOTAL</b>	<b>R 478 800.00</b>

Over and above these costs are the costs to mobilise plant to site on a low-bed truck from the nearest large town.

## **7 ENVIRONMENTAL AWARENESS PLAN**

The environmental awareness plan has been compiled to inform the Applicant's employees of the environmental risks, which may result from the mining operations and the manner in which the risks must be dealt with in order to avoid pollution and degradation of the environment.

Environmental training must be conducted during induction, before actual mining commencement. Environmental training must be conducted every time new staff is employed and monthly for the duration of the mining period.

The Environmental Management Plan shall be an Item on the monthly construction meeting's agenda. Continuous environmental education will be carried out during the monthly staff meetings. The Contractor shall appoint an in-house Environmental Officer which shall inspect the works daily and report back to the Contractor, who in turn needs to report any identified impacts to the Engineers. Monthly external EMP compliance audits are recommended, to ensure adherence to this EMP document.

The following items were included in the Environmental Awareness Plan:

- Definition of the environment
- General housekeeping rules
- How to look after the environment (flora and fauna)
- How to avoid pollution of the air, water
- What to do in an emergency.

The Contractor must submit a proposal for the environmental training to the Project Engineer for approval. It is the Contractor's responsibility to provide the site foreman with no less than 1 hour's environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the staff. Translators are to be used where necessary.

The Project Engineer should be on hand to explain more difficult / technical issues and to answer questions. The use of pictures and real-life examples is encouraged as these tend to be more easily remembered. Use should be made of the environmental awareness posters on site.

The need for a "clean site" policy also needs to be explained to the staff.

The Environmental Awareness Plan is attached in Appendix C.

## 8 CONCLUSION

The environmental impacts associated either of the borrow pits are all manageable with adherence to the attached borrow pit specific and general environmental management and rehabilitation plans.

## 9 REFERENCE AND SUPPORTING DOCUMENTATION

Bromilow, C., 1995. *Problem Plants of South Africa*, Briza Publications.

Mucina, L. and Rutherford, M.C (eds) 2006. *The Vegetation of South Africa, Lesotho and Swaziland*, Strelitzia Publishers.

Van Wyk, E. and Van Outshoorn, F. 1999. *Grasses of Southern Africa*, Briza, Publications.

[www.Google.Earth.com](http://www.Google.Earth.com), source of Satellite Imaginary.

**UNDERTAKING**

I, Michaela

the undersigned and duly authorised thereto by .....

DRPW

Company/Close Corporation/Municipality (Delete that which is not applicable) have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager.

Signed at EL this 17<sup>th</sup> day of Oct 2011

[Handwritten Signature]

Signature of applicant

[Handwritten Designation]

Designation

**Agency declaration:** This document was completed by .....on behalf of.....



**APPROVAL**

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 29 of 2002)

Signed at.....this.....day of.....20.....

.....

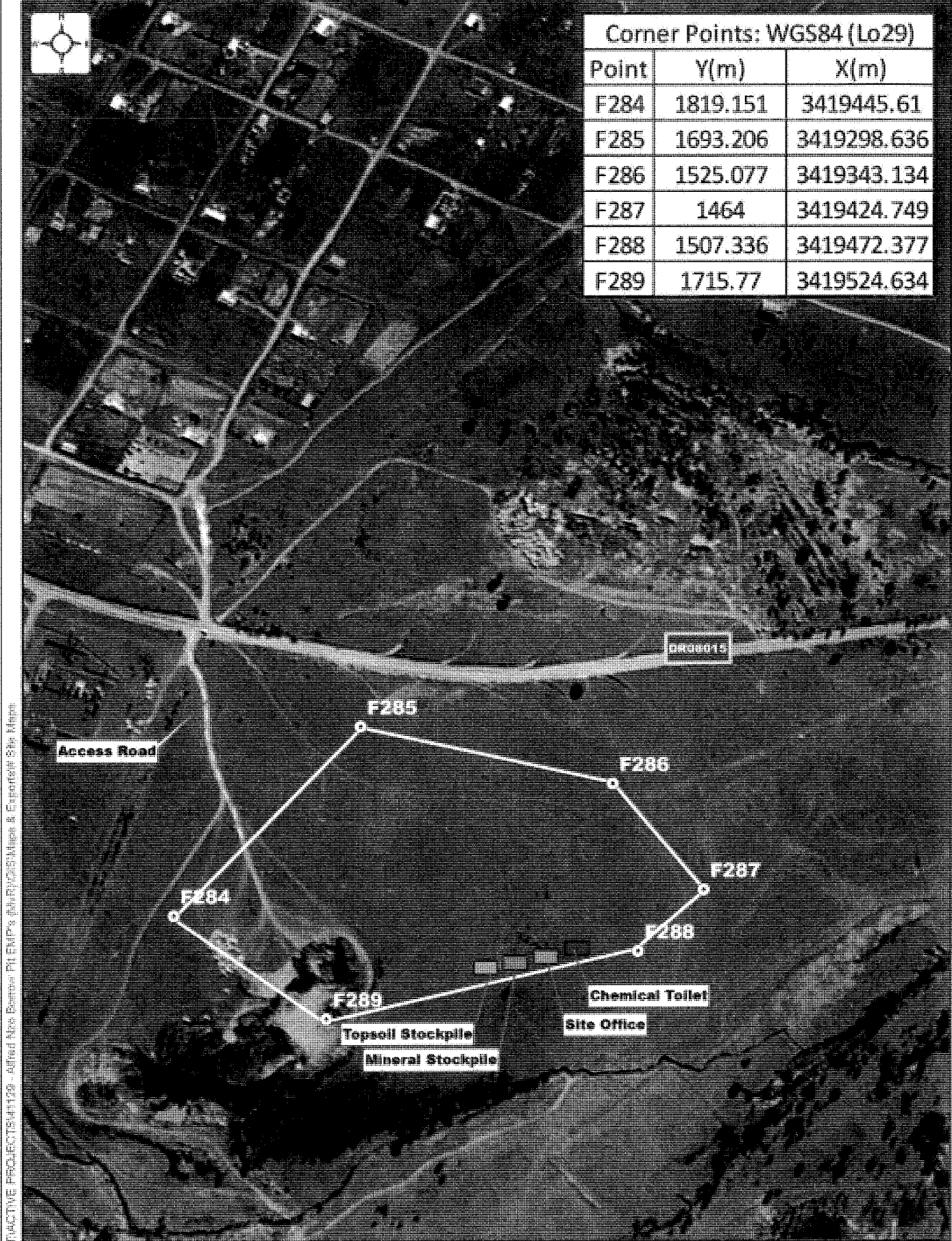
**REGIONAL MANAGER**

**REGION:**.....

**APPENDIX A  
AREA WIDE LOCALITY MAP  
SITE PLANS  
SURVEY DRAWINGS**



Corner Points: WGS84 (Lo29)		
Point	Y(m)	X(m)
F284	1819.151	3419445.61
F285	1693.206	3419298.636
F286	1525.077	3419343.134
F287	1464	3419424.749
F288	1507.336	3419472.377
F289	1715.77	3419524.634



TRAFFIC PROJECTS/102 - Alfred Nzo Borrow Pit EMP's Study/Consultant & Contractor Site Map

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 HILTON 3245    Fax: (033) 343 6788

**Alfred Nzo Borrow Pit EMP's**  
 Road: DR08015  
 Site Layout - BP01

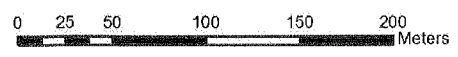
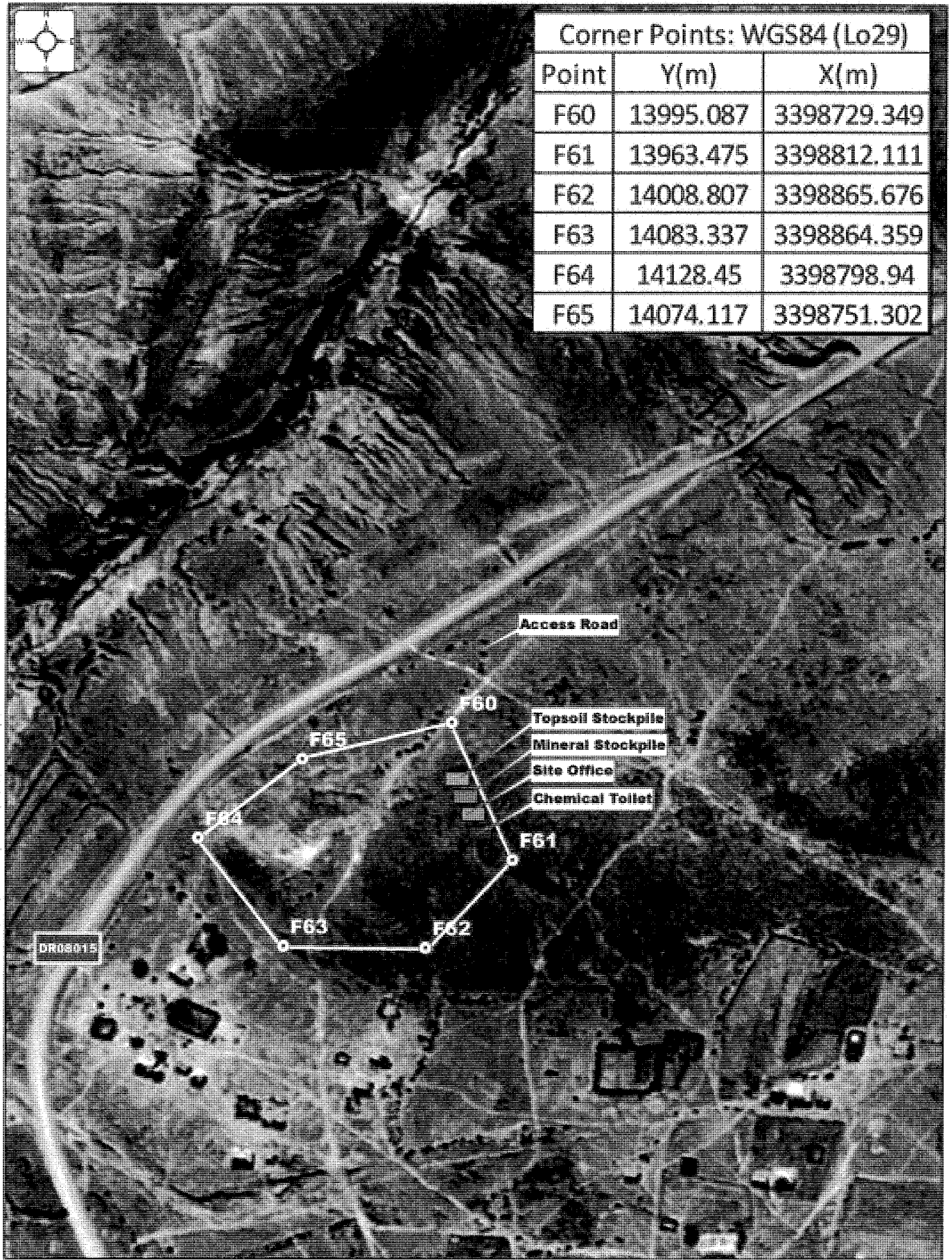


Fig  
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 Scale  
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Corner Points: WGS84 (Lo29)		
Point	Y(m)	X(m)
F60	13995.087	3398729.349
F61	13963.475	3398812.111
F62	14008.807	3398865.676
F63	14083.337	3398864.359
F64	14128.45	3398798.94
F65	14074.117	3398751.302

T:\ACTIVE PROJECTS\41129 - Alfred Nzo Borrow Pit EMP's (MVR)\GIS\Maps & Exports\# Site Maps



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**Alfred Nzo Borrow Pit EMP's**  
 Road: DR08015  
**Site Layout - BP05**



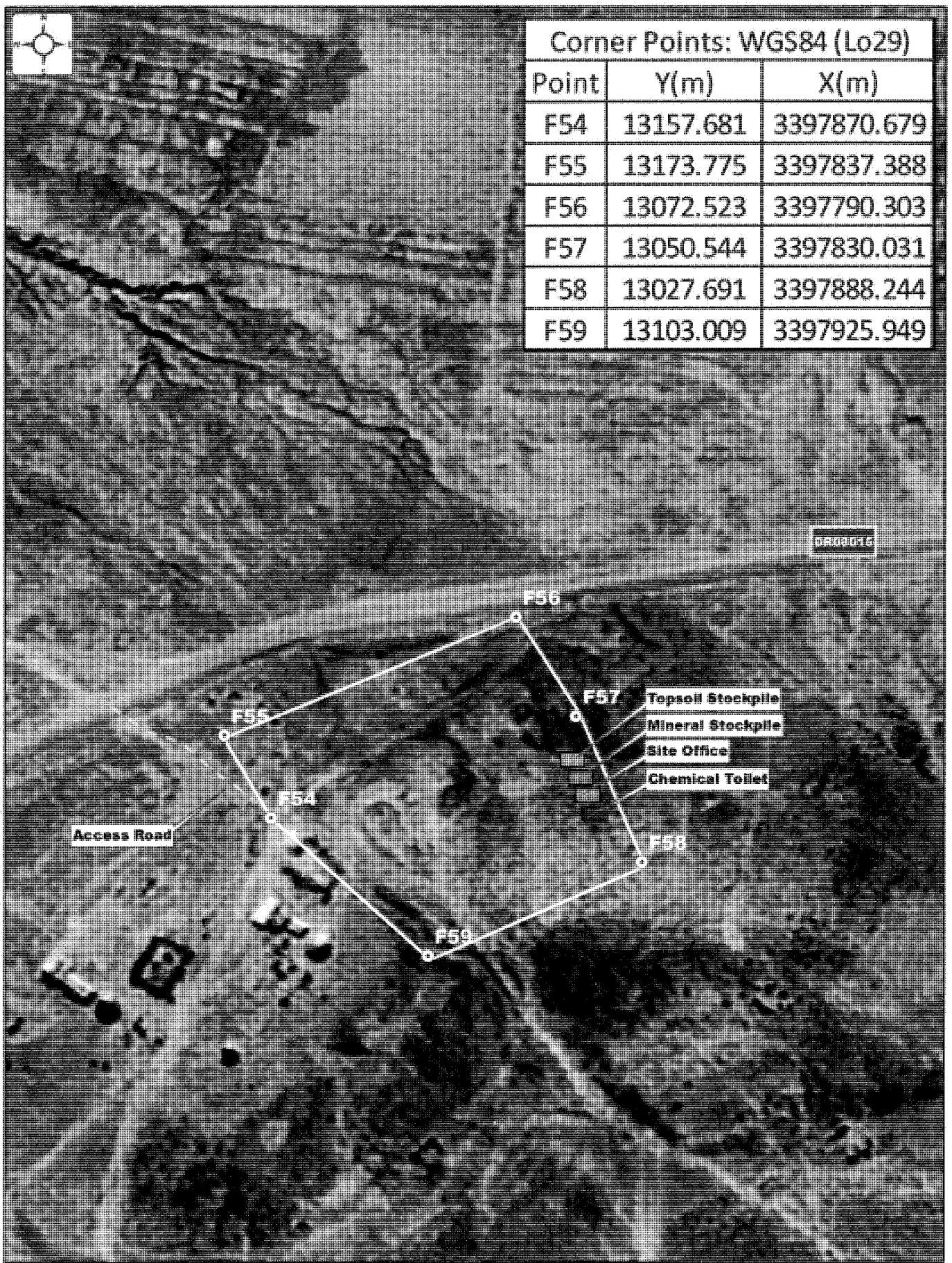
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2

Scale  
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Corner Points: WGS84 (Lo29)		
Point	Y(m)	X(m)
F54	13157.681	3397870.679
F55	13173.775	3397837.388
F56	13072.523	3397790.303
F57	13050.544	3397830.031
F58	13027.691	3397888.244
F59	13103.009	3397925.949



TRAFFIC PROJECTS/1012 - Alfred Nzo Borrow Pit/EMP's/AN/1012/1012 - Engineering Site Maps

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**Alfred Nzo Borrow Pit EMP's**  
 Road: DR08015  
**Site Layout - BP06**

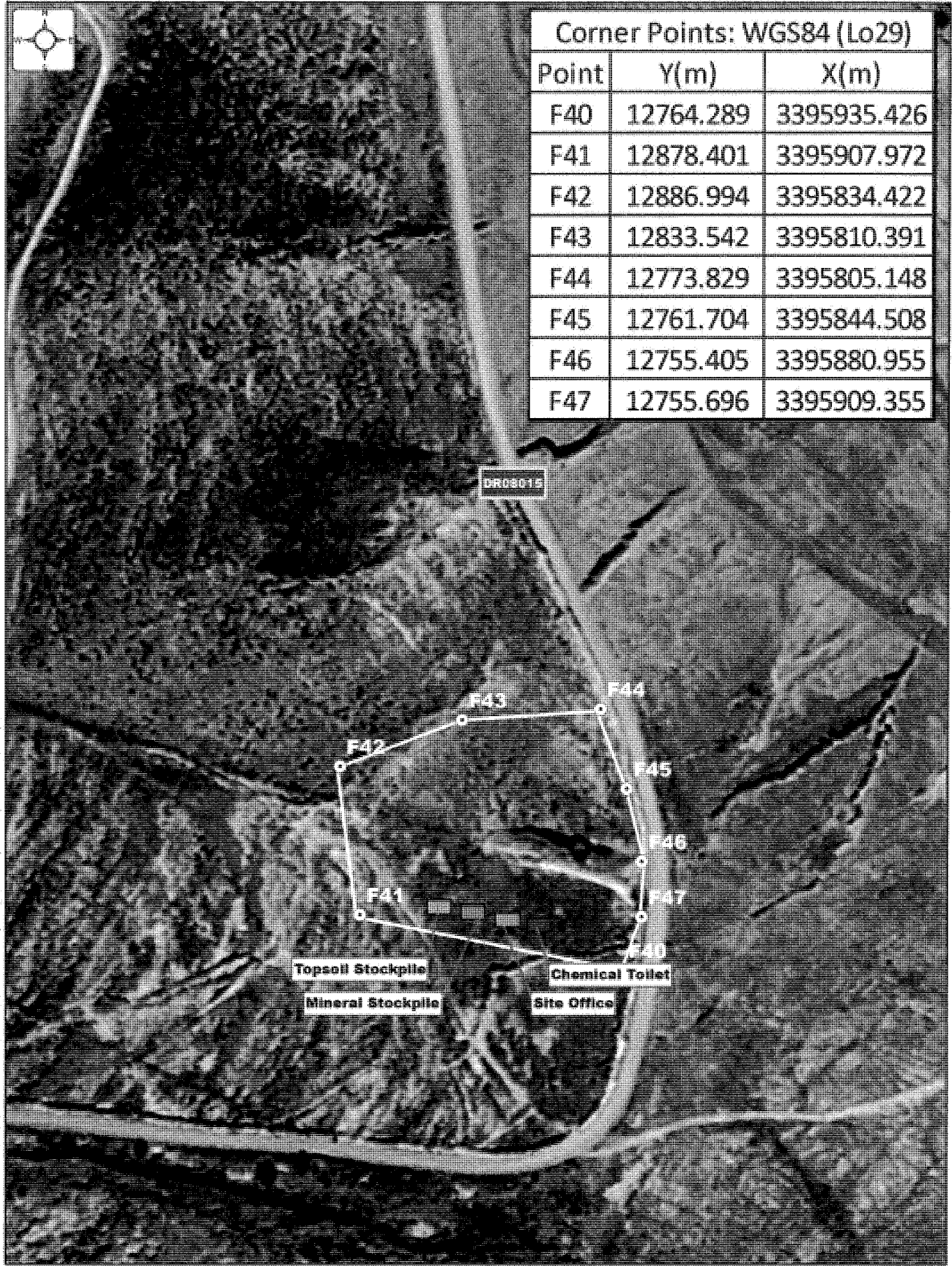


Fig 2  
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Corner Points: WGS84 (Lo29)		
Point	Y(m)	X(m)
F40	12764.289	3395935.426
F41	12878.401	3395907.972
F42	12886.994	3395834.422
F43	12833.542	3395810.391
F44	12773.829	3395805.148
F45	12761.704	3395844.508
F46	12755.405	3395880.955
F47	12755.696	3395909.355



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**Alfred Nzo Borrow Pit EMP's**  
Road: DR08015  
**Site Layout - BP07**

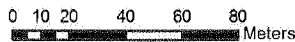
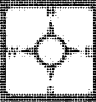


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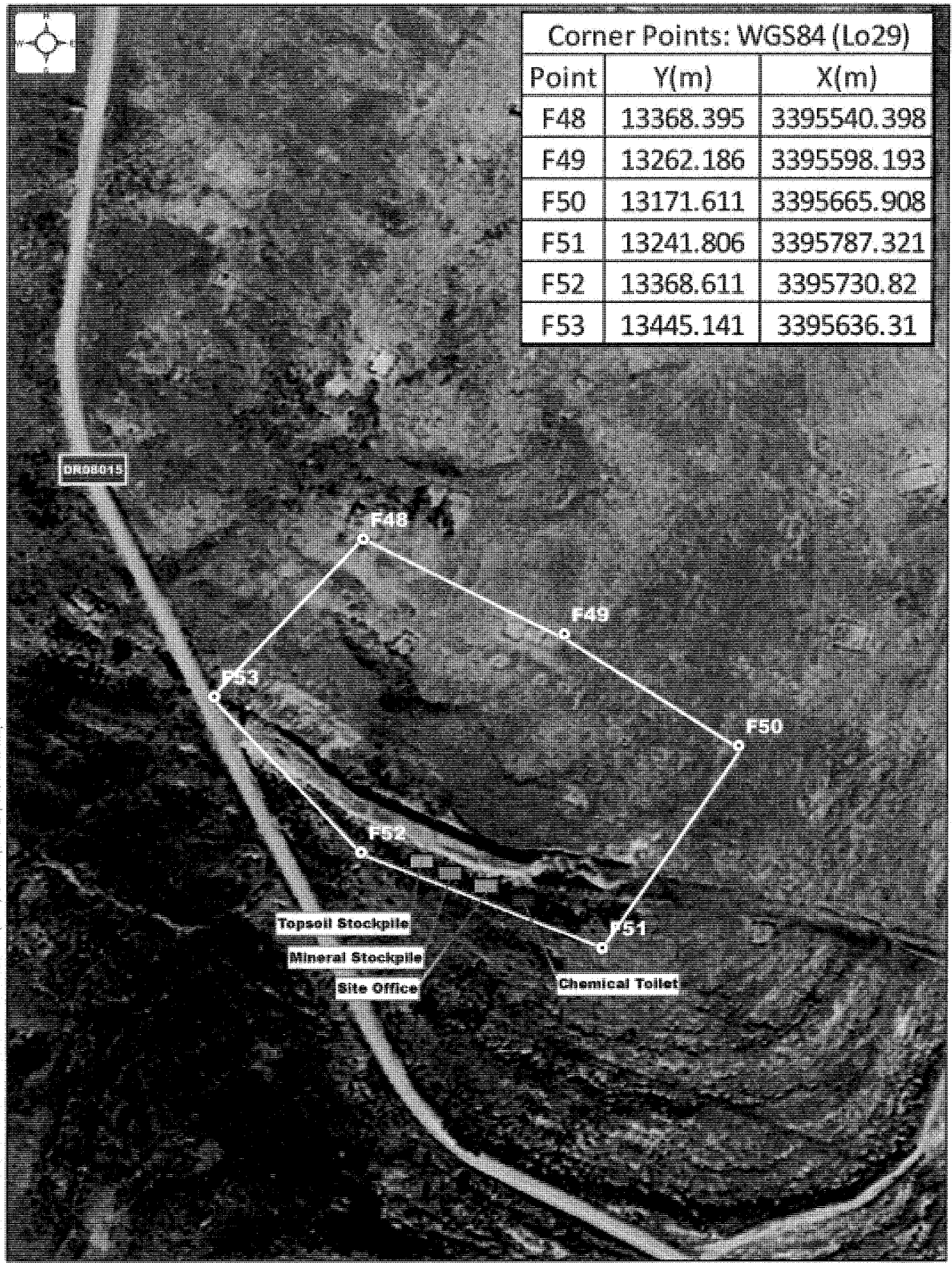
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Corner Points: WGS84 (Lo29)		
Point	Y(m)	X(m)
F48	13368.395	3395540.398
F49	13262.186	3395598.193
F50	13171.611	3395665.908
F51	13241.806	3395787.321
F52	13368.611	3395730.82
F53	13445.141	3395636.31

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Corner Points: WGS84 (Lo29)

Point	Y(m)	X(m)
F112	13828.191	3391456.288
F113	13840.411	3391482.496
F114	13876.484	3391504.728
F115	13927.648	3391496.336
F116	13932.801	3391441.123
F117	13857.417	3391425.369
F118	13832.46	3391437

PROJECTS\41129 - Alfred Nzo Borrow Pit EMP's (M/R)\GIS\Maps & Exports\# Site Maps

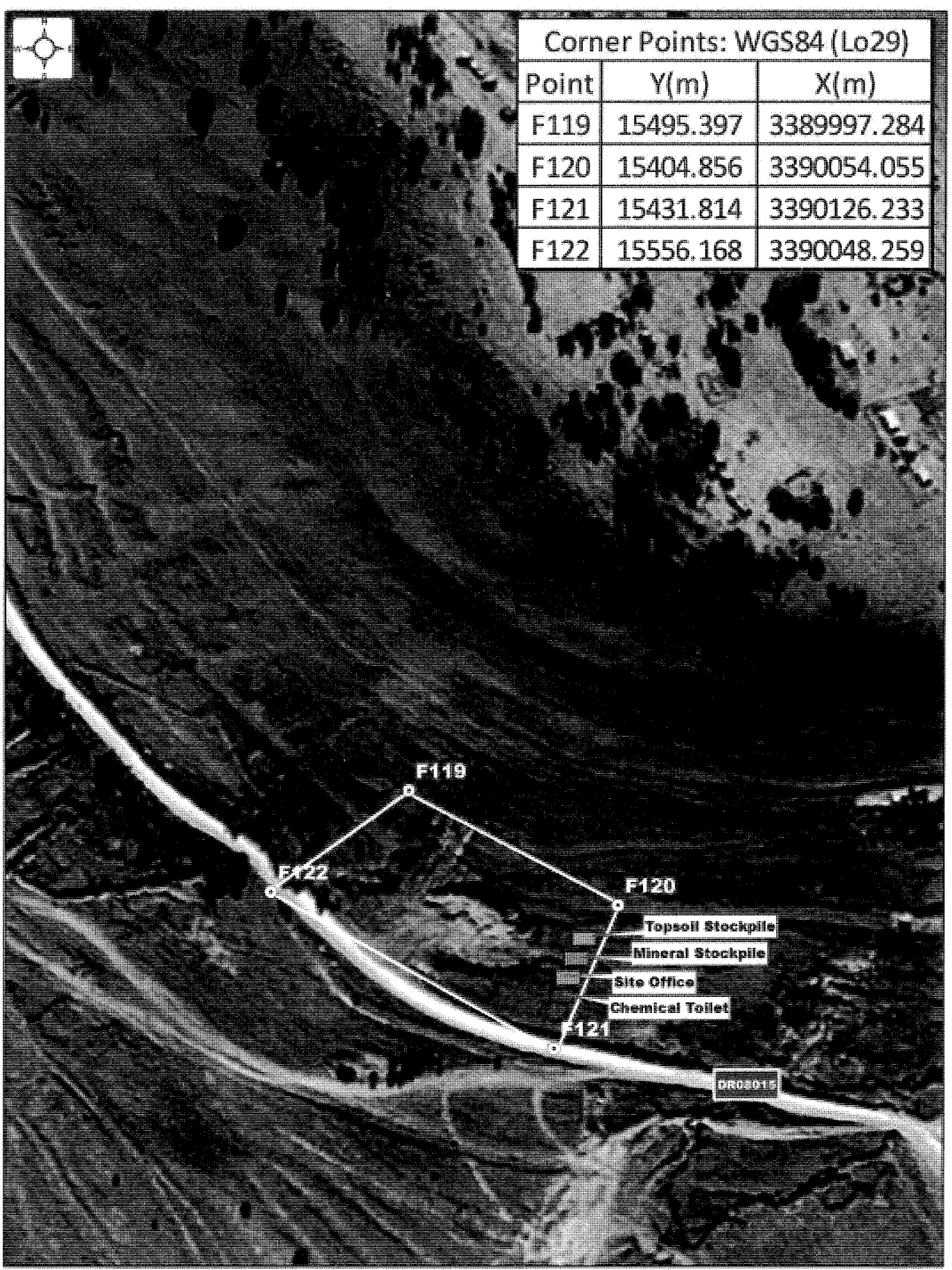







Corner Points: WGS84 (Lo29)		
Point	Y(m)	X(m)
F119	15495.397	3389997.284
F120	15404.856	3390054.055
F121	15431.814	3390126.233
F122	15556.168	3390048.259

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**Alfred Nzo Borrow Pit EMP's**  
Road: DR08015  
**Site Layout - BP10**

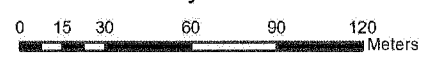
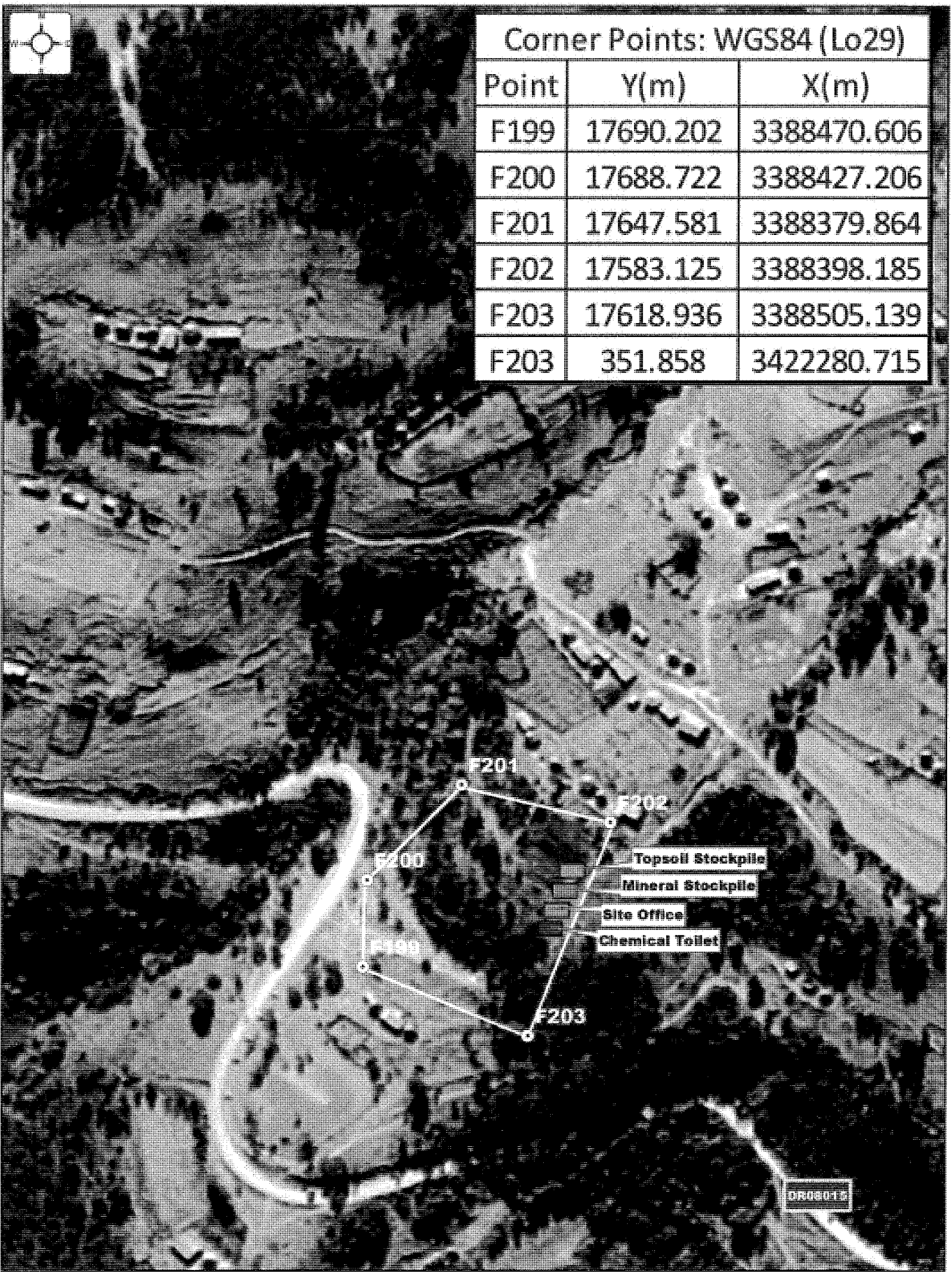


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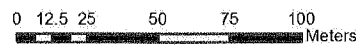


### Corner Points: WGS84 (Lo29)

Point	Y(m)	X(m)
F199	17690.202	3388470.606
F200	17688.722	3388427.206
F201	17647.581	3388379.864
F202	17583.125	3388398.185
F203	17618.936	3388505.139
F203	351.858	3422280.715



TI/ACTIVE PROJECTS/41120 - Alfred Nzo Borrow Pit EMP's (MUR)GIS/Maps & Exports# Site Maps



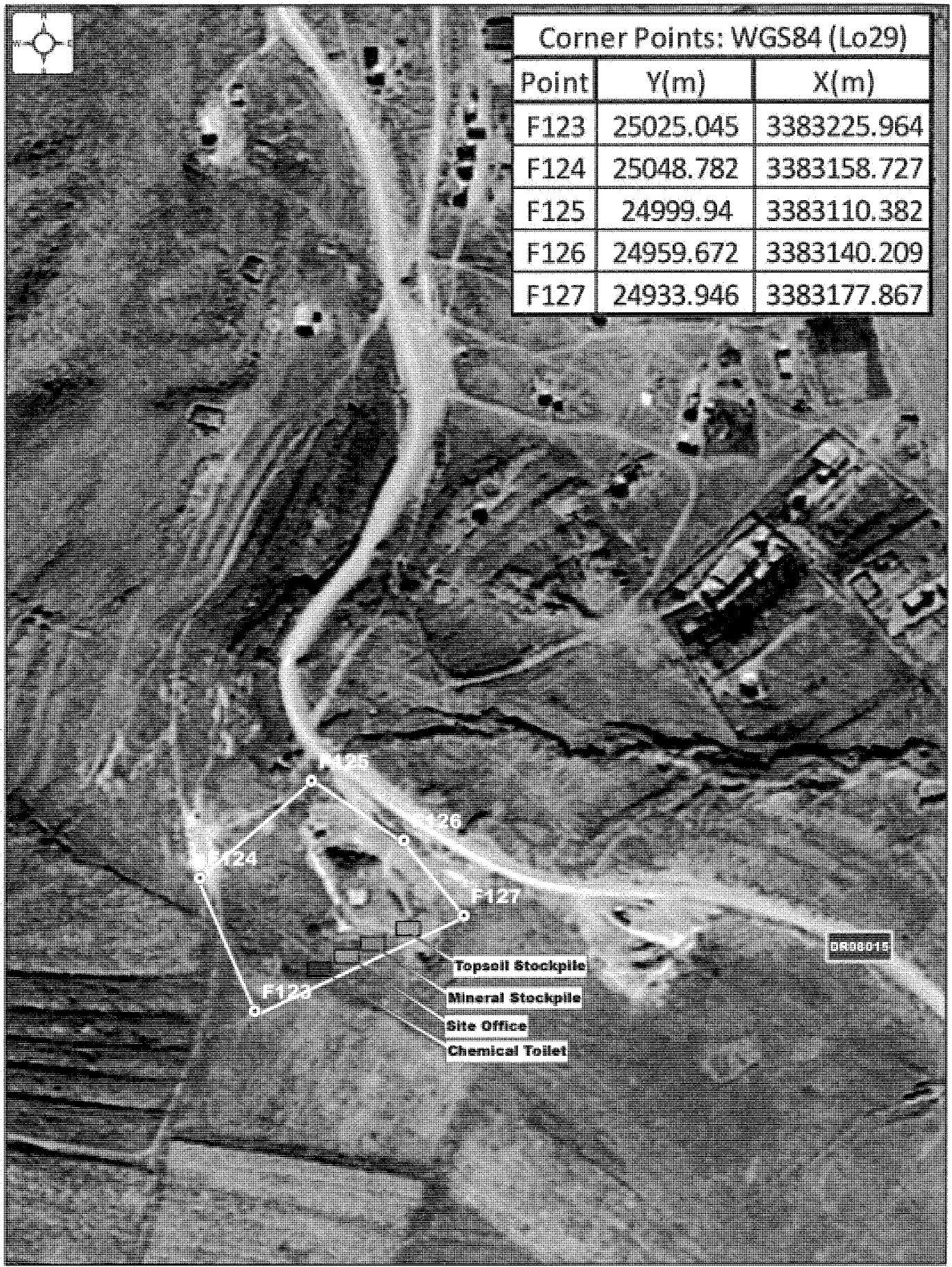




Corner Points: WGS84 (Lo29)

Point	Y(m)	X(m)
F123	25025.045	3383225.964
F124	25048.782	3383158.727
F125	24999.94	3383110.382
F126	24959.672	3383140.209
F127	24933.946	3383177.867

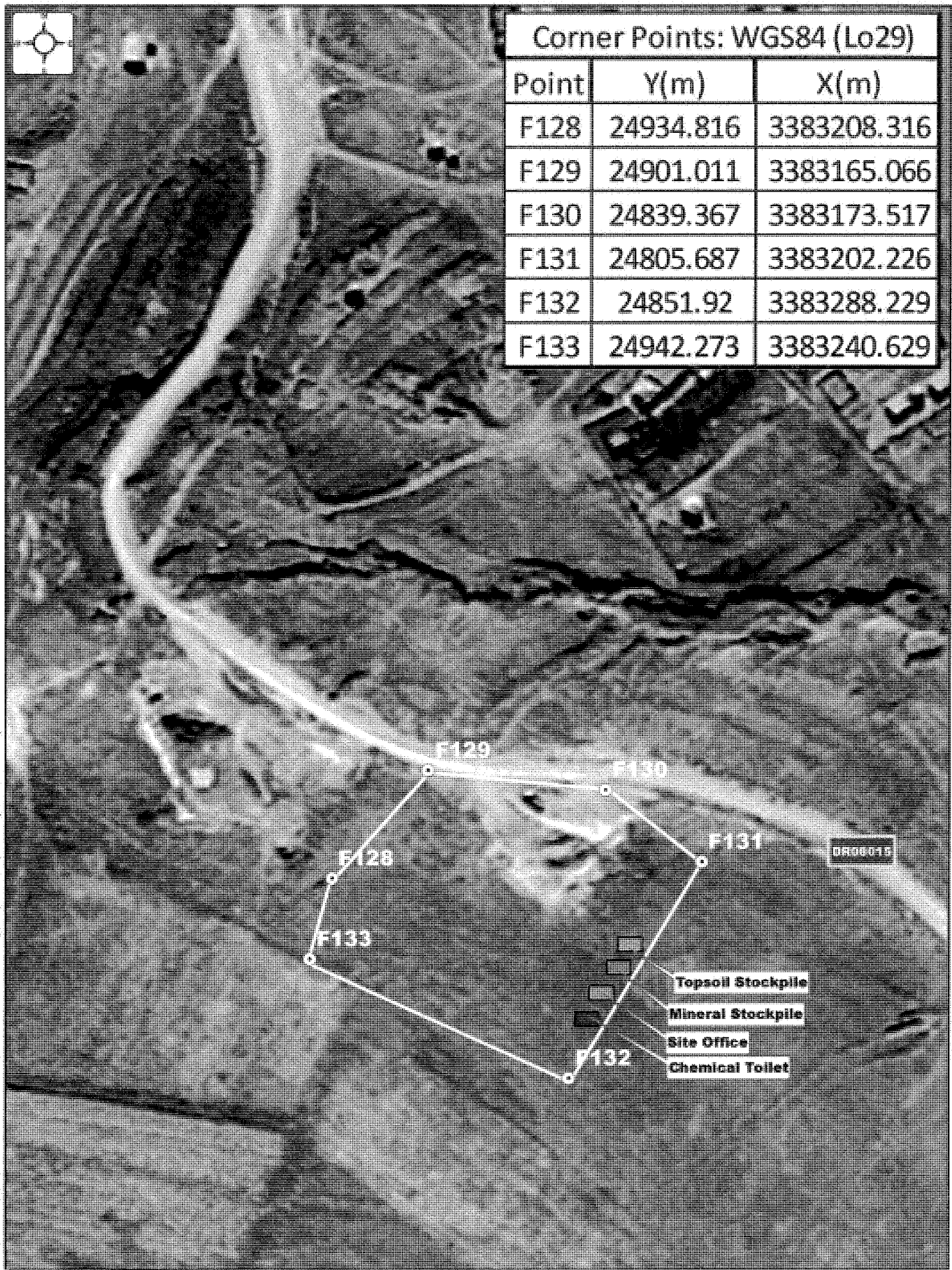
TRAFFIC PROJECTS/41120 - Alfred Nzo Borrow Pit EMP's (M/R)08/01/05 & Expansion Site Map





Corner Points: WGS84 (Lo29)		
Point	Y(m)	X(m)
F128	24934.816	3383208.316
F129	24901.011	3383165.066
F130	24839.367	3383173.517
F131	24805.687	3383202.226
F132	24851.92	3383288.229
F133	24942.273	3383240.629

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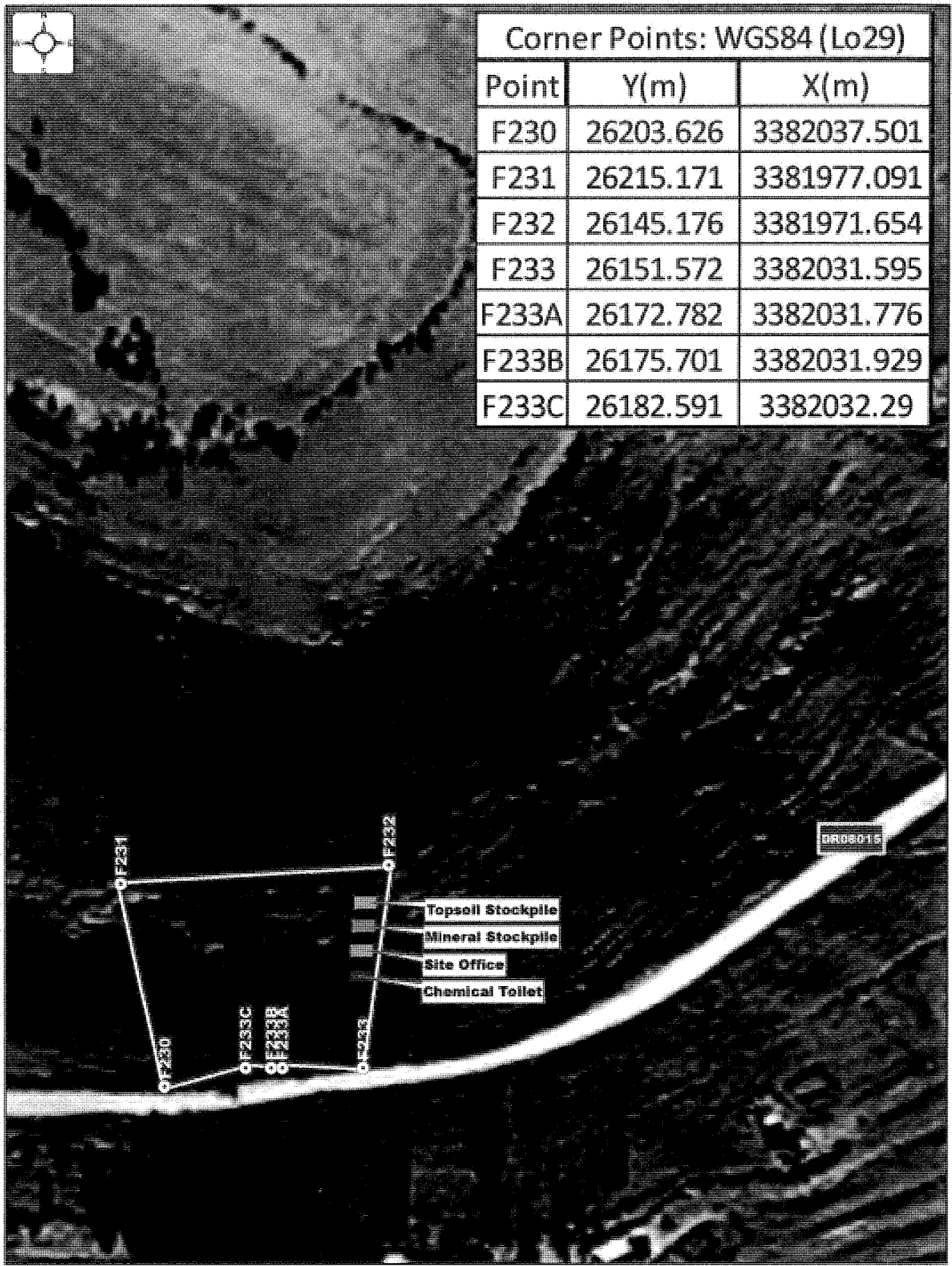




### Corner Points: WGS84 (Lo29)

Point	Y(m)	X(m)
F230	26203.626	3382037.501
F231	26215.171	3381977.091
F232	26145.176	3381971.654
F233	26151.572	3382031.595
F233A	26172.782	3382031.776
F233B	26175.701	3382031.929
F233C	26182.591	3382032.29

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Alfred Nzo Borrow Pit EMP's  
 Road: DR08015  
 Site Layout - BP15



Fig  
2

Scale  
1 : 1 500



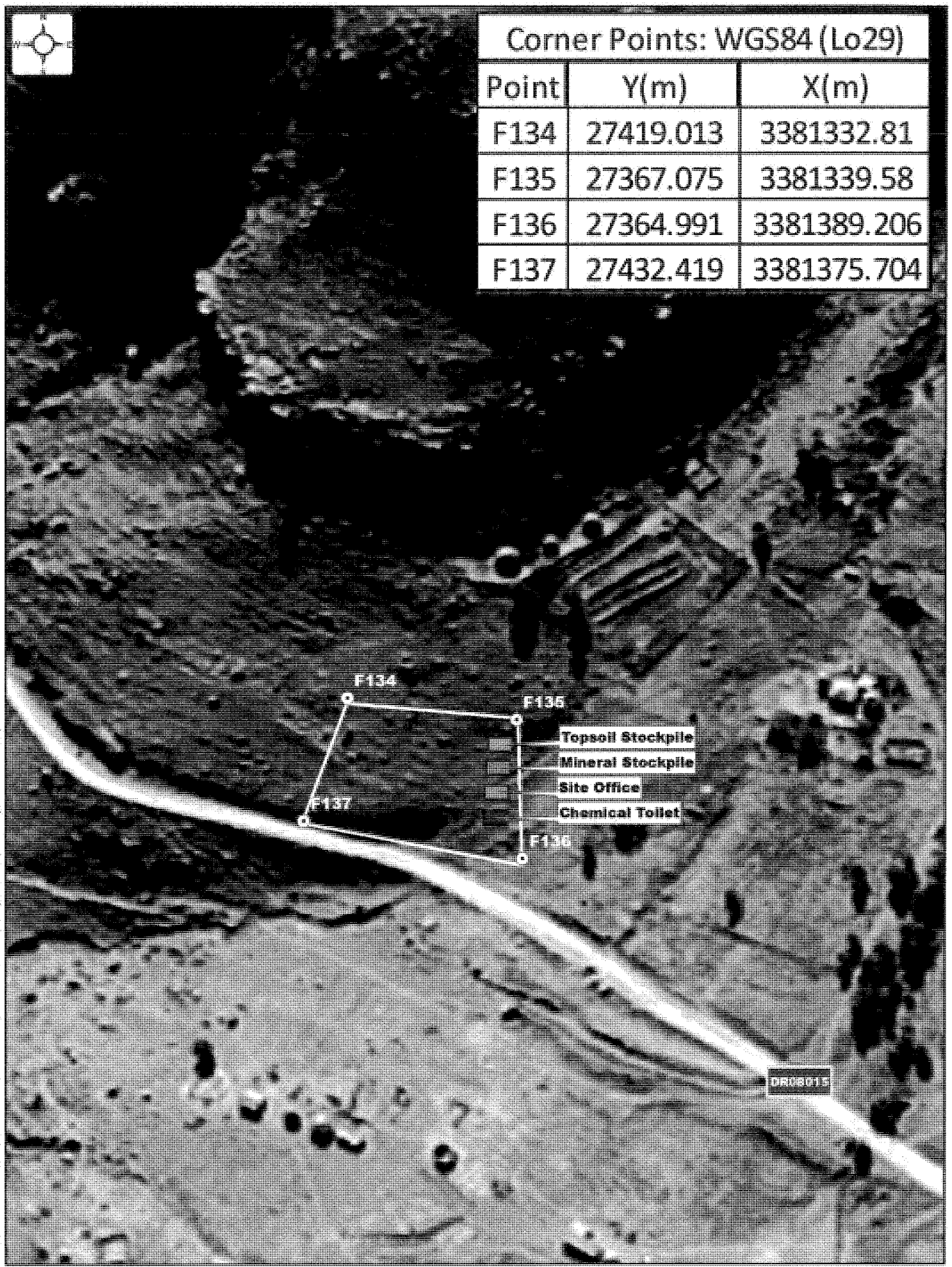
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 HILTON 3245  
 Tel: (033) 343 6789  
 Fax: (033) 343 6788



Corner Points: WGS84 (Lo29)

Point	Y(m)	X(m)
F134	27419.013	3381332.81
F135	27367.075	3381339.58
F136	27364.991	3381389.206
F137	27432.419	3381375.704

ACTIVE PROJECTS\1129 - Alfred Nzo Borrow Pit EMP's (M/R)\GIS\Maps & Exports\# Site Maps





### Corner Points: WGS84 (Lo29)

Point	Y(m)	X(m)
F138	28112.193	3379637.137
F139	28066.44	3379661.516
F140	28117.657	3379742.938
F141	28179.365	3379690.211
F142	28150.321	3379631.675



TERRATEST PROJECTS/1129 - Alfred Nzo Borrow Pit EMP's/MP/03/05/06/07/08/09/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100

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 P.O. Box 794    Tel: (033) 343 6789  
 HILTON 3245    Fax: (033) 343 6788

**Alfred Nzo Borrow Pit EMP's**  
 Road: DR08015  
**Site Layout - BP17**

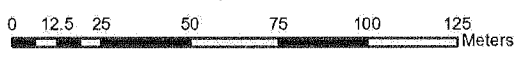


Fig  
2

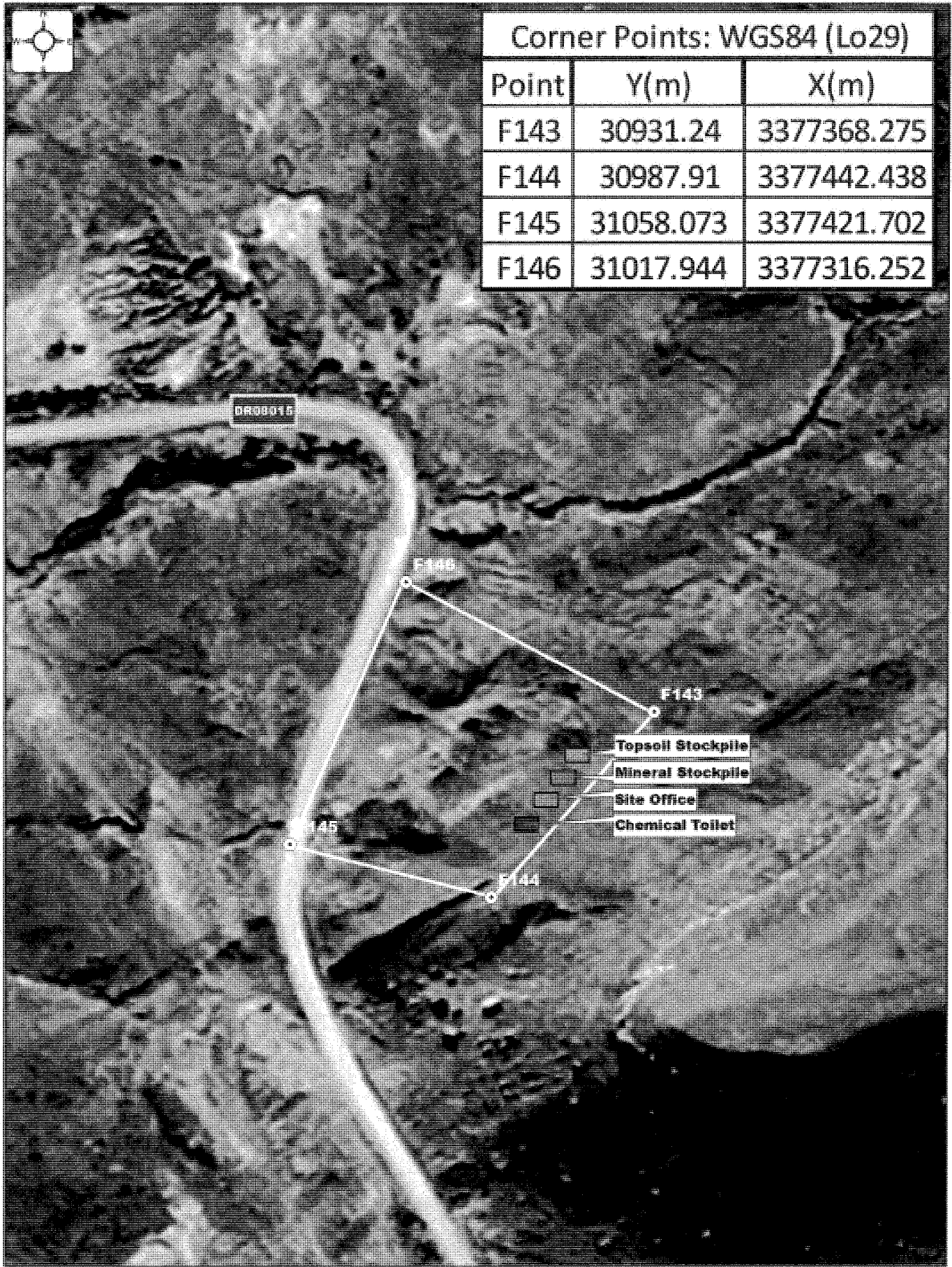
Scale  
1 : 2 000





### Corner Points: WGS84 (Lo29)

Point	Y(m)	X(m)
F143	30931.24	3377368.275
F144	30987.91	3377442.438
F145	31058.073	3377421.702
F146	31017.944	3377316.252



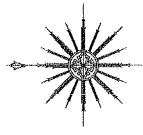
T:\ACTIVE PROJECTS\41129 - Alfred Nzo Borrow Pit EMP's (MVP)\GIS\Maps & Exports# Site Maps





OSMATIC REFERENCE	
No.	Point

NOTES



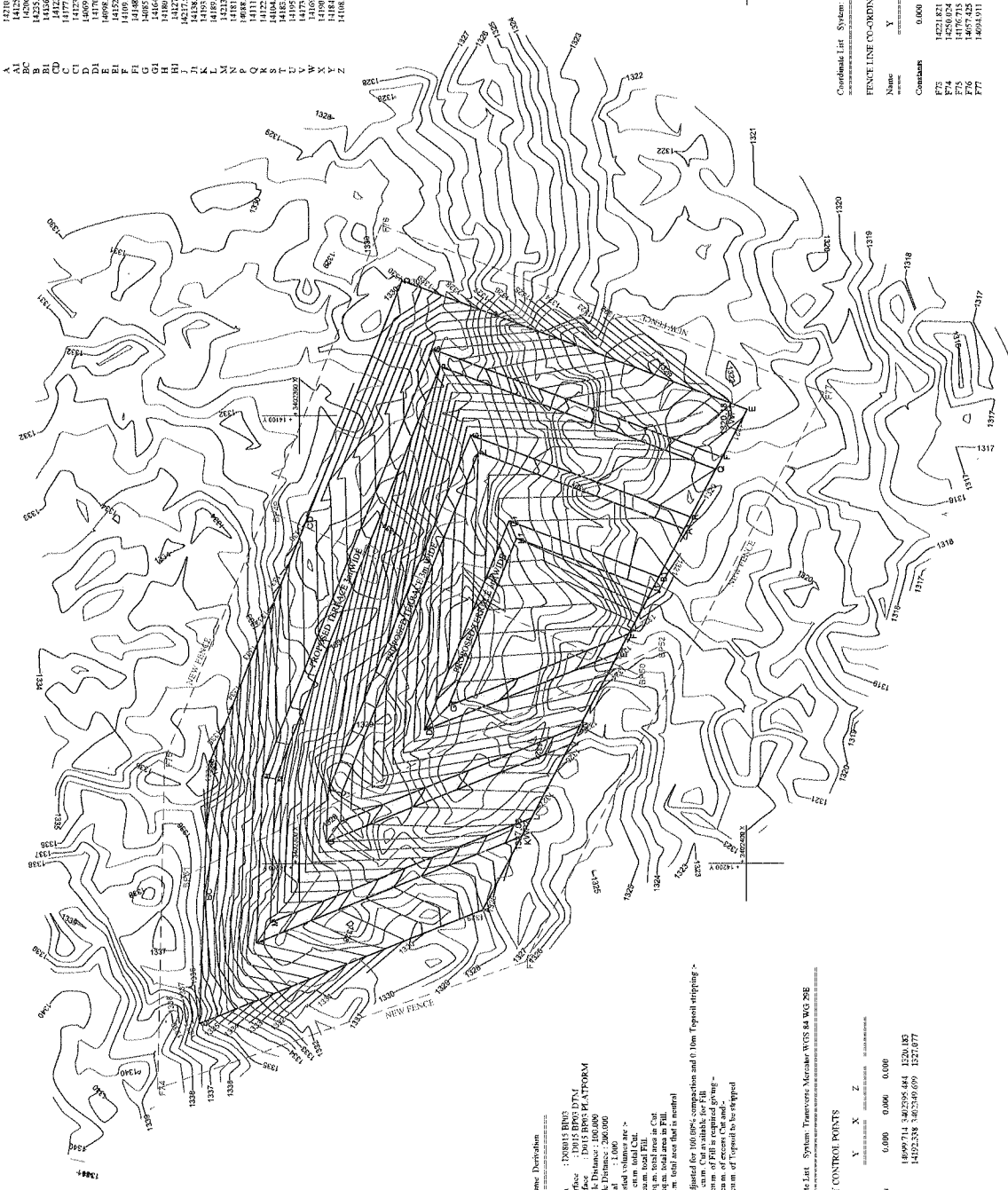
REVISIONS	
No.	Description

Scale 1:1000

SUBJECT SURVEYS CC	
WGS84	
EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	
TERRA-TEST	
D08015 P003 BORROW PIT SURVEY AND PLANNING DESIGN	

Coordinate List System: Transverse Mercator WGS 84 WGS 2011  
PLATFORM SETTINGS OUT CO-ORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
A	14125.246	5402346.971	1328.400
B	14125.246	5402348.532	1328.450
BC	14206.711	5402278.660	1325.800
B	14206.711	5402279.221	1325.850
B	14206.711	5402293.782	1325.900
B	14206.711	5402308.343	1325.950
CD	14125.829	5402301.375	1320.000
C	14177.869	5402279.722	1326.000
D	14069.808	5402323.626	1320.000
D1	14178.188	5402328.650	1324.000
D2	14178.188	5402329.650	1324.000
E	14152.888	5402321.532	1322.700
E1	14109.721	5402354.428	1326.500
F	14109.721	5402354.428	1326.500
F1	14164.799	5402333.439	1324.000
G	14185.155	5402329.884	1326.000
G1	14164.799	5402333.439	1324.000
H	14127.575	5402325.444	1322.600
H1	14237.275	5402250.268	1322.600
I	14108.729	5402378.822	1320.600
J	14189.762	5402321.821	1327.800
K	14189.762	5402321.821	1327.800
L	14189.762	5402321.821	1327.800
M	14189.762	5402321.821	1327.800
N	14189.762	5402321.821	1327.800
O	14189.762	5402321.821	1327.800
P	14189.762	5402321.821	1327.800
Q	14189.762	5402321.821	1327.800
R	14189.762	5402321.821	1327.800
S	14189.762	5402321.821	1327.800
T	14189.762	5402321.821	1327.800
U	14189.762	5402321.821	1327.800
V	14189.762	5402321.821	1327.800
W	14189.762	5402321.821	1327.800
X	14189.762	5402321.821	1327.800
Y	14189.762	5402321.821	1327.800
Z	14189.762	5402321.821	1327.800



Coordinate List System: Transverse Mercator WGS 84 WGS 2011  
FENCE LINE CO-ORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
F72	14221.821	5402350.941	1326.000
F73	14176.715	5402298.528	1325.800
F74	14176.715	5402298.528	1325.800
F76	14067.423	5402318.250	1320.000
F77	14094.931	5402417.521	1322.600

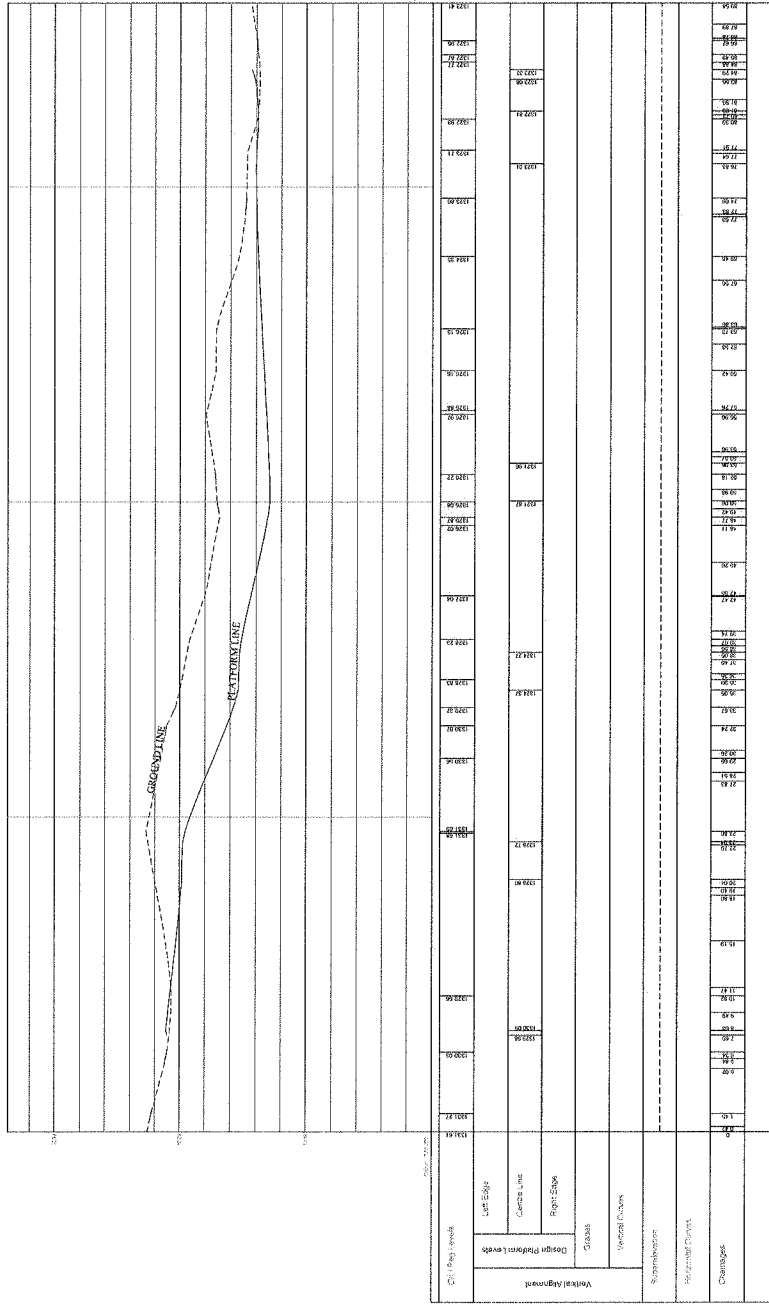
**DTM Volume Description**

Description: D08015 B003 DTM  
Design Surface: D0815 B003 PLATFORM  
Ground Hook Distance: 100.000  
Grid Interval: 1.000  
The unmodified volumes are:  
7191.17 cu m total area in Cut  
400.00 cu m total area in Fill  
4922.07 cu m total Fill  
1.56 cu m total area in Cut and Fill  
This volume is for 100% completion and 10 Ton Topsoil stripping.

14234.8 cu m total area in Cut  
5389.46 cu m total area in Fill is required giving  
9884.23 cu m of excess Cut and  
1185.25 cu m of topsoil to be stripped

Coordinate List System: Transverse Mercator WGS 84 WGS 2011  
SURVEY CONTROL POINTS

Name	Y	X	Z
Constants	0.000	0.000	0.000
W70	14049.714	5402305.441	1320.145
W72	14052.538	5402349.699	1327.877



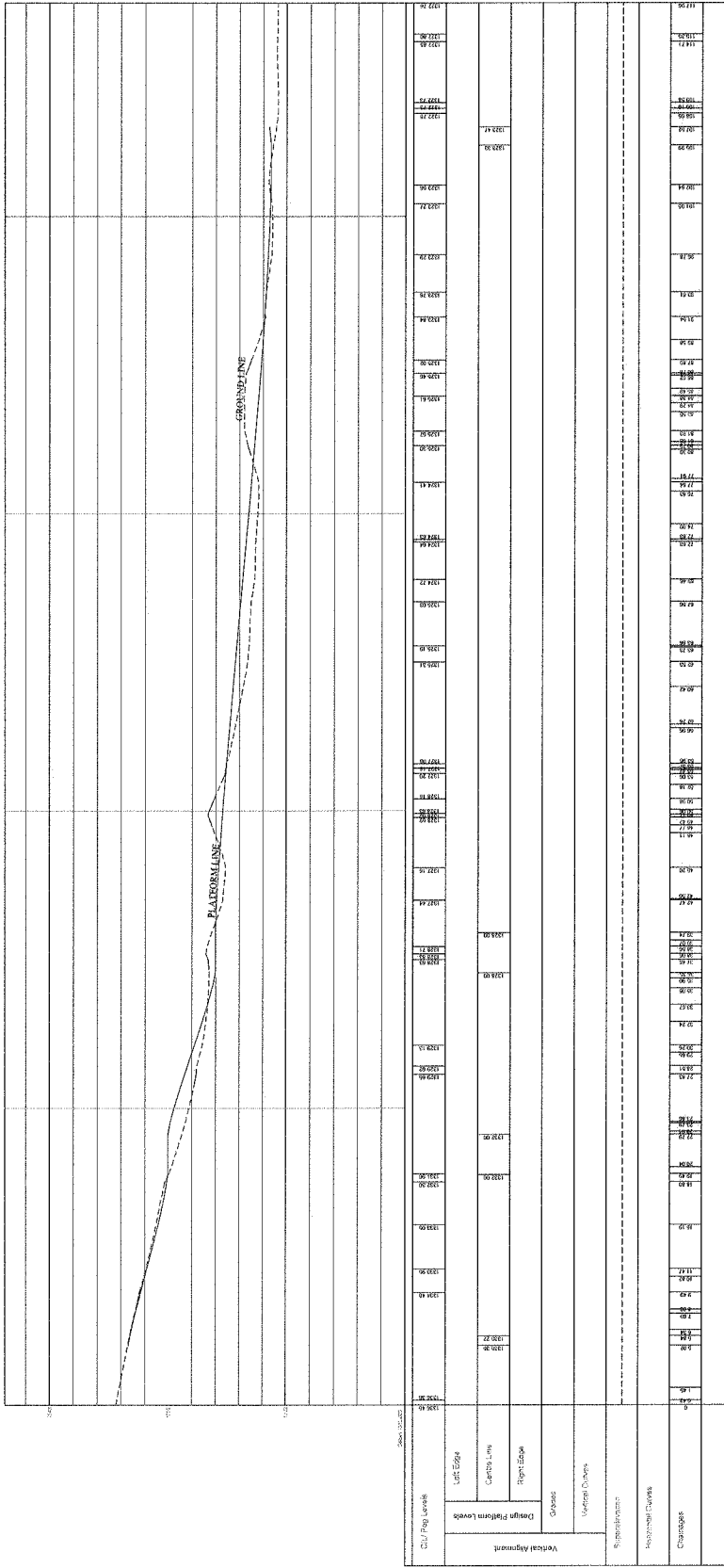
Long Section for 0.00 to 89.58 (BP49 TO BP50)

DATE: 2 JUNE 2011  
 CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT  
 DRAWN BY: GORDON DRAKE  
 DESIGNED BY: SABLE SURVEYS CC  
 SURVEYORS: SABLE SURVEYS CC

ENGINEERS: TERRACEST

TITLE: ROAD CROSS-SECTION SURVEY AND PLANNING

SCALES  
 Horizontal Scale: 400  
 Vertical Scale: 400  
 DRAWING No.



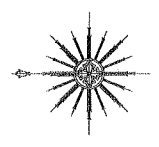
Long Section for 0.00 to 117.96 (BP51 to BP52)

DATE: 2 JUNE 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	TITLE: DORRIS BORROW PIT OF SURVEY AND PLANTATION	SCALES Horizontal Scale: 400 Vertical Scale: 400
DRAWN BY: GORDON BRACE	DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: THREATEST	DRAWING NO.
SURVEYORS: SABLE SURVEYS CC			

Coordinate List System: Transverse Mercator WGS 84 WGS 2011

PLATFORM SETTING OUT CO-ORDINATES

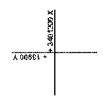
Name	Y	X	Z
Constant	0.000	0.000	0.000
A	13981886	3401158.479	13340.000
AI	13959016	3401156.314	1339.000
B	14077716	3401293.172	1340.000
C	14108244	3401155.105	1331.000
CI	14081354	3401404.389	1343.000
DI	14088234	3401103.659	1340.000
E	14061806	3401071.172	1343.000
EI	13989335	3401075.072	1340.000
F	13976313	3401101.015	1338.000
FI	13971240	3401081.855	1339.000
G	14060451	3401085.255	1340.000
GI	14056338	3401117.205	1339.000
H	14079772	3401439.418	1347.000
K	14074108	3401118.295	1335.000
LI	14044390	3401158.867	1339.000
MI	14053485	3401190.363	1344.000
NI	13955262	3401170.806	1339.000
O	14054954	3401448.237	1347.000
PI	14053273	3401127.161	1344.000
RI	14106117	3401099.317	1344.000
SI	14055242	3401116.258	1339.000
T	13982854	3401087.469	1339.000
TI	13977101	3401098.268	1338.000
UI	13966453	3401123.448	1337.000
VI	14011859	3401026.546	1337.000
W	14051907	3401107.751	1340.000
XI	14052758	3401128.254	1338.000
Y	14059505	3401424.564	1338.000
YI	14049054	3401173.574	1340.000
Z	13958232	3401159.250	1339.000
ZI	13965230	3401170.065	1338.000



Coordinate List System: Transverse Mercator WGS 84 WGS 2011

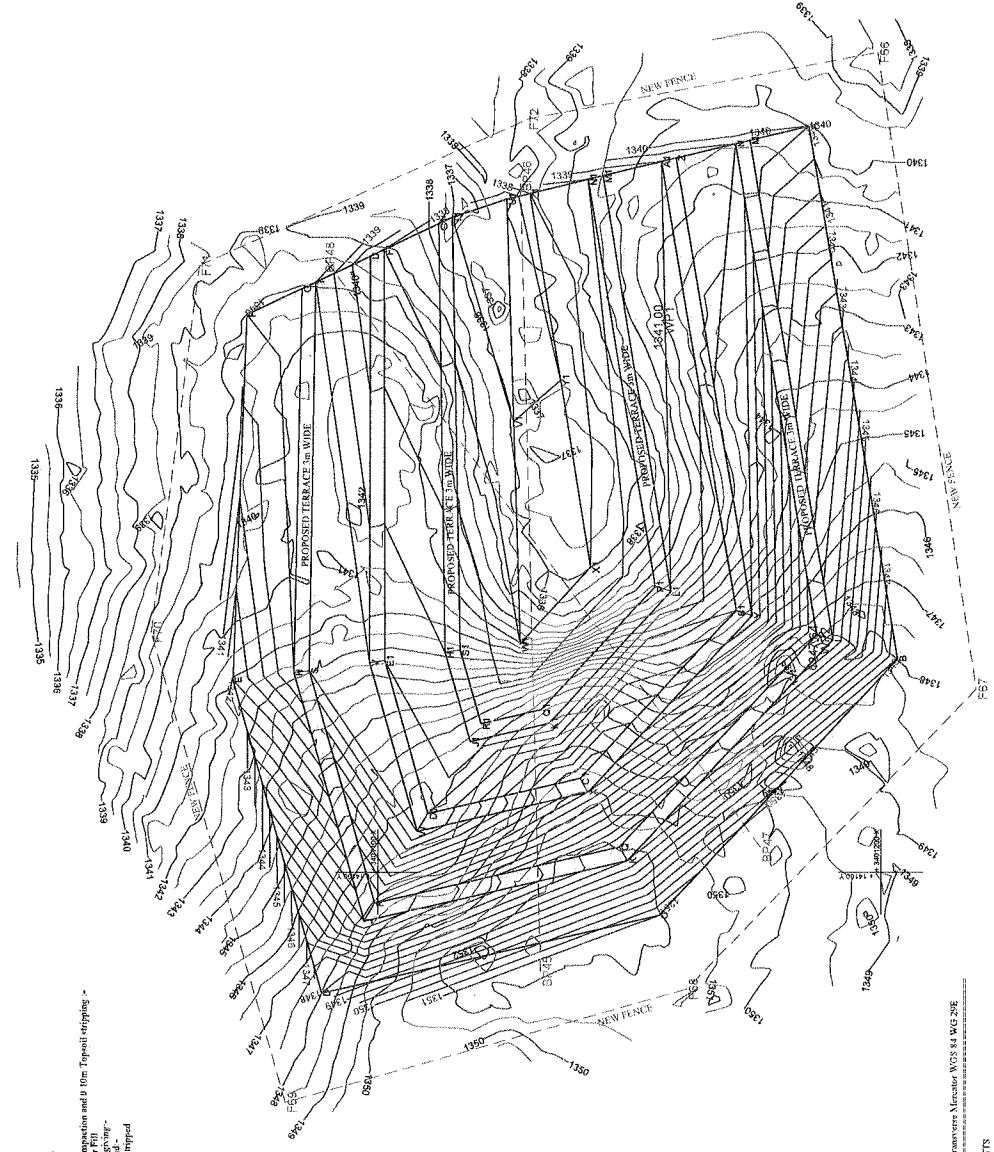
FENCE LINE CO-ORDINATES

Name	Y	X	Z
Constant	0.000	0.000	0.000
F66	13978440	3401165.120	1339.000
F67	14067701	3401181.986	1340.000
F68	14122208	3401161.644	1340.000
F69	14145471	3401081.126	1340.000
F71	13979626	3401064.568	1340.000
F72	13976616	3401129.586	1340.000



DTM Volume Description

Description: D0815 BDM  
 Ground Surface: D015 BDM DTM  
 Design Surface: D015 BDM PLATFORM  
 Design Elevation: 100.000  
 Design Elevation: 200.000  
 Grid Interval: 0.500  
 Cell Area: 0.25000000  
 544.72 cum. total FILL  
 144.545 cum. of FILL  
 144.545 cum. of FILL  
 144.545 cum. of FILL  
 144.545 cum. of FILL  
 696.07 cum. of FILL in required giving  
 9790.02 cum. of excess cut and  
 116.05 cum. of deposit to be stripped



Coordinate List System: Transverse Mercator WGS 84 WGS 2011

SURVEY CONTROL POINTS

Name	Y	X	Z
Constant	0.000	0.000	0.000
WP1	13986444	3401154.115	1340.000
WP2	14054103	3401173.236	1347.649

Scale 1:1000

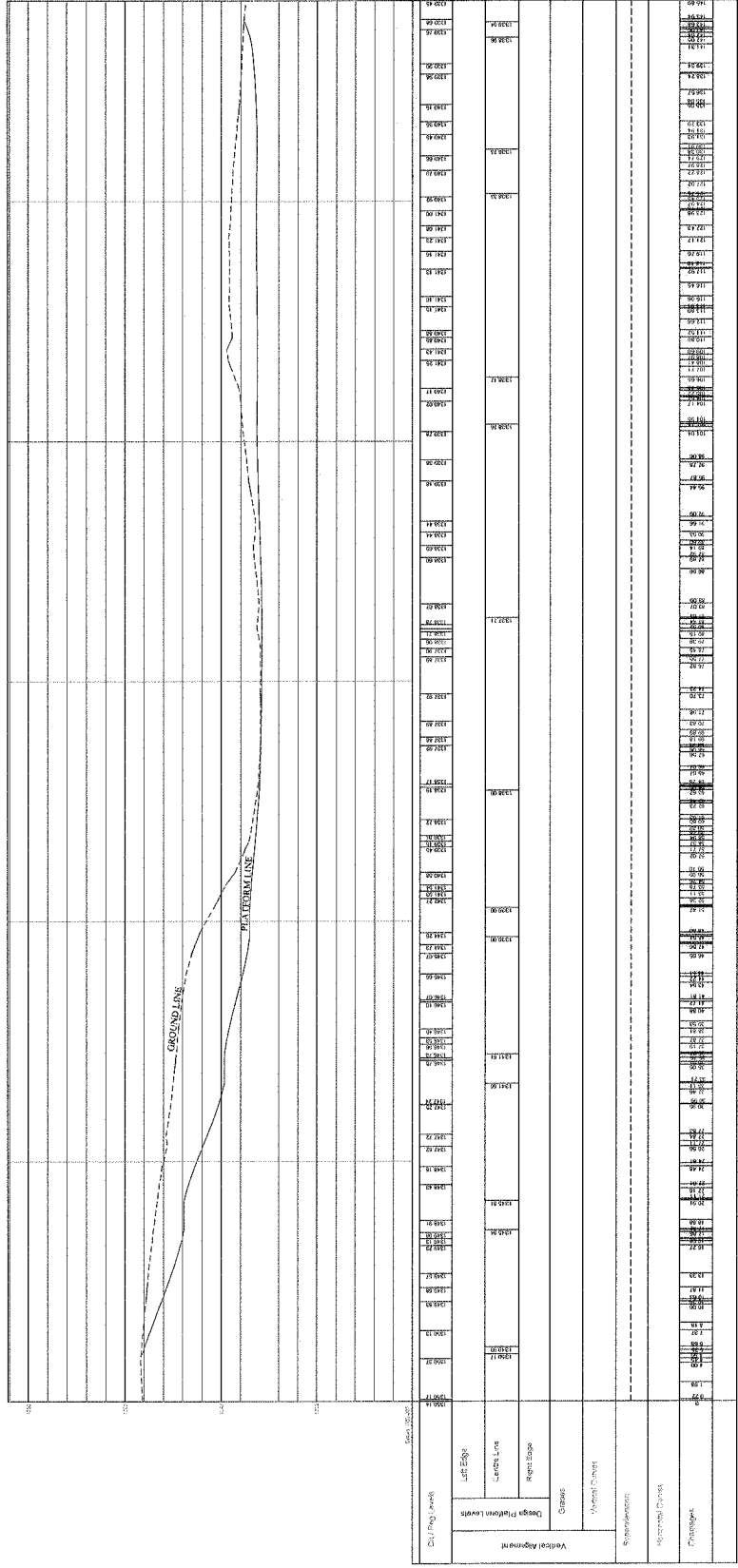
SABLE SURVEYS CC

WGS2

EASTERN CAPE  
DEPARTMENT OF ROADS  
AND TRANSPORT

TERRA VEIT

D0815 BDM  
BORROW PIT SURVEY  
AND PLATFORM DESIGN



Long Section for 0.00 to 145.89 (BP47 to BP48)

DATE: 2 JUNE 2011  
 DRAWN BY: FORDON DRAKE  
 DESIGNED BY: NABE SURVEYS CO.  
 STRYVENS, SCHEE SURVEYS CO.

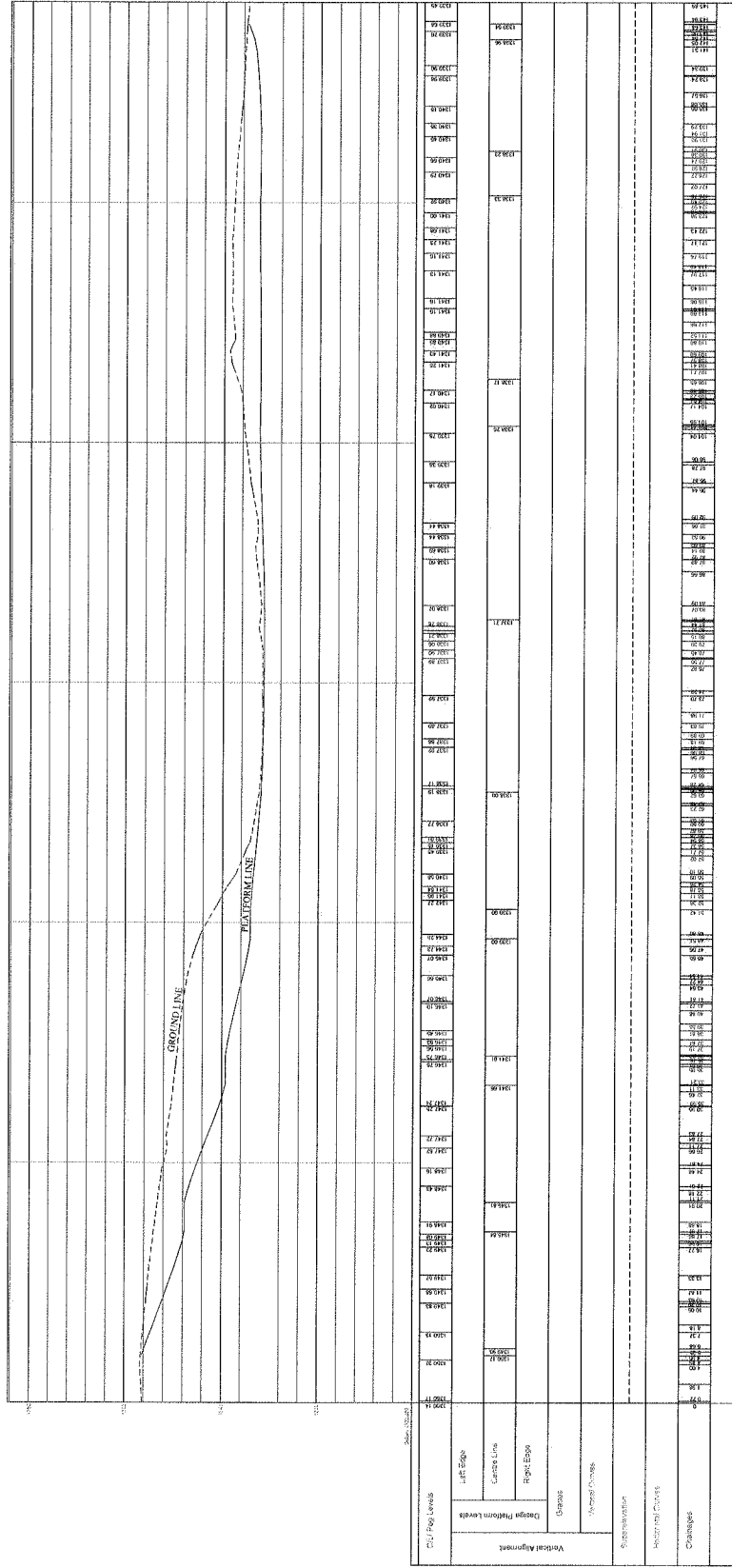
COUNTY OF WISCONSIN DEPARTMENT  
 OF TRANSPORTATION

ENGINEERS: TERRACOST

TITLE: DOUBLE BORROW PIT OF SURVEY AND  
 PLATFORM DESIGN

SCALE:  
 HORIZONTAL Scale: 1"=50'  
 Vertical Scale: 5"

DRAWING No.

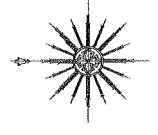


Long Section for 0.00 to 145.89 (BP47 TO BP48)

DATE: 2 JUNE 2011	CLIENT: EASTERN CARE DEPARTMENT OF ROADS AND TRANSPORT	TITLE: DORSET BORROW PIT 04 SURVEY AND PLATFORM DESIGN	SCALE: Horizontal Scale: 500 Vertical Scale: 500
DRAWN BY: GORDON BRAKI	DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: TERNATIST	DRAWING No.
SERVEYS SABLE SURVEYS CC			

DRAWING REFERENCE  
No. 1. Date: 10/19/14

NOTES



REVISIONS  
No. Description Date  
1. Initial Issue 10/19/14

Scale 1:750

SAMPLE SHEETS  
W329  
COUNTY OF CALIFORNIA  
DEPARTMENT OF ROADS  
AND TRANSPORT  
PERKINS TEST  
DORRIS BRAY  
AND PLANNING DESIGN

Coordinate List System: Transverse Mercator WGS 84 WGS 2NE

PLATFORM SETTINGS OUT COORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
A	14115.754	3398796.634	1210.800
A1	14238.696	3398746.896	1209.350
B	14060.593	3398760.179	1205.000
B1	14012.719	3398833.427	1204.000
C	13975.884	3398851.734	1203.000
C1	13962.408	3398816.511	1218.800
D	13961.179	3398746.875	1216.000
D1	14016.586	3398743.247	1208.500
E	14002.465	3398775.225	1206.500
F	14017.487	3398841.165	1226.000
F1	14070.600	3398807.445	1216.000
G	14070.345	3398838.448	1221.000
G1	14070.600	3398807.445	1216.000
H	14070.600	3398807.445	1216.000
H1	14070.600	3398807.445	1216.000
I	14070.600	3398807.445	1216.000
J	14070.600	3398807.445	1216.000
J1	14070.600	3398807.445	1216.000
K	14070.600	3398807.445	1216.000
K1	14070.600	3398807.445	1216.000
L	14070.600	3398807.445	1216.000
L1	14070.600	3398807.445	1216.000
M	14070.600	3398807.445	1216.000
M1	14070.600	3398807.445	1216.000
N	14070.600	3398807.445	1216.000
N1	14070.600	3398807.445	1216.000
O	14070.600	3398807.445	1216.000
O1	14070.600	3398807.445	1216.000
P	14070.600	3398807.445	1216.000
P1	14070.600	3398807.445	1216.000
Q	14070.600	3398807.445	1216.000
Q1	14070.600	3398807.445	1216.000
R	14070.600	3398807.445	1216.000
R1	14070.600	3398807.445	1216.000
S	14070.600	3398807.445	1216.000
S1	14070.600	3398807.445	1216.000
T	14070.600	3398807.445	1216.000
T1	14070.600	3398807.445	1216.000
U	14070.600	3398807.445	1216.000
U1	14070.600	3398807.445	1216.000
V	14070.600	3398807.445	1216.000
V1	14070.600	3398807.445	1216.000
W	14070.600	3398807.445	1216.000
W1	14070.600	3398807.445	1216.000
X	14070.600	3398807.445	1216.000
X1	14070.600	3398807.445	1216.000
Y	14070.600	3398807.445	1216.000
Y1	14070.600	3398807.445	1216.000
Z	14070.600	3398807.445	1216.000

Coordinate List System: Transverse Mercator WGS 84 WGS 2NE

FENCE LINE COORDINATES

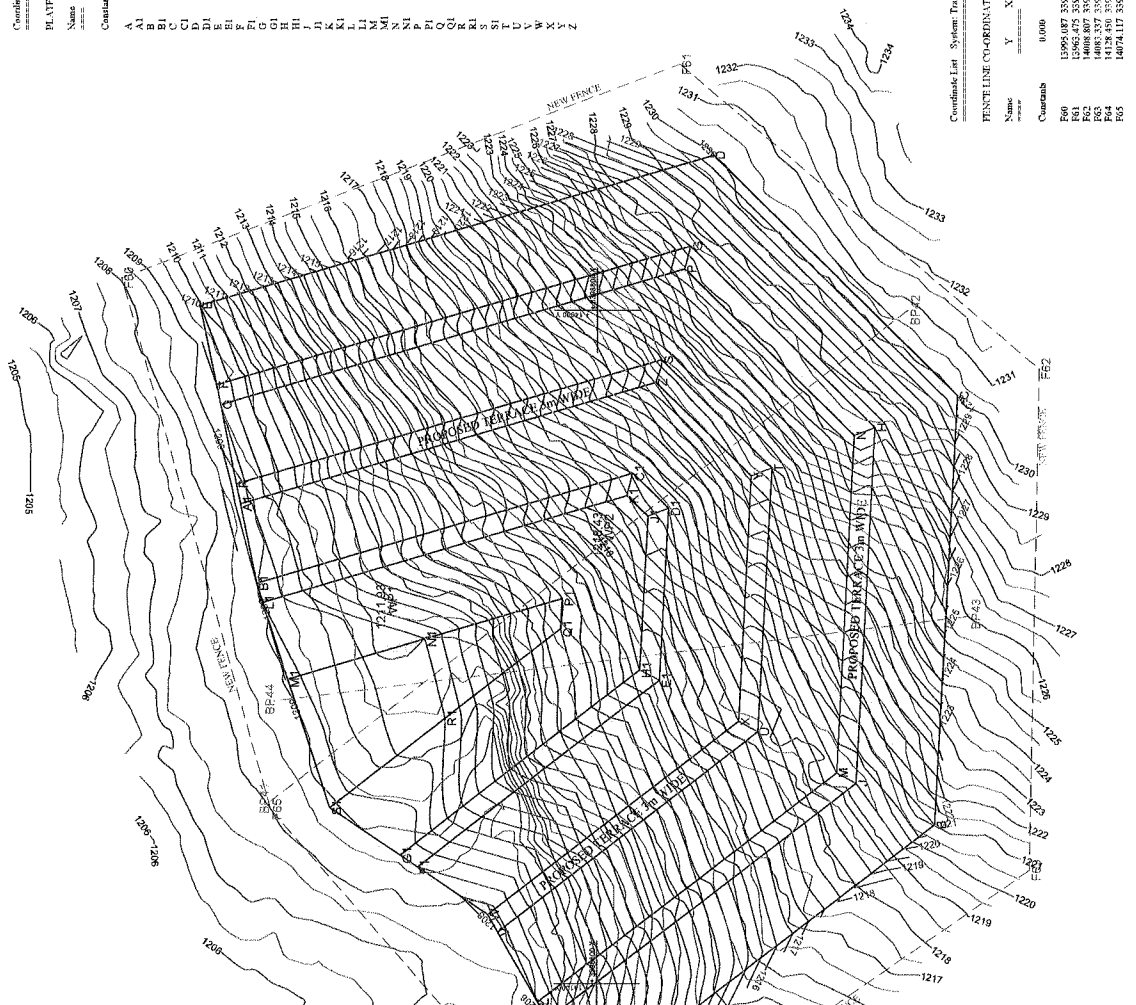
Name	Y	X	Z
Constants	0.000	0.000	0.000
F50	13995.082	3398726.340	
F51	13962.475	3398812.111	
F52	14008.807	3398865.678	
F53	14128.450	3398798.140	
F54	14074.117	3398751.302	
F55			

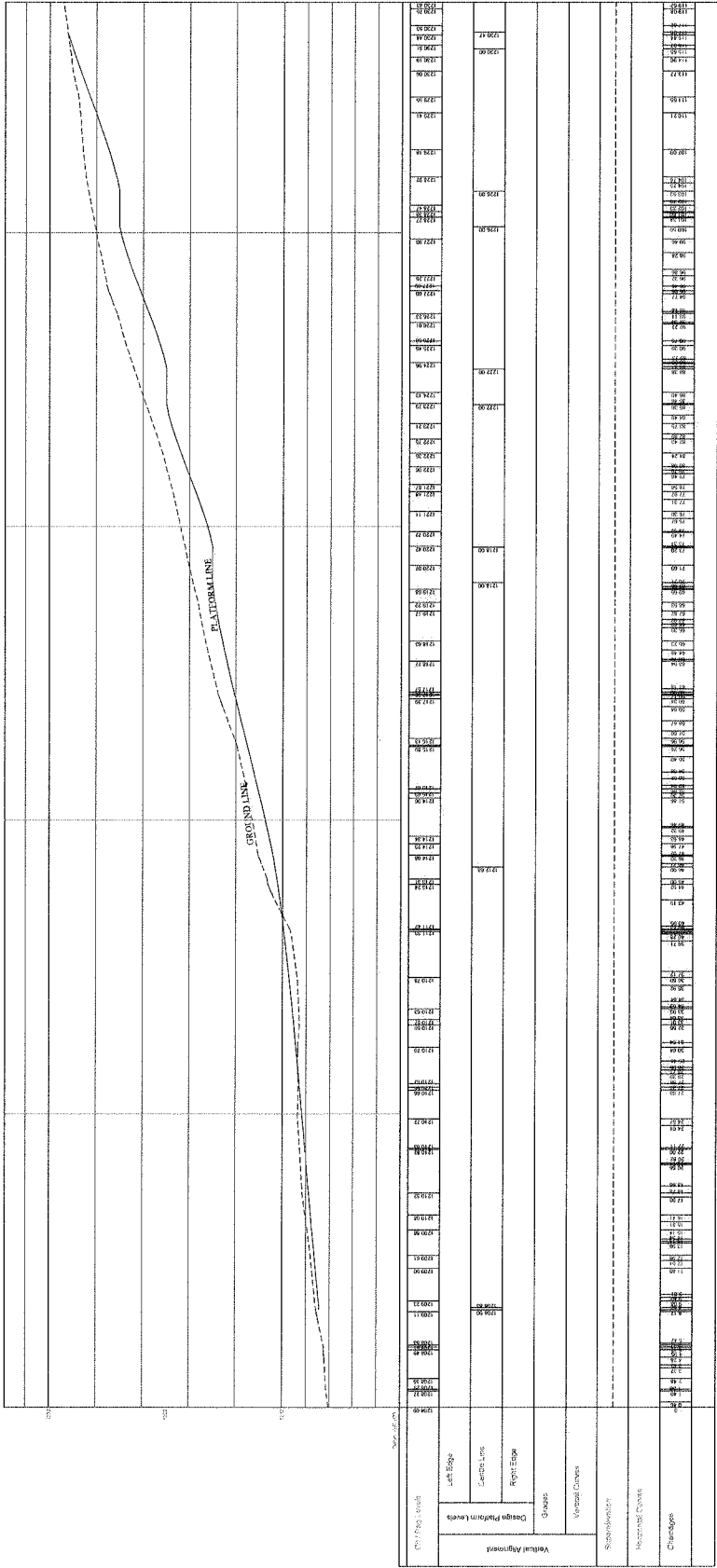
DTM Volume Definition  
Description : D0615 BROW  
Ground Surface : D015 BROW DTM  
Design Surface : D015 BROW PLATFORM  
Design Method : Triangulation  
Design File Distance : 200.000  
Grid Interval : 0.200  
The computed volumes are :  
7864.17 cu. m. total area in Cut  
1541.38 cu. m. total area in Fill  
3973.78 cu. m. total area in Fill  
Volumes adjusted for 100% compaction and 0.10m Topsoil stripping :  
1846.90 cu. m. of Fill in estimated group  
4625.68 cu. m. of excess Cut available  
1091.98 cu. m. of Topsoil to be stripped

Coordinate List System: Transverse Mercator WGS 84 WGS 2NE

SURVEY CONTROL POINTS

Name	Y	X	Z
Constants	0.000	0.000	0.000
WP1	14043.865	3398768.408	1211.926
WP2	14022.251	3398807.752	1218.425

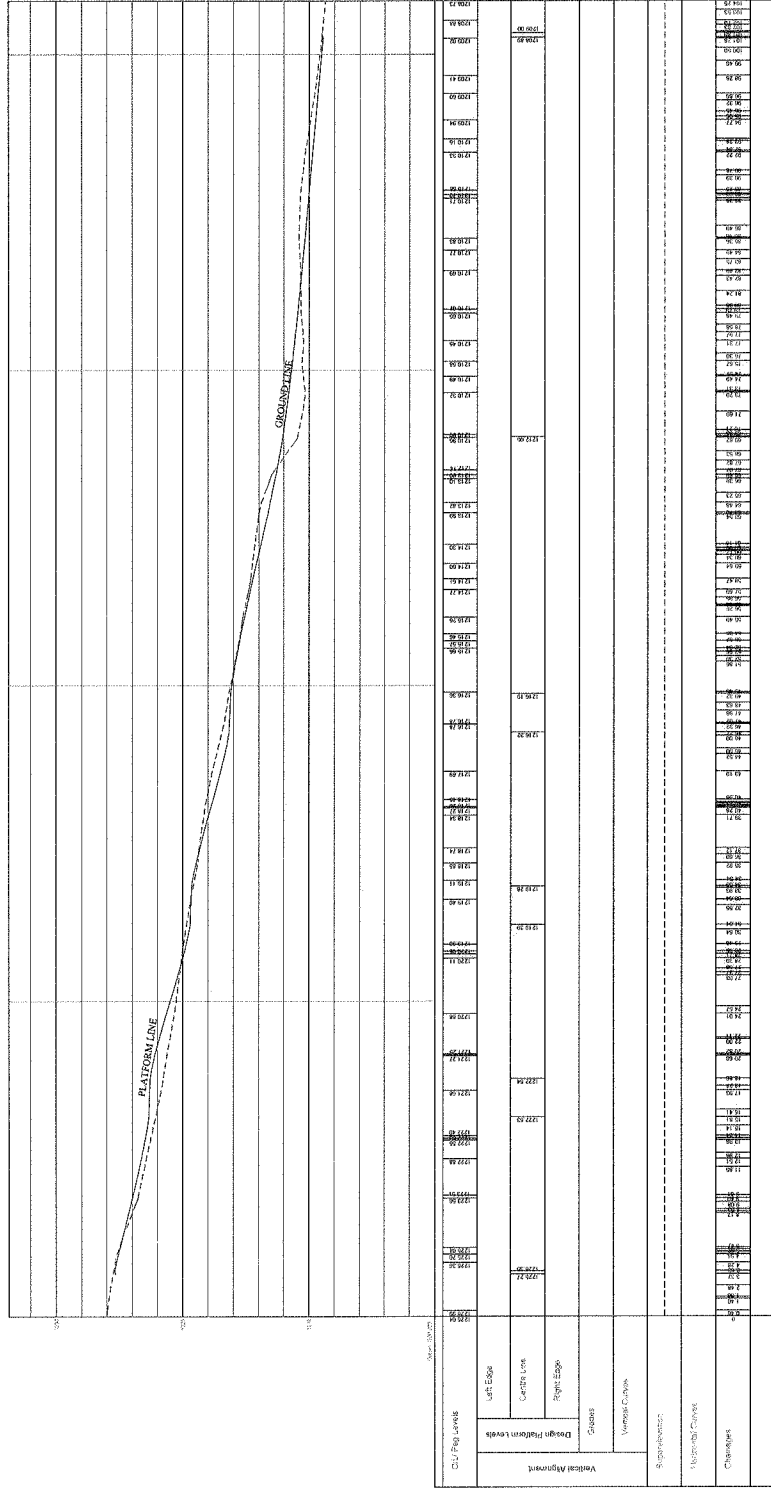




Long Section for 0.00 to 119.62 (BP41 to BP42)

DATE: JUNE 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	PROJECT: THE RING'S BARRIERS SURVEY AND PLATFORM DESIGN	SCALE: Horizontal Scale: 400 Vertical Scale: 400
DRAWN BY: GORDON DRAKE	DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: TERKATSE	DRAWING NO.
SURVEYORS: SABLE SURVEYS CC			





Long Section for 0.00 to 104.25 (BP43 to BP44)

DATE: 1 JUNE 2011	STATE OF MICHIGAN DEPARTMENT OF HIGHWAY TRANSPORTATION	TITLE: DEBRIS BARRIERS SURVEY AND PLATFORM DESIGN	SCALE: National Scale: 600 Vertical Scale: 400
DRAWN BY: GORDON DRAKE	ENGINEERS: TERRA TEST		DRAWING NO:
DESIGNED BY: SABLE SURVEYS CC			
BY: TERRY SABLE SURVEYS CC			

DRAWING REFERENCE

NOTES

Scale 1:750

REVISIONS

DATE

BY

APPROVED

PROJECT

SCALE

SCALE 1:750

SCALE SURVEY CO.

WQ29

EASTERN CAMP ROADS AND TRANSPORT

TERRAFEST

DORRIS BING UNIVERSITY AND PLATFORM DESIGN



Coordinates List System: Transverse Mercator WGS 84 WQ 29E

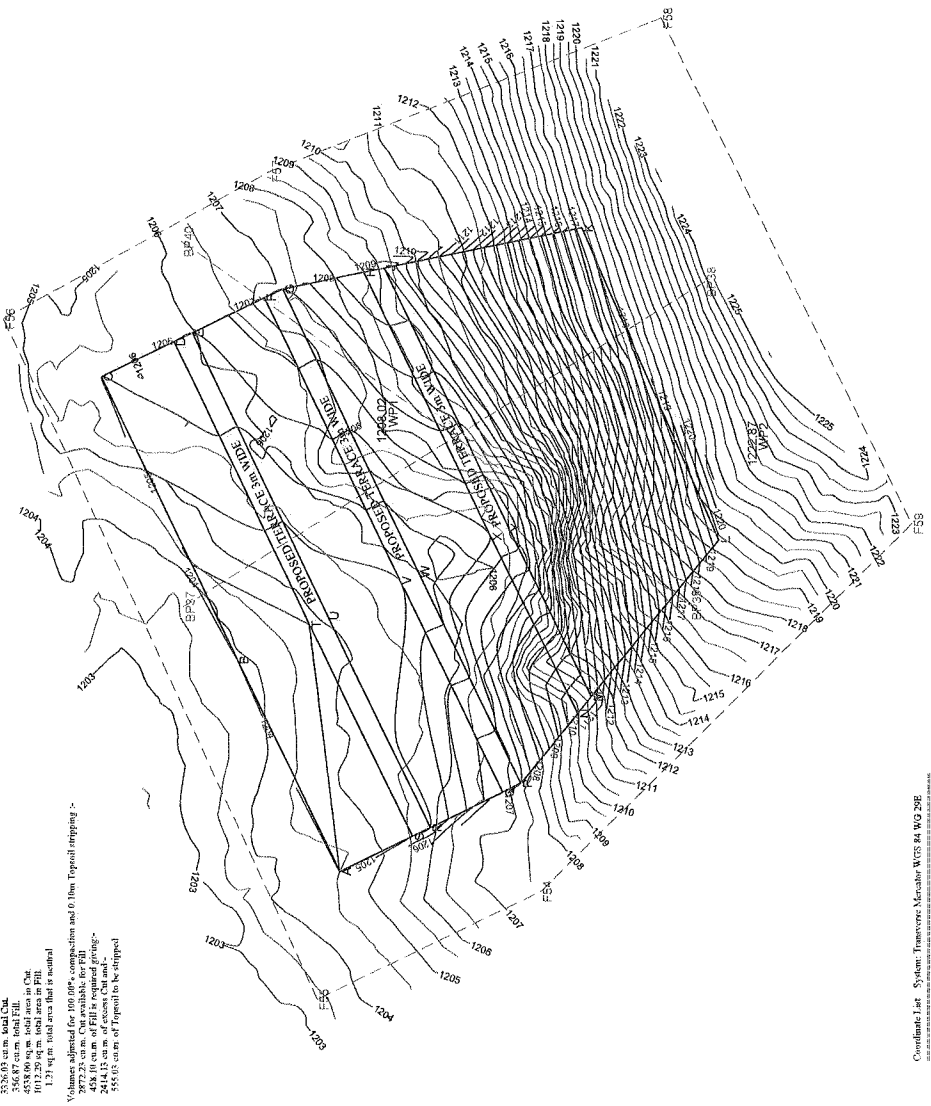
PLATFORM SETTING OUT CO-ORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
A	13154.757	339782.40	6.81
B	13172.233	339782.250	1204.000
C	13175.412	339782.705	1206.000
D	13174.407	339781.847	1206.000
E	13168.482	339783.513	1207.000
F	13165.579	339784.051	1208.500
G	13168.805	339782.462	1217.500
H	13165.748	339786.587	1217.000
I	13161.159	339782.656	1216.000
J	13141.559	339787.623	1207.000
K	13148.638	339785.425	1207.000
L	13146.477	339785.458	1207.000
M	13117.866	339785.071	1204.500
N	13111.464	339784.510	1205.000
O	13110.072	339782.288	1205.000
P	13105.233	339786.685	1206.000

Coordinates List System: Transverse Mercator WGS 84 WQ 29E

FENCE LINE CO-ORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
F54	13197.641	339780.629	
F55	13173.775	339787.388	
F56	13169.543	339780.083	
F58	13167.641	339788.244	
F59	13165.089	339782.549	



DTM Volume Deviation

Description : TR08015 BR06

Ground Surface : D0151 BR06 DTM

Design Level : 1.000000

Ground Hole Distance : 100.0000

Design Hole Distance : 200.0000

The unutilized volumes are :

3336.03 cu m total cut

4538.60 cu m total area in cut

1017.20 sq m total area in fill

1.71 sq m total area that is neutral

Volume adjusted for 100.00% compaction and 0.10m Porosity stripping :-

268.70 cu m of excess cut and

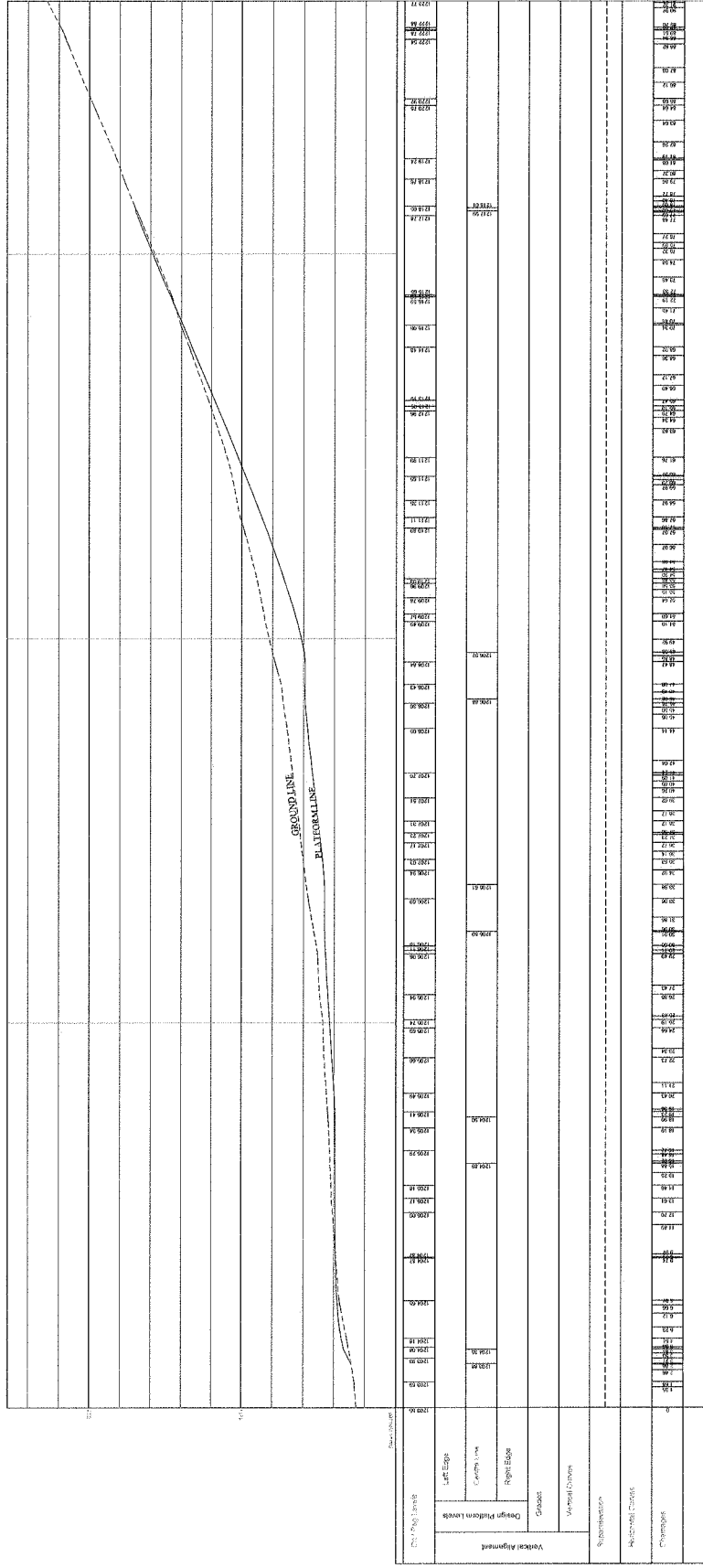
2414.13 cu m of excess cut and

555.03 cu m of Porosity to be stripped

Coordinates List System: Transverse Mercator WGS 84 WQ 29E

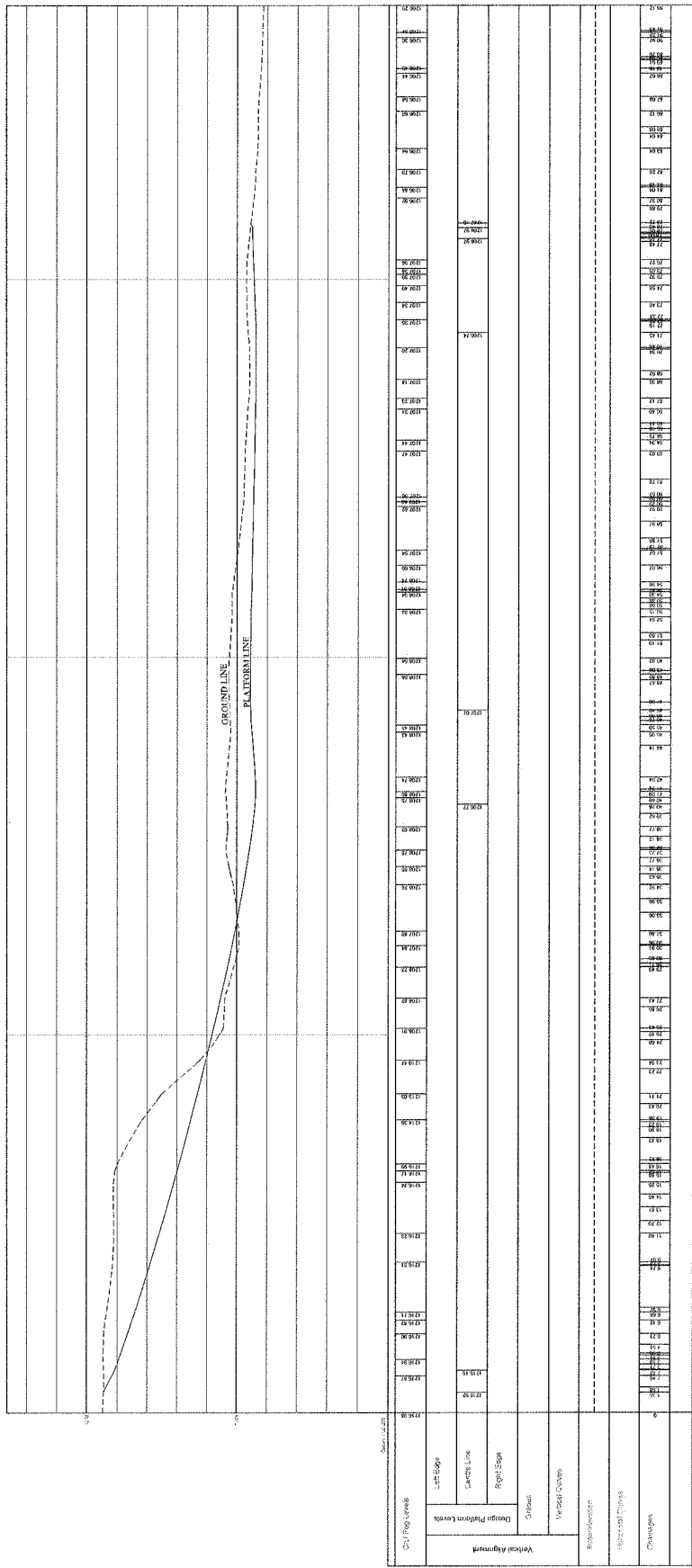
SURVEY CONTROL POINTS

Name	Y	X	Z
Constants	0.000	0.000	0.000
W20	13086.510	339787.403	1206.017
W22	13089.503	339790.684	1222.654



Long Section for 0.00 to 91.43 (BP37 TO BP38)

DATE: 30 MAY 2011	STATE UNIVERSITY OF CALIFORNIA DEPARTMENT OF HIGHWAYS AND TRANSPORTATION	SCALE: Horizontal Scale: 300 Vertical Scale: 300
DRAWN BY: GORDON DRAKE	ENGINEERS: TERRATEST	DRAWING No.
DESIGNED BY: SABLE SURVEYS, C/P	TITLE: MARIKS BORROW PIT OF SURVEY AND PLATFORM DESIGN	
SURVEYORS: SABLE SURVEYS, C/P		

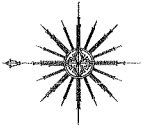


Long Section for 0.00 to 93.12 (BP39 to BP40)

DATE: 30 MAY 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	TITLE: DORBIT BORROW PIT 06 SURVEY AND PLATFORM DESIGN	DRAWING NO.
DRAWN BY: GORDON DRAKE	ENGINEERS: TERABEST SURVEYORS & SAMBLE SURVEYS CC		
DESIGNED BY: SAMBLE SURVEYS CC	SCALES: Horizontal Scale: 300 Vertical Scale: 300		

DETAILED REFERENCE  
 Date: \_\_\_\_\_  
 Title: \_\_\_\_\_

NOTICE



REVISIONS

No.	Description	Date

Scale 1:750

SAMPLE SURVEYS CO

WCS

EASTERN CAPE  
 DEPARTMENT OF ROADS  
 AND TRANSPORT

PROJECT

ROADS 01007  
 BIRCHCRAW PIT SURVEY  
 AND PLATFORM DESIGN

Sheet No.

12989.0 Y  
 335662.0 X

Coordinate List System: Transverse Mercator WGS 84 UTM 29E  
 DATUM: WGS 84  
 ELLIPSOID: GRS 1980  
 MERIDIAN: 150° 00' 00" W  
 FALSE EASTING: 500000.000  
 FALSE NORTING: 0.000  
 SCALE FACTOR: 0.999609309266001  
 TOWERS: 111131.000  
 SOFTENING: 0.000000000000000

PLATFORM SETTING POINT COORDINATES

Name	Y	X	Z
Control	0.000	0.000	0.000
A	12765.200	3395925.884	1124.000
A1	12765.200	3395925.884	1124.000
B	12811.459	3395866.979	1143.000
B1	12811.459	3395866.979	1143.000
C	12859.887	3395878.184	1152.000
C1	12859.887	3395878.184	1152.000
D	12764.582	3395862.814	1145.000
D1	12764.582	3395862.814	1145.000
E	12763.664	3395854.021	1150.000
E1	12763.664	3395854.021	1150.000
F	12764.697	3395861.224	1137.000
F1	12764.697	3395861.224	1137.000
G	12766.206	3395875.041	1135.000
G1	12766.206	3395875.041	1135.000
H	12814.451	3395857.470	1135.000
H1	12814.451	3395857.470	1135.000
I	12765.257	3395861.972	1150.000
I1	12765.257	3395861.972	1150.000
J	12765.257	3395861.972	1150.000
J1	12765.257	3395861.972	1150.000
K	12765.257	3395861.972	1150.000
K1	12765.257	3395861.972	1150.000
L	12762.588	3395870.738	1130.200
L1	12762.588	3395870.738	1130.200
M	12766.206	3395875.041	1135.000
M1	12766.206	3395875.041	1135.000
N	12766.206	3395875.041	1135.000
N1	12766.206	3395875.041	1135.000
O	12766.206	3395875.041	1135.000
O1	12766.206	3395875.041	1135.000
P	12766.206	3395875.041	1135.000
P1	12766.206	3395875.041	1135.000
Q	12766.206	3395875.041	1135.000
Q1	12766.206	3395875.041	1135.000
R	12766.206	3395875.041	1135.000
R1	12766.206	3395875.041	1135.000
S	12828.614	3395901.533	1145.500
S1	12828.614	3395901.533	1145.500
T	12811.706	3395860.756	1145.000
T1	12811.706	3395860.756	1145.000
U	12819.605	3395862.537	1150.000
U1	12819.605	3395862.537	1150.000
V	12819.605	3395862.537	1150.000
V1	12819.605	3395862.537	1150.000
W	12817.222	3395862.417	1141.500
W1	12817.222	3395862.417	1141.500
X	12813.455	3395868.401	1141.500
X1	12813.455	3395868.401	1141.500
Y	12813.455	3395868.401	1141.500
Y1	12813.455	3395868.401	1141.500
Z	12801.655	3395851.804	1135.500
Z1	12801.655	3395851.804	1135.500

12989.0 Y  
 335662.0 X

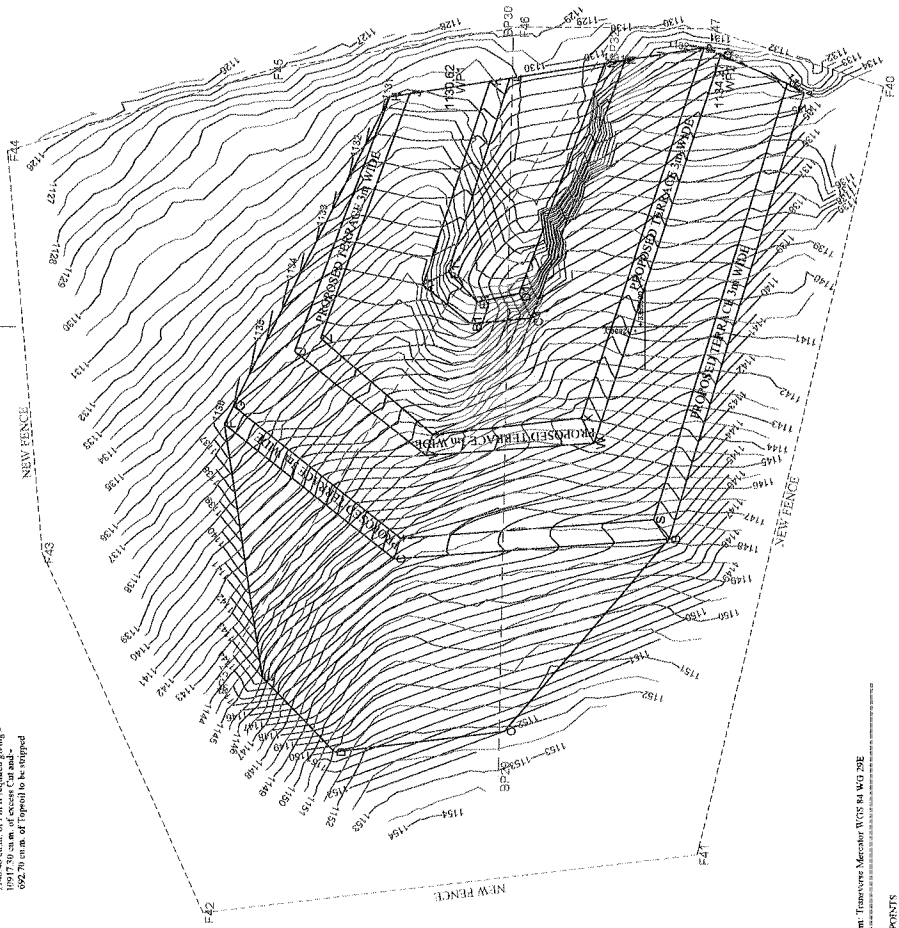
Coordinate List System: Transverse Mercator WGS 84 UTM 29E  
 DATUM: WGS 84  
 ELLIPSOID: GRS 1980  
 MERIDIAN: 150° 00' 00" W  
 FALSE EASTING: 500000.000  
 FALSE NORTING: 0.000  
 SCALE FACTOR: 0.999609309266001  
 TOWERS: 111131.000  
 SOFTENING: 0.000000000000000

NEW FENCE LINE COORDINATES

Name	Y	X	Z
Control	0.000	0.000	0.000
F40	12764.200	3395825.026	1145.000
F41	12879.400	3395907.972	1145.000
F42	12886.994	3395834.422	1145.000
F43	12775.829	3395805.146	1145.000
F44	12764.200	3395825.026	1145.000
F45	12761.704	3395844.508	1145.000
F46	12764.200	3395825.026	1145.000
F47	12764.200	3395825.026	1145.000

DNA Volume Description  
 Description: D015 BR07  
 Ground Surface: D015 BR07 EXM  
 Design Surface: D015 BR07 PLATFORM  
 Ground Hole Distance: 100.000  
 Ground Hole Diameter: 0.000  
 Ground Interval: 0.500  
 The unadjusted volume are -  
 1687.50 cu m total FILL  
 6542.00 sq m total area in Cut  
 585.00 sq m total area in Fill  
 Volume adjusted for 100.00% compaction and 0.10m Topsoil stripping -  
 1206.70 cu m. Cut available for Fill  
 11917.50 cu m. of Excav. Cut and  
 692.70 cu m. of Topsoil to be stripped

12989.0 Y  
 335662.0 X

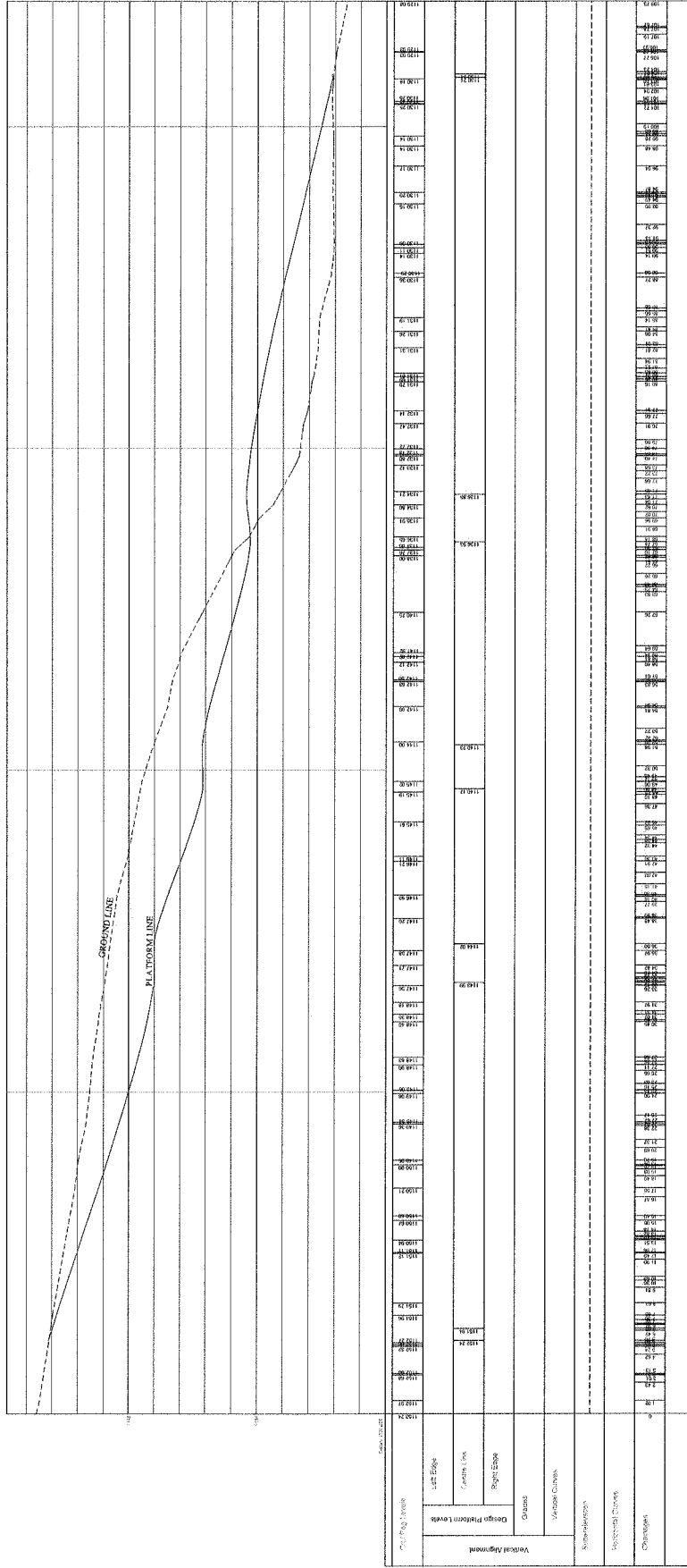


12989.0 Y  
 335662.0 X

Coordinate List System: Transverse Mercator WGS 84 UTM 29E  
 DATUM: WGS 84  
 ELLIPSOID: GRS 1980  
 MERIDIAN: 150° 00' 00" W  
 FALSE EASTING: 500000.000  
 FALSE NORTING: 0.000  
 SCALE FACTOR: 0.999609309266001  
 TOWERS: 111131.000  
 SOFTENING: 0.000000000000000

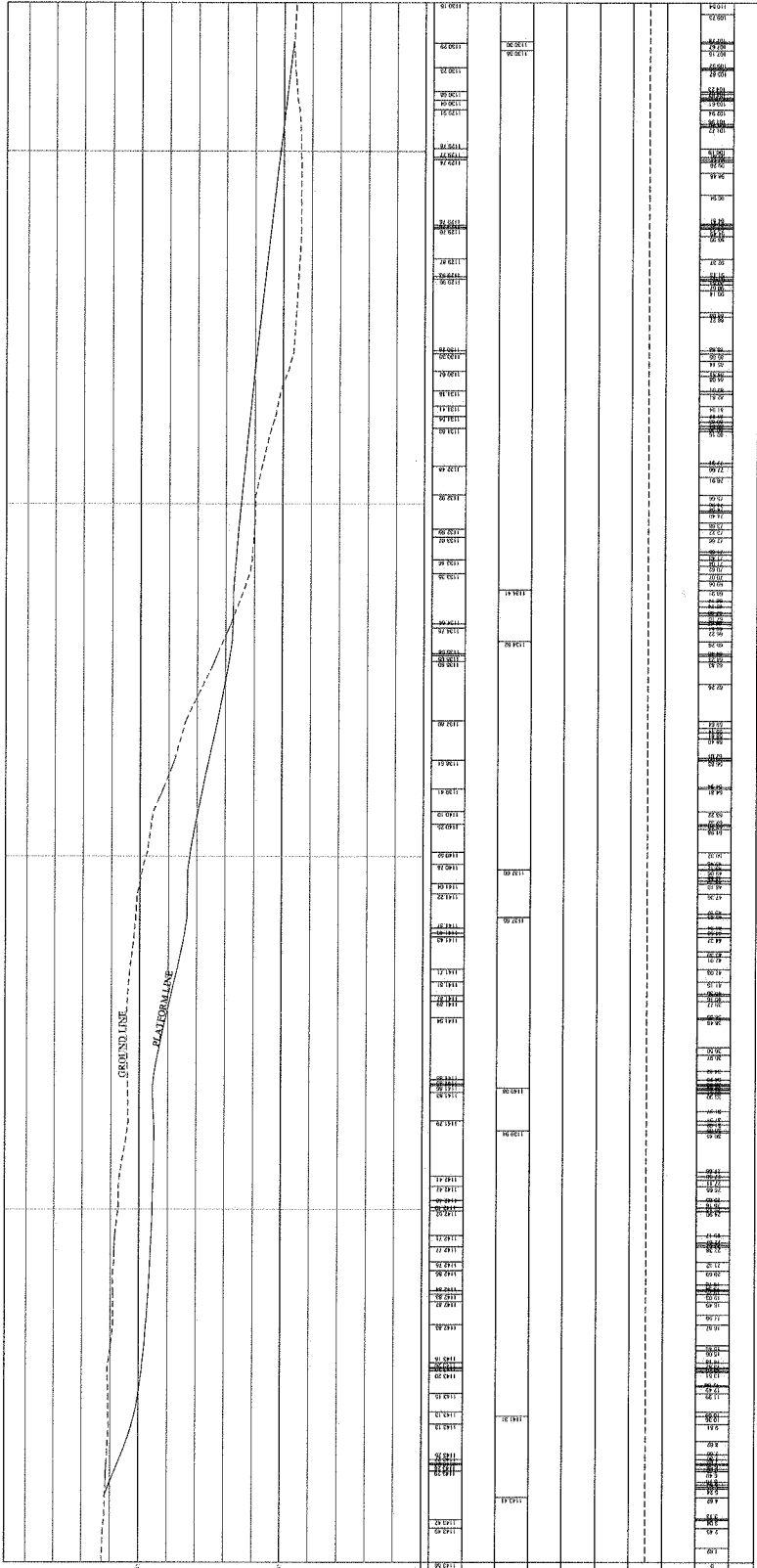
SURVEY CONTROL POINTS

Name	Y	X	Z
Control	0.000	0.000	0.000
W71	12765.200	3395971.695	1130.623
W72	12765.674	3395911.645	1134.287



Long Section for 0.00 to 109.73 (BP29 TO BP30)

DATE: 27 MAY 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	SCALES Horizontal Scale: 350 Vertical Scale: 350
DRAWN BY: GORDON DUSAK	ENGINEERS: TERRA TEST	DRAWING NO.
DESIGNED BY: SABLE SURVEYS CC	TITLE: D880'S BORROW PIT OF SURVEY AND PLATFORM DESIGN	
SURVEYORS: SABLE SURVEYS CC		



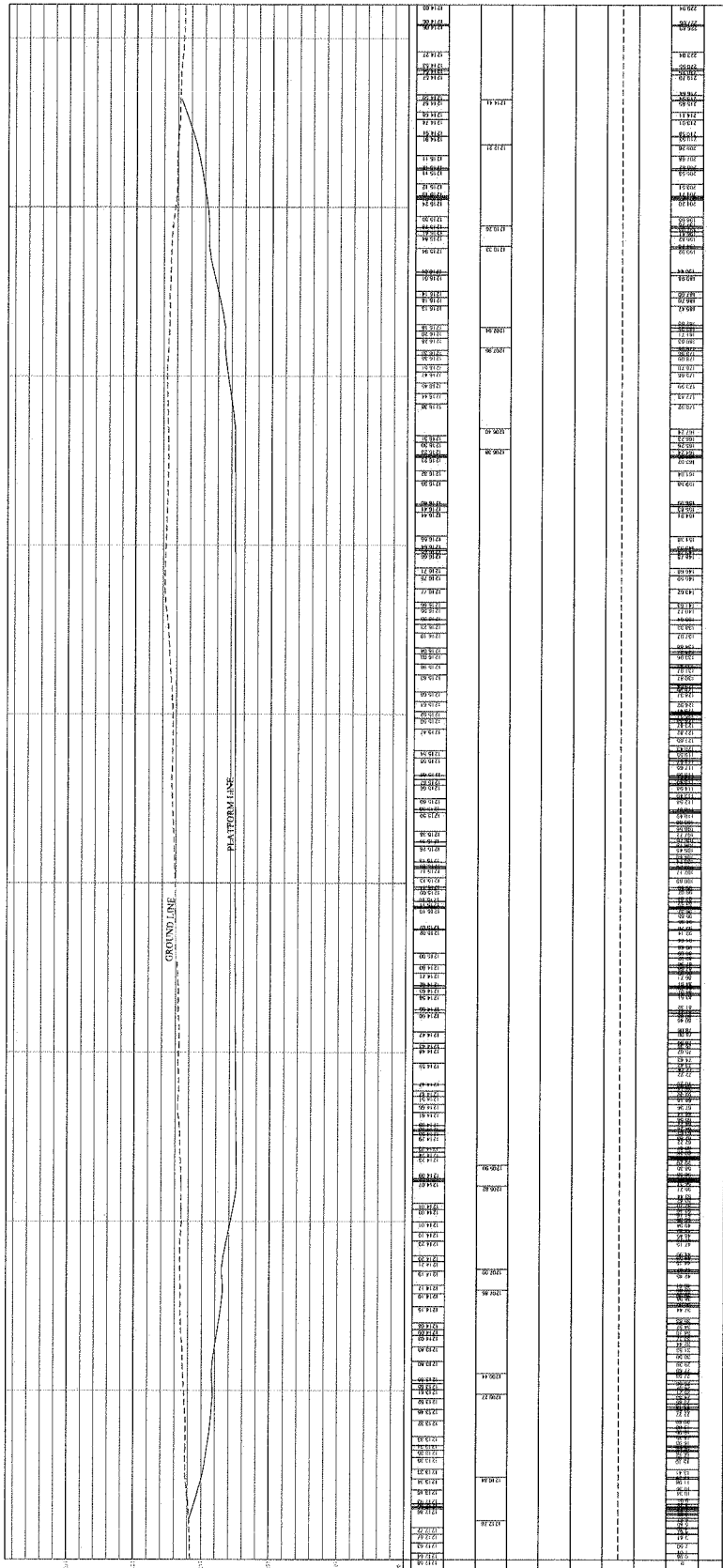
Long Section for 0.00 to 110.54 (BP31 TO BP32)

DATE: 27 MAY 2011  
 DRAWN BY: GORDON DRAKE  
 DESIGNED BY: SABLE SURVEYS OF  
 SURVEYORS SABLE SURVEYS OF

CLIENT: EASTERN CANE DEPARTMENT  
 OF ROADS AND TRANSPORT  
 ENGINEERS: TERRALTEST

TITLE: DOUBLE BORROW FIT OF SURVEY AND  
 PLATFORM DESIGN

SCALES  
 Horizontal Scale: 1:50  
 Vertical Scale: 1:50  
 DRAWING No.



Long Section for 0.00 to 229.94 (BP35 TO BP36)

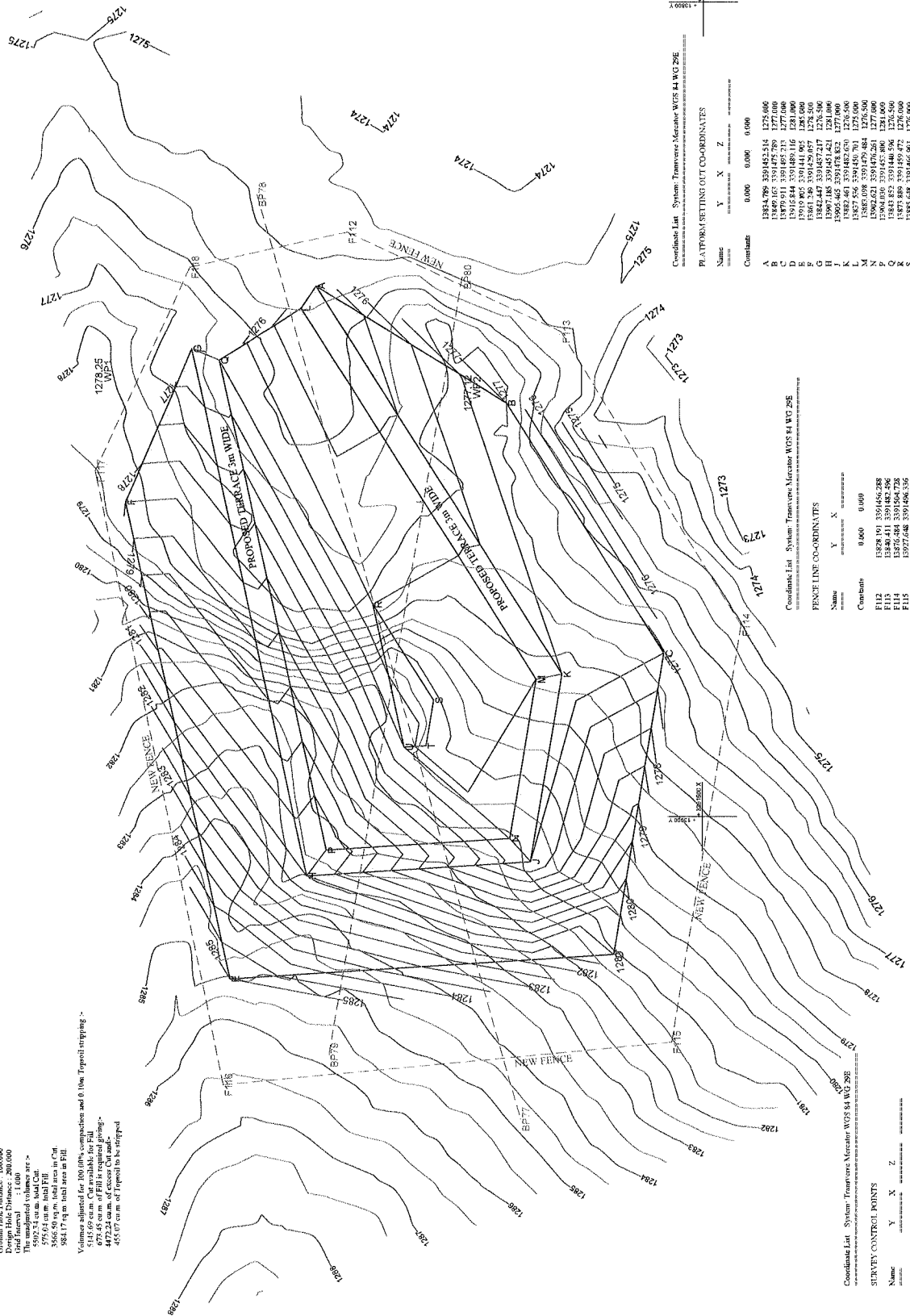
DATE: 30 MAY 2011	CLIENT: SABLE SURVEYS CC OF ROADS AND TRANSPORT	SCALES Horizontal: 1:500 Vertical: 1:100
DRAWN BY: GORDON DRAKE	ENGINEERS: TERRATEST	DRAWING No.
DESIGNED BY: SABLE SURVEYS CC	TITLE: D88015 BORROW PIT @ SURVEY AND PLATFORM DESIGN	
SURVEYORS: SABLE SURVEYS CC		



**DTM Volume Details**

Description : DMS BRW  
 Design Surface : DMS BRW  
 Ground Elevation : DMS BRW  
 Channel Elevation : DMS BRW  
 Grid Interval : 1.00  
 The unadjusted volumes are :  
 3566.50 cu m, total area in Cut  
 584.17 sq m, total area in Fill  
 Volume adjusted for 100.00% compaction and 0.00% Topsoil stripping :  
 125.69 cu m, total area in Cut  
 575.64 cu m, total area in Fill  
 4472.24 cu m, of excess Cut and  
 455.07 cu m, of Topsoil to be stripped

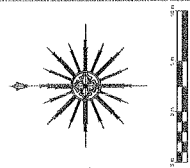
DMS BRW  
 DMS BRW  
 DMS BRW  
 DMS BRW  
 1.00  
 3566.50 cu m, total area in Cut  
 584.17 sq m, total area in Fill  
 Volume adjusted for 100.00% compaction and 0.00% Topsoil stripping :  
 125.69 cu m, total area in Cut  
 575.64 cu m, total area in Fill  
 4472.24 cu m, of excess Cut and  
 455.07 cu m, of Topsoil to be stripped



**DRAWING REFERENCE**

No.	Date	By

**NOTES**



**REVISIONS**

No.	Date	Description

**Scale 1:500**

SABLE SURVEYS CC

WJ39

EASTERN COPE  
AND TRANSPORT

TERRACE

DMS BRW  
DMS BRW  
DMS BRW

**COORDINATE LIST SYSTEM: TRANSVERSE MERCATOR WGS 84 WGS 2011**

**PLATFORM SETTINGS: OUT COORDINATES**

Name	Y	X	Z
A	13845.795	3591463.735	1275.600
B	13845.795	3591463.735	1275.600
C	13845.795	3591463.735	1275.600
D	13845.795	3591463.735	1275.600
E	13845.795	3591463.735	1275.600
F	13845.795	3591463.735	1275.600
G	13845.795	3591463.735	1275.600
H	13845.795	3591463.735	1275.600
I	13845.795	3591463.735	1275.600
J	13845.795	3591463.735	1275.600
K	13845.795	3591463.735	1275.600
L	13845.795	3591463.735	1275.600
M	13845.795	3591463.735	1275.600
N	13845.795	3591463.735	1275.600
O	13845.795	3591463.735	1275.600
P	13845.795	3591463.735	1275.600
Q	13845.795	3591463.735	1275.600
R	13845.795	3591463.735	1275.600
S	13845.795	3591463.735	1275.600
T	13845.795	3591463.735	1275.600
U	13845.795	3591463.735	1275.600
V	13845.795	3591463.735	1275.600
W	13845.795	3591463.735	1275.600
X	13845.795	3591463.735	1275.600
Y	13845.795	3591463.735	1275.600
Z	13845.795	3591463.735	1275.600

**COORDINATE LIST SYSTEM: TRANSVERSE MERCATOR WGS 84 WGS 2011**

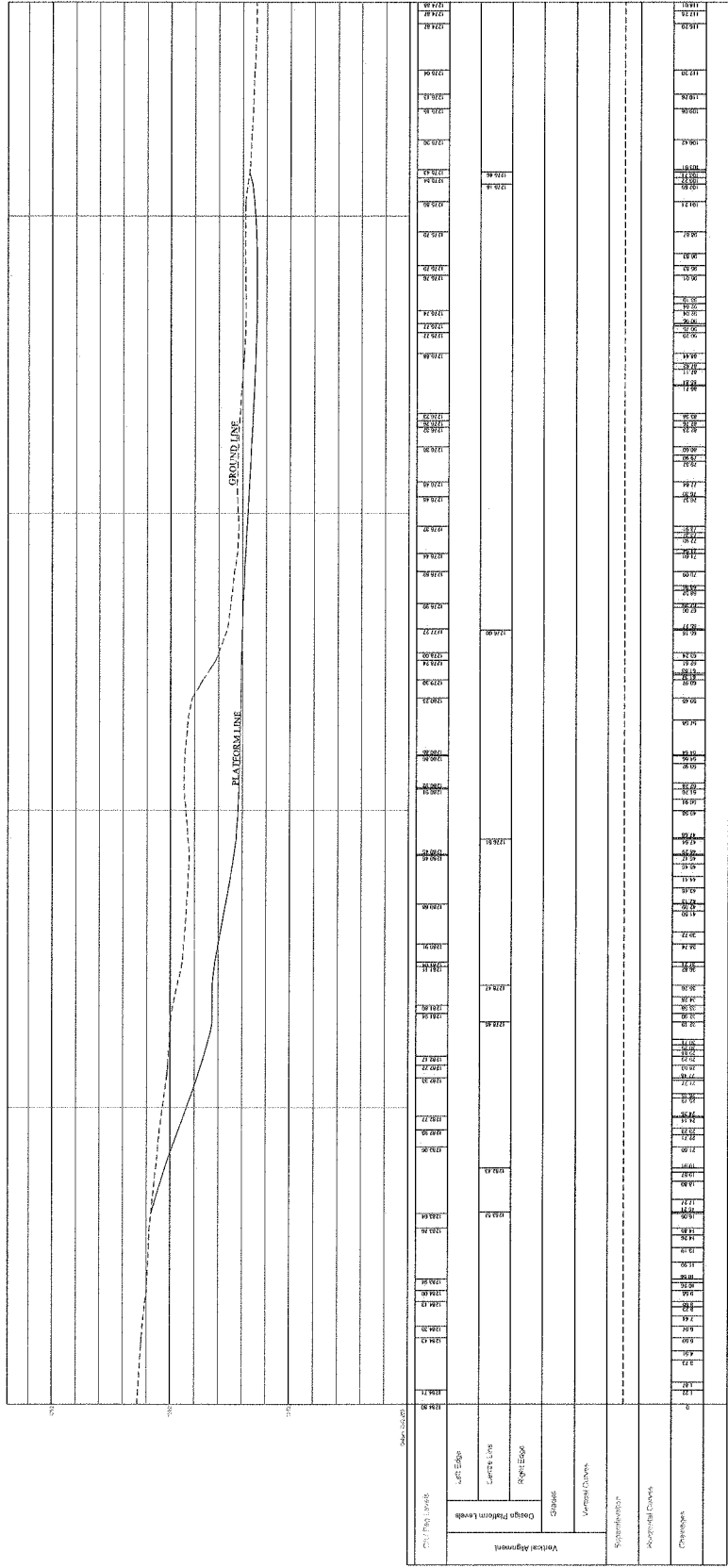
**PERCENT LINE COORDINATES**

Name	Y	X	Z
A	13845.795	3591463.735	1275.600
B	13845.795	3591463.735	1275.600
C	13845.795	3591463.735	1275.600
D	13845.795	3591463.735	1275.600
E	13845.795	3591463.735	1275.600
F	13845.795	3591463.735	1275.600
G	13845.795	3591463.735	1275.600
H	13845.795	3591463.735	1275.600
I	13845.795	3591463.735	1275.600
J	13845.795	3591463.735	1275.600
K	13845.795	3591463.735	1275.600
L	13845.795	3591463.735	1275.600
M	13845.795	3591463.735	1275.600
N	13845.795	3591463.735	1275.600
O	13845.795	3591463.735	1275.600
P	13845.795	3591463.735	1275.600
Q	13845.795	3591463.735	1275.600
R	13845.795	3591463.735	1275.600
S	13845.795	3591463.735	1275.600
T	13845.795	3591463.735	1275.600
U	13845.795	3591463.735	1275.600
V	13845.795	3591463.735	1275.600
W	13845.795	3591463.735	1275.600
X	13845.795	3591463.735	1275.600
Y	13845.795	3591463.735	1275.600
Z	13845.795	3591463.735	1275.600

**COORDINATE LIST SYSTEM: TRANSVERSE MERCATOR WGS 84 WGS 2011**

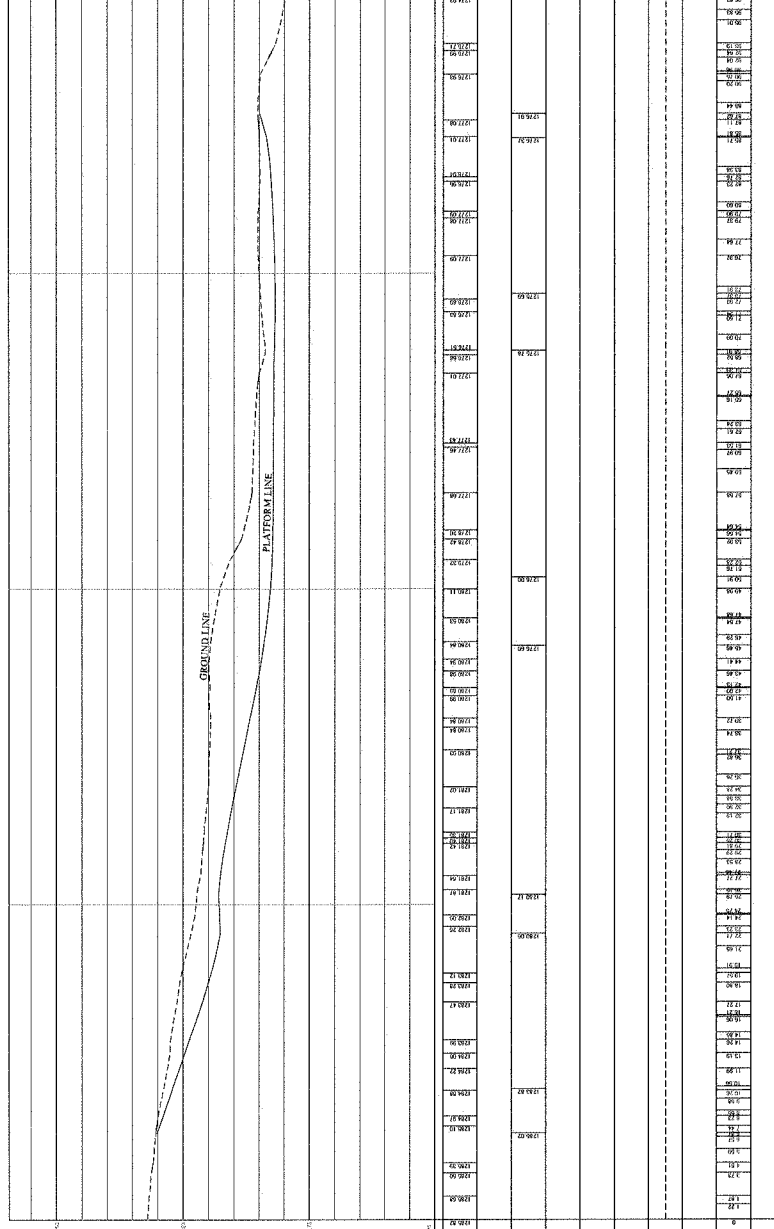
**SURVEY CONTROL POINTS**

Name	Y	X	Z
WPI	13845.795	3591463.735	1275.600
WPI	13845.795	3591463.735	1275.600
WPI	13845.795	3591463.735	1275.600



Long Section for 0.00 to 118.01 (BP77 to BP78)

DATE: 20 JUNE 2011	CLIENT: EASTERN GABRIEL DEPARTMENT OF ROADS AND TRANSPORT	SCALE: Horizontal Scale: 400 Vertical Scale: 400
DRAWN BY: GORDON DRAKE	TITLE: JAMES BORROW RT 09 SURVEY AND RECONSTRUCTION	DRAWING NO.
DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: TERRA TEST	
SURVEYORS: SABLE SURVEYS CC		

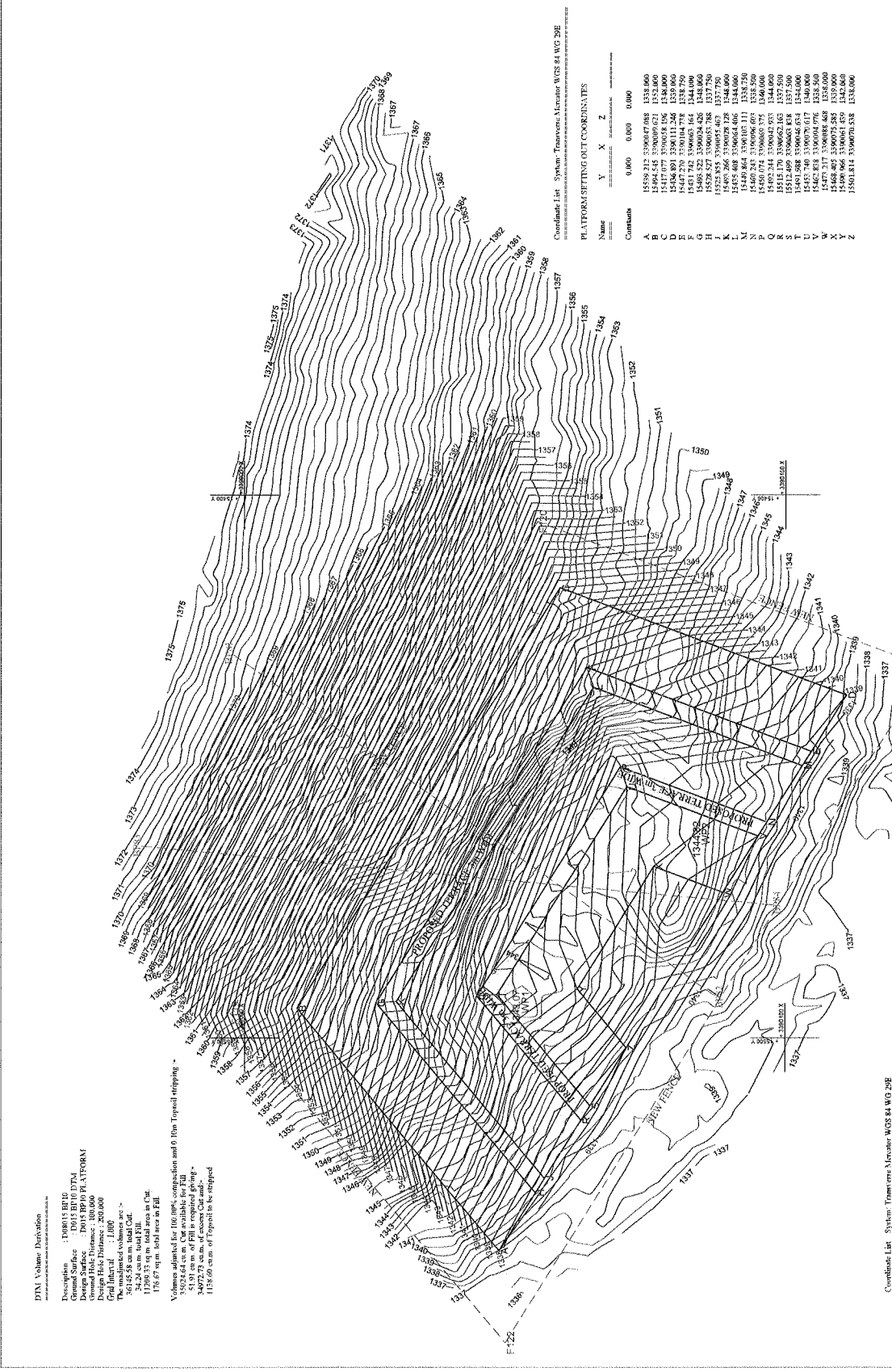
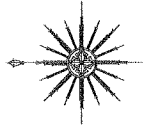


Long Section for 0.00 to 96.83 (BP79 to BP80)

DATE: 20 JUNE 2011	CLIENT: EASTERN CANTON DEPARTMENT OF ROADS AND TRANSPORT	DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: TERRATEST	TITLE: TORRENT CREEK BRIDGE SURVEY AND PLATFORM DESIGN	SCALES: Horizontal Scale: 400 Vertical Scale: 400
DRAWN BY: GORDON DRAKE			ENGINEERS: TERRATEST		DRAWING NO.
DESIGNED BY: SABLE SURVEYS CC			ENGINEERS: TERRATEST		DRAWING NO.
SURVEYORS: SABLE SURVEYS CC			ENGINEERS: TERRATEST		DRAWING NO.

ORIGINATING REFERENCE	
File No.	100
Sheet No.	100

NOTES



DTM Volume Derivation  
 Description : 100015 BP ID  
 Design Surface : D015 BP AD PLATFORM  
 Ground Hole Distance : 100.000  
 Grid Interval : 1.000  
 The unadvised volume are :-  
 56135.58 cu m. total cut.  
 17265.33 sq m. total area in Cut.  
 176.67 sq m. total area in Fill.  
 Volume adjusted for 10% compaction and 0.10m Topsoil stripping \*  
 59236.64 cu m. Cut available for Fill  
 34972.73 sq m. of excess Cut and \*  
 1138.00 sq m. of Topsoil to be stripped

Coordinate List System: Transverse Mercator WGS 84 UTM 29E  
 UTM Zone Number: 29  
 UTM Easting: 500000  
 UTM Northing: 5000000

PLATFORM SETTING OUT COORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
A	15292.312	539007.049	1337.660
B	154664.545	539007.621	1332.000
C	15417.077	539008.196	1338.000
D	15467.270	539004.771	1337.750
E	15451.742	539006.164	1344.000
F	15458.527	539005.382	1337.750
G	15458.527	539005.382	1337.750
H	15458.527	539005.382	1337.750
I	15458.527	539005.382	1337.750
J	15458.527	539005.382	1337.750
K	15458.527	539005.382	1337.750
L	15458.527	539005.382	1337.750
M	15458.527	539005.382	1337.750
N	15458.527	539005.382	1337.750
O	15458.527	539005.382	1337.750
P	15458.527	539005.382	1337.750
Q	15458.527	539005.382	1337.750
R	15458.527	539005.382	1337.750
S	15458.527	539005.382	1337.750
T	15458.527	539005.382	1337.750
U	15458.527	539005.382	1337.750
V	15458.527	539005.382	1337.750
W	15458.527	539005.382	1337.750
X	15458.527	539005.382	1337.750
Y	15458.527	539005.382	1337.750
Z	15458.527	539005.382	1337.750

Coordinate List System: Transverse Mercator WGS 84 UTM 29E  
 UTM Zone Number: 29  
 UTM Easting: 500000  
 UTM Northing: 5000000

FENCE LINE CO-ORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
F10	15405.399	539007.384	1343.000
F11	15451.814	539012.233	1343.000
F12	15516.106	539048.239	1343.000

Coordinate List System: Transverse Mercator WGS 84 UTM 29E  
 UTM Zone Number: 29  
 UTM Easting: 500000  
 UTM Northing: 5000000

SURVEY CONTROL POINTS

Name	Y	X	Z
Constants	0.000	0.000	0.000
WP1	14498.776	539065.978	1343.008
WP2	15462.304	539084.242	1344.827

Scale 1:750

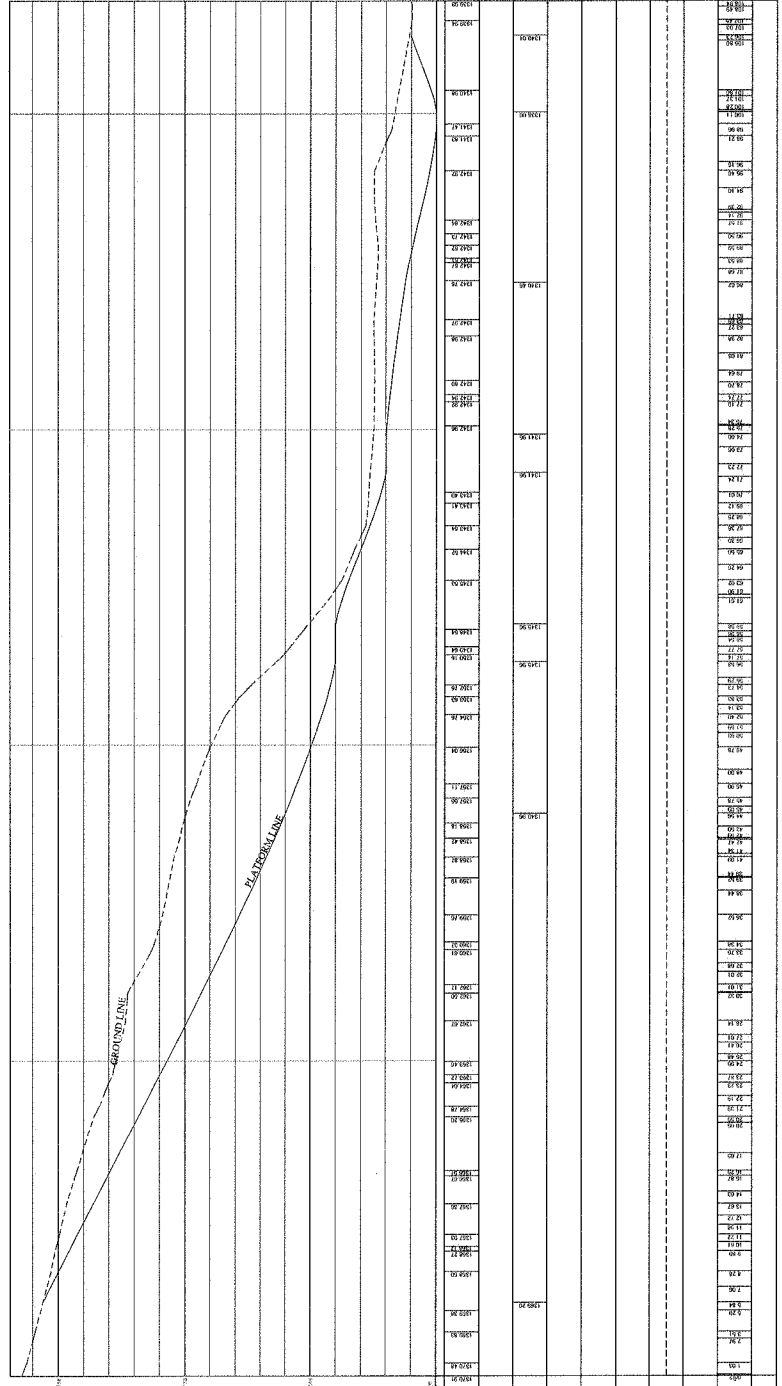
SABLE STRAITS CT  
 WGS 84

NEW ZEALAND  
 DEPARTMENT OF ROADS  
 AND TRANSPORT

TERRATEST

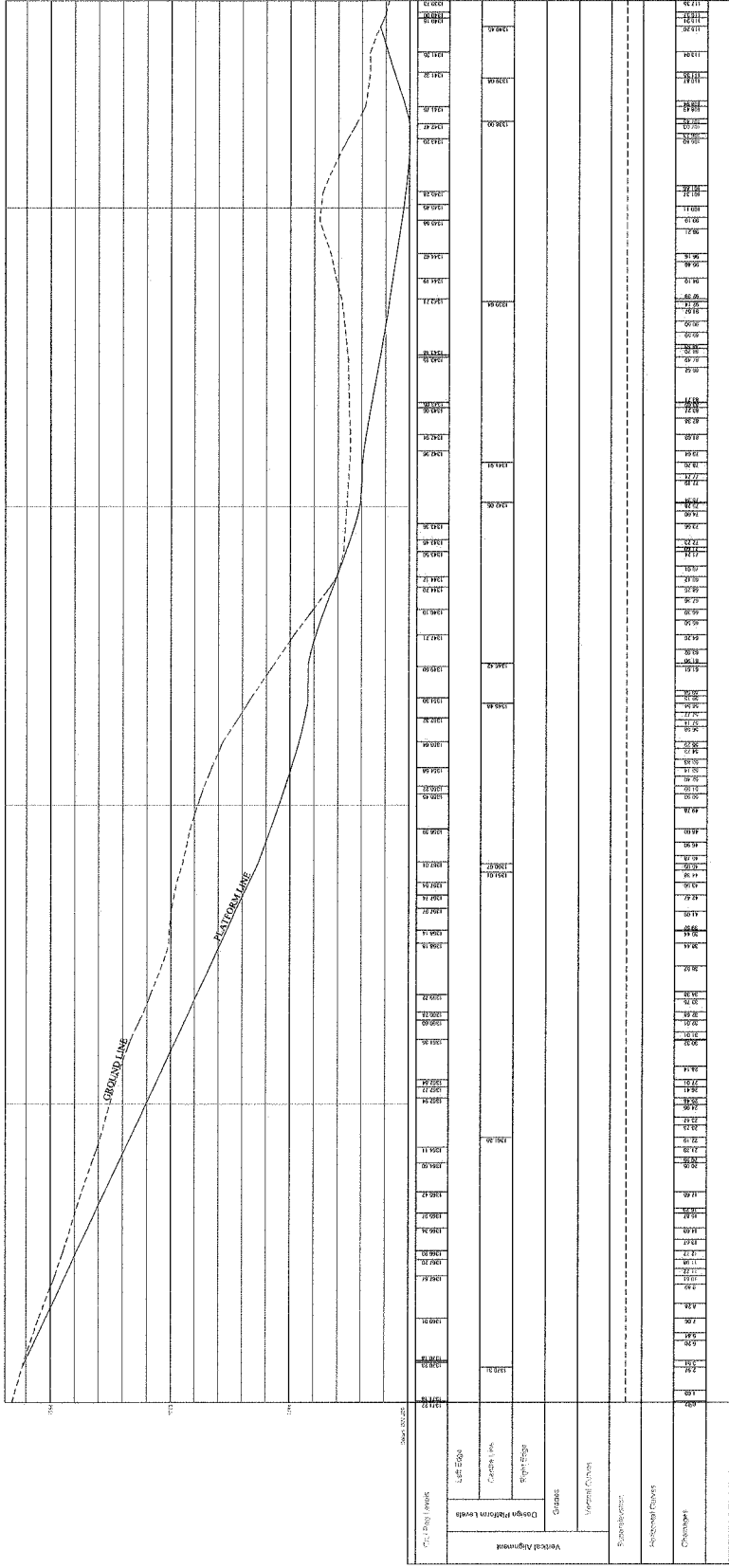
D00015 BP ID  
 ROADWAY SURVEY  
 AND PLATFORM DESIGN

Scale 1:750



Long Section for 0.00 to 108.94 (BP81 TO BP82)

DATE: 26 JUNE 2011	CLIENT: EASTERN CARBIDE DEPARTMENT OF ROAD AND TRANSPORT	SCALES: Horizontal Scale: 1:500 Vertical Scale: 40D
DRAWN BY: GORDON DRAKE	DESIGNED BY: SABLE SURVEYS CC	DRAWING No.:
ENGINEERS: TERRA TEST	SURVEYORS: SABLE SURVEYS CC	
TITLE: FERRIS BOBROW PIT TO SURVEY AND PLATFORM DESIGN		



Long Section for 0.00 to 17.35 (BP83 to BP84)

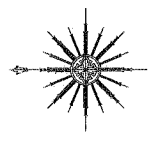
DATE: 20 JUNE 2011  
 CLIENT: EASTERN CARBIDE DEPARTMENT OF ROADS AND TRANSPORT  
 DESIGNED BY: SABLE SURVEYS CC  
 ENGINEERS: TERRA TEST  
 SURVEYORS: SABLE SURVEYS CC

TITLE: DORRIS BORNGOW PT 10 SURVEY AND PLATFORM DESIGN

SCALES  
 Horizontal Scale: 400  
 Vertical Scale: 400  
 DRAWING NO.

DRAWING REFERENCE  
 No. 10000  
 Date

NOTES



Coordinate List System: Transverse-Mercator WGS 84 WGS 2011  
 PLATFORM OFFSETTING COORDINATES

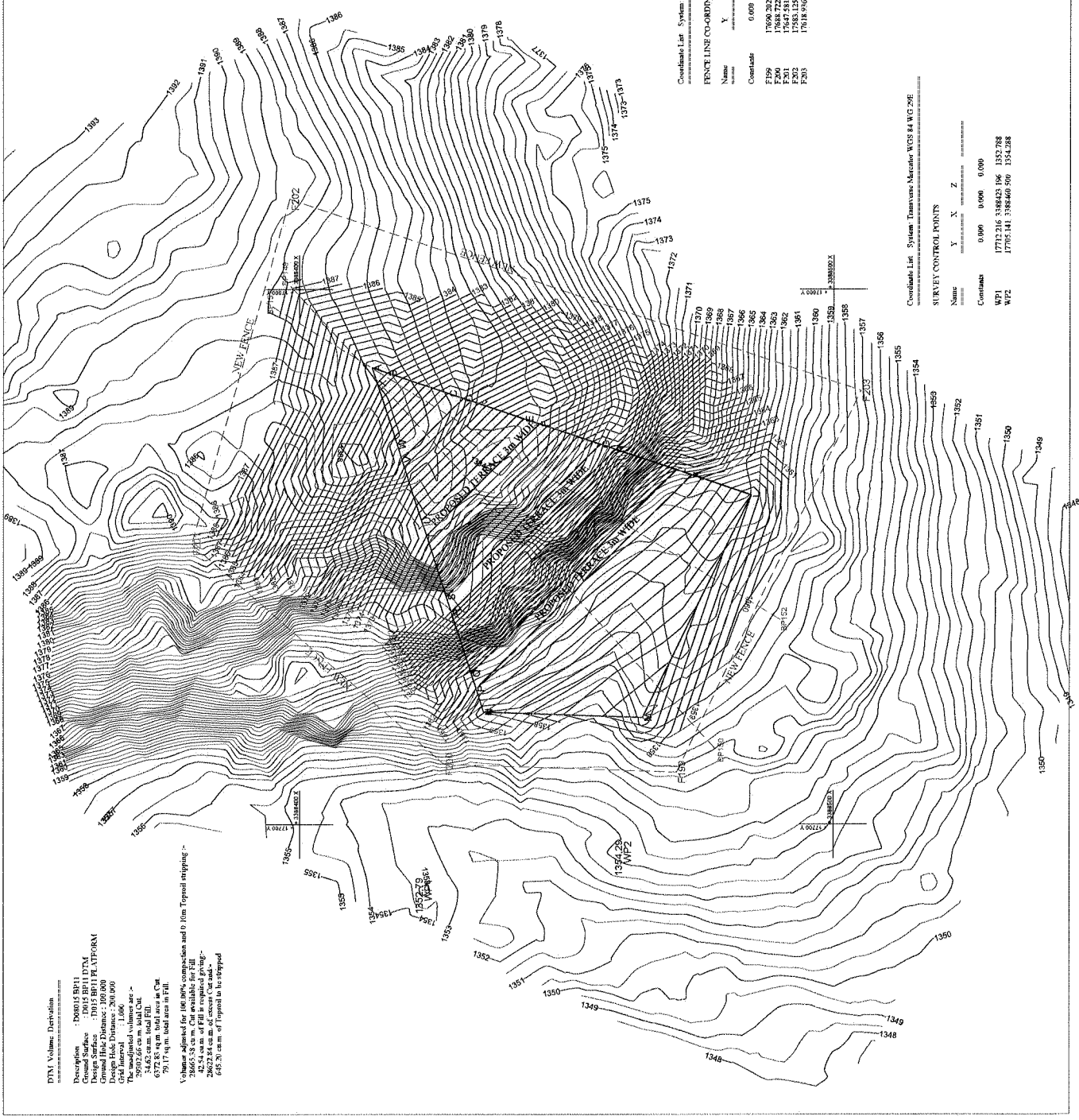
Name	Y	X
Coordinates	0.000	0.000
A	17614.656	3388415.615
B	17615.608	3388416.460
C	17616.418	3388427.839
D	17617.181	3388442.063
E	17617.913	3388444.948
F	17618.595	3388459.132
G	17619.226	3388470.511
H	17619.808	3388477.555
I	17620.341	3388481.544
J	17620.826	3388486.194
K	17621.263	3388491.517
L	17621.653	3388497.315
M	17621.997	3388503.485
N	17622.297	3388510.029
O	17622.553	3388516.948
P	17622.767	3388524.251
Q	17622.939	3388532.048
R	17623.071	3388540.332
S	17623.164	3388549.103
T	17623.219	3388558.359
U	17623.246	3388568.101
V	17623.236	3388578.328
W	17623.190	3388589.151
X	17623.008	3388601.464

Coordinate List System: Transverse-Mercator WGS 84 WGS 2011  
 FENCE LINE COORDINATES

Name	Y	X
Coordinates	0.000	0.000
F199	17690.202	3388470.046
F200	17690.467	3388470.046
F201	17647.433	3388579.864
F202	17583.125	3388596.185
F203	17618.946	3388505.119

Coordinate List System: Transverse-Mercator WGS 84 WGS 2011  
 SURVEY CONTROL POINTS

Name	Y	X	Z
Coordinates	0.000	0.000	0.000
WPI	17712.216	3388423.094	1332.788
WZ	17705.141	3388460.500	1351.288



DTM Volume Description  
 Description: D06012 B011  
 Designation: D06012 B011 PLATFORM  
 Ground Hole Distance: 100.000  
 Ground Hole Diameter: 100.000  
 Grid Interval: 1.000  
 The unadjusted volumes are:  
 24.42 cu m total fill  
 6372.85 sq m total area in Cut  
 79.17 sq m total area in Fill  
 Volumes Adjusted for 100% compaction and 0.10m Topsoil stripping =  
 30665.38 cu m Cut available for fill  
 28622.84 cu m of excess Cut and  
 648.20 cu m of Topsoil to be stripped

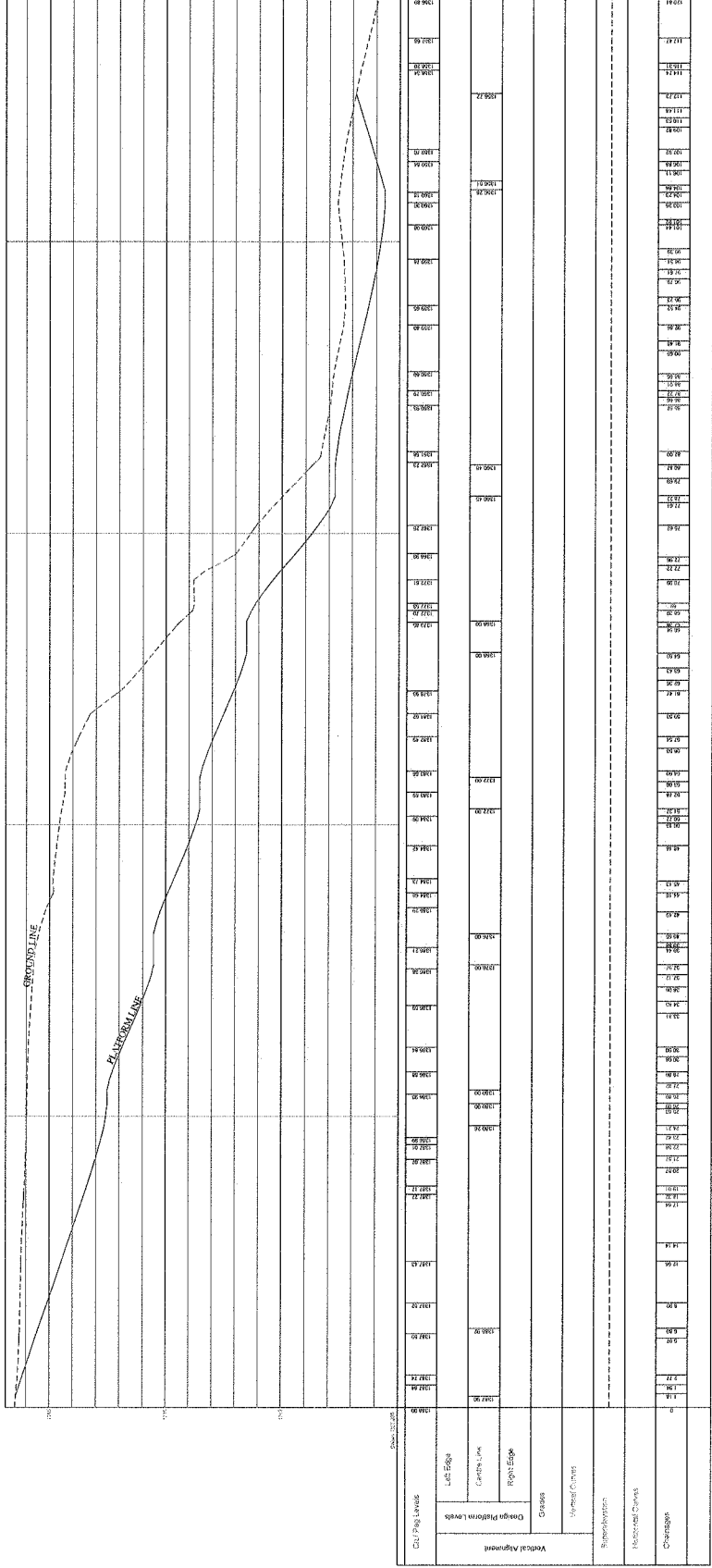
REVISIONS  
 No. 10000  
 Date

Scale 1:750

SABLE SURVEYS CC  
 WGS 2011  
 EASTERN CAPE  
 DEPARTMENT OF ROADS  
 AND TRANSPORT  
 TIERA TEST  
 B06015 B011  
 BOMBAY FIT SURVEY  
 AND PLATFORM DESIGN

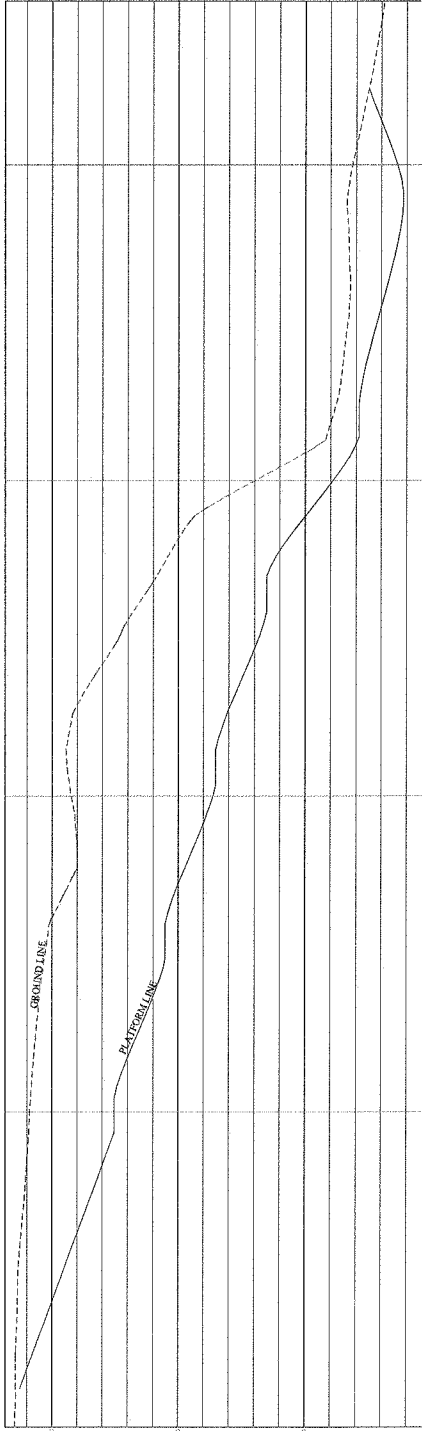
Drawn by: [ ]  
 Checked by: [ ]  
 Approved by: [ ]  
 Date: [ ]





Long Section for 0.00 to 120.81 (BP 140 to BP150)

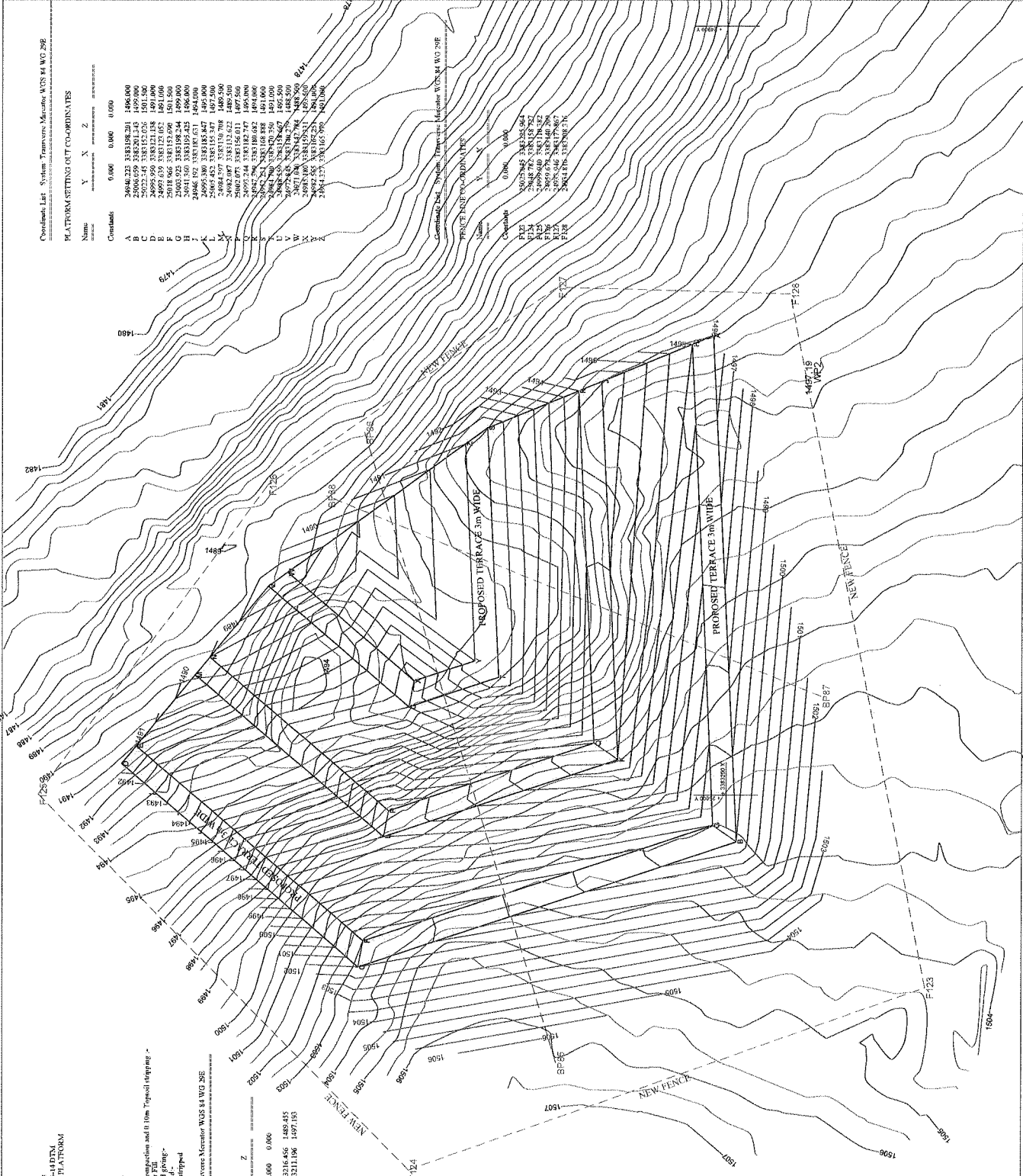
DATE: 25 JULY 2011	CLIENT: EASTERN SHORE DEPARTMENT OF ROADS AND TRANSPORT	PROJECT: TITLE DORIS BORELOW PIT 11 SURVEY AND PLATFORM DESIGN	SCALES: Horizontal Scale: 1"=20' Vertical Scale: 1"=4'
DRAWN BY: GORDON DRAKE	ENGINEERS: DEBATEST		DRAWING No.
DESIGNED BY: SAGE SURVEYS CC			
SURVEYORS: SAGE SURVEYS CC			

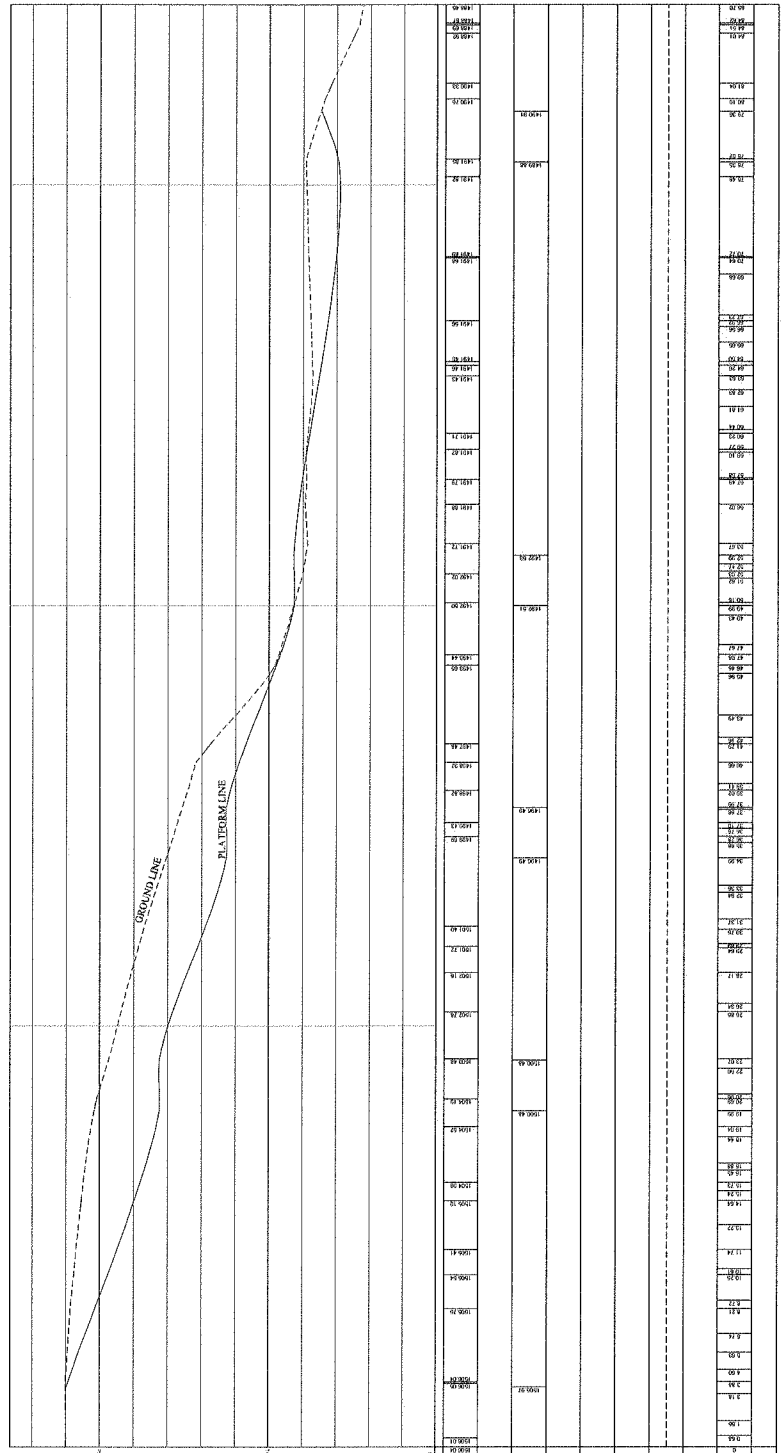


Station	Ground Elevation	Platform Elevation
1298.00	1298.00	1298.00
1299.00	1299.00	1299.00
1300.00	1300.00	1300.00
1301.00	1301.00	1301.00
1302.00	1302.00	1302.00
1303.00	1303.00	1303.00
1304.00	1304.00	1304.00
1305.00	1305.00	1305.00
1306.00	1306.00	1306.00
1307.00	1307.00	1307.00
1308.00	1308.00	1308.00
1309.00	1309.00	1309.00
1310.00	1310.00	1310.00
1311.00	1311.00	1311.00
1312.00	1312.00	1312.00
1313.00	1313.00	1313.00
1314.00	1314.00	1314.00
1315.00	1315.00	1315.00
1316.00	1316.00	1316.00
1317.00	1317.00	1317.00
1318.00	1318.00	1318.00
1319.00	1319.00	1319.00
1320.00	1320.00	1320.00
1321.00	1321.00	1321.00
1322.00	1322.00	1322.00
1323.00	1323.00	1323.00
1324.00	1324.00	1324.00
1325.00	1325.00	1325.00
1326.00	1326.00	1326.00
1327.00	1327.00	1327.00
1328.00	1328.00	1328.00
1329.00	1329.00	1329.00
1330.00	1330.00	1330.00
1331.00	1331.00	1331.00
1332.00	1332.00	1332.00
1333.00	1333.00	1333.00
1334.00	1334.00	1334.00
1335.00	1335.00	1335.00
1336.00	1336.00	1336.00
1337.00	1337.00	1337.00
1338.00	1338.00	1338.00
1339.00	1339.00	1339.00
1340.00	1340.00	1340.00
1341.00	1341.00	1341.00
1342.00	1342.00	1342.00
1343.00	1343.00	1343.00
1344.00	1344.00	1344.00
1345.00	1345.00	1345.00
1346.00	1346.00	1346.00
1347.00	1347.00	1347.00
1348.00	1348.00	1348.00

Long Section for 0.00 to 112.99 (BP151 to BP152)

DATE: 25 JULY 2011	CLIENT: EASTERN CAROLINA DEPARTMENT OF ROADS AND TRANSPORT	ENGINEERS: TERRATEST	TITLE: D88615 BORROW PIT II SURVEY AND PLATFORM DESIGN
DRAWN BY: GORDON DRAKE	DESIGNED BY: SABLE SURVEYS, CC	STRATFORDS SABLE SURVEYS, CC	
SCALES Horizontal Scale: 400 Vertical Scale: 400		DRAWING No.	

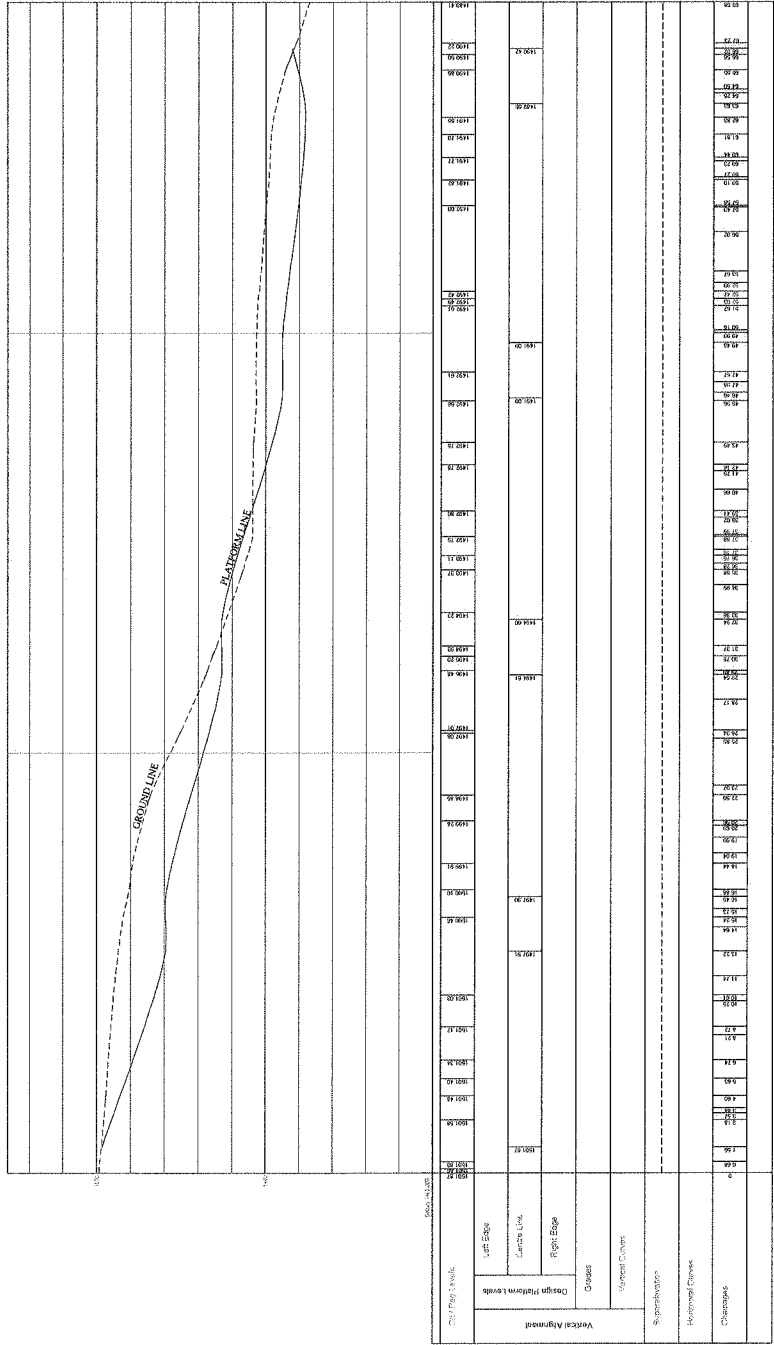




Station	Ground Elevation	Platform Elevation
85.00	100.00	100.00
85.01	100.00	100.00
85.02	100.00	100.00
85.03	100.00	100.00
85.04	100.00	100.00
85.05	100.00	100.00
85.06	100.00	100.00
85.07	100.00	100.00
85.08	100.00	100.00
85.09	100.00	100.00
85.10	98.00	100.00
85.11	97.00	100.00
85.12	96.00	100.00
85.13	95.00	100.00
85.14	94.00	100.00
85.15	93.00	100.00
85.16	92.00	100.00
85.17	91.00	100.00
85.18	90.00	100.00
85.19	89.00	100.00
85.20	88.00	100.00
85.21	87.00	100.00
85.22	86.00	100.00
85.23	85.00	100.00
85.24	84.00	100.00
85.25	83.00	100.00
85.26	82.00	100.00
85.27	81.00	100.00
85.28	80.00	100.00
85.29	79.00	100.00
85.30	78.00	100.00
85.31	77.00	100.00
85.32	76.00	100.00
85.33	75.00	100.00
85.34	74.00	100.00
85.35	73.00	100.00
85.36	72.00	100.00
85.37	71.00	100.00
85.38	70.00	100.00
85.39	69.00	100.00
85.40	68.00	100.00
85.41	67.00	100.00
85.42	66.00	100.00
85.43	65.00	100.00
85.44	64.00	100.00
85.45	63.00	100.00
85.46	62.00	100.00
85.47	61.00	100.00
85.48	60.00	100.00
85.49	59.00	100.00
85.50	58.00	100.00
85.51	57.00	100.00
85.52	56.00	100.00
85.53	55.00	100.00
85.54	54.00	100.00
85.55	53.00	100.00
85.56	52.00	100.00
85.57	51.00	100.00
85.58	50.00	100.00
85.59	49.00	100.00
85.60	48.00	100.00
85.61	47.00	100.00
85.62	46.00	100.00
85.63	45.00	100.00
85.64	44.00	100.00
85.65	43.00	100.00
85.66	42.00	100.00
85.67	41.00	100.00
85.68	40.00	100.00
85.69	39.00	100.00
85.70	38.00	100.00

DATE: 23 JUNE 2011  
 CLIENT: EASTERN SHORE DEPARTMENT OF TRANSPORT  
 DRAWN BY: GORDON DRAKE  
 DESIGNED BY: SABLE SURVEYS CC  
 ENGINEERS: TERRATEST  
 TITLE: D8014 BORROW PIT SURVEY AND PLATFORM DESIGN  
 PRINTED BY: SABLE SURVEYS CC

SCALES  
 Horizontal: 1:500  
 Vertical: 1:50  
 DRAWING No:



Long Section for 0.00 to 69.68 (BP87 to BP88)

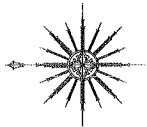
DATE: 23 JUNE 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	SCALES Horizontal Scale: 300 Vertical Scale: 300
DRAWN BY: GORDON BRACK	TITLE: PONDUS BORKOW HT E SURVEY AND PLAN DESIGN	DRAWING No.
DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: TERRA TEST	
STRYDOMS SABLE SURVEYS CC		



DEPARTMENT REFERENCE

Scale: 1:500

NOTES



NO.	DATE	BY

NO.	REVISION	DATE

Scale 1:500

SARIE SERVICES CC

WGS84

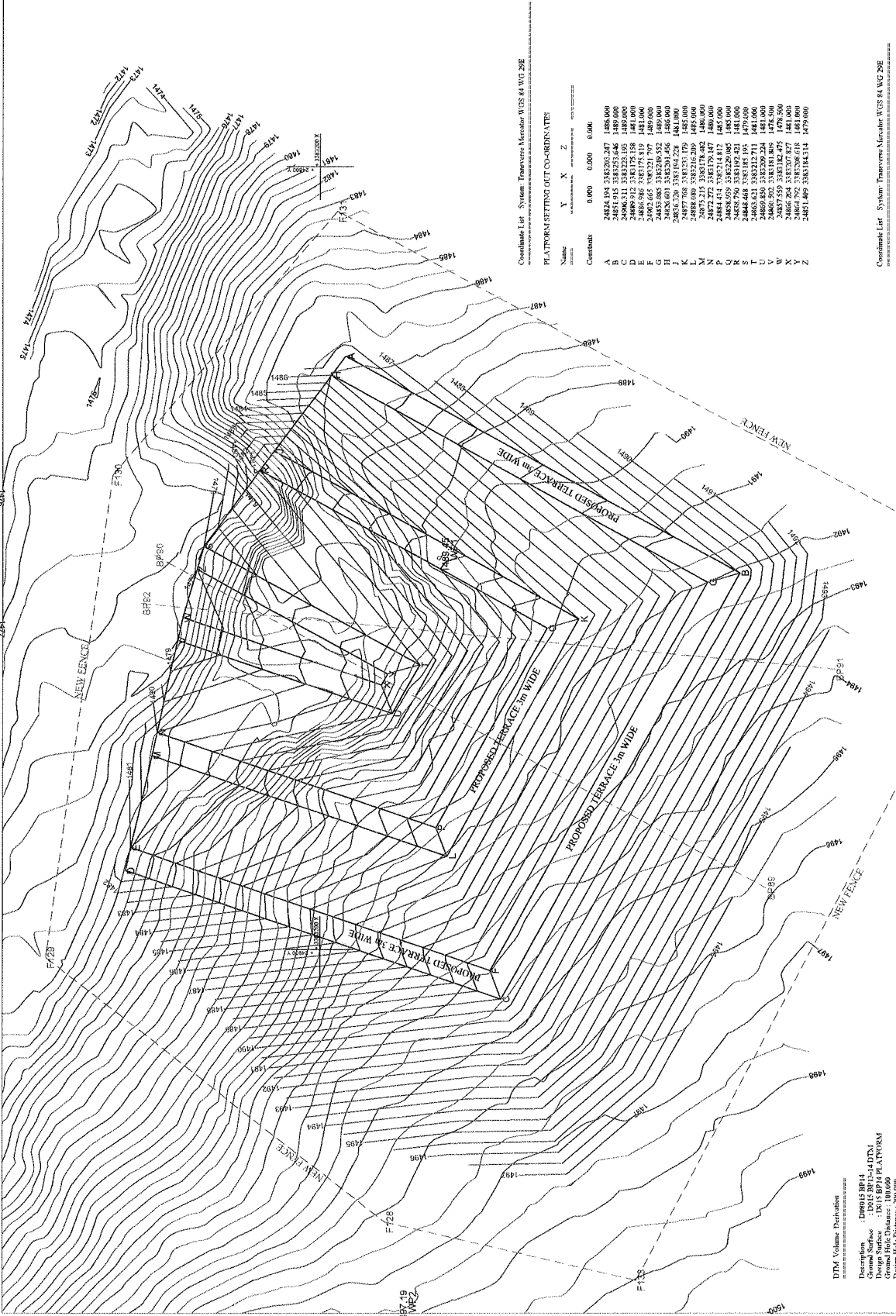
DEPARTMENT OF ROADS AND TRANSPORT

TERRACE 17

D06015 BP14

NEW FENCE

AND THAT AREA DESIGN



Coordinate List System: Transverse Mercator WGS 84 WGS 2011

PLATFORM SETTING GCP COORDINATES

Name	Y	X	Z
A	24824.194	3382305.247	1486.000
B	24824.194	3382305.247	1486.000
C	24824.194	3382305.247	1486.000
D	24824.194	3382305.247	1486.000
E	24824.194	3382305.247	1486.000
F	24824.194	3382305.247	1486.000
G	24824.194	3382305.247	1486.000
H	24824.194	3382305.247	1486.000
I	24824.194	3382305.247	1486.000
J	24824.194	3382305.247	1486.000
K	24824.194	3382305.247	1486.000
L	24824.194	3382305.247	1486.000
M	24824.194	3382305.247	1486.000
N	24824.194	3382305.247	1486.000
O	24824.194	3382305.247	1486.000
P	24824.194	3382305.247	1486.000
Q	24824.194	3382305.247	1486.000
R	24824.194	3382305.247	1486.000
S	24824.194	3382305.247	1486.000
T	24824.194	3382305.247	1486.000
U	24824.194	3382305.247	1486.000
V	24824.194	3382305.247	1486.000
W	24824.194	3382305.247	1486.000
X	24824.194	3382305.247	1486.000
Y	24824.194	3382305.247	1486.000
Z	24824.194	3382305.247	1486.000

Coordinate List System: Transverse Mercator WGS 84 WGS 2011

FENCE LINE COORDINATES

Name	Y	X	Z
F128	24824.194	3382305.247	1486.000
F129	24824.194	3382305.247	1486.000
F130	24824.194	3382305.247	1486.000
F131	24824.194	3382305.247	1486.000
F132	24824.194	3382305.247	1486.000
F133	24824.194	3382305.247	1486.000

DTM Volume Derivation

Description : D06015 BP14

Ground Surface : D06015 BP14-44 DTM

Design Height : 200.000

Design Hole Distance : 200.000

Grid Interval : 1.000

Grid Interval : 2.000

2214.56 cu.m. total Cut

83.97 cu.m. total Area for Fill

Volume calculated for 100.00% compaction and 0.00m Topsoil stripping -

217.00 cu.m. Cut which is for Fill

0.16 cu.m. of Fill is required for compaction

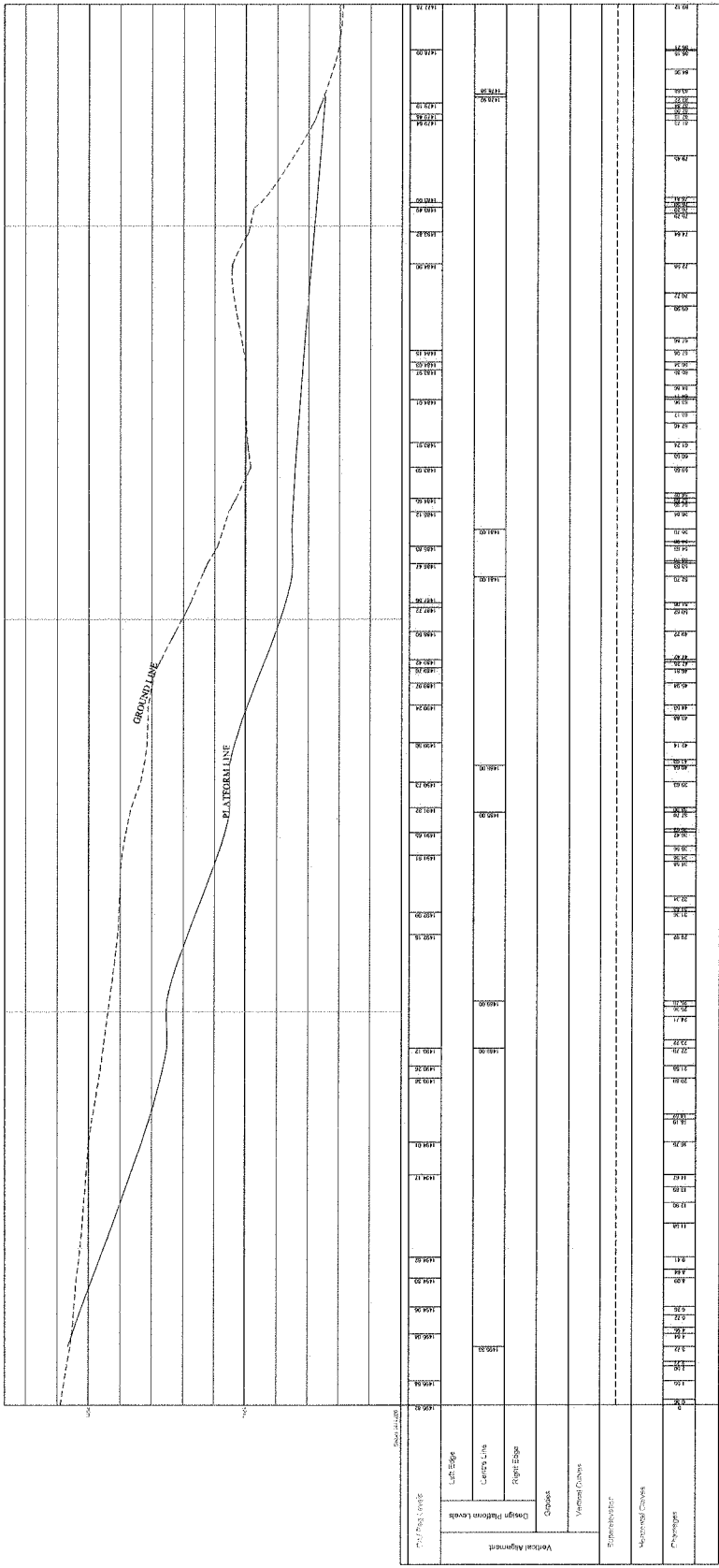
0.73 cu.m. of Topsoil is required

0.73 cu.m. of Topsoil to be stripped

Coordinate List System: Transverse Mercator WGS 84 WGS 2011

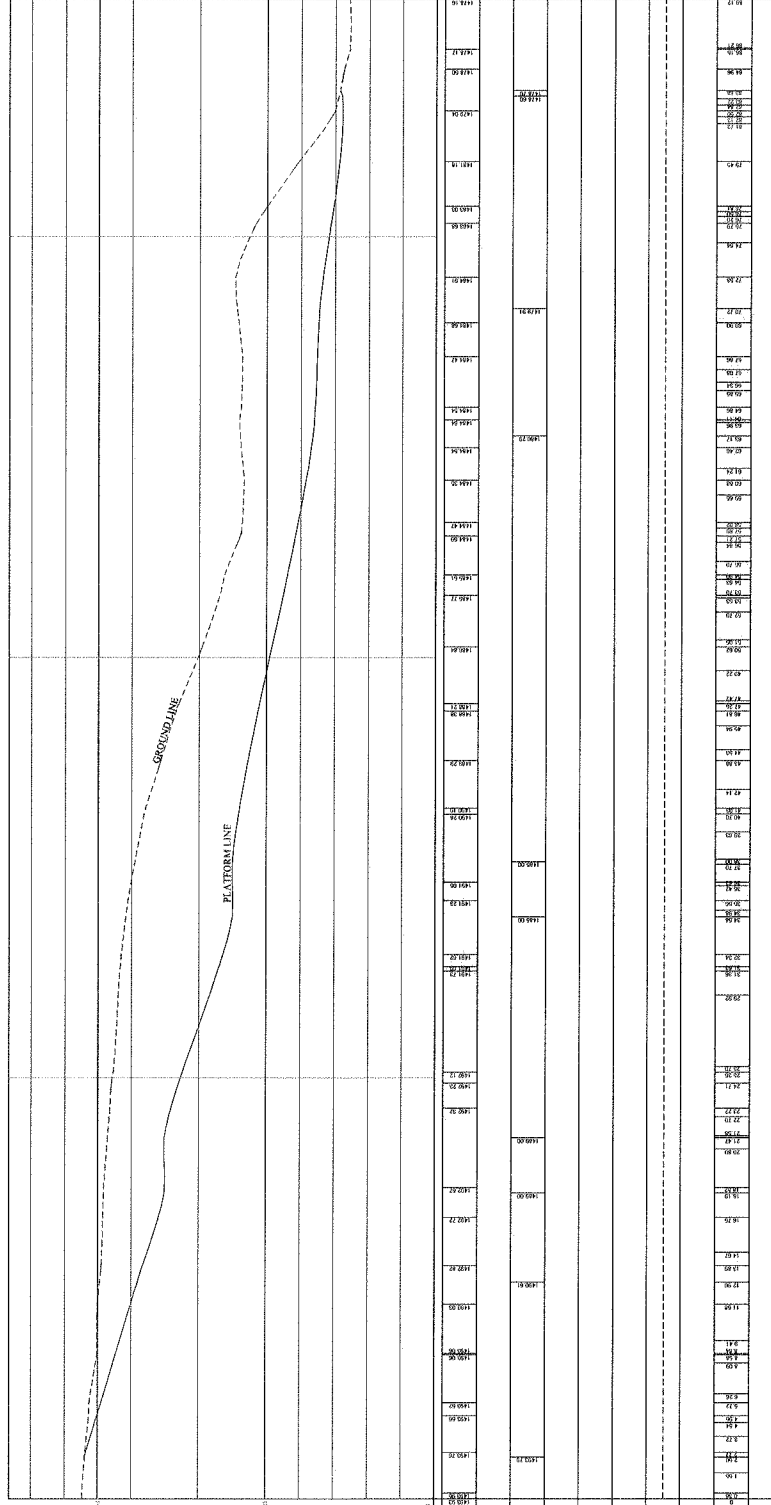
SURVEY CONTROL POINTS

Name	Y	X	Z
WP1	24824.194	3382305.247	1486.000
WP2	24824.194	3382305.247	1486.000



Long Section for 0.00 to 89.12 (BP89 to BP90)

DATE: 25 JUNE 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	SCALE: Horizontal Scale: 200 Vertical Scale: 500
DRAWN BY: GORDON DRAKE	DESIGNED BY: SABLE SURVEYS CC	DRAWING NO.
SITE: E. PRIMA RIVERMOUTH 14 STREET AND PLATFORMERS		
ENGINEERS: TERRAEST		
SURVEYORS: SABLE SURVEYS CC		



Long Section for 0.00 to 89.12 (BP91 to BP92)

DATE: 23 JUNE 2011  
 DRAWN BY: GORDON DR. IRE  
 DESIGNED BY: SABLE SURVEYS CC  
 SURVEYORS: SABLE SURVEYS CC

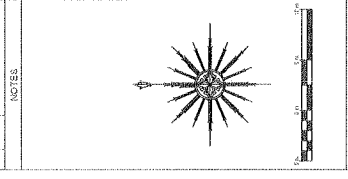
ENGINEER: TERRATEST

TITLE: DORSET BORROW PIT 1 SURVEY AND PLATFORM DESIGN

SCALES  
 Horizontal Scale: 300  
 Vertical Scale: 300  
 DRAWING No.

DRAWING REFERENCE

No.	Description	Date	By



REVISIONS

No.	Description	Date	By

Scale 1:500

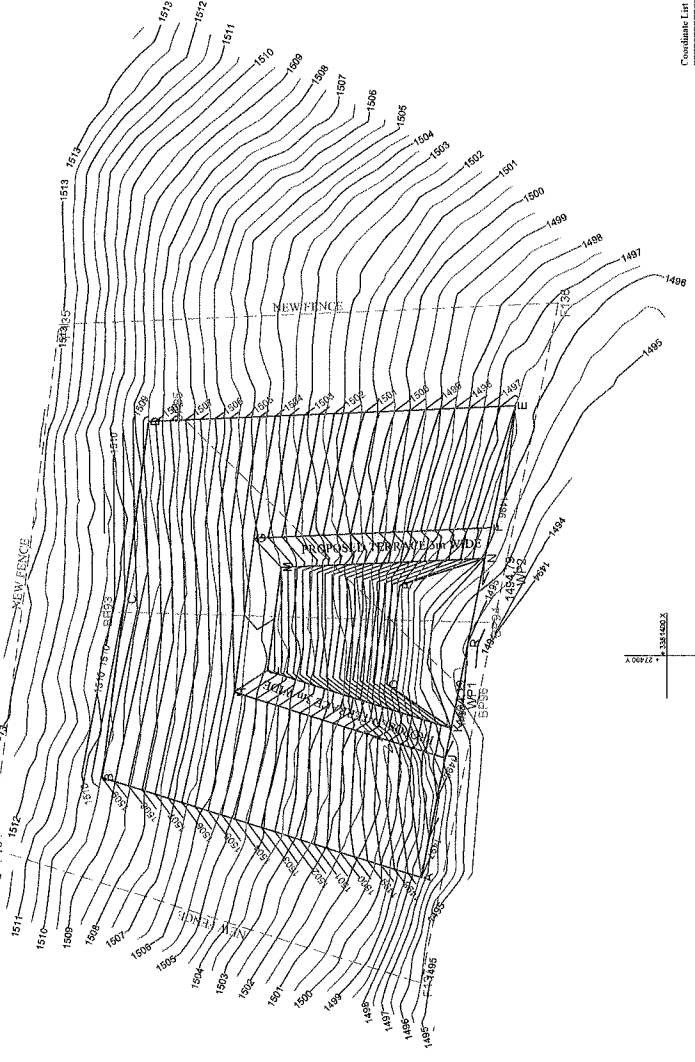
DATE: 21 JUN 2011

SAME REVIEWS CC
WZ29
UNIVERSITY OF DEPARTMENT OF ROADS AND TRANSPORT
TERMINAL
ROADS BRANCH SURVEY AND PLATFORM DESIGN

Coordinate List System: Transverse Mercator WGS 84 UTM 29E

PLATFORM SETTING OUT COORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
A	27421.937	3381875.692	1497.000
B	27411.975	3381845.812	1505.000
C	27394.744	3381846.111	1509.250
D	27375.179	3381834.526	1496.000
E	27367.290	3381832.524	1495.300
F	27359.528	3381831.015	1495.000
G	27351.996	3381829.629	1495.500
H	27344.717	3381828.316	1495.000
I	27337.691	3381827.071	1494.000
J	27330.918	3381825.896	1495.500
K	27324.401	3381824.791	1495.000
L	27318.139	3381823.755	1495.000
M	27312.140	3381822.788	1494.000
N	27306.399	3381821.889	1495.500
O	27300.814	3381821.058	1495.000
P	27295.389	3381820.294	1495.000
Q	27290.121	3381819.597	1496.000
R	27285.007	3381818.967	1495.000



DTM Volume Description

Description: DTM 1515 DTM  
 Design Surface: D015 BTP16 DTM  
 Geom. Hole Distance: 100.000  
 Geom. Hole Diameter: 100.000  
 Grad Interval: 0.300

The unadjusted volumes are >  
 127.39 cu m. Compaction for Fill  
 20.84 cu m. total area in Cut  
 1565.33 sq.m. total area in Fill  
 66.92 sq.m. total area in PHL

Volumes adjusted for 100% compaction and 0.10m Topsoil stripping >  
 127.39 cu m. Compaction for Fill  
 20.84 cu m. total area in Cut  
 1277.55 cu m. of excess Cut and  
 165.21 cu m. of Topsoil to be stripped

Coordinate List System: Transverse Mercator WGS 84 UTM 29E

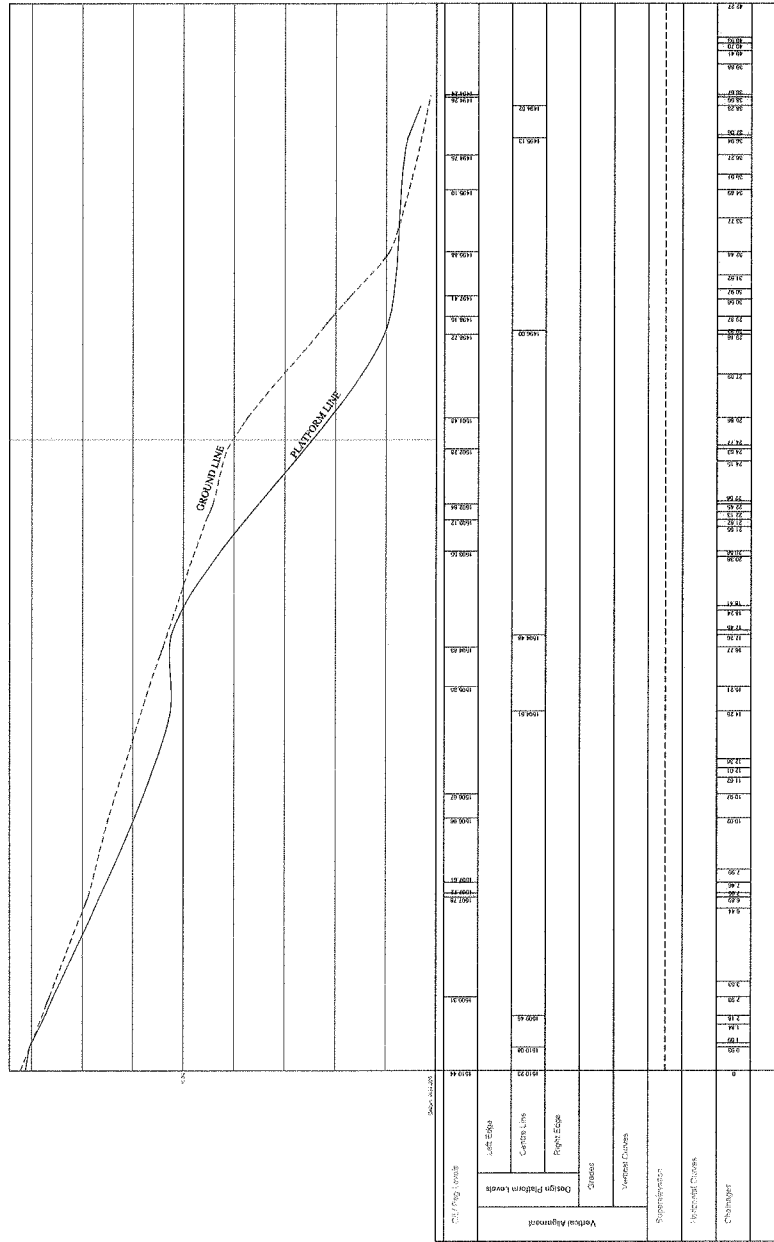
FENCE LINE COORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
F124	27120.045	3381835.880	1495.000
F125	27110.045	3381835.880	1495.000
F155	27154.991	3381836.206	1495.000
F157	27152.419	3381837.704	1495.000

Coordinate List System: Transverse Mercator WGS 84 UTM 29E

SURVEY CONTROL POINTS

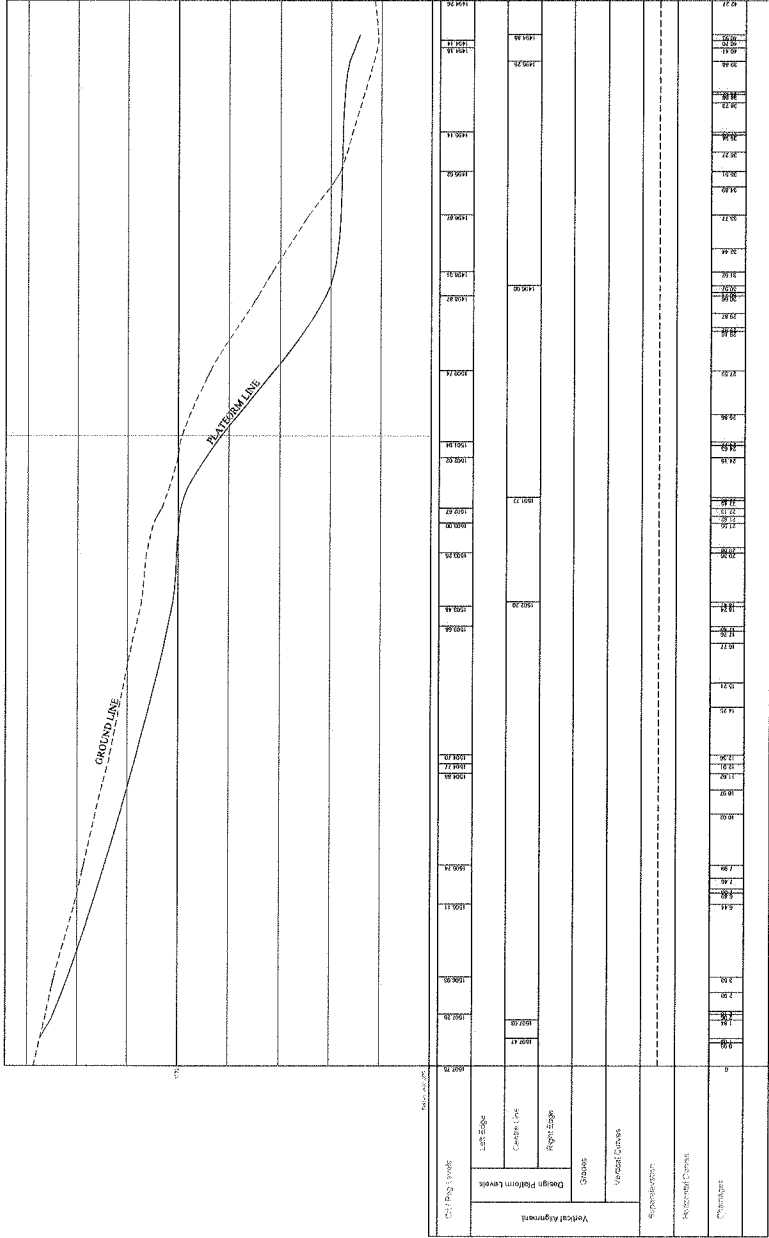
Name	Y	X	Z
Constants	0.000	0.000	0.000
WZ1	27405.883	3381830.829	1494.850
WZ2	27391.680	3381834.864	1494.850



Long Section for 0.00 to 42.27 (BP93 to BP94)

DATE 24 JUNE 2011	CLIENT EASTERN CAMP DEPARTMENT OF ROADS AND TRANSPORT	DESIGNED BY S.M.B. SURVEYS CC	ENGINEERS TERRAFEST	DRAWING NO.
DRAWN BY GORDON DRAKE	TITLE 10006 BORROW PIT 16 SURVEY AND PLATFORM DESIGN	SURVEYORS S.M.B. SURVEYS CC		
SCALES Horizontal Scale: 1:500 Vertical Scale: 1:10				





Long Section for 0.00 to 42.27 (BP96 TO BP96)

DATE: 24 JUNE 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	SCALE: Horizontal Scale: 200 Vertical Scale: 200
DRAWN BY: GORDON DRAKE	TITLE: BORROW BORROW PIT IS SURVEY AND PLATFORM DESIGN	DRAWING NO.
DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: TPRAK-TEST	
SURVEYORS: SABLE SURVEYS CC		

INSURANCE REFERENCE					
No.	24-93	56			



**Scale 1:750**

SABLE SURVEYS CC

WCS9

DEPARTMENT OF HIGHWAYS AND TRANSPORT

TERRA TEST

DOBRIE REP77  
ROSA VENTURA 11  
AND PETER MURPHY

**DDA Volume Definition**

Project No. : D015 RPT7  
 Design Surface : D015 RPT7 DTM  
 Design Point : D015 RPT7 PLATFORM  
 Volume Units : m³  
 Volume Factor : 1.000  
 The unadjusted volume are :-  
 6577.33 cu m total area in Cut  
 1130.07 cu m total area in Fill  
 Volume adjusted for 100.00% compaction and 0.10m typical stripping :-  
 6435.30 cu m of excess Cut available  
 578.54 cu m of Fill required (range) :-  
 748.80 cu m of Topsoil to be stripped

Coordinate List System: Transverse Meridian WGS 84 WGS 206

**SURVEY CONTROL POINTS**

Name	Y	X	Z
Constants	0.000	0.000	0.000
WP1	28161.228	3379651.644	1495.532
WP2	28166.867	3379677.797	1497.870

Coordinate List System: Transverse Meridian WGS 84 WGS 206

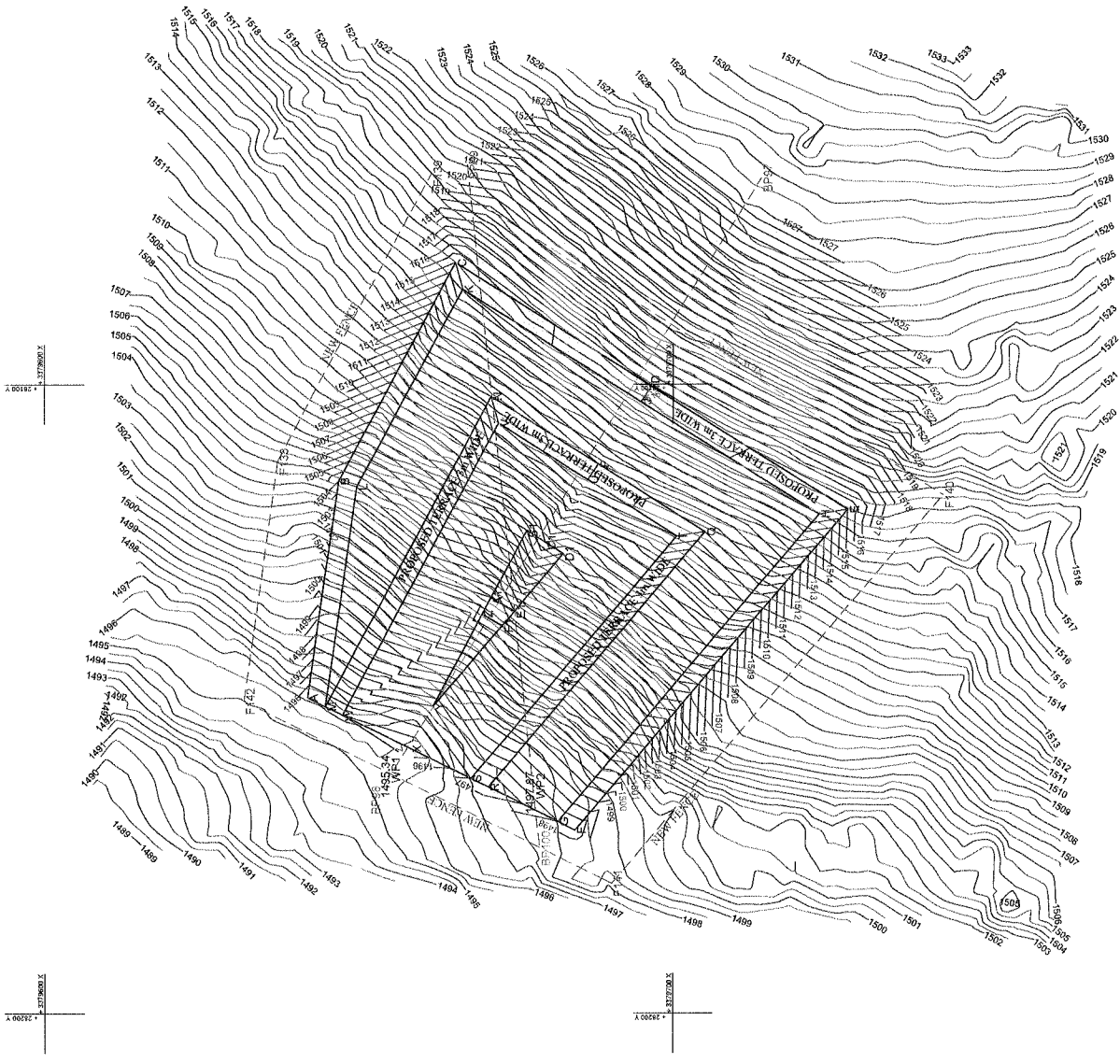
**PLATFORM SETTING OUT CO-ORDINATES**

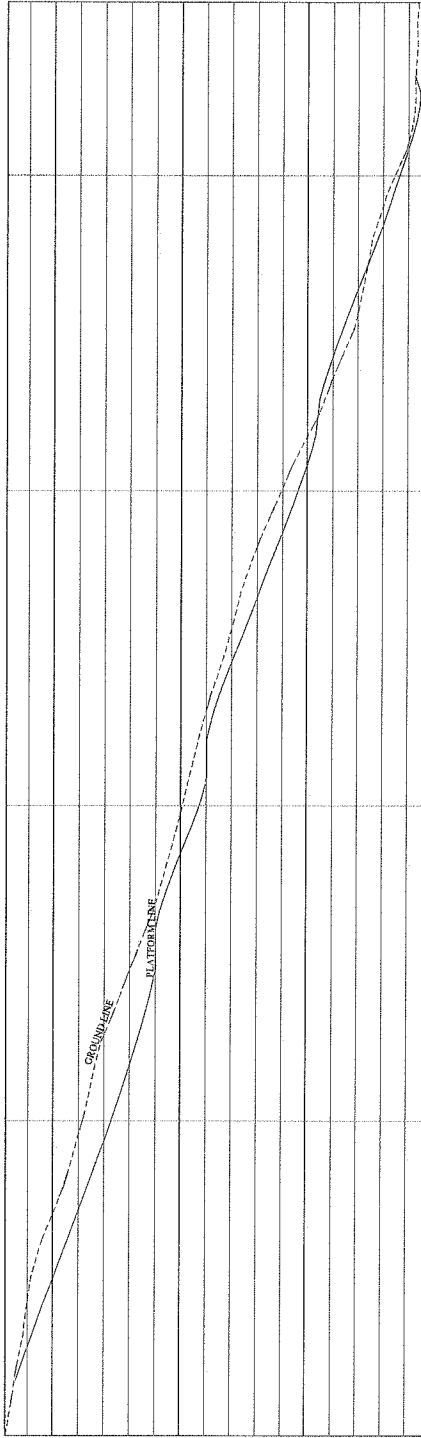
Name	Y	X	Z
Constants	0.000	0.000	0.000
A	28149.789	3379641.854	1495.500
A1	28153.859	3379670.916	1500.000
B	28155.947	3379646.797	1504.000
C	30046.626	3379665.298	1515.000
C1	28125.026	3379670.550	1508.000
D	28135.867	3379682.456	1507.000
E	28119.959	3379777.815	1515.000
F	28120.424	3379784.232	1515.000
F1	28118.304	3379672.685	1505.002
G	28120.424	3379784.232	1515.000
H	28120.424	3379784.232	1515.000
I	28102.766	3379604.851	1516.000
J	28102.766	3379604.851	1516.000
K	28102.766	3379604.851	1516.000
L	28102.766	3379604.851	1516.000
M	28102.766	3379604.851	1516.000
N	28102.766	3379604.851	1516.000
O	28102.766	3379604.851	1516.000
P	28102.766	3379604.851	1516.000
Q	28102.766	3379604.851	1516.000
R	28102.766	3379604.851	1516.000
S	28102.766	3379604.851	1516.000
T	28102.766	3379604.851	1516.000
U	28102.766	3379604.851	1516.000
V	28102.766	3379604.851	1516.000
W	28102.766	3379604.851	1516.000
X	28102.766	3379604.851	1516.000
Y	28102.766	3379604.851	1516.000
Z	28102.766	3379604.851	1516.000

Coordinate List System: Transverse Meridian WGS 84 WGS 206

**FENCE LINE CO-ORDINATES**

Name	Y	X	Z
Constants	0.000	0.000	0.000
F138	28112.392	3379627.137	1511.000
F139	28062.440	3379661.516	1511.000
F140	28116.658	3379742.098	1511.000
F142	28150.521	3379631.675	1511.000

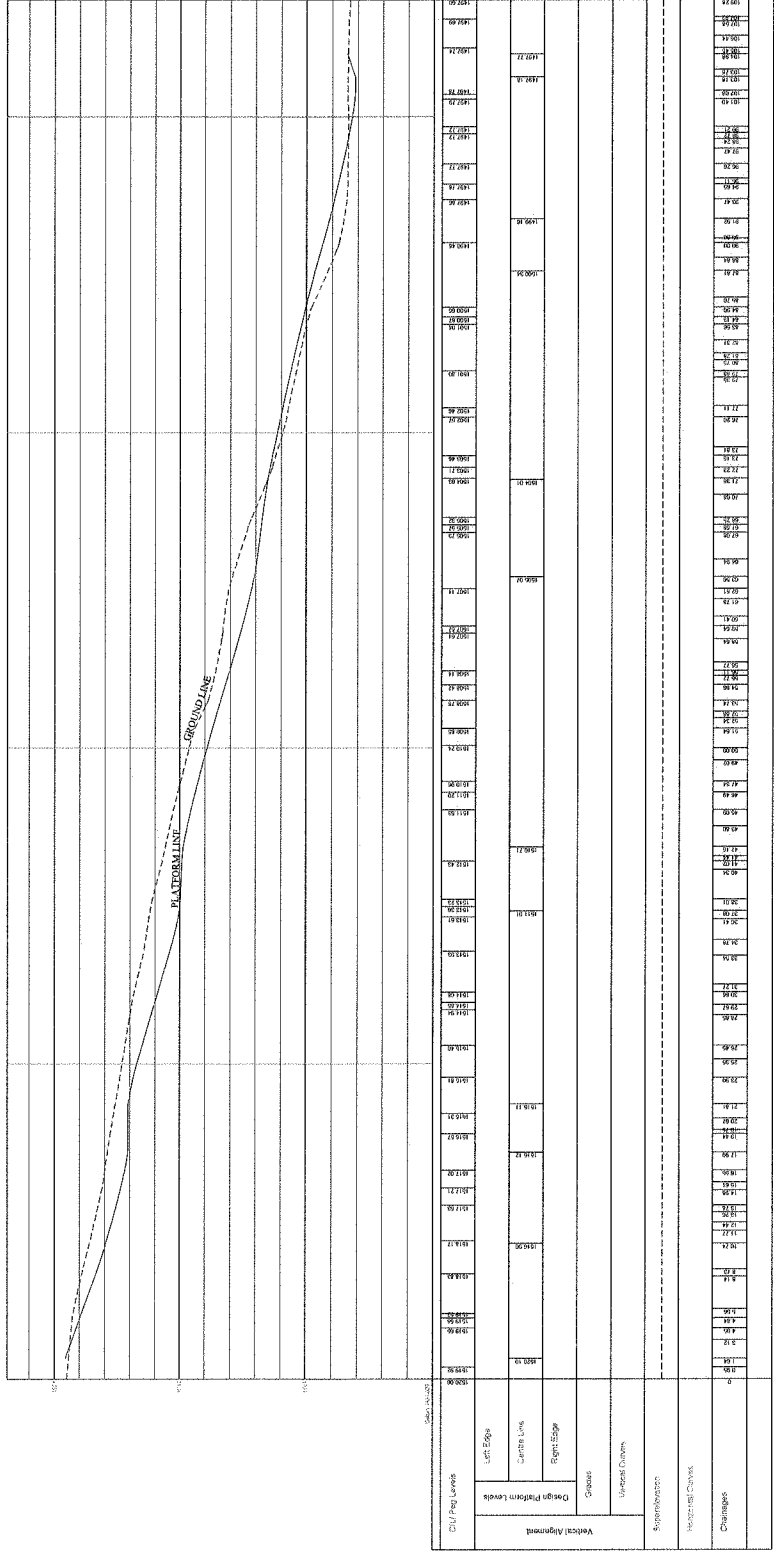




Stationing	Elevation	Ground Level	Platform Level
100.00	100.00	100.00	100.00
100.05	100.05	100.05	100.05
100.10	100.10	100.10	100.10
100.15	100.15	100.15	100.15
100.20	100.20	100.20	100.20
100.25	100.25	100.25	100.25
100.30	100.30	100.30	100.30
100.35	100.35	100.35	100.35
100.40	100.40	100.40	100.40
100.45	100.45	100.45	100.45
100.50	100.50	100.50	100.50
100.55	100.55	100.55	100.55
100.60	100.60	100.60	100.60
100.65	100.65	100.65	100.65
100.70	100.70	100.70	100.70
100.75	100.75	100.75	100.75
100.80	100.80	100.80	100.80
100.85	100.85	100.85	100.85
100.90	100.90	100.90	100.90
100.95	100.95	100.95	100.95
113.78	113.78	113.78	113.78

Long Section for 0.00 to 113.78 (BP97 to BP98)

DATE: 24 JUNE 2011	CLIENT: EASTERN CAPE DEPARTMENT OF ROADS AND TRANSPORT	SCALE: Horizontal Scale: 400 Vertical Scale: 400
DRAWN BY: GORDON DRAKE	TITLE: DUNDAS BORROW PIT 17 SURVEY AND PLATFORM DESIGN	SCHEMATIC NO:
DESIGNED BY: SABLE SURVEYS CC	ENGINEERS: TERRATEST	
SUPERVISOR: SABLE SURVEYS CC		



Long Section for 0.00 to 109.28 (BP99 TO BP100)

DATE: 24 JUNE 2011  
 DRAWN BY: GORDON DRAKE  
 DESIGNED BY: SABLE SURVEYS CC  
 SURVEYORS: SABLE SURVEYS CC

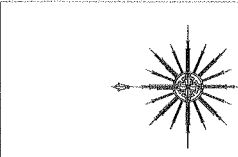
CLIENT: EASTERN CAPED DEPARTMENT  
 OF ROADS AND TRANSPORT  
 ENGINEERS: TRAK TEST

TITLE: D8806 BORROW PIT SURVEY AND  
 PLATIFICATION DESIGN

SCALES  
 Horizontal Scale: 400  
 Vertical Scale: 400  
 DRAWING No.

No.	Description
1	...

NOTES



REVISIONS

No.	Description
1	...

Scale 1:750

Author	...
Checked	...
Approved	...
Date	...

Project Name	SABLE STURVEY CC
Client	...
Contract No.	...
Date	21 JUNE 2011
Scale	1:750
Drawn by	...
Checked by	...
Approved by	...
Date	...

Coordinate List System: Transverse Mercator WGS 84 WGS 298

PLATFORM BETTING OUT CO-ORDINATES

Name	Y	X	Z
Constants	0.000	0.000	0.000
A	31017.202	3377238.560	1331.000
A1	31002.577	3377596.275	1332.000
B	30956.830	3377584.912	1331.000
B1	30968.828	3377486.965	1332.000
C	30960.106	3377379.549	1332.000
C1	31007.497	3377582.426	1330.000
D	31009.697	3377413.790	1329.250
D1	31044.246	3377599.690	1329.000
E	31044.246	3377599.690	1329.000
E1	31044.246	3377599.690	1329.000
F	31038.996	3377585.638	1328.750
F1	31038.996	3377585.638	1328.750
G	31032.796	3377582.235	1328.500
G1	31032.796	3377582.235	1328.500
H	31023.621	3377425.601	1328.250
H1	31023.621	3377425.601	1328.250
I	31023.621	3377425.601	1328.250
I1	31023.621	3377425.601	1328.250
J	31023.621	3377425.601	1328.250
J1	31023.621	3377425.601	1328.250
K	31023.621	3377425.601	1328.250
K1	31023.621	3377425.601	1328.250
L	31023.621	3377425.601	1328.250
L1	31023.621	3377425.601	1328.250
M	31023.621	3377425.601	1328.250
M1	31023.621	3377425.601	1328.250
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T	31023.621	3377425.601	1328.250
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U1	31023.621	3377425.601	1328.250
V	31023.621	3377425.601	1328.250
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W1	31023.621	3377425.601	1328.250
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Y	31023.621	3377425.601	1328.250
Y1	31023.621	3377425.601	1328.250
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Coordinate List System: Transverse Mercator WGS 84 WGS 298

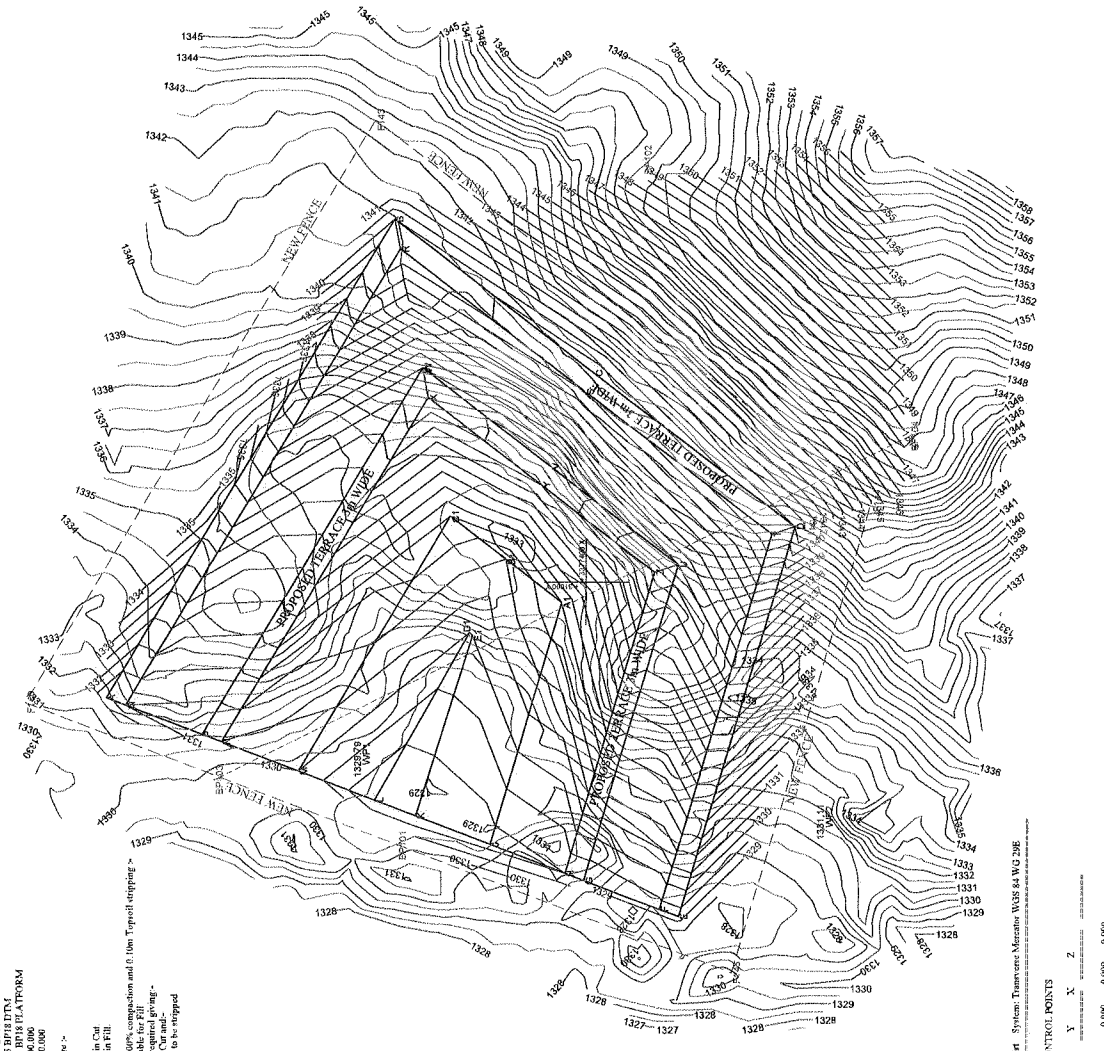
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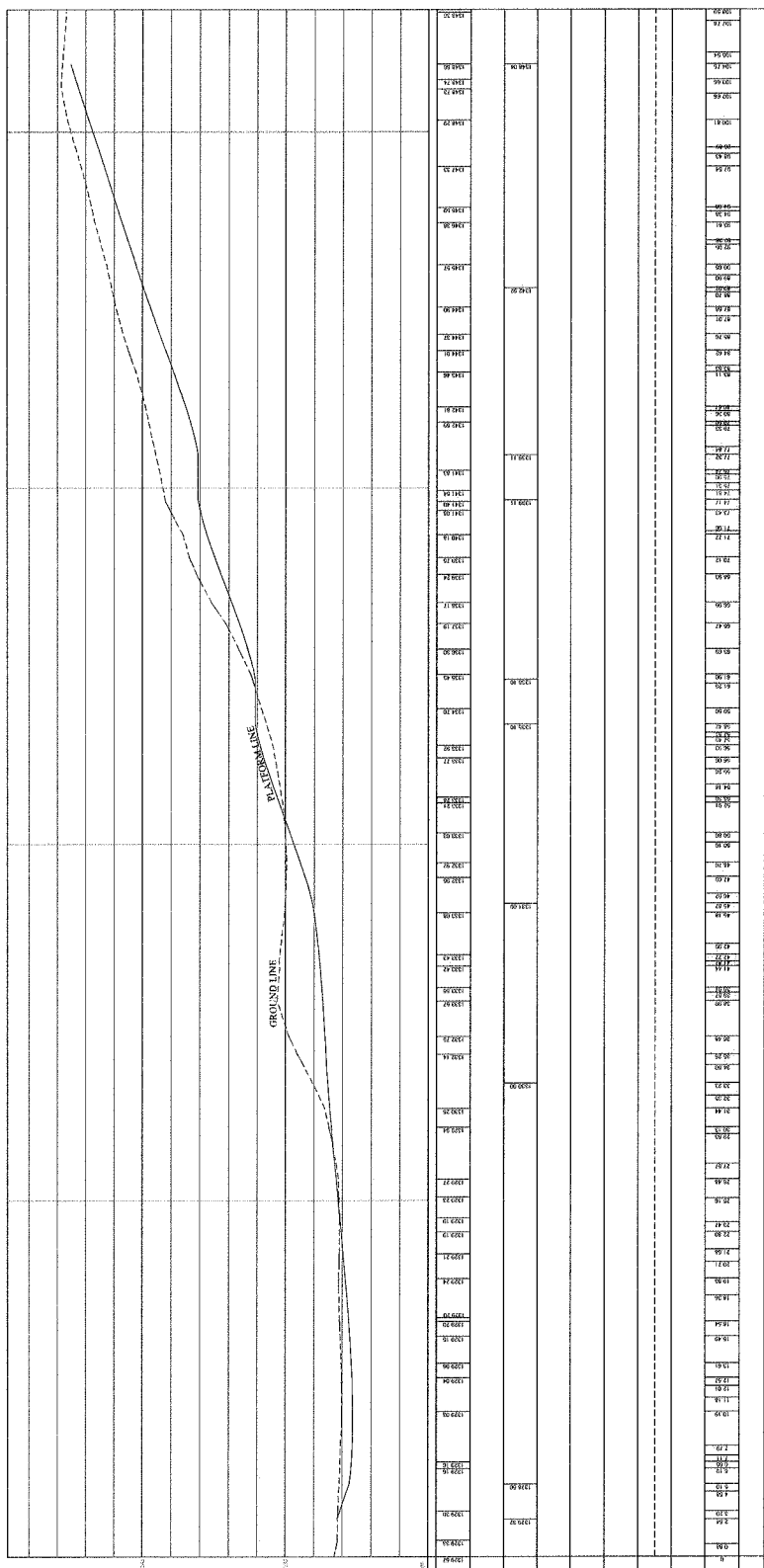
DTM Volume Derivations

Description : D10R15 BP18  
 Drawn by : D10R15 BP18  
 Drawn Date : 2011-06-18 14:10:00  
 Ground Hook Distance : 160.000  
 Design Hook Distance : 200.000  
 The unadjusted volume are :-  
 848.89 cu.m. total Cut  
 2421.83 cu.m. total area in Fill  
 8192.74 cu.m. Cut available for fill  
 6561.51 cu.m. total area in grading  
 6240.65 cu.m. of excess ground  
 898.53 cu.m. of Topsoil to be stripped

Coordinate List System: Transverse Mercator WGS 84 WGS 298

SURVEY CONTROL POINTS

Name	Y	X	Z
Constants	0.000	0.000	0.000
WP1	31023.516	3377562.289	1328.786
WP2	31034.776	3377463.339	1331.111



Long Section for 0.00 to 108.59 (BP101 to BP102)

DATE: 24 JUNE 2011  
 CLIENT: EASTERN CARB DEPARTMENT OF ROADS AND TRANSPORT  
 DRAWN BY: GORDON DRAKE  
 DESIGNED BY: SABLE SURVEYS CC  
 SURVEYORS: SABLE SURVEYS CC

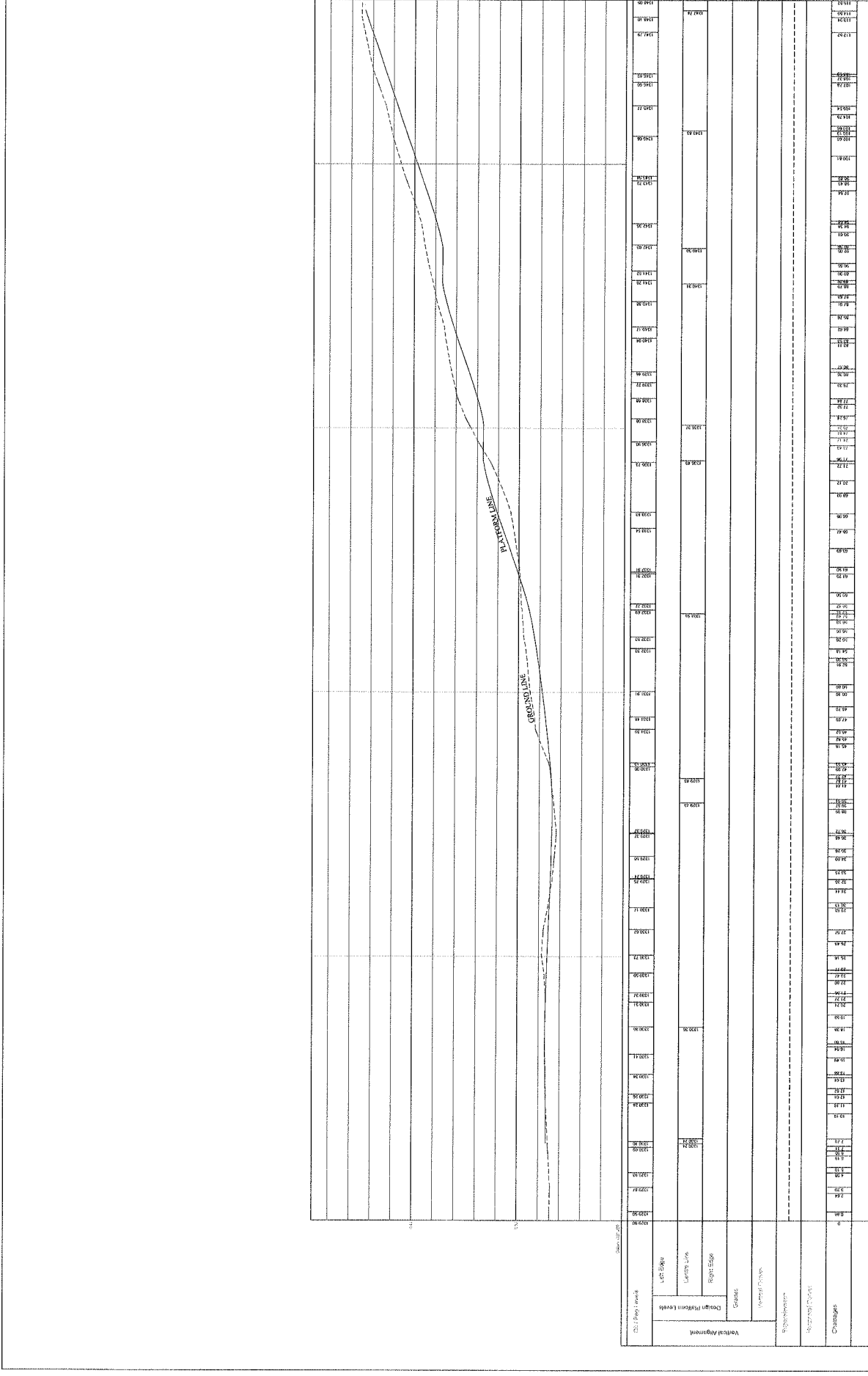
ENGINEERS: TEBBATES

TITLE: BORROW PIT IN SURVEY AND RECONSTRUCTION

SCALES  
 Horizontal Scale: 50  
 Vertical Scale: 50  
 DRAWING NO.

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DATE: 2/15/2011  
 DRAWN BY: GORDON BRADY  
 DESIGNED BY: SABLE SURVEYS CO  
 SURVEYORS: SABLE SURVEYS CO  
 ENGINEERS: THERI GUSTY  
 CLIENT: EASTERN CARBON DEPARTMENT OF ROADS AND TRANSPORT  
 TITLE: 2000'S BORROW PIT IS SURVEY AND PLATFORM DESIGN  
 SCALES: Horizontal Scale: 1"=50' Vertical Scale: 1"=5'  
 DRAWING NO:

**APPENDIX B**  
**PUBLIC PARTICIPATION**



Our Ref. 41129/IS

5 July 2011

Eastern Cape Parks Board  
PO Box 11235  
Southernwood  
East London  
35200

Submitted via post on 05 July 2011.

**ATTENTION: EASTERN CAPE PARKS BOARD**

Dear Sir/Madam,

**BID'S FOR THE APPLICATION FOR BORROW PITS ALONG NINETEEN ROADS WITHIN  
THE ALFRED NZO DISTRICT MUNICIPALITY**

Attached please find nineteen Background Information Documents (BID) for the Borrow Pit Applications for assorted materials, within the Alfred Nzo District Municipality.

Any comments are to be directed to the details provided hereunder or on the BID's. Please note that comments are to be extended before the 26 July 2011.

Yours faithfully,

**Imke Summers**  
**FOR: TERRATEST (Pty) Ltd**

Email: [summersi@terratest.co.za](mailto:summersi@terratest.co.za)



Our Ref. 41129/IS

5 July 2011

South African Heritage Resource Agency  
PO Box 759  
Southernwood  
East London  
5200

Submitted via post on 05 July 2011.

**ATTENTION: SAHRA**

Dear Mr T. Lungile

**BID'S FOR THE APPLICATION FOR BORROW PITS ALONG NINETEEN ROADS WITHIN  
THE ALFRED NZO DISTRICT MUNICIPALITY**

Attached please find nineteen Background Information Documents (BID) for the Borrow Pit Applications for assorted materials, within the Alfred Nzo District Municipality.

Any comments are to be directed to the details provided hereunder or on the BID's. Please note that comments are to be extended before the 26 July 2011.

Yours faithfully,

**Imke Summers**  
**FOR: TERRATEST (Pty) Ltd**

Email: [summersi@terratest.co.za](mailto:summersi@terratest.co.za)



Our Ref. 41129/IS

5 July 2011

WESSA  
26 Lawrence Street  
Central Hill  
Port Elizabeth  
6001

Submitted via post on 05 July 2011.

**ATTENTION: WESSA**

Dear Dr. Jenny Gon

**BID'S FOR THE APPLICATION FOR BORROW PITS ALONG NINETEEN ROADS WITHIN  
THE ALFRED NZO DISTRICT MUNICIPALITY**

Attached please find nineteen Background Information Documents (BID) for the Borrow Pit Applications for assorted materials, within the Alfred Nzo District Municipality.

Any comments are to be directed to the details provided hereunder or on the BID's. Please note that comments are to be extended before the 26 July 2011.

Yours faithfully,

**Imke Summers**  
**FOR: TERRATEST (Pty) Ltd**

Email: [summersi@terratest.co.za](mailto:summersi@terratest.co.za)

**Alfred Nzo Borrow Pit Investigation  
Background Information Document:**

**DR08015**

Our Reference: 41129



**CONTROLAB**

**Prepared for:**

Eastern Cape Transport  
Stellenbosch Park  
Flemming Street  
Schornville  
King William's Town  
5601

**Prepared for:**

Controlab CC.  
10 St Pauls Rd  
East London,  
Eastern Cape  
5201  
Tel: +27 43 722 5420



**Prepared by:**

Terratest (Pty) Ltd  
PO Box 794  
Hilton  
3201  
Tel: +27 33 343 6789

## **BACKGROUND INFORMATION DOCUMENT FOR THE INVESTIGATION AND PROPOSED APPLICATION OF BORROW PITS IN THE ALFRED NZO DISTRICT OF THE EASTERN CAPE**

### **1. Introduction**

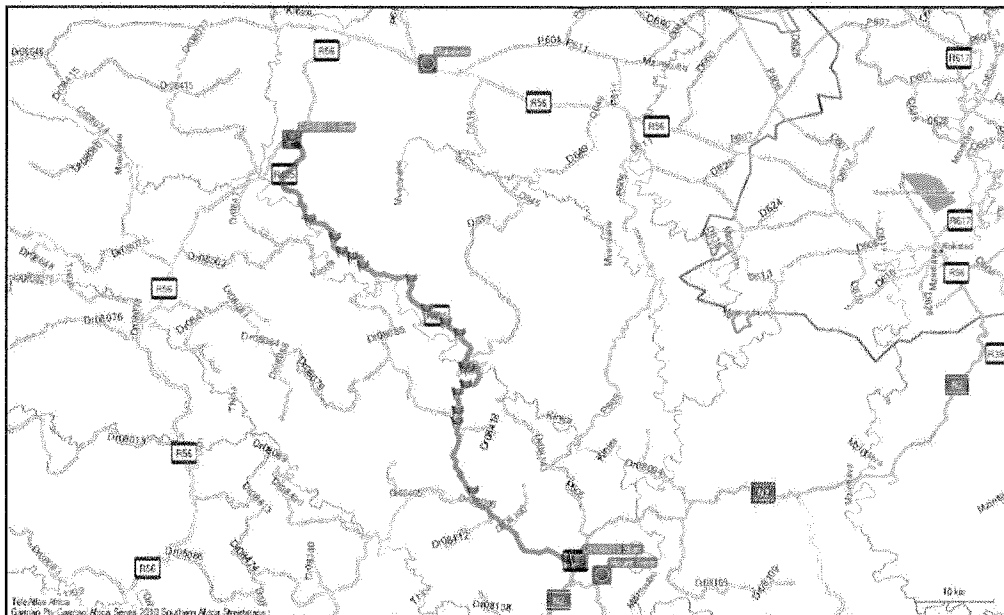
Terratest (Pty) Ltd was appointed by Controlab CC. on behalf of the Eastern Cape Department of Roads and Transport, to manage the environmental investigation and permitting process of numerous borrow pits in the Alfred Nzo District Municipality. The borrow pits are to be used as a source of materials for the resurfacing of numerous stretches of road throughout the region.

The objective of this Background Information Document (BID) is:

- To provide information and to notify and inform parties regarding the application procedure;
- To invite parties to register as Interested and Affected Parties (IAPs).

### **2. Site Locality**

The borrow pits are situated on the DR08015, which starts north of Mount Frere and ends 27km from the town of Matatiele (See Figure 1 below). The DR08015 is 88.2 km's long and starts at the intersection with the N2 and ends at the intersection with the R56.



**Figure 1. The alignment of the DR08015 (in pink) (Controlab CC).<sup>1</sup>**

<sup>1</sup> Controlab CC., *Geotechnical Borrow Pit Assessment, Initial Assessment Report for the DR08015*, December 2010.



The key co-ordinate points along the alignment are:

Point	Southerly co-ordinate	Easterly co-ordinate
BP01	S30° 53' 43.1"	E28° 59' 00.5"
BP03	S30° 44' 31.9"	E28° 51' 09.4"
BP04	S30° 43' 49.5"	E28° 51' 12.0"
BP05	S30° 42' 34.3"	E28° 51' 11.3"
BP06	S30° 42' 04.1"	E28° 51' 47.1"
BP07	S30° 41' 00.4"	E28° 51' 59.8"
BP08	S30° 40' 50.4"	E28° 51' 41.6"
BP09	S30° 38' 36.0"	E28° 51' 19.4"
BP10	S30° 31' 51.1"	E30° 50' 18.8"
BP11	S30° 36' 59.0"	E28° 48' 56.9"
BP13	S30° 34' 07.1"	E28° 44' 27.6"
BP14	S30° 34' 07.1"	E28° 44' 27.6"
BP15	S30° 33' 29.9"	E28° 43' 37.1"
BP16	S30° 33' 08.3"	E28° 42' 51.8"
BP17	S30° 32' 12.2"	E28° 42' 23.4"
BP18	S30° 30' 58.7"	E28° 40' 35.5"

### 3. Description of the Site

Of the eighteen borrow pits identified, sixteen were recommended in the Materials Investigation (Controlab CC.), as being suitable for future use. All sixteen pits are existing pits that has previously been mined for materials. Please see the table below for details regarding the location, materials composition and yield of each borrow pit:

Borrow Pit	Km log	Materials composition	Yield
BP01	1.4km	Decomposed dolerite, sandstone and mudstone	High
BP03	28.1km	Decomposed dolerite and sandstone	High
BP04	29.4km	Decomposed dolerite	Fair
BP05	31.6km	Decomposed dolerite, sandstone and mudstone	High
BP06	33.0km	Mudstone, decomposed dolerite and sandstone	High
BP07	38.3km	Sandstone and decomposed dolerite	Fair to high
BP08	39.5km	Shale, sandstone and decomposed dolerite	High
BP09	44.8km	Decomposed dolerite	Fair
BP10	47.1km	Decomposed dolerite some mudstone	High
BP11	51.2km	Sandstone and mudstone	Fair

BP13	63.3km	Decomposed dolerite	Fair to high
BP14	63.4km	Sandstone, shale and mudstone	High
BP15	66.0km	Mudstone	High
BP16	67.4km	Decomposed dolerite	Fair to high
BP17	69.7km	Mudstone and sandstone	Fair
BP18	74.0km	Mudstone and decomposed dolerite	Fair to high

#### **4. Project Description**

The project entails the formalised permitting of the borrow pits in terms of the Department of Mineral Resources. An area of no more than 1.5ha is to be mined as per the regulations for mining permits. The mined materials are to be used by the Department of Roads and Transport, for the upgrading and rehabilitation of existing surfaces.

The proposed mining method is open cast excavation with a front-end loader and loading onto tipper trucks for transport. The mining operations will be operated in accordance with an approved Environmental Management Programme as per the requirements set out by the Department of Mineral Resources.

#### **5. Heritage Impact Assessment**

A Heritage Impact Assessment was conducted on the sixteen borrow pits that are found along the DR08015. Of the sixteen borrow pits investigated, ancestral graves occur immediately adjacent to the following pits:

- Borrow Pit 05: Approximately 16 stone-packed graves, and one grave with a granite headstone, are located within 30 meters of the southern borrow pit face.
- Borrow Pit 06: Various family graves are located within a fenced homestead precinct within 5 metres of the existing southern/south-western borrow pit face.
- Borrow Pit 18: At least three stone-packed graves are located across the road from, and directly opposite to the borrow pit.

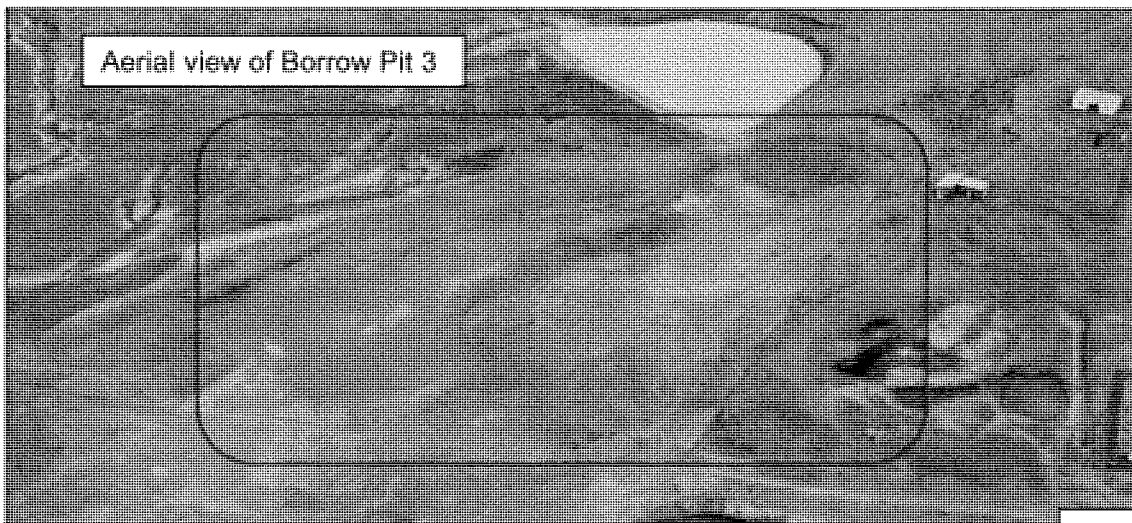
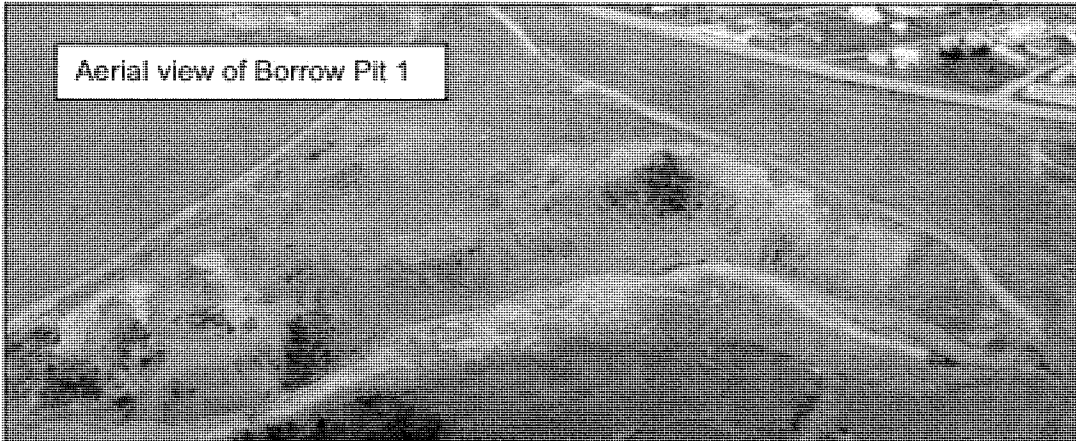
#### **6. How to participate**

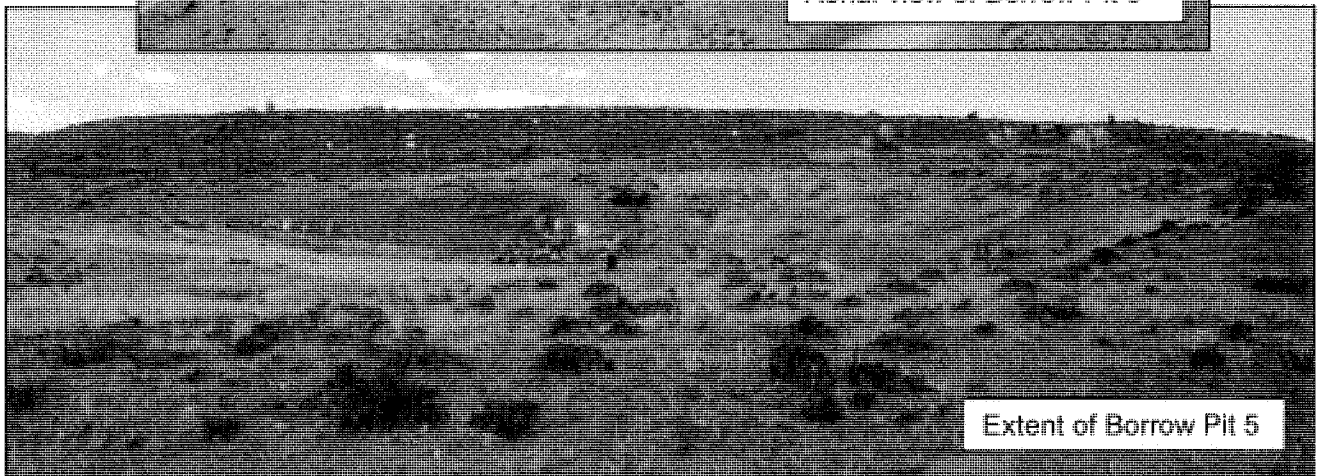
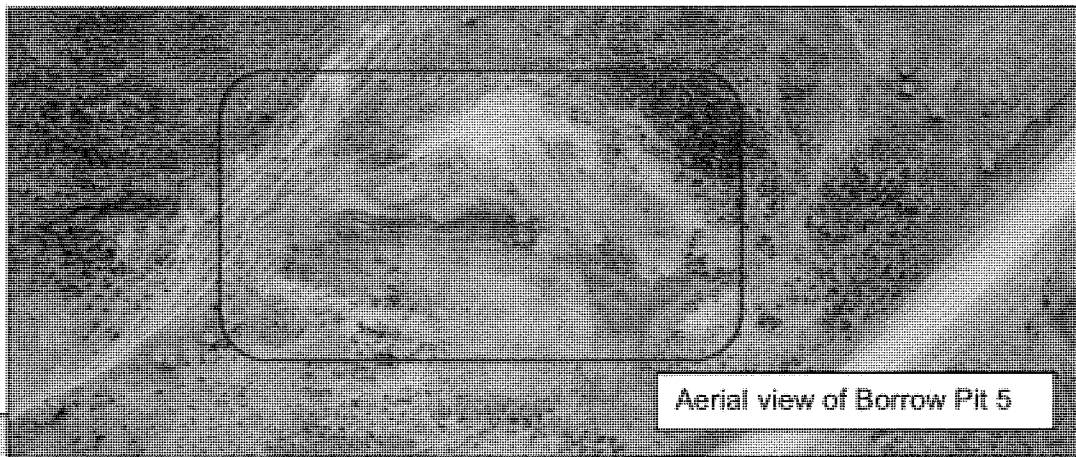
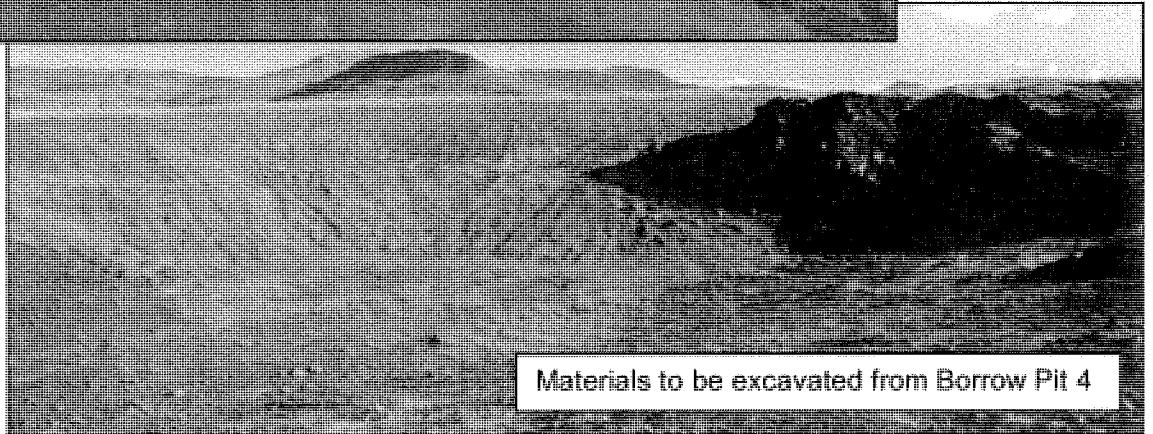
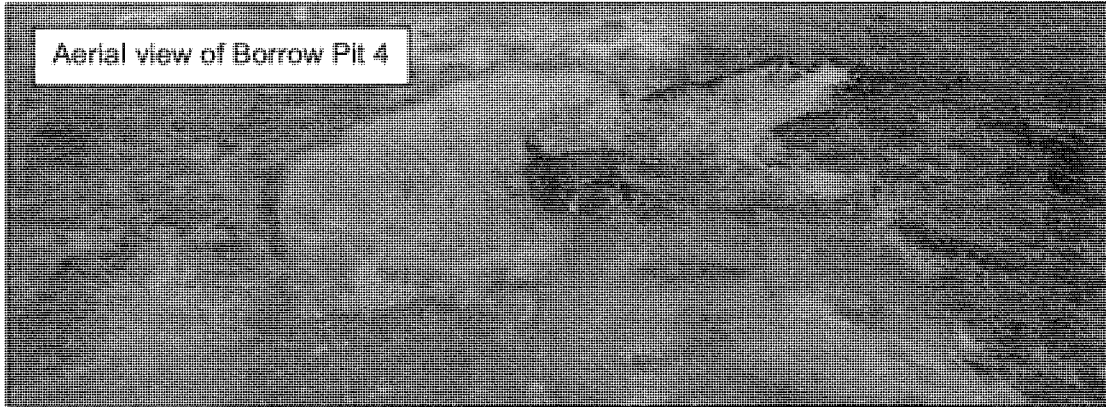
According to the Environmental Impact Assessment Regulations (2010) promulgated in terms of the National Environmental Management Act (Act 107 of 1998) those who are

impacted by a proposed development must have the opportunity to comment and/or raise concerns. These inputs are then addressed through the EIA process. For this reason it is imperative that you as an interested and/or affected party (IAP) comment on the proposed development and highlight issues or concerns that you feel need to be considered during the proposed planning and implementation process. This can be done by contacting the environmental consultant (details given on page 01) who will register you as an IAP. If you intend to register as an IAP please forward the following information to Terratest before **26 July 2011**.

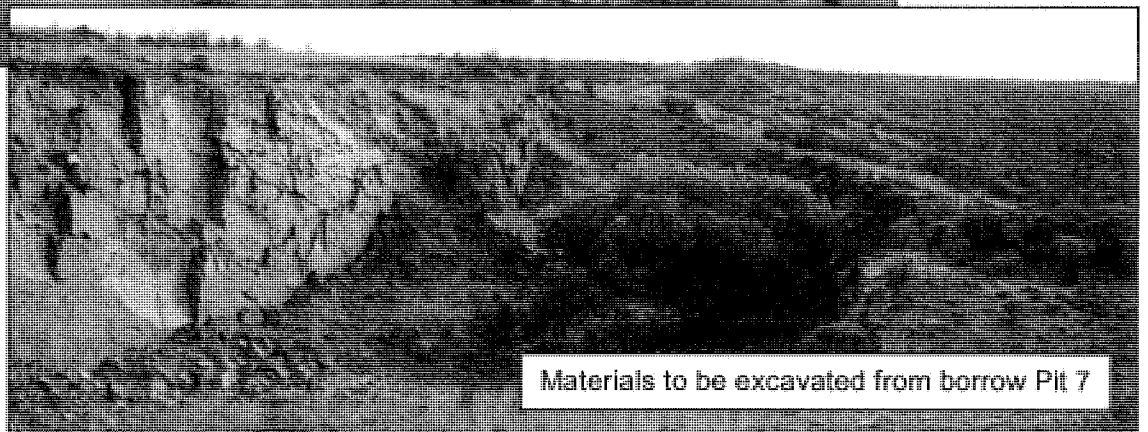
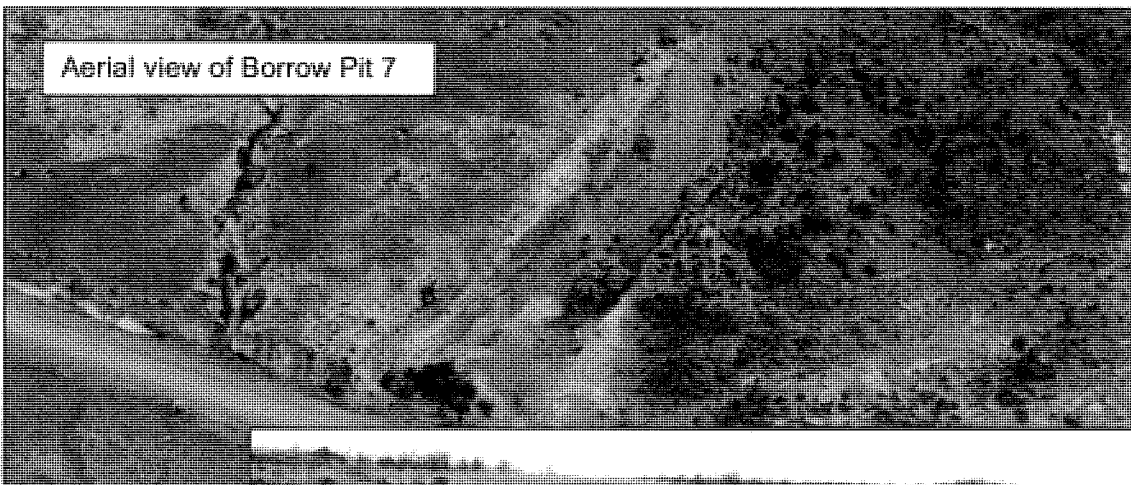
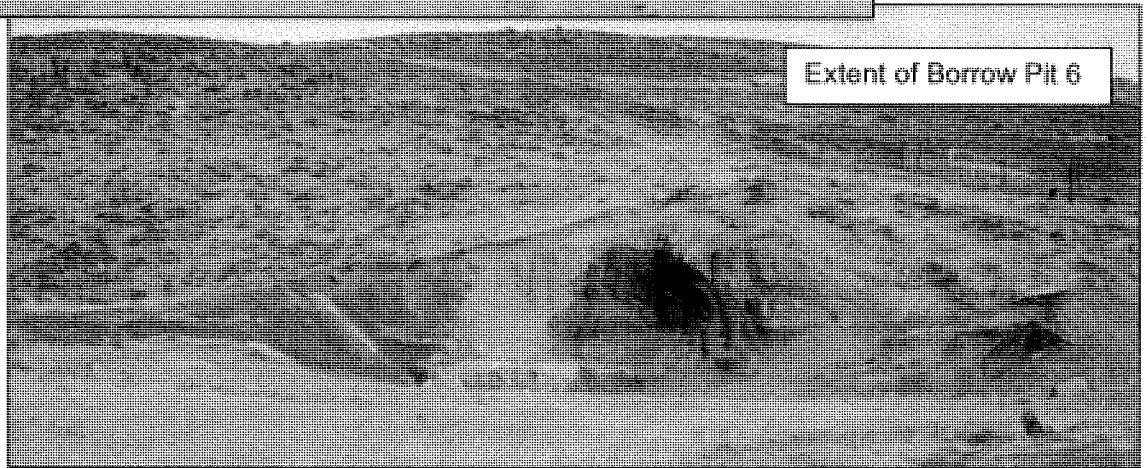
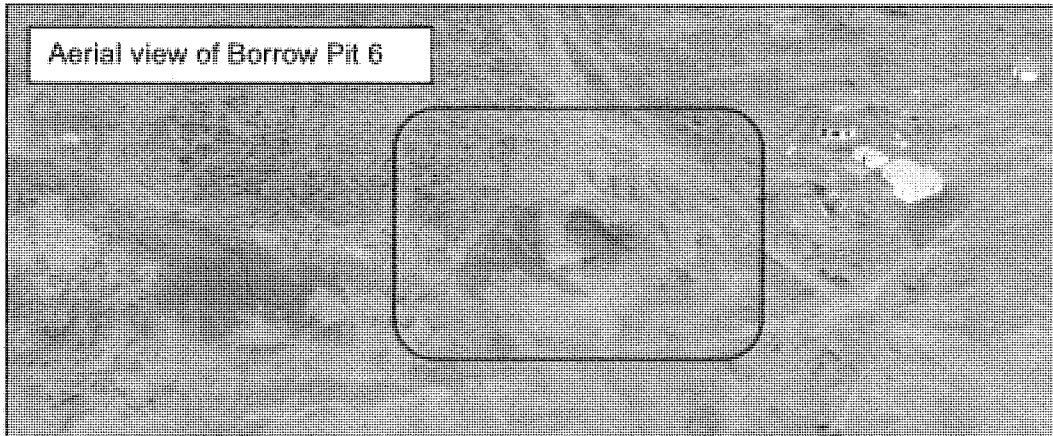
- **Your Name**
- **Your Contact Details**
- **Your Comment**

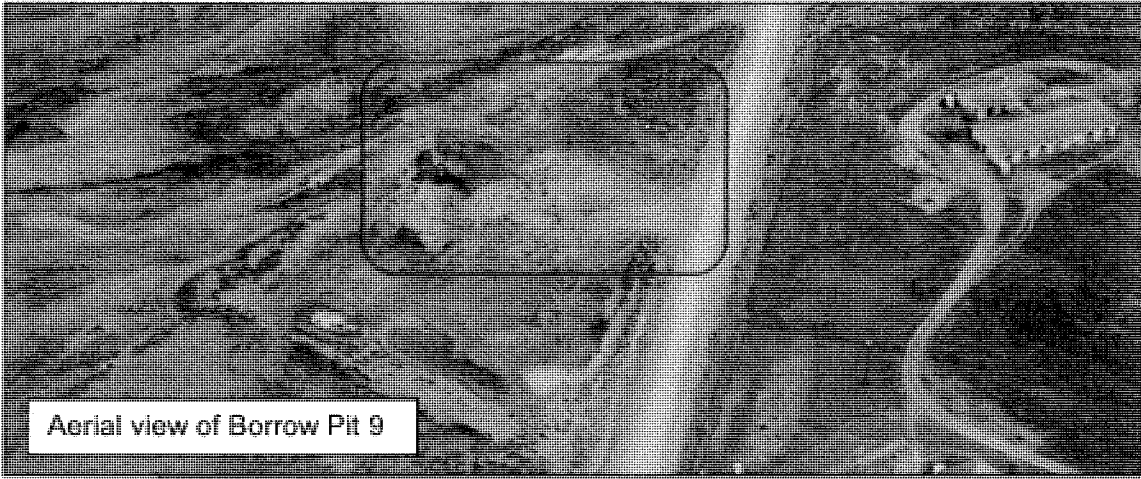
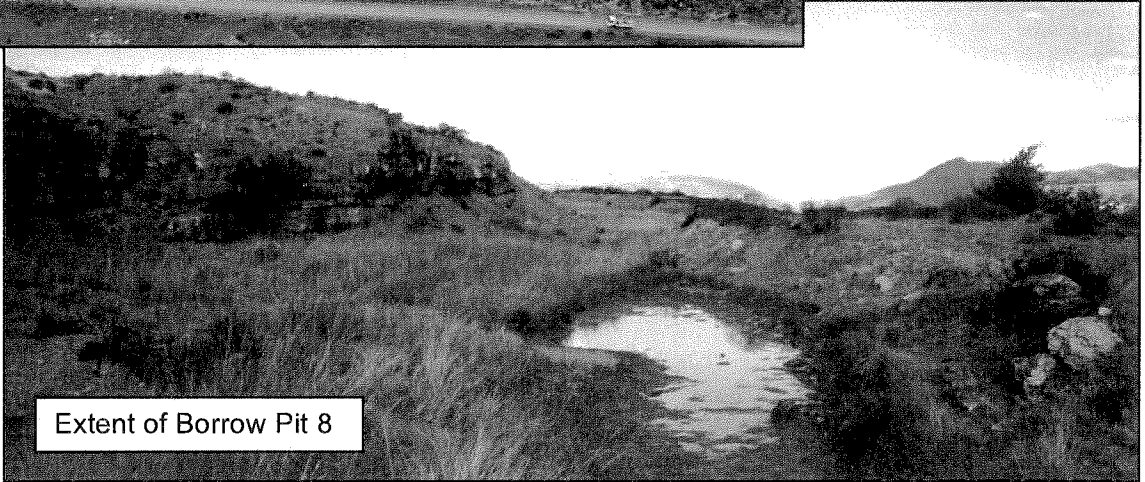
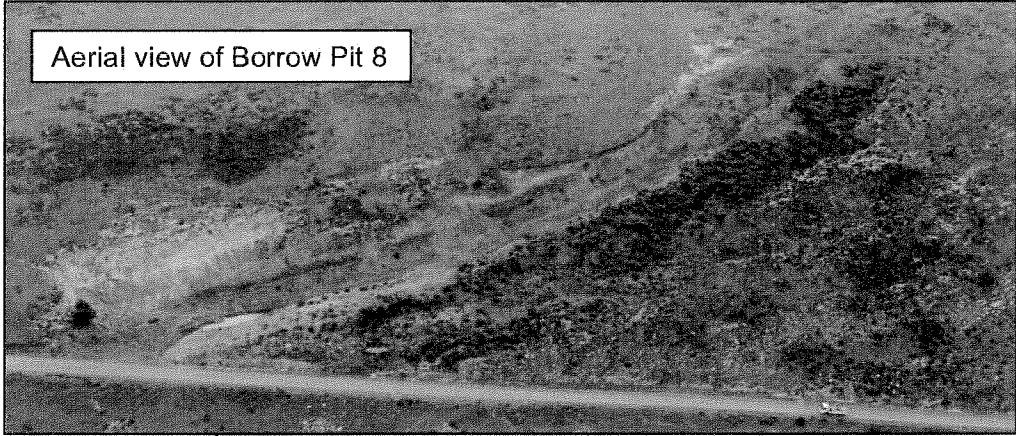
A comments form is attached in Appendix A.



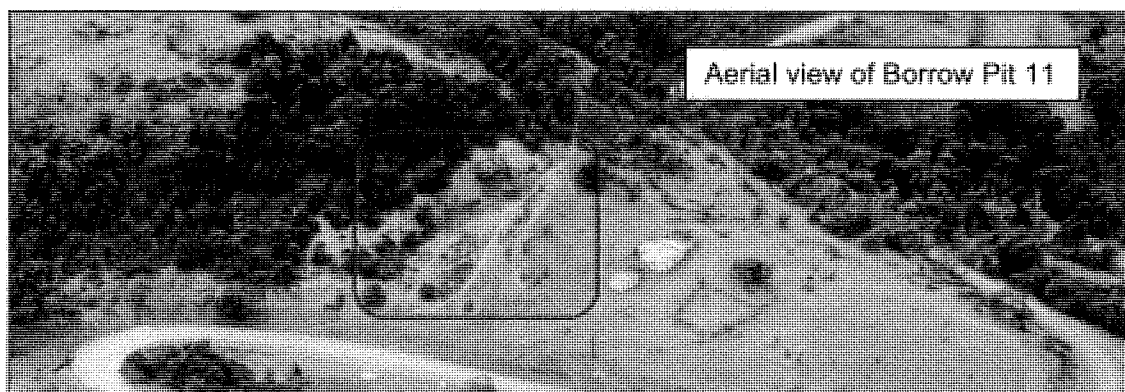
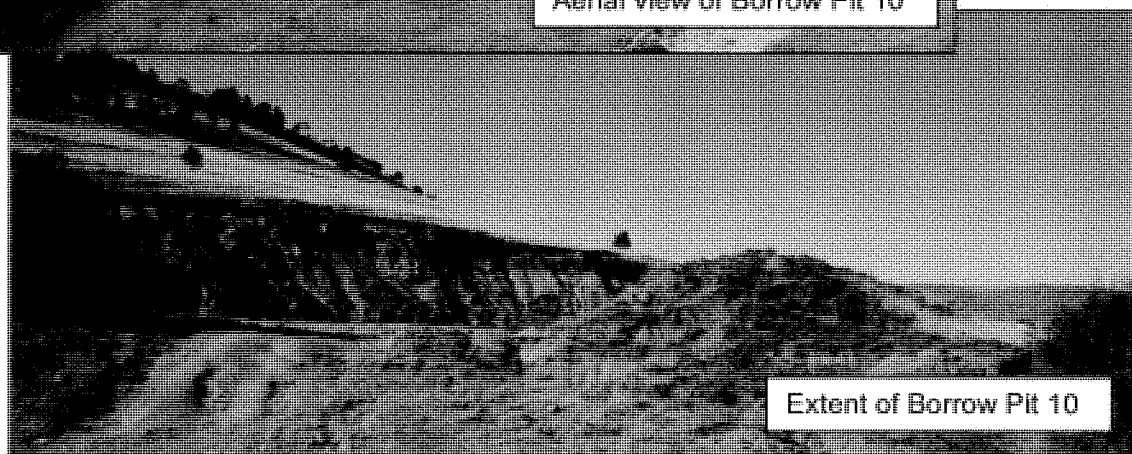
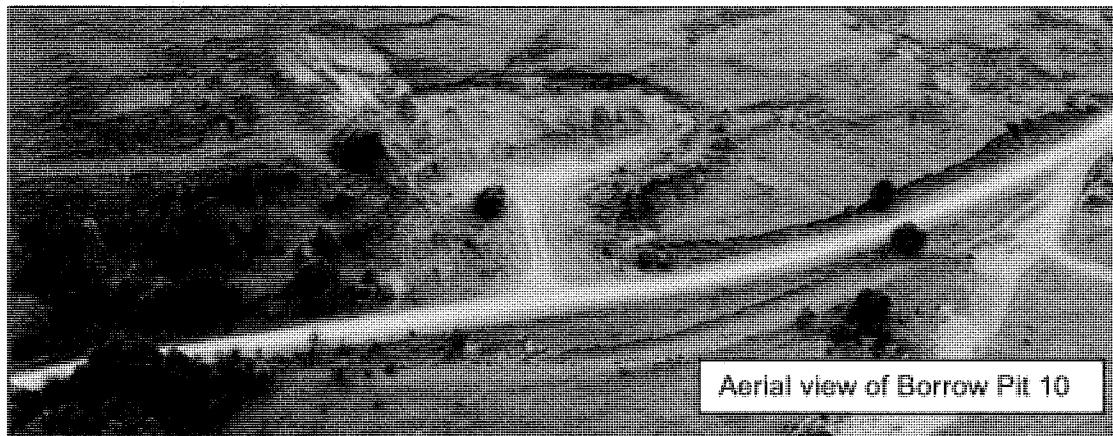


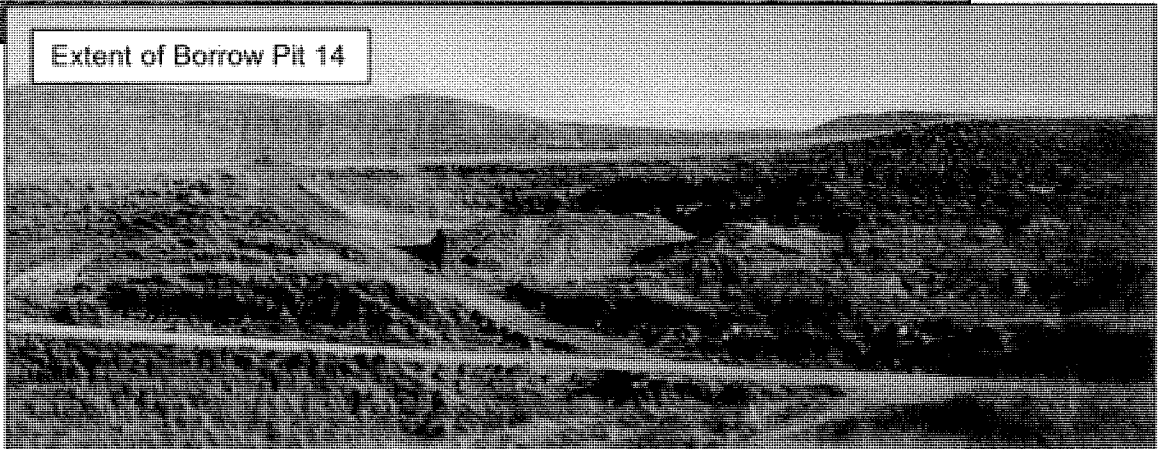
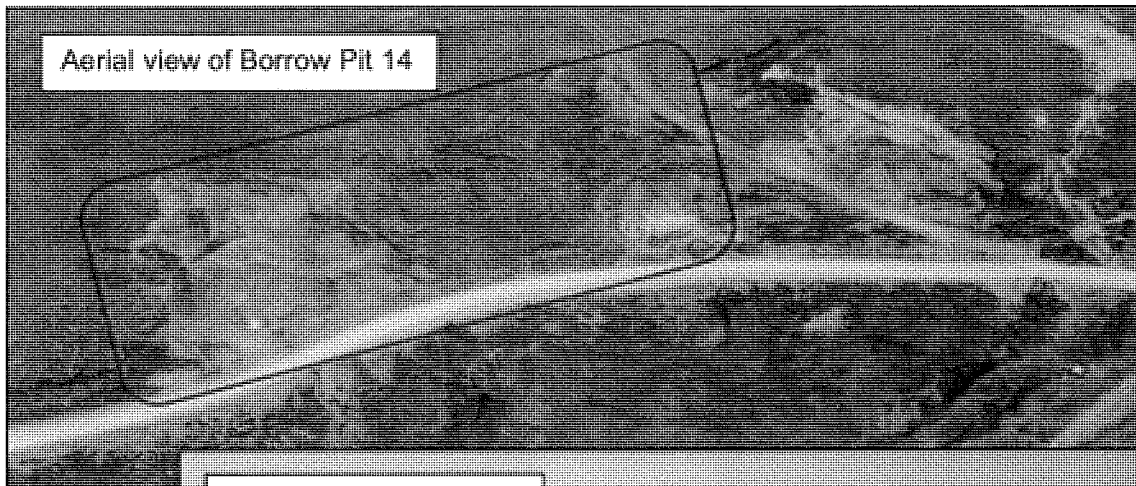
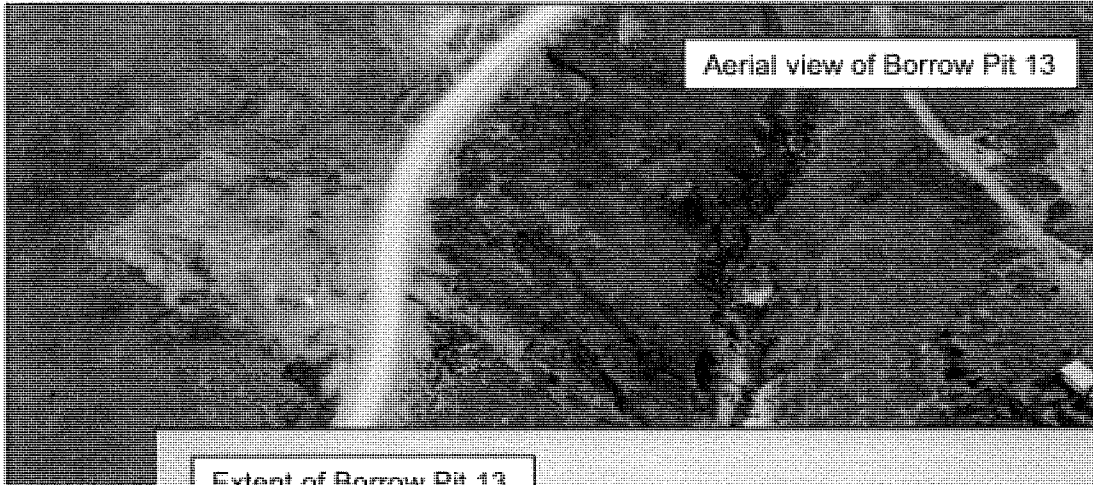


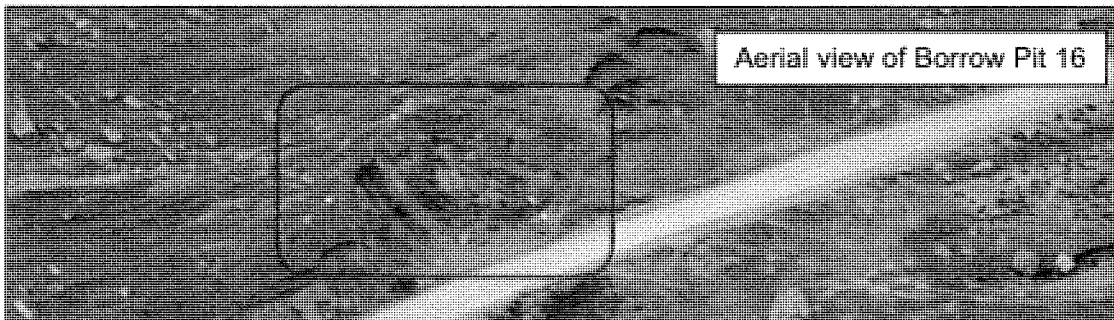
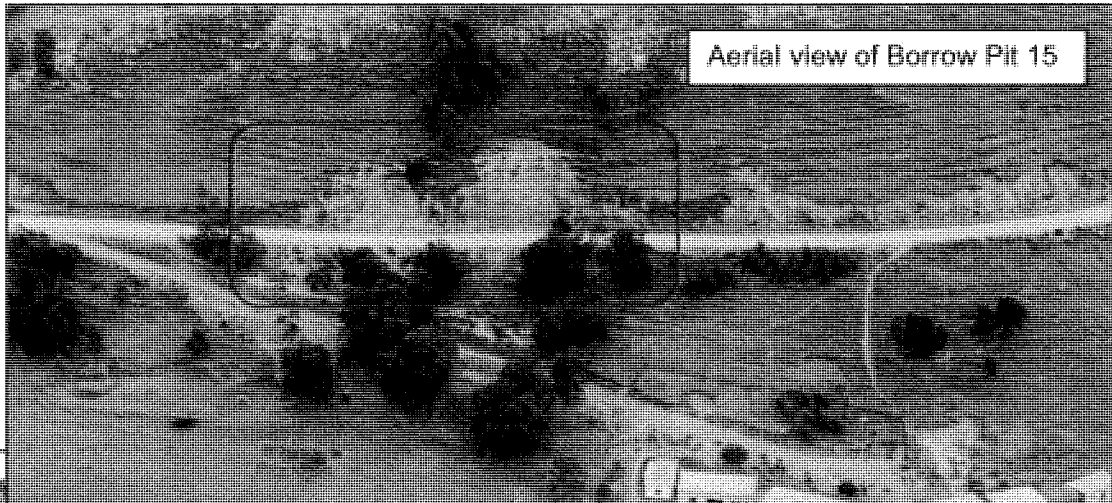




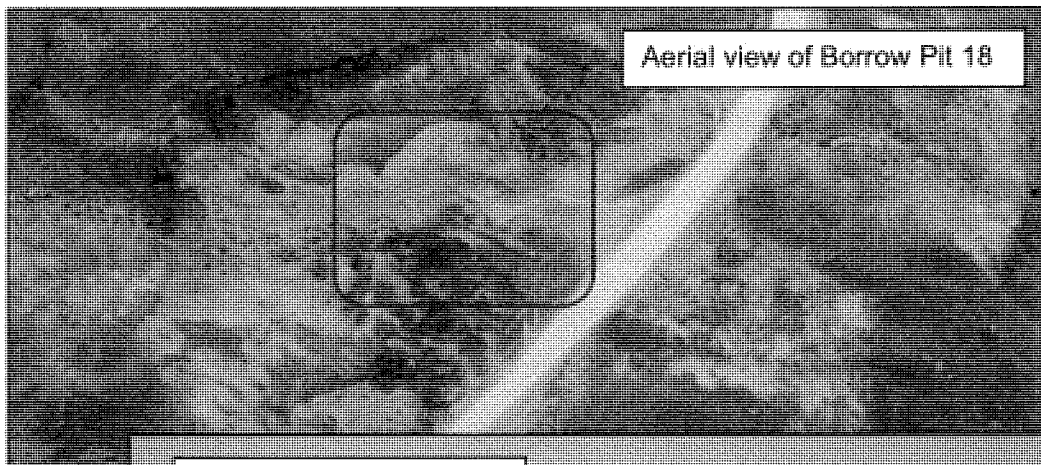
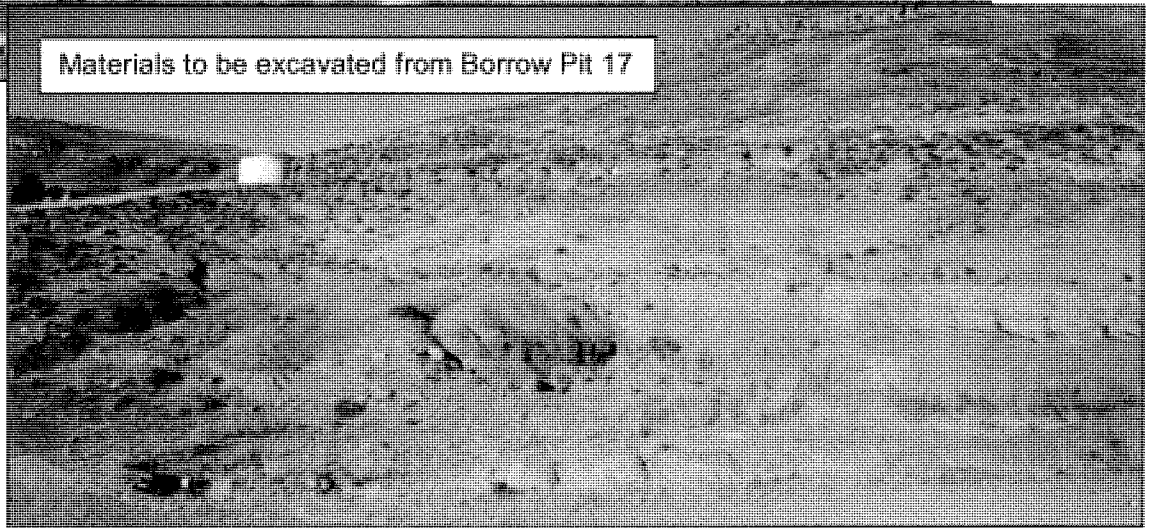
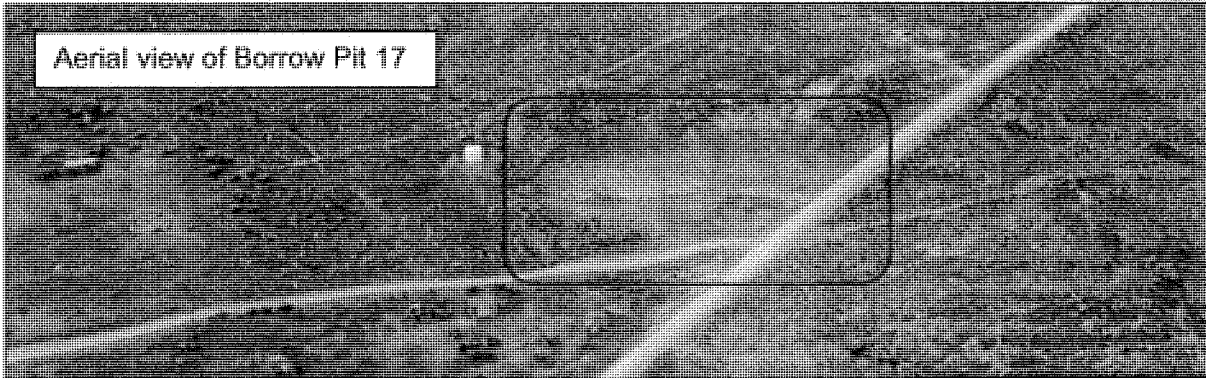












**Appendix A – Comments Forms**

<b>REGISTRATION FORM – Our Ref - 41129</b>
<b>Name:</b> <b>Surname</b> <b>Address:</b>  <b>Postal Code:</b>  <b>Tel No:</b> <b>Fax No:</b> <b>Cell No:</b>  <b>e-mail :</b>
<b>Comments: (add extra pages should you need)</b>
<b>Do you require any additional information?</b>
<b>Other parties which you think should be included in the process:</b>
<i>Your comments are highly appreciated, and will be included in the final report to be submitted to the decision-making authorities.</i>
<b><u>PLEASE RETURN NO LATER THAN 26 JULY 2011 TO:</u></b> <b>Imke Summers</b> <b>c/o TERRATEST (Pty) Ltd</b> <b>PO Box 794</b> <b>Hilton</b> <b>3245</b> <b>TEL No: 033 343 6789</b> <b>Fax No: 033 343 6788</b> <b>e-mail: <a href="mailto:summersi@terratest.co.za">summersi@terratest.co.za</a></b>

Your Ref.....  
Our Ref. 41129

6<sup>th</sup> July 2011

.....  
.....  
.....

ATTENTION: .....

Dear Sir/ Madam

**ALFRED NZO MASIPALA WENDAWO, ISICELO SE KWARI, INCWADI YESAZISO.**

Isebe lezendlela nemisebenzi( Roads and Public Works) kwiphondo lase Mpumakoloni lijongene nohlelo logunyaziso lwekwari kwindawo zonke ezikwi ngingi kaMasipala wase Alfred Nzo. Koluhlelo isebe licele iTerratest (Pty) Ltd (inkampani yenzululwazi) ukuthatha ingxaxheba malunga nokhuseleko lwezendalo ngalomsebenzi.

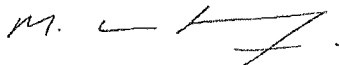
Esi sicelo sokombiwa kwekwari sifakwa lisebe leZembiwa (Mineral Resources) elikwi Phondo leMpumakoloni (Eastern Cape Province), elonana lingunyazisa ukusetyenziswa kwezombiwa kwindawo zonke ze-Phondo.

Inkosi ithathwe ingu mnikazi mhlaba okanye ummeli wesizwe salondawo kucelwa imvume yekwari. Ukuba umhlali unamava malunga nolomsebenzi ocelwa nguRhulumentu, maka thethe phambi koLwesihlanu, **5 August 2011** nalomtu ulandelayo:

**Imke Summers**  
Address: PO Box 794  
Hilton  
3245  
Email: summersi@terratest.co.za  
Tel: 033 343 6789  
Fax: 033 343 6788

Okanye athethe nomgunyazisi weleta.

Ngokuzithoba,



**Magnus van Rooyen**  
(for TERRATEST)

Your Ref.  
Our Ref. 41129

6<sup>th</sup> July 2011

.....  
.....  
.....

ATTENTION:.....

Dear Sir/ Madam

**ALFRED NZO, MASEPALA WA SETEREKE, KOPO YA KWARI, LENGOLO LA TSIBISO.**

Lefapha la tsa Mmila le Mesebetsi (Roads and Public Works) Eastern Cape le shebane le ho nehana ka tumello ya tshebediso ya sebaka sa majwana / kwari( borrow pit) sebakeng sa Masepala wa Alfred Nzo.

Mosebetsing oo, ho kgethuwe ditsibi tsa mokgatlo waTerratest (PTY) LTD ho shebana le tsa tlhokomelo ya tikoloho (dihlodilweng).

Kopo ya mosebetsi e kengwa ke lefapha la tsa Diepuwa (Mineral Resources) Eastern Cape Province, leo e leng lona le nang le matla a ho fana ka tumello ya ho sebedisa diepuwa Lebatoweng.

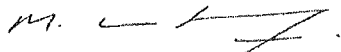
Morena o kgethuwe e le monga mobu/sebaka kapa moemedi setjhabeng seo ho kentsweng kopo ya tshebediso ya kwari. Ha e ba ho le teng motho ya nang le tlhahiso mabapi le mosebetsi ona o kupuweng ke Kgoromente , o kopjwa hore a hlahise maikutlo a hae pele ho letsatsi la

**Labohlano, 5 Phato (August) 2011, a ka buwa le : Imke Summers**

**Address:** PO Box 794  
Hilton  
3245  
**Email:** summersi@terratest.co.za  
**Tel:** 033 343 6789  
**Fax:** 033 343 6788

Kapa a buwe le mongodi wa lengolo lena dinomorong tse beilweng.

Ka boikokobetso



**Magnus van Rooyen**  
(for TERRATEST)



TELEPHONE CONTACT RECORD

Contact with: chief lupindo of: 18 Phone: 073 011 88 65

J&G Contact: File/Project No.: / Date: 24 June 2011

Initiated by: Temb'e Subject: Time: 13:03

NOTES: Why does people who were looking for borrow pits did not ask permission from him? What if they chose someone site. Can those people from the department come to the community to explain.

Address: P. O. Box 894

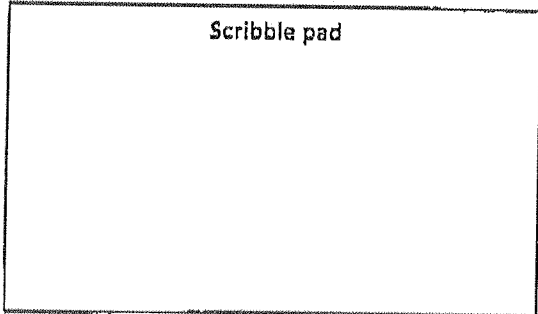
Matatiele

47 30

ACTIONS:



Terratest (Pty) Ltd
PO Box 794, Hilton, 3245
Tel. 033 343 6789
Fax 033 343 6788
Email: vanrooyenm@terratest.co.za



TELEPHONE CONTACT RECORD

Contact with: Chief Matandela<sup>18</sup> of Nyaniwa Phone: 076 349 0103  
 J&G Contact: File/Project No.: / Date: 24 June 2011  
 Initiated by: Tembie Subject: Time: 09:20

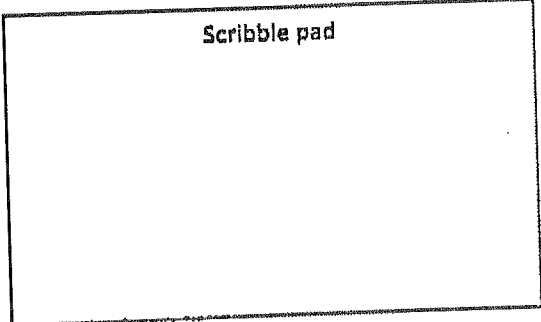
NOTES: They did not know that the borrow pits belong to the state. What they don't like is that they open those borrow pits and the community does not benefit from them. If they do open those borrow pits they would like to have something that the community and the traditional council to benefit.

address: Chief D.N Matandela  
 P. O. Box 1183  
 MATATIFLE  
 4730

ACTIONS:



Terratest (Pty) Ltd  
 PO Box 794, Hilton, 3245  
 Tel. 033 343 6789  
 Fax 033 343 6788  
 Email:  
 vanrooyenm@terratest.co.za



TELEPHONE CONTACT RECORD

Contact with: Clly Bhone of Ward 18 Phone: 082 770 6638

J&G Contact: ..... File/Project No.: ..... / ..... Date: 24 June 2011

Initiated by: Tembie Subject: ..... Time: 10:24 - 10:28

NOTES: He said he is around town he would like to come to the office so that he can understand what I am talking about.

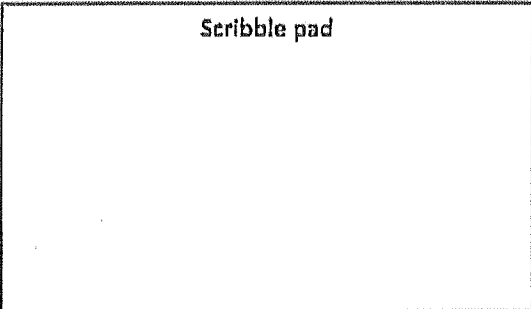
He had a meeting at 12:56 He understood but he asked if those sites for borrow pits are in someone's site will they get compensation.

He thinks that the community need to get compensation for their land. When making or using those pits their grazing lands are being affected. ~~limited~~ limited land that they do not have place for their graves and fields. They do not need money they can get even community hall.

ACTIONS: P.O. Box 1687  
Matahiel  
4730



Terratest (Pty) Ltd  
PO Box 794, Hilton, 3245  
Tel. 033 343 6789  
Fax 033 343 6788  
Email:  
vanrooyenm@terratest.co.za



**REGISTERED LETTER  
GEREGISTREERDE BRIEF**

(with an insurance option/met 'n versekeringsopsie)

Full tracking and tracing/Volledige volg en spoor

Addressed to/Geadresseer aan  
**L.K. NDEUNGA**

**Box 422**  
**MATATLEW**  Postcode  
Poskode

The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregisteerde briewe van toepassing.

Postage paid R \_\_\_\_\_ c

Service fee / Diensgeld R \_\_\_\_\_ c

Insurance / Versekering R \_\_\_\_\_ c

Total / Totaal R \_\_\_\_\_ c

Insured value of contents  
Versekerde waarde van inhoud R \_\_\_\_\_ c

Enquiries/Navrae  
Toll-free number  
Tolvry nommer  
**0800 111 502**

Initial of accepting officer

Date Stamp

Paraaf van aanvaarder  
beaampte

**REGISTERED LETTER  
(with an insurance option)**  
**RD 674 112 045 ZA**  
**CUSTOMER COPY 301027R**  
Klientaalskrif

701281  
Lebono Litho Printers 011 493 7021

**REGISTERED LETTER  
GEREGISTREERDE BRIEF**

(with an insurance option/met 'n versekeringsopsie)

Full tracking and tracing/Volledige volg en spoor

Addressed to/Geadresseer aan  
**V. N BOBOCA**

**Box 96**  
**MT FIERE**    Postcode  
Poskode

The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregisteerde briewe van toepassing.

Postage paid R \_\_\_\_\_ c

Service fee / Diensgeld R \_\_\_\_\_ c

Insurance / Versekering R \_\_\_\_\_ c

Total / Totaal R \_\_\_\_\_ c

Insured value of contents  
Versekerde waarde van inhoud R \_\_\_\_\_ c

Enquiries/Navrae  
Toll-free number  
Tolvry nommer  
**0800 111 502**



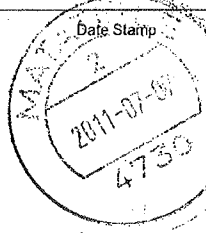
Initial of accepting officer



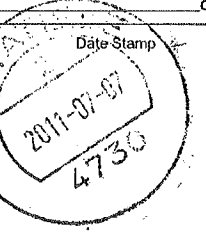
Date Stamp



Paraaf van aanvaarder  
beaampte



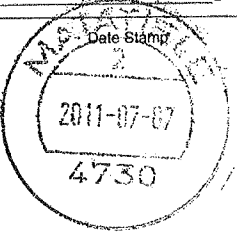
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**CUSTOMER COPY 301027R**  
Klientaalskrif



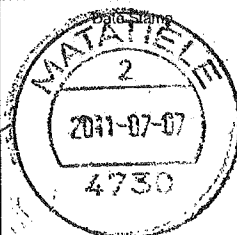
701281  
Lebono Litho Printers 011 493 7021



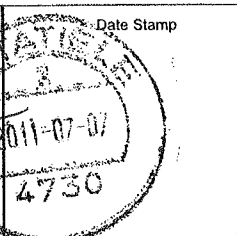
<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c	
<b>Full tracking and tracing/Volledige volg en spoor</b>		Insured value of contents Versekerde waarde van inhoud R _____ c		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	
Addressed to/Geadresseer aan <b>D. N MATLANDER</b> <b>Box 1183</b> <b>MATATULE 4730</b> Postcode Poskode		Initial of accepting officer 		Date Stamp 	
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en slags op binnelandse geregistreerde briewe van toepassing.		Afix Track and Trace <b>REGISTERED LETTER</b> <i>(with an insurance option)</i> <b>RD 674 111 645 ZA</b> <b>CUSTOMER COPY 301027R</b>		Paraaf van aaneem-beample Datumstempel	



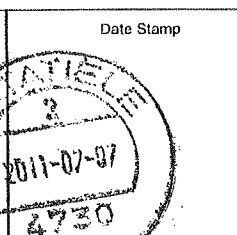
<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c	
<b>Full tracking and tracing/Volledige volg en spoor</b>		Insured value of contents Versekerde waarde van inhoud R _____ c		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	
Addressed to/Geadresseer aan <b>SONWABILE Mngwenya</b> <b>Box 33</b> <b>LEBARULE</b> Postcode Poskode		Initial of accepting officer 		Date Stamp 	
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en slags op binnelandse geregistreerde briewe van toepassing.		Afix Track and Trace <b>REGISTERED LETTER</b> <i>(with an insurance option)</i> <b>RD 674 111 654 ZA</b> <b>CUSTOMER COPY 301027R</b>		Paraaf van aaneem-beample Datumstempel	

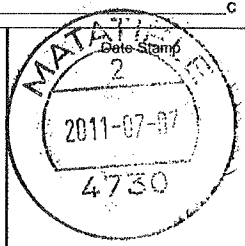
<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c	
<b>Full tracking and tracing/Volledige volg en spoor</b>		Insured value of contents Versekerde waarde van inhoud R _____ c		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	
Addressed to/Geadresseer aan <b>COUNCILLOR STUURMAN</b> <b>Box 10147</b> <b>MATATULE 4730</b> Postcode Poskode		Initial of accepting officer 		Date Stamp 	
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en slags op binnelandse geregistreerde briewe van toepassing.		Afix Track and Trace <b>REGISTERED LETTER</b> <i>(with an insurance option)</i> <b>RD 674 111 668 ZA</b> <b>CUSTOMER COPY 301027R</b>		Paraaf van aaneem-beample Datumstempel	

<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c
<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c
Addressed to/Geadresseer aan <b>MD MABAREN</b>		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	Initial of accepting officer 	Date Stamp 
<b>Box 139</b> <b>MALUT</b>		<b>RD 674 112 062 ZA</b> <b>CUSTOMER COPY 301027R</b> Klientafskrif	Paraaf van aaneem-beample	Datumstempel
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only.		Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.		


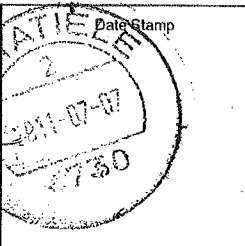
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<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c
Addressed to/Geadresseer aan <b>Chief V. Makaula</b>		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	Initial of accepting officer 	Date Stamp 
<b>Box 68070</b> <b>MT FRERE</b>		<b>RD 674 112 076 ZA</b> <b>CUSTOMER COPY 301027R</b> Klientafskrif	Paraaf van aaneem-beample	Datumstempel
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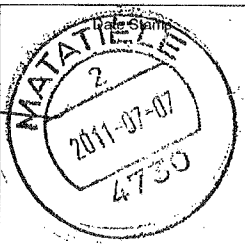
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<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c
Addressed to/Geadresseer aan <b>Councillor S. CERESHE</b>		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	Initial of accepting officer 	Date Stamp 
<b>Box 309</b> <b>MT FRERE</b>		<b>RD 674 112 080 ZA</b> <b>CUSTOMER COPY 301027R</b> Klientafskrif	Paraaf van aaneem-beample	Datumstempel
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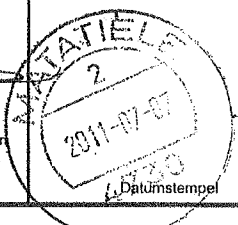
<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c
<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c
Addressed to/Geadresseer aan <b>SCWANGWA</b>		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	Initial of accepting officer 	Date Stamp 
<b>Box 1</b> <b>MOUNT FRERE</b>		<b>RD 674 112 093 ZA</b> <b>CUSTOMER COPY 301027R</b> Klientafskrif	Paraaf van aaneem-beample	Datumstempel
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only.		Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en slegs op binnelandse geregistreerde briewe van toepassing.		

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<b>Full tracking and tracing / Volledige volg en spoor</b>		Insured value of contents Versekerde waarde van inhoud R _____ c		Enquiries / Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	
Addressed to / Geadresseer aan <b>PATRICK ZOLLE BONO</b>  <b>Box 1687</b> <b>MATATIELE</b>		Initial of accepting officer <b>D</b>			
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only.		<b>REGISTERED LETTER</b> <i>(with an insurance option)</i> <b>RD 674 111 566 ZA</b> <b>CUSTOMER COPY 301027R</b> klientafskrif		Paraaf van aanneembepaalde Datumstempel	
Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.					

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<b>Full tracking and tracing / Volledige volg en spoor</b>		Insured value of contents Versekerde waarde van inhoud R _____ c		Enquiries / Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	
Addressed to / Geadresseer aan <b>Shubumisa Ndlekh</b>  <b>Box 171</b> <b>MATATIELE</b>		Initial of accepting officer <b>D</b>			
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only.		<b>REGISTERED LETTER</b> <i>(with an insurance option)</i> <b>RD 674 111 570 ZA</b> <b>CUSTOMER COPY 301027R</b> klientafskrif		Paraaf van aanneembepaalde Datumstempel	
Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.					

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<b>Full tracking and tracing / Volledige volg en spoor</b>		Insured value of contents Versekerde waarde van inhoud R _____ c		Enquiries / Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	
Addressed to / Geadresseer aan <b>Chief Lubisi</b>  <b>Box 1503</b> <b>MATATIELE</b>		Initial of accepting officer <b>D</b>			
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Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.					


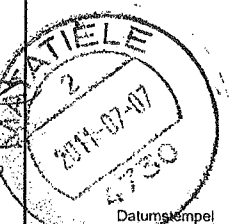
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<b>Full tracking and tracing / Volledige volg en spoor</b>		Insured value of contents Versekerde waarde van inhoud R _____ c		Enquiries / Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>	
Addressed to / Geadresseer aan <b>Chief Lubinda</b>  <b>Box 894</b> <b>MATATIELE</b>		Initial of accepting officer <b>D</b>			
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only.		<b>REGISTERED LETTER</b> <i>(with an insurance option)</i> <b>RD 674 111 597 ZA</b> <b>CUSTOMER COPY 301027R</b> klientafskrif		Paraaf van aanneembepaalde Datumstempel	
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<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c	
Addressed to/Geadresseer aan Chief Pharmacy Box 1604 MTE 4737 Postcode Poskode		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>		Initial of accepting officer	Date Stamp 
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregisteerde briewe van toepassing.				Affix Track and Trace <b>REGISTERED LETTER</b> <i>(with an insurance option)</i> <b>RD 674 111 606 ZA</b> <b>CUSTOMER COPY 301027R</b>	
				Paraaf van aaneem-beampte	

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<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c	
<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c	
Addressed to/Geadresseer aan Chief Makaula Box 50 MT PREPE 5290 Postcode Poskode		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>		Initial of accepting officer	Date Stamp 
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				Paraaf van aaneem-beampte	

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<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c	
<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c	
Addressed to/Geadresseer aan Bazub Zib Box mandilein MT PREPE 5090 Postcode Poskode		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>		Initial of accepting officer	Date Stamp 
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				Paraaf van aaneem-beampte	

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<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> <i>(with an insurance option/met 'n versekeringsopsie)</i>				Postage paid R _____ c Service fee / Diensgeld R _____ c Insurance / Versekering R _____ c <b>Total / Totaal</b> R _____ c	
<b>Full tracking and tracing/Volledige volg en spoor</b>				Insured value of contents Versekerde waarde van inhoud R _____ c	
Addressed to/Geadresseer aan TSHANGIE (HEARMAN) Box 369 MATATIELE 4737 Postcode Poskode		Enquiries/Navrae Toll-free number Tolvry nommer <b>0800 111 502</b>		Initial of accepting officer	Date Stamp 
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				Paraaf van aaneem-beampte	

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# Classifieds

EAST GRIQUALAND FEVER APRIL 29, 2011

## NEWS 9



**ENVIRONMENTAL IMPACT ASSESSMENT  
PROCESS FOR PROPOSED MINING OF  
GRAVEL FROM BORROW PITS FOR THE  
MAINTENANCE OF GRAVEL ROADS IN THE  
ALFRED NZO DISTRICT MUNICIPALITY  
AREA OF THE EASTERN CAPE**

Notice is hereby given in terms of Regulation 49 of the Regulations published in the Government Notice No. 26275, under Section 22 of the Minerals & Petroleum Resources Development Act (Act No 28 of 2002) of intent to carry out the following activity:

**Proposed Activity:** Mining of gravel at the Borrow Pits located at km1.4; km17; km28.1; km29.4; km31.6; km33; km38.3; km39.5; km44.8; km47.1; km51.2; km56.4; km63.3; km63.4; km66; km67.4; km69.7 and km74 along the DR08015.

**Proponent:** The project proponent is the Eastern Cape Department of Roads and Transport (DoRT)

**Consultant:** TerraTest (Pty) Ltd, P O Box 794, Hilton 3245, Tel: 033 343 6789, Fax: 033 343 6788. Contact Person: Magnus van Rooyen, e-mail: vanrooyenm@terratest.co.za

In order to ensure that you are identified as an interested and/or affected party please submit your name, contact information and interest in the matter to the contact person given above within 21 days from the date of this advertisement.

**APPENDIX C**  
**GEOTECHNICAL FEASIBILITY REPORT**  
**HERITAGE IMPACT ASSESSMENT**

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**GEOTECHNICAL BORROW PIT  
ASSESSMENT**

**INITIAL ASSESSMENT REPORT**

**FOR**

**DR08015**

**Prepared for:**

Province of the Eastern Cape  
The Head of Department  
Department of Roads and Transport  
Eastern Cape Government  
Private Bag X0023  
BHISHO  
5605

**Prepared by:**

Controlab cc  
P O Box 346  
EAST LONDON  
5200

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## CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>1. INTRODUCTION.....</b>	<b>3</b>
1.1 TERMS OF REFERENCE.....	3
1.2 AVAILABLE INFORMATION.....	3
<b>2. GENERAL DESCRIPTION OF THE PROJECT .....</b>	<b>3</b>
<b>3. OBJECTIVES AND STRATEGIES .....</b>	<b>4</b>
<b>4. SCOPE OF THE INVESTIGATION .....</b>	<b>5</b>
<b>5. VISUAL ASSESSMENT SURVEY .....</b>	<b>5</b>
<b>6. BORROW PIT INFORMATION .....</b>	<b>6</b>
<b>7. ENVIRONMENTAL CONSIDERATIONS .....</b>	<b>6</b>
<b>8. ASSESSMENT OF SUITABILITY.....</b>	<b>7</b>
<b>9. ESTIMATED QUANTITIES.....</b>	<b>8</b>
<b>10. RECOMMENDATIONS .....</b>	<b>9</b>

<b>ANNEXURE A:</b>	<b>KM 1+400 LHS</b>
<b>ANNEXURE B:</b>	<b>KM 17+000 RHS</b>
<b>ANNEXURE C:</b>	<b>KM 28+100 LHS</b>
<b>ANNEXURE D:</b>	<b>KM 29+400 LHS</b>
<b>ANNEXURE E:</b>	<b>KM 31+600 RHS</b>
<b>ANNEXURE F:</b>	<b>KM 33+000 RHS</b>
<b>ANNEXURE G:</b>	<b>KM 38+300 RHS</b>
<b>ANNEXURE H:</b>	<b>KM 39+500 RHS</b>
<b>ANNEXURE I:</b>	<b>KM 44+800 LHS</b>
<b>ANNEXURE J:</b>	<b>KM 47+100 RHS</b>
<b>ANNEXURE K:</b>	<b>KM 51+200 RHS</b>
<b>ANNEXURE L:</b>	<b>KM 56+400 LHS</b>
<b>ANNEXURE M:</b>	<b>KM 63+300 LHS</b>
<b>ANNEXURE N:</b>	<b>KM 63+400 LHS</b>
<b>ANNEXURE O:</b>	<b>KM 66+000 RHS</b>
<b>ANNEXURE P:</b>	<b>KM 67+400 RHS</b>
<b>ANNEXURE Q:</b>	<b>KM 69+700 RHS</b>
<b>ANNEXURE R:</b>	<b>KM 74+000 RHS</b>

## EXECUTIVE SUMMARY

This report represents the findings of the visual assessment survey performed on the borrow pits in road DR08015.

The road is within the Alfred Nzo District Municipality and Umzimvubu/Matatiele Local Municipalities with the start and end co-ordinates as follows:

- Start co-ordinate - S30° 53' 48.2" E28° 59' 44.9"
- End co-ordinate - S30° 25' 34.7" E28° 39' 18.7"

Eighteen (18) borrow pits were identified on the road:

➤ BP01	1.4km - Left Hand Side	S30° 53' 43.1"	E28° 59' 00.5"
➤ BP02	17.0km - Right Hand Side	S30° 49' 09.2"	E28° 52' 17.2"
➤ BP03	28.1km - Left Hand Side	S30° 44' 31.9"	E28° 51' 09.4"
➤ BP04	29.4km - Left Hand Side	S30° 43' 49.5"	E28° 51' 12.0"
➤ BP05	31.6km - Right Hand Side	S30° 42' 34.3"	E28° 51' 11.3"
➤ BP06	33.0km - Right Hand Side	S30° 42' 04.1"	E28° 51' 47.1"
➤ BP07	38.3km - Right Hand Side	S30° 41' 00.4"	E28° 51' 59.8"
➤ BP08	39.5km - Right Hand Side	S30° 40' 50.4"	E28° 51' 41.6"
➤ BP09	44.8km - Left Hand Side	S30° 38' 36.0"	E28° 51' 19.4"
➤ BP10	47.1km - Right Hand Side	S30° 31' 51.1"	E30° 50' 18.8"
➤ BP11	51.2km - Right Hand Side	S30° 36' 59.0"	E28° 48' 56.9"
➤ BP12	56.4km - Left Hand Side	S30° 34' 59.4"	E28° 47' 50.6"
➤ BP13	63.3km - Left Hand Side	S30° 34' 07.1"	E28° 44' 27.6"
➤ BP14	63.4km - Left Hand Side	S30° 34' 07.1"	E28° 44' 27.6"
➤ BP15	66.0km - Right Hand Side	S30° 33' 29.9"	E28° 43' 37.1"
➤ BP16	67.4km - Right Hand Side	S30° 33' 08.3"	E28° 42' 51.8"
➤ BP17	69.7km - Right Hand Side	S30° 32' 12.2"	E28° 42' 23.4"
➤ BP18	74.0km - Right Hand Side	S30° 30' 58.7"	E28° 40' 35.5"

It is recommended that the environmental and materials investigation be approved for the following borrow pit:

Borrow Pit	Km Log	Yield	Material Description
➤ BP01	1.4km	High	Decomposed dolerite, sandstone and mudstone
➤ BP03	28.1km	High	Decomposed dolerite and sandstone
➤ BP04	29.4km	Fair	Decomposed dolerite
➤ BP05	31.6km	High	Decomposed dolerite, sandstone and mudstone
➤ BP06	33.0km	High	Mudstone, decomposed dolerite and sandstone
➤ BP07	38.3km	Fair to high	Sandstone and decomposed dolerite
➤ BP08	39.5km	High	Shale, sandstone and decomposed dolerite
➤ BP09	44.8km	Fair	Decomposed dolerite

Geotechnical Borrowpit Assessments

<b>Borrow Pit</b>	<b>Km Log</b>	<b>Yield</b>	<b>Material Description</b>
➤ BP10	47.1km	High	Decomposed dolerite some mudstone
➤ BP11	51.2km	Fair	Sandstone and mudstone
➤ BP13	63.3km	Fair to High	Decomposed dolerite
➤ BP14	63.4km	High	Sandstone, shale and mudstone
➤ BP15	66.0km	High	Mudstone
➤ BP16	67.4km	Fair to High	Decomposed dolerite
➤ BP17	69.7km	Fair	Mudstone and sandstone
➤ BP18	74.0km	Fair to High	Mudstone and decomposed dolerite

## 1. INTRODUCTION

Controlab was appointed by the Department of Roads and Transport, Province of the Eastern Cape for geotechnical borrow pit assessments. The contract number was SCMU 10-08/09-0032. The consultants acting on behalf of the Department of Roads and Transport were the RAMS Joint Venture consisting of Aurecon and Vela VKE.

This report summarises the information collected as part of the initial assessment phase investigation on road DR08015.

### 1.1 Terms of Reference

The report is compiled based on the information collected during the first phase investigation on DR08015 and in accordance to the requirements of the contract document (SCMU 10-08/09-0032).

### 1.2 Available Information

The information provided to Controlab by the RAMS Joint Venture consisted of the following:

- District Municipality - Alfred Nzo
- Local Municipality - Umzimvubu (BP1 to BP7) Matatiele (BP8 to BP18)
- Road Number - DR08015
- Start co-ordinate - S30° 53' 48.2" E28° 59' 44.9"
- End co-ordinate - S30° 25' 34.7" E28° 39' 18.7"

## 2. GENERAL DESCRIPTION OF THE PROJECT

DR08015 is a gravel road starting north of the town of Mount Frere and ends 27km from the town of Matatiele within the Province of the Eastern Cape. The road falls within the Umzimvubu and Matatiele Local Municipalities. DR08015 is approximately 88.2km long and runs in a south to north direction. The road starts at the intersection with the N2 and runs in a northern direction and ends at the intersection with R56 (TR01905).

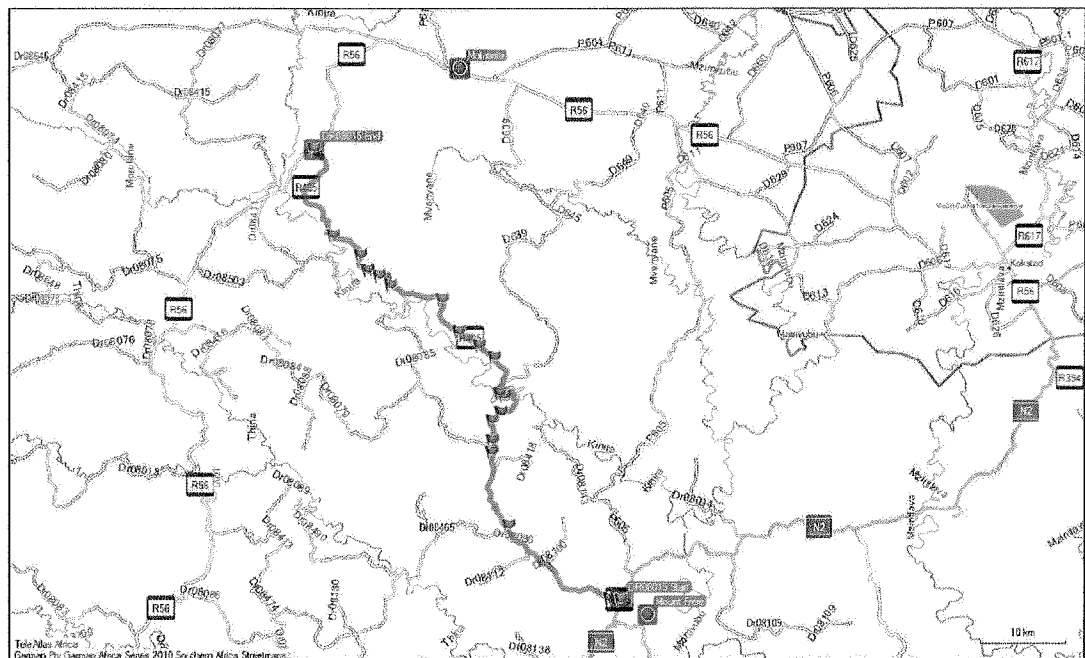
According to the geological map number 3028 Kokstad published in 1979 by the Chief Director of Surveys and Mapping, the area under investigation falls within the Karoo supergroup, embracing the Drakensberg and Beaufort groups and Tarkastad subgroup.

The materials in this area would generally consist of medium to fine grained sandstone and mudstones. In the Cedarville area there is dolerite dyke intrusions.

Mount Frere normally receives about 671mm of rain per year, with most rainfall occurring mainly during midsummer. It receives the lowest rainfall (7mm) in June and the highest (110mm) in January. The average midday temperatures for Mount Frere range from 18.3°C in June to 25.9°C in January. The region is the coldest during July when the mercury drops to 3.7°C on average during the night.

Matatiele normally receives about 609mm of rain per year, with most rainfall occurring mainly during midsummer. It receives the lowest rainfall (2mm) in July and the highest (116mm) in January. The average midday temperatures for Matatiele range from 15.6°C in June to 24.9°C in January. The region is the coldest during July when the mercury drops to 0.6°C on average during the night.

Wienerts climatic N number for the area is less than 2, which should indicate that the rocks would decompose implying that chemical weathering would dominate over mechanical weathering.



### 3. OBJECTIVES AND STRATEGIES

The objective with the initial assessment phase investigation is to carry out a visual assessment survey is to identify existing and potential gravel sources prior to performing a detailed environmental study and materials testing. Part of the initial assessment is to identify noticeable constraints at the various borrow pits, identify the material type and identifying whether it would be suitable for expansion.



The strategy followed during the initial assessment can be summarised as follows:

- Getting available information from the RAMS JV
- Contacting the relevant District Municipality
- Programming the project start and end co-ordinates
- Sending the field technician to transverse the road to locate existing borrow pits
- Completing the visual assessment survey form for all identified borrow pits, photographic record of the borrow pit as well as getting co-ordinates of the perimeter of the borrow pit
- Submission of the visual assessment forms to Controlab laboratory for electronic capturing
- Compilation of the initial assessment report.

#### 4. SCOPE OF THE INVESTIGATION

The report deals with eighteen (18) borrow pits identified on road DR08015. These borrow pits were situated at the following kilometre references:

➤ BP01	1.4km - Left Hand Side	S30° 53' 43.1"	E28° 59' 00.5"
➤ BP02	17.0km - Right Hand Side	S30° 49' 09.2"	E28° 52' 17.2"
➤ BP03	28.1km - Left Hand Side	S30° 44' 31.9"	E28° 51' 09.4"
➤ BP04	29.4km - Left Hand Side	S30° 43' 49.5"	E28° 51' 12.0"
➤ BP05	31.6km - Right Hand Side	S30° 42' 34.3"	E28° 51' 11.3"
➤ BP06	33.0km - Right Hand Side	S30° 42' 04.1"	E28° 51' 47.1"
➤ BP07	38.3km - Right Hand Side	S30° 41' 00.4"	E28° 51' 59.8"
➤ BP08	39.5km - Right Hand Side	S30° 40' 50.4"	E28° 51' 41.6"
➤ BP09	44.8km - Left Hand Side	S30° 38' 36.0"	E28° 51' 19.4"
➤ BP10	47.1km - Right Hand Side	S30° 31' 51.1"	E30° 50' 18.8"
➤ BP11	51.2km - Right Hand Side	S30° 36' 59.0"	E28° 48' 56.9"
➤ BP12	56.4km - Left Hand Side	S30° 34' 59.4"	E28° 47' 50.6"
➤ BP13	63.3km - Left Hand Side	S30° 34' 07.1"	E28° 44' 27.6"
➤ BP14	63.4km - Left Hand Side	S30° 34' 07.1"	E28° 44' 27.6"
➤ BP15	66.0km - Right Hand Side	S30° 33' 29.9"	E28° 43' 37.1"
➤ BP16	67.4km - Right Hand Side	S30° 33' 08.3"	E28° 42' 51.8"
➤ BP17	69.7km - Right Hand Side	S30° 32' 12.2"	E28° 42' 23.4"
➤ BP18	74.0km - Right Hand Side	S30° 30' 58.7"	E28° 40' 35.5"

#### 5. VISUAL ASSESSMENT SURVEY

The visual assessment field data sheets are attached in the various appendices.

## 6. BORROW PIT INFORMATION

The material identified in the various borrow pits were as follows:

- BP01 1.4km Decomposed dolerite, sandstone and mudstone
- BP02 17.0km Mudstone
- BP03 28.1km Decomposed dolerite and sandstone
- BP04 29.4km Decomposed dolerite
- BP05 31.6km Decomposed dolerite, sandstone and mudstone
- BP06 33.0km Mudstone, decomposed dolerite and sandstone
- BP07 38.3km Sandstone and decomposed dolerite
- BP08 39.5km Shale, sandstone and decomposed dolerite
- BP09 44.8km Decomposed dolerite
- BP10 47.1km Decomposed dolerite some mudstone
- BP11 51.2km Sandstone and mudstone
- BP12 56.4km Decomposed dolerite
- BP13 63.3km Decomposed dolerite
- BP14 63.4km Sandstone, shale and mudstone
- BP15 66.0km Mudstone
- BP16 67.4km Decomposed dolerite
- BP17 69.7km Mudstone and sandstone
- BP18 74.0km Mudstone and decomposed dolerite

## 7. ENVIRONMENTAL CONSIDERATIONS

The environmental constraints noted during the visual assessment were as follows:

- BP01 1.4km - No environmental constraints noted.
- BP02 17.0km - This borrow pit was fully reinstated.
- BP03 28.1km - Houses were noted on the one side of the borrow pit.
- BP04 29.4km - No environmental constraints noted.
- BP05 31.6km - Houses and graves were noted on the one side of the borrow pit.
- BP06 33.0km - Houses were noted on the one side of the borrow pit.
- BP07 38.3km - No environmental constraints noted.
- BP08 39.5km - Surface water was noted on the floor of the borrow pit.
- BP09 44.8km - Surface water was noted on the floor of the borrow pit.

- BP10 47.1km - Surface water was noted on the floor of the borrow pit.
- BP11 51.2km - Houses were noted approximately 30 from the borrow pit.
- BP12 56.4km - Houses were noted around the borrow pit  
- Surface water was noted on the floor of the borrow pit.
- BP13 63.3km - No environmental constraints noted.
- BP14 63.4km - No environmental constraints noted.
- BP15 66.0km - No environmental constraints noted.
- BP16 67.4km - Houses were noted on the one side of the borrow pit.
- BP17 69.7km - A reservoir was noted on the side of the borrow pit.
- BP18 74.0km - No environmental constraints noted.

## **8. ASSESSMENT OF SUITABILITY**

The suitability for further investigation based on the visual assessment was as follows:

- BP01 1.4km - The borrow pit can be extended in the area between the road and the existing borrow pit:  
- Excavators will be required for the extensions.
- BP02 17.0km - Due to the fact that this borrow pit was reinstated it is not feasible to re-open it.
- BP03 28.1km - The borrow pit can be extended taking into account the position of the houses  
- Excavators will be required for the extensions.
- BP04 29.4km - The borrow pit can be extended in the area away from the road  
- Excavators will be required for the extensions.
- BP05 31.6km - The borrow pit can be extended taking into account the position of the houses and grave site  
- Excavators will be required for the extensions.
- BP06 33.0km - The borrow pit can be extended in to the hillside away from the houses  
- Excavators will be required for the extensions.
- BP07 38.3km - The borrow pit can be extended in to the hillside  
- Excavators will be required for the extensions.

- BP08 39.5km - The borrow pit can be extended in to the existing face  
- Drainage would have t be addressed during extensions  
- Excavators will be required for the extensions.
- BP09 44.8km - The borrow pit can be extended in to the existing face  
- Drainage would have t be addressed during extensions  
- Excavators will be required for the extensions.
- BP10 47.1km - The borrow pit can be extended in to the existing face  
- Drainage would have t be addressed during extensions  
- Excavators will be required for the extensions.
- BP11 51.2km - The borrow pit can be extended in to the existing face away from the houses  
- Excavators will be required for the extensions.
- BP12 56.4km - Due to the houses around the borrow pit this borrow pit will not be feasible for extensions.
- BP13 63.3km - The borrow pit can be extended in all directions away from the road  
- Excavators will be required for the extensions.
- BP14 63.4km - The borrow pit can be extended in all directions away from the road  
- Excavators will be required for the extensions.
- BP15 66.0km - The borrow pit can be extended in all directions away from the road  
- Excavators will be required for the extensions.
- BP16 67.4km - The borrow pit can be extended in to the hillside away from the houses  
- Excavators will be required for the extensions.
- BP17 69.7km - The borrow pit can be extended in to the face away from the reservoir  
- Excavators will be required for the extensions.
- BP18 74.0km - The borrow pit can be extended into the hillside away from the road  
- Excavators will be required for the extensions.

## 9. ESTIMATED QUANTITIES

An indication of the available quantities based on the visual assessment was as follows:

➤ BP01	1.4km	High
➤ BP02	17.0km	Nil
➤ BP03	28.1km	High
➤ BP04	29.4km	Fair
➤ BP05	31.6km	High
➤ BP06	33.0km	High
➤ BP07	38.3km	Fair to High
➤ BP08	39.5km	High
➤ BP09	44.8km	Fair
➤ BP10	47.1km	High
➤ BP11	51.2km	Fair
➤ BP12	56.4km	Poor
➤ BP13	63.3km	Fair to High
➤ BP14	63.4km	High
➤ BP15	66.0km	High
➤ BP16	67.4km	Fair to High
➤ BP17	69.7km	Fair
➤ BP18	74.0km	Fair to High

## 10. RECOMMENDATIONS

It is recommended that the environmental and material investigation be requested for the following borrow pits:

➤ BP01	1.4km	High	Decomposed dolerite, sandstone and mudstone
➤ BP03	28.1km	High	Decomposed dolerite and sandstone
➤ BP04	29.4km	Fair	Decomposed dolerite
➤ BP05	31.6km	High	Decomposed dolerite, sandstone and mudstone
➤ BP06	33.0km	High	Mudstone, decomposed dolerite and sandstone
➤ BP07	38.3km	Fair to high	Sandstone and decomposed dolerite
➤ BP08	39.5km	High	Shale, sandstone and decomposed dolerite
➤ BP09	44.8km	Fair	Decomposed dolerite
➤ BP10	47.1km	High	Decomposed dolerite some mudstone
➤ BP11	51.2km	Fair	Sandstone and mudstone
➤ BP13	63.3km	Fair to High	Decomposed dolerite
➤ BP14	63.4km	High	Sandstone, shale and mudstone
➤ BP15	66.0km	High	Mudstone
➤ BP16	67.4km	Fair to High	Decomposed dolerite
➤ BP17	69.7km	Fair	Mudstone and sandstone
➤ BP18	74.0km	Fair to High	Mudstone and decomposed dolerite

# PROVINCE OF EASTERN CAPE



## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres		South	East
Local Municipality	Umzimvubu	Start		30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End		30 ° 25 ' 35 "	28 ° 39 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 1.4KM - LHS	Borrow Pit Co - ordinates :
KM Log from Start co-ord :	1.4KM - Left Hand Side	S 30 ° 53 ' 43.1 "
Estimated Yield :	High	E 28 ° 59 ' 00.5 "
Type of Material :	dec Dol + Sandstone + mudstone	

**Description of Source :**

Existing Borrow Pit	X
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Owner: Not identified.

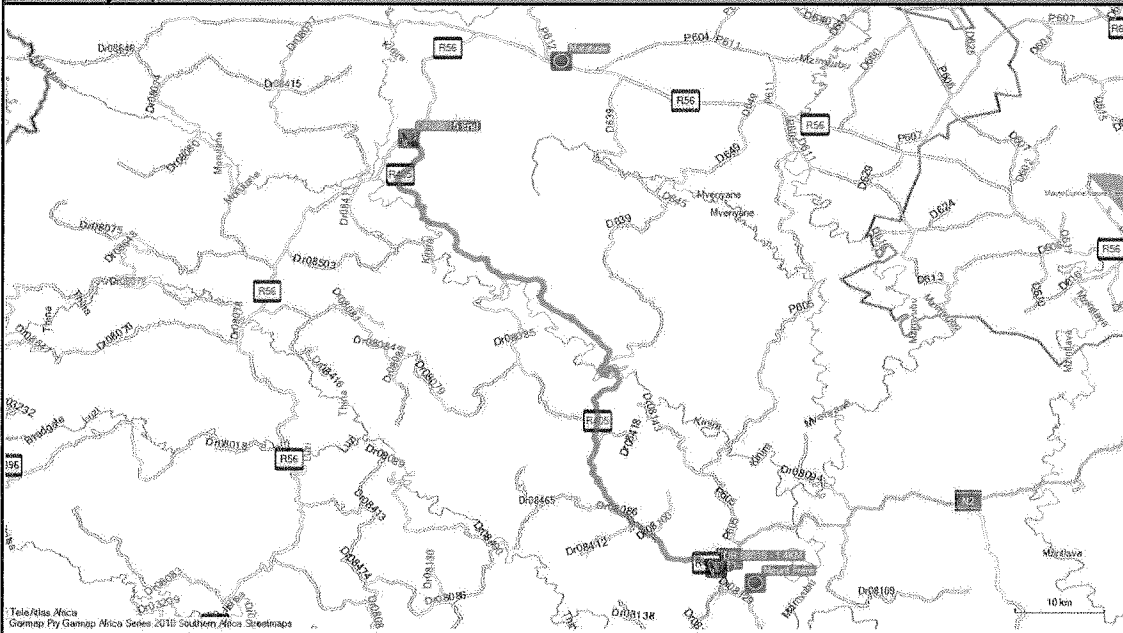
Good potential source.

SIGNATURE \_\_\_\_\_

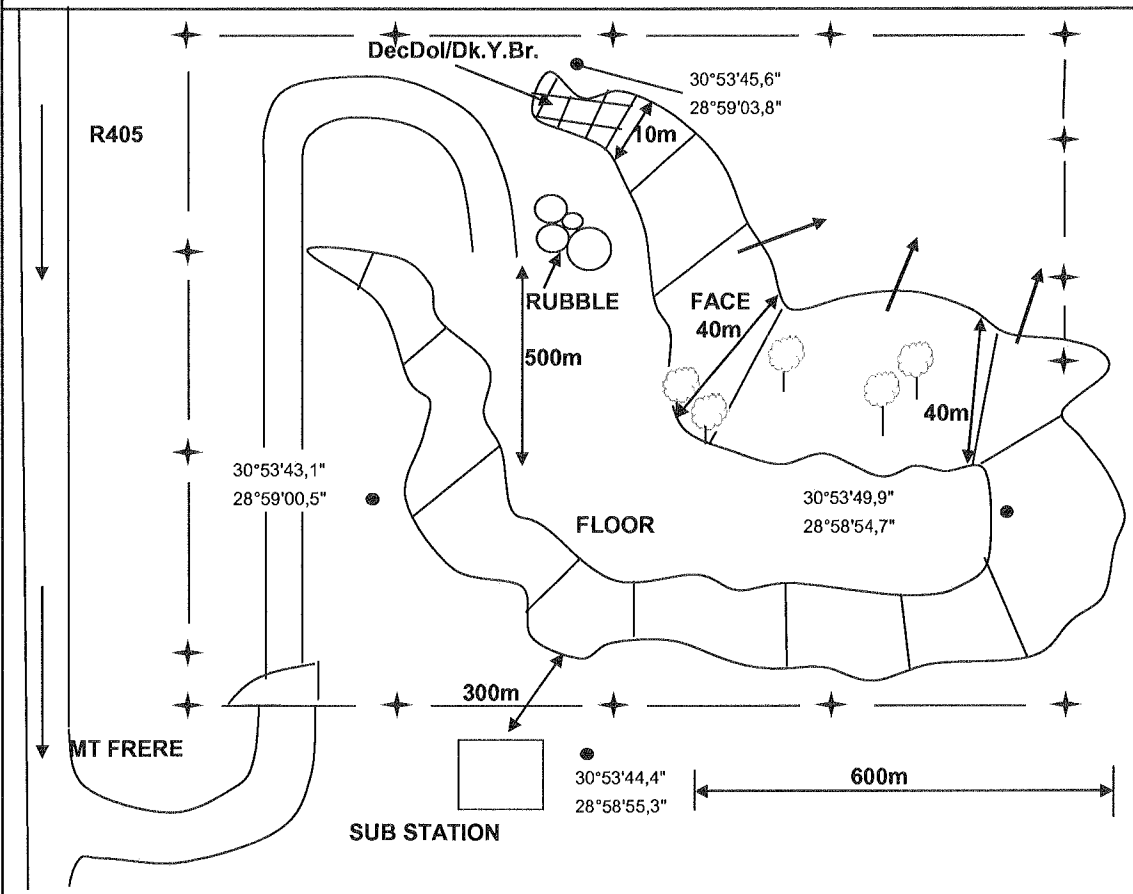
DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

#### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk Y Br dec Dol + P O Ss + dk O ms

b) Depth of Overburden : -

c) Ave Height / Length of Existing Face : -

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended parallel to road. Has already been partially rehabilitated.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



### 1.3 Possible Constraints

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc			X

Comments :

1.4 Photo Report



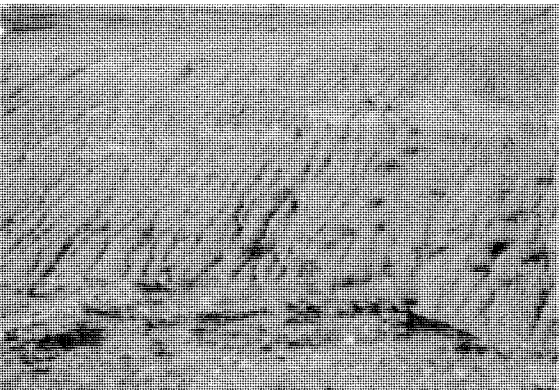
DR08015  
BP1 - 1.4KM  
S30°53'45.8"  
E28°59'02.8"  
North West  
Face - access road behind



DR08015  
BP1 - 1.4KM  
S30°53'45.2"  
E28°59'01.1"  
North West  
Face - reinstated



DR08015  
BP1 - 1.4KM  
S30°53'44.6"  
E28°59'00.8"  
North West  
Floor



DR08015  
BP1 - 1.4KM  
S30°53'42.8"  
E28°59'59.2"  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Umzimvubu	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 39 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 17.0KM - RHS	Borrow Pit Co - ordinates :
KM Log from Start co-ord :	17.0KM - Right Hand Side	S 30 ° 49 ' 09.2 "
Estimated Yield :	Nil	E 28 ° 52 ' 17.2 "
Type of Material :	Mudstone	

**Description of Source :**

Existing Borrow Pit	X
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

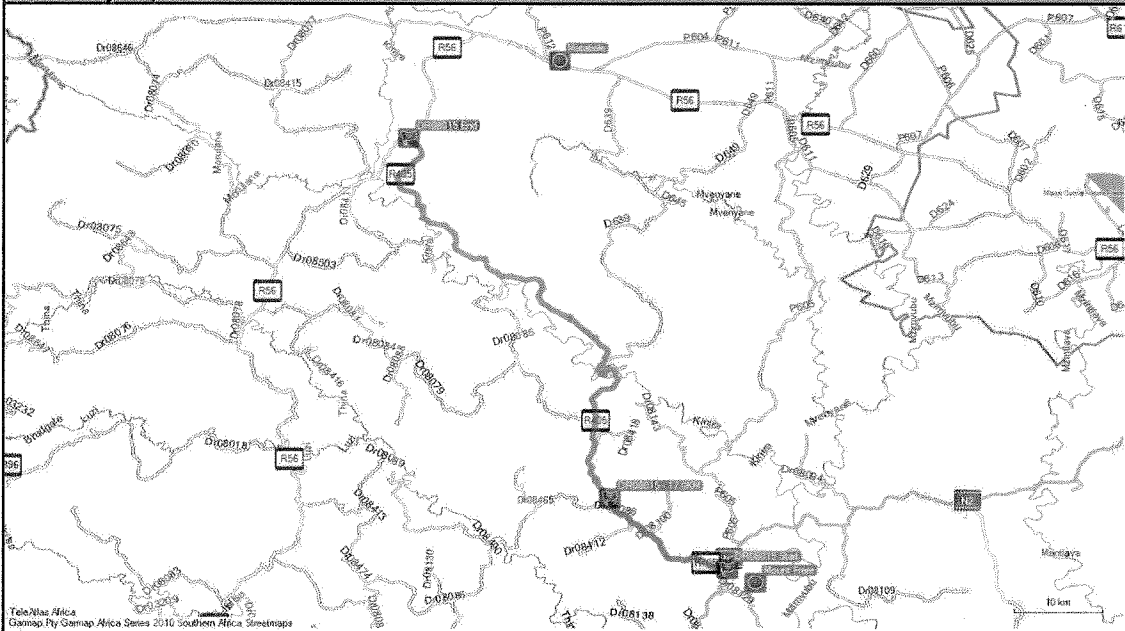
Chief: Nosizkie (Tel: 072 335 1548)  
 Nonyanisa (Tel: 076 202 7796)  
 Borrow pit reinstated.  
 Do not investigated further at this stage.

SIGNATURE \_\_\_\_\_

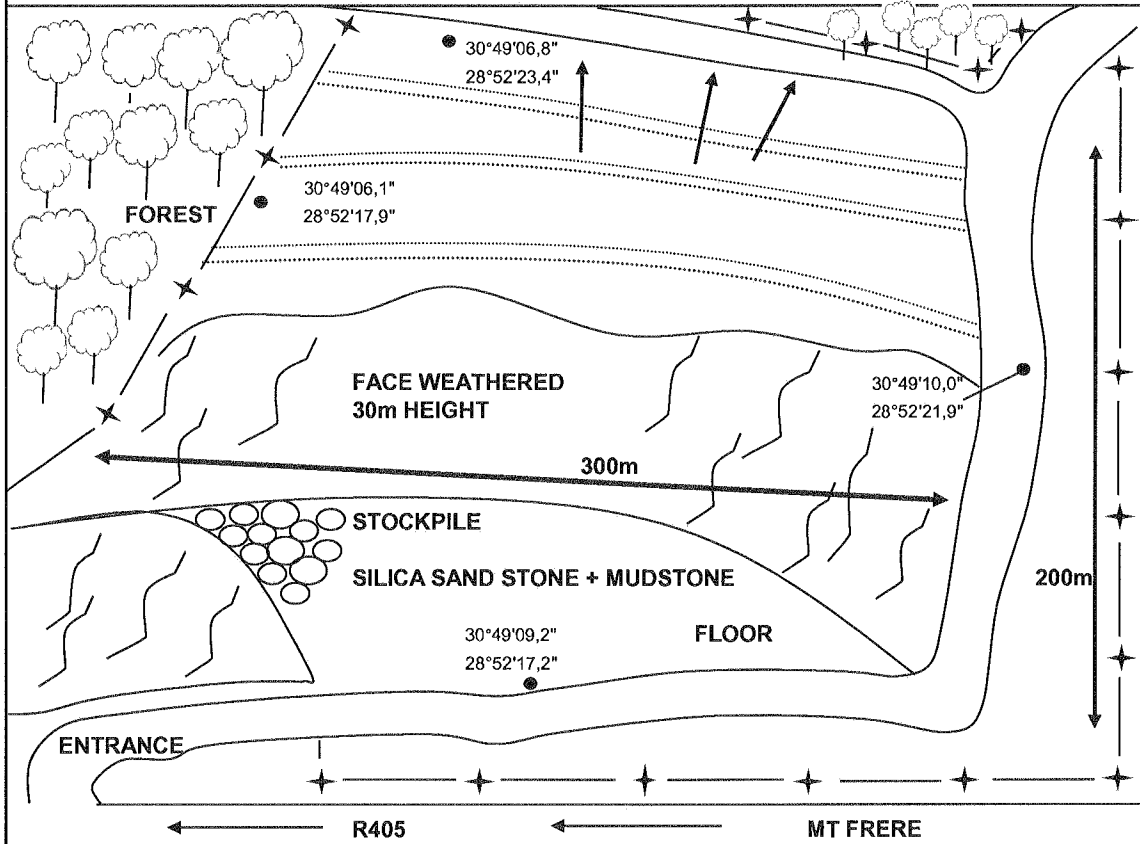
DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

#### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : It R O + It Y ms

b) Depth of Overburden : 200mm

c) Ave Height / Length of Existing Face : 20m/150m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

e) Consistency of Floor :

Loose	X
Dense	
Highly Weathered	
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Borrow

pit fully reinstated.

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**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

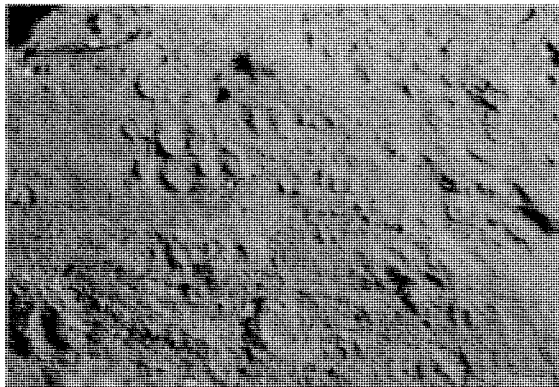
1.4 Photo Report



DR08015  
BP2 - 17.0KM  
S30°49'09.2"  
E28°52'17.2"  
Face



DR08015  
BP2 - 17.0KM  
S30°49'09.2"  
E28°52'17.2"  
Face



DR08015  
BP2 - 17.0KM  
S30°49'09.2"  
E28°52'17.2"  
Floor



DR08015  
BP2 - 17.0KM  
S30°49'09.2"  
E28°52'17.2"  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Umzivubu	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 39 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 28.1KM - LHS	Borrow Pit Co - ordinates :
KM Log from Start co-ord :	28.1KM - Left Hand Side	S 30 ° 44 ' 31.9 "
Estimated Yield :	High	E 28 ° 51 ' 09.4 "
Type of Material :	dk Br dec Dol + sandstone	

**Description of Source :**

Existing Borrow Pit	<input checked="" type="checkbox"/>
Cutting in Road	<input type="checkbox"/>
Exposed out Crop	<input type="checkbox"/>
New	<input type="checkbox"/>

**Comments :**

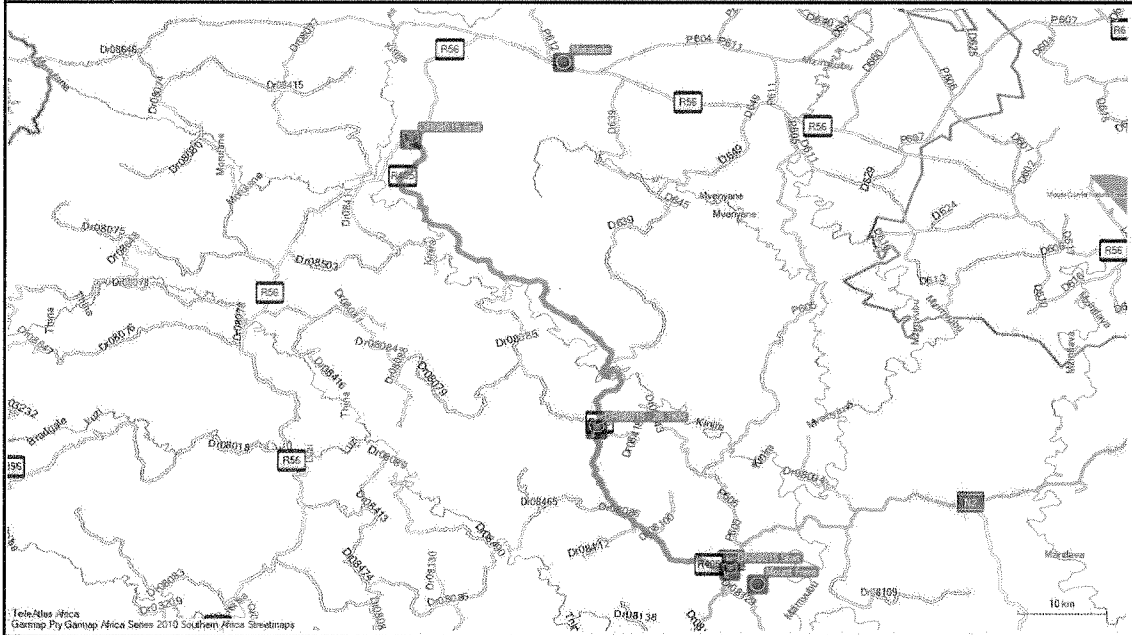
Chief: Nosizkie (Tel: 072 335 1548)  
Nonyaniso (Tel: 076 202 7796)  
Good potential source.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

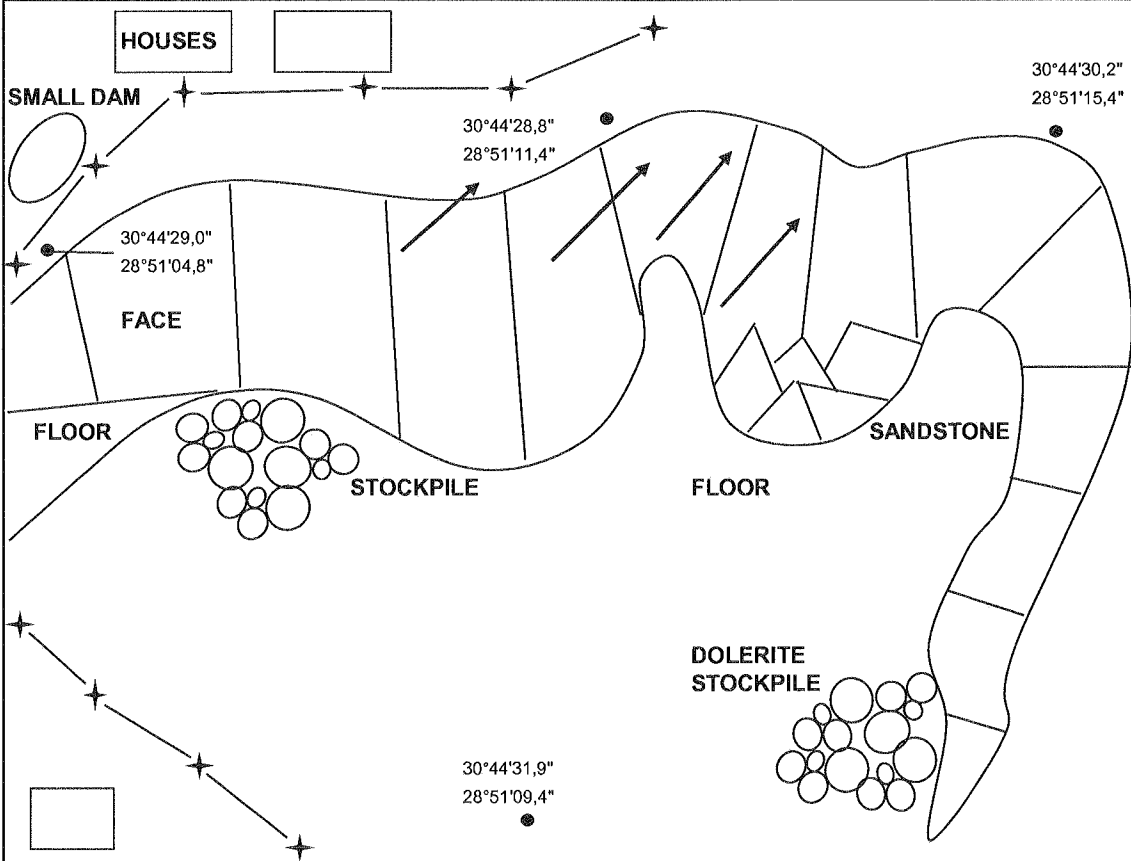
### 1. Initial Assessment Stage

#### 1.1 Locality Map





**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk Br dec Dol + Br sandstone

b) Depth of Overburden : 150mm

c) Ave Height / Length of Existing Face : 20m/40m

d) Consistency of Face :

Loose	
Dense	X
Highly Weathered	
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	X
Highly Weathered	
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be

extended away from houses. Borrow pit  
partially reinstated.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation	X		
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

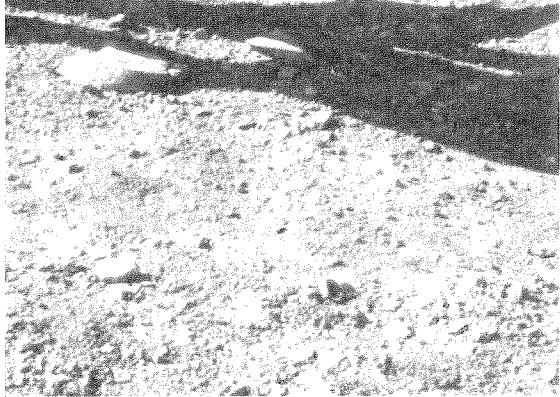
1.4 Photo Report



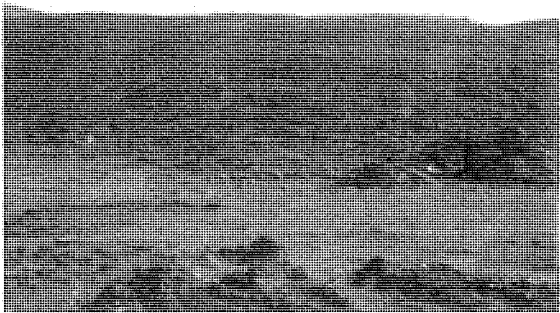
DR08015  
BP3 - 28.1KM  
S30°44'31.9"  
E28°51'09.4"  
Face



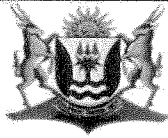
DR08015  
BP3 - 28.1KM  
S30°44'31.9"  
E28°51'09.4"  
Face



DR08015  
BP3 - 28.1KM  
S30°44'31.9"  
E28°51'09.4"  
Floor



DR08015  
BP3 - 28.1KM  
S30°44'31.9"  
E28°51'09.4"  
General view



**PROVINCE OF EASTERN CAPE**  
**BORROW PIT MANAGEMENT SYSTEM FOR THE**  
**DEPARTMENT OF ROADS AND TRANSPORT**



BORROW PIT DATA INPUT SHEET

**Road Information**

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Umzimvubu	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

**Borrow Pit Information**

Borrow Pit No. or Source No. :	DR08015 - 29.4KM - LHS	Borrow Pit Co - ordinates :		
KM Log from Start co-ord :	29.4KM - Left Hand Side	S	30 ° 43 ' 49.5 "	
Estimated Yield :	Fair	E	28 ° 51 ' 12 "	
Type of Material :	dec Dol			

**Description of Source :**

Existing Borrow Pit	<b>X</b>
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

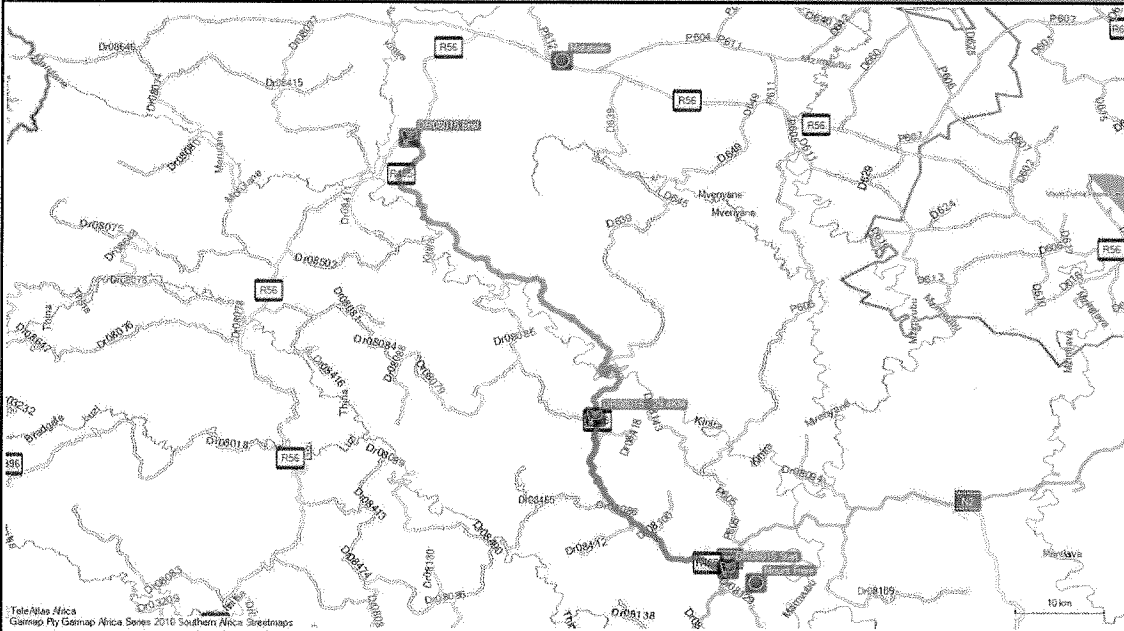
Chief: Nosizkie (Tel: 072 335 1548)  
 Nonyaniso (Tel: 076 202 7796)  
 Investigated further.

**SIGNATURE**

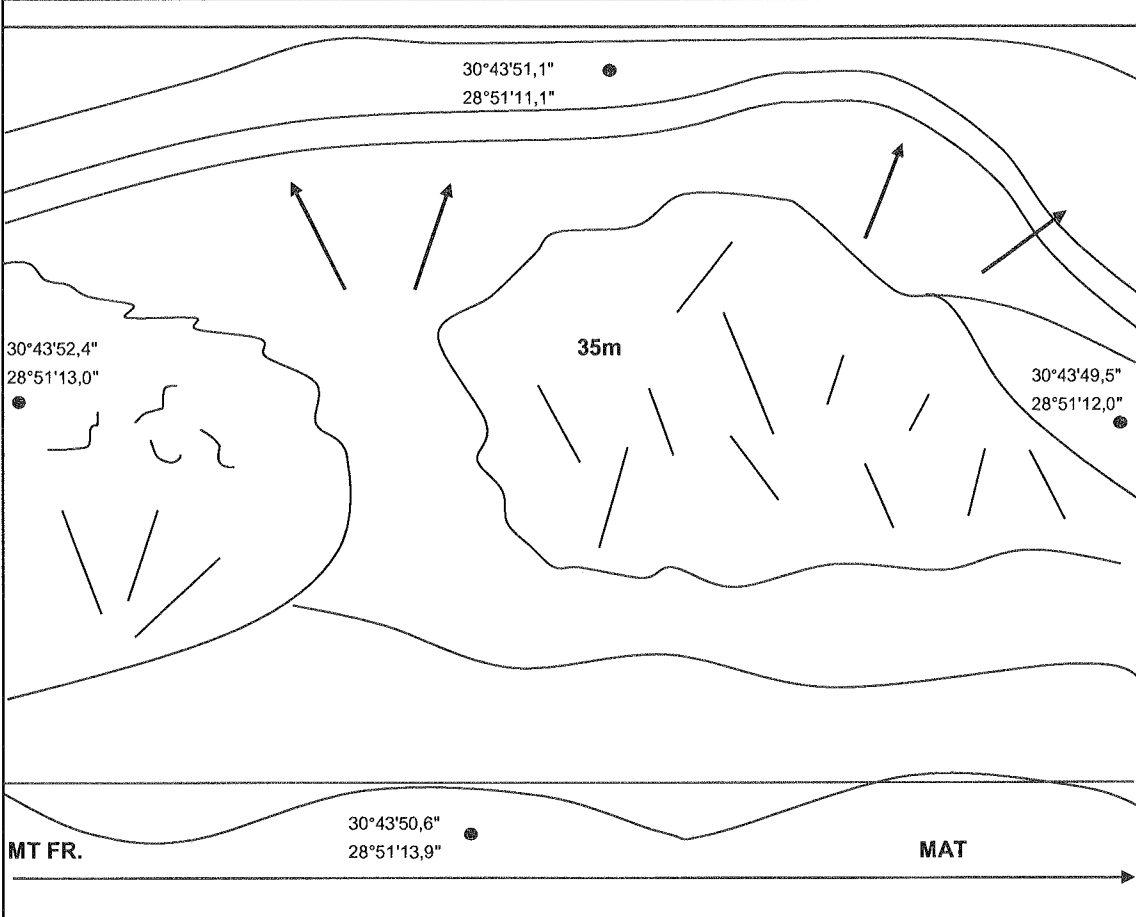
**DATE:**

**1. Initial Assessment Stage**

**1.1 Locality Map**



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk Br + dk G Dol  
 b) Depth of Overburden : -  
 c) Ave Height / Length of Existing Face : 35m/40m

d) Consistency of Face :

Loose	
Dense	X
Highly Weathered	
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	X
Highly Weathered	
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended away from road. Some very hard rock exposed.

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**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

Comments :

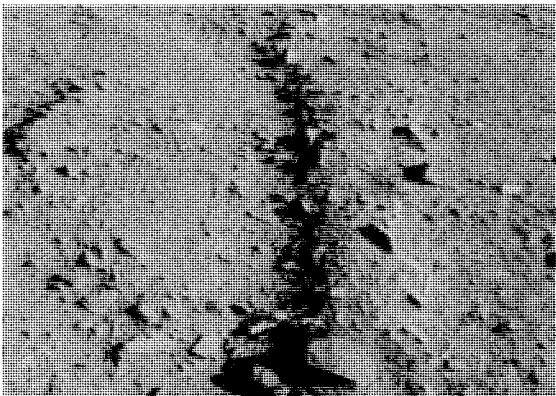
1.4 Photo Report



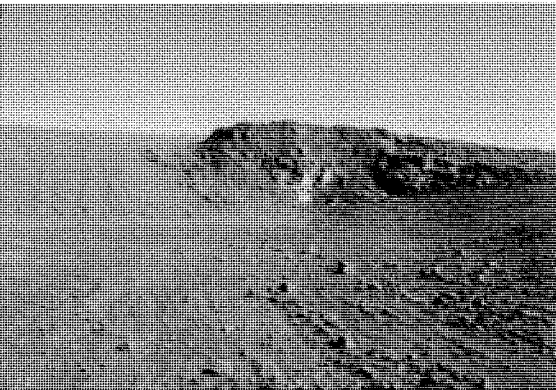
DR08015  
BP4 - 29.4KM  
S30°43'49.5"  
E28°51'12.0"  
Face



DR08015  
BP4 - 29.4KM  
S30°43'49.5"  
E28°51'12.0"  
Face



DR08015  
BP4 - 29.4KM  
S30°43'49.5"  
E28°51'12.0"  
Floor



DR08015  
BP4 - 29.4KM  
S30°43'49.5"  
E28°51'12.0"  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Umzimvubu	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 31.6KM - RHS	Borrow Pit Co - ordinates :
KM Log from Start co-ord :	31.6KM - Right Hand Side	S 30 ° 42 ' 34.3 "
Estimated Yield :	High	E 28 ° 51 ' 11.3 "
Type of Material :	dec Dol + sandstone + mudstone	

**Description of Source :**

Existing Borrow Pit	X
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Owner: Not identified.

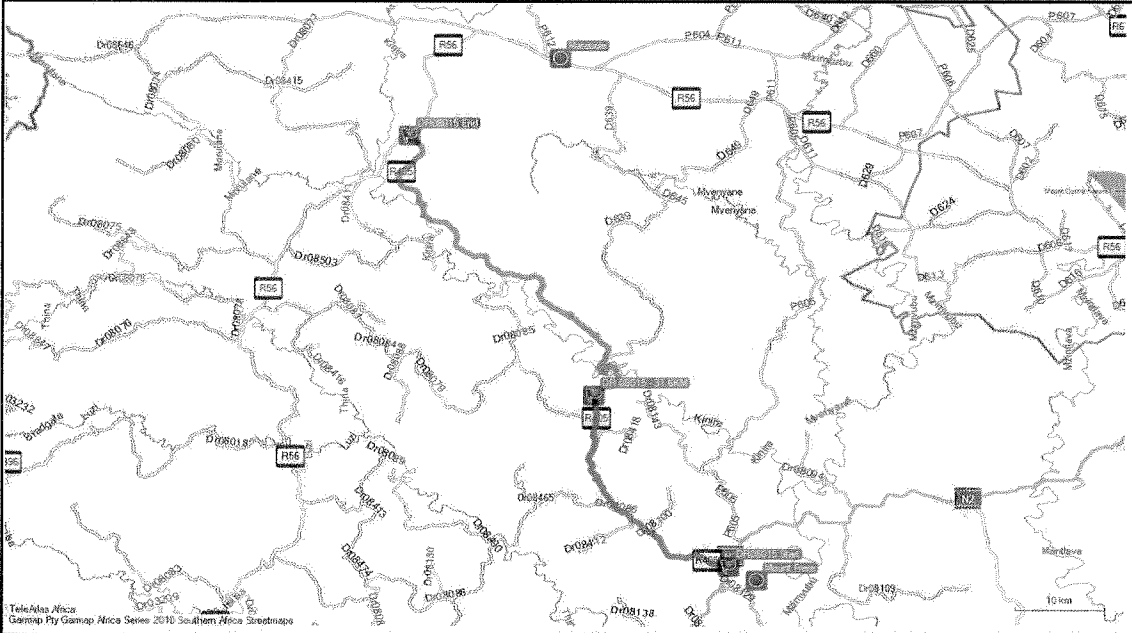
Good potential source.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

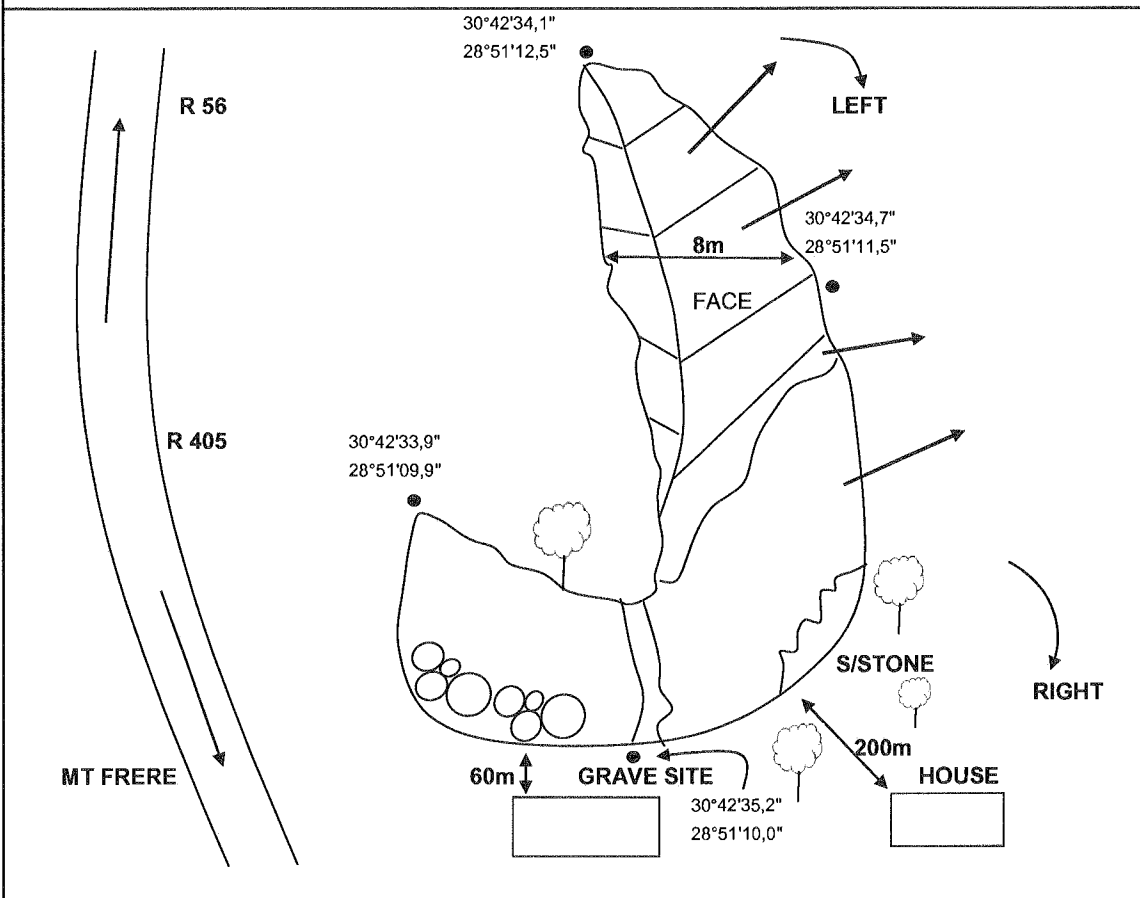
### 1. Initial Assessment Stage

#### 1.1 Locality Map





**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : lt Y O ss + dk Br dec Dol + P + lt Ol ms

b) Depth of Overburden : 100mm

c) Ave Height / Length of Existing Face : 8m/30m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be

extended away from road. Taking into  
account house and grave site.

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**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites	X		
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation	X		
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

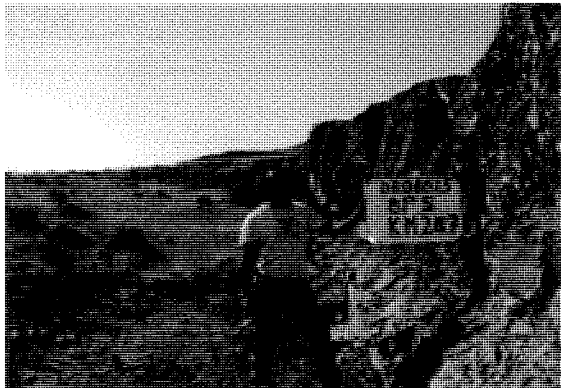
**Comments :**

Large empty rectangular area for providing comments.

1.4 Photo Report



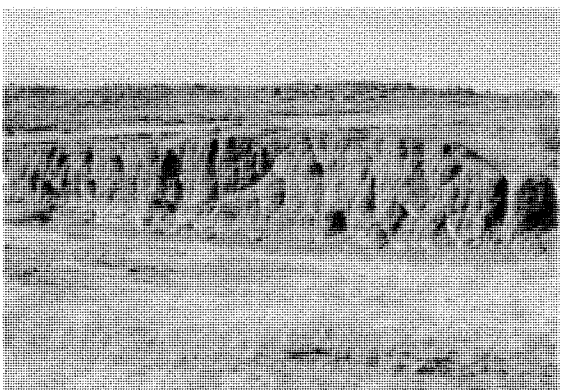
DR08015  
BP5 - 31.6KM  
S30°42'34.4"  
E28°51'11.9"  
South West  
Face - tree and road



DR08015  
BP5 - 31.6KM  
S30°42'34.6"  
E28°51'11.8"  
South East  
Face - top of borrow pit



DR08015  
BP5 - 31.6KM  
S30°42'34.4"  
E28°51'11.7"  
South West  
Floor



DR08015  
BP5 - 31.6KM  
S30°42'34.3"  
E28°51'10.3"  
South East  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Umzimvubu	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. : <u>DR08015 - 33.0KM - RHS</u>	Borrow Pit Co - ordinates :
KM Log from Start co-ord : <u>33.0KM - Right Hand Side</u>	S <u>30</u> ° <u>42</u> ' <u>04.1</u> "
Estimated Yield : <u>High</u>	E <u>28</u> ° <u>51</u> ' <u>47.1</u> "
Type of Material : <u>Mudstone + dec Dol + sandstone</u>	

**Description of Source :**

Existing Borrow Pit	<input checked="" type="checkbox"/>
Cutting in Road	<input type="checkbox"/>
Exposed out Crop	<input type="checkbox"/>
New	<input type="checkbox"/>

**Comments :**

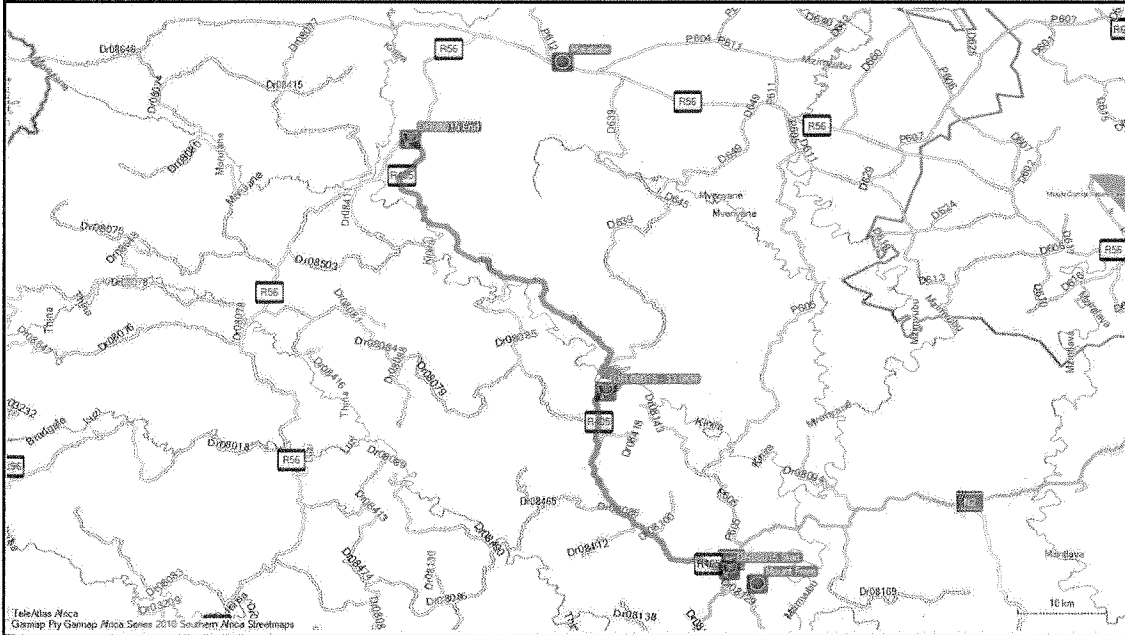
Owner: Not identified.  
 Good potential source.

SIGNATURE \_\_\_\_\_

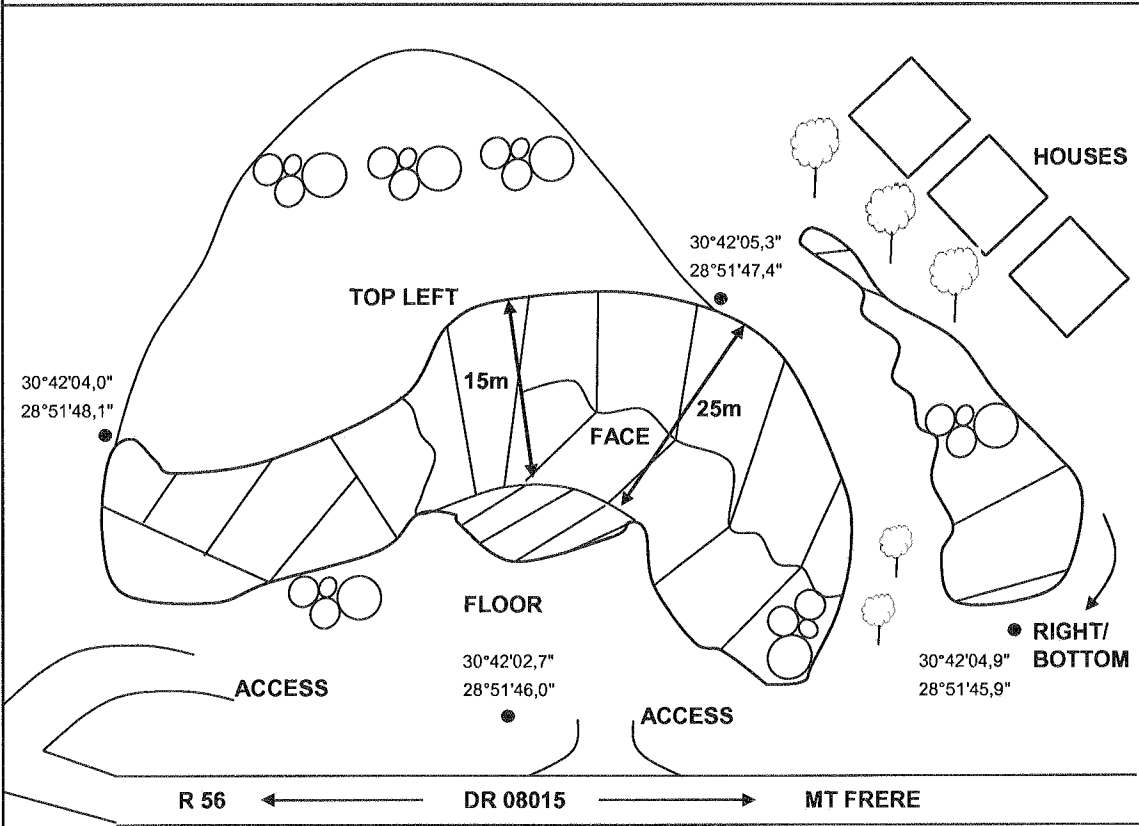
DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

#### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : P ms + dk R Br dec Dol + dk Bl ss

b) Depth of Overburden : -

c) Ave Height / Length of Existing Face : 25m/30m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended into hillside - away from house.

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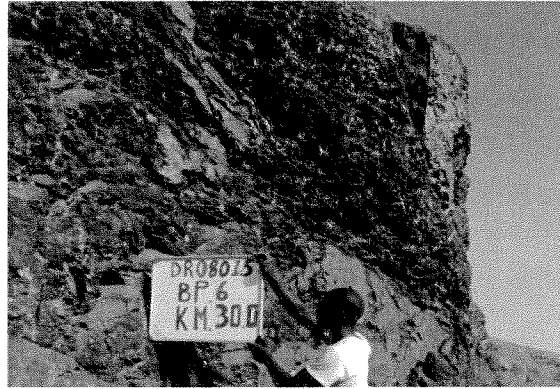
---

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation	X		
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

Comments :

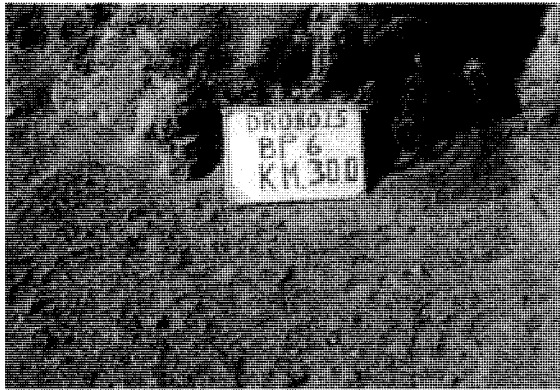
1.4 Photo Report



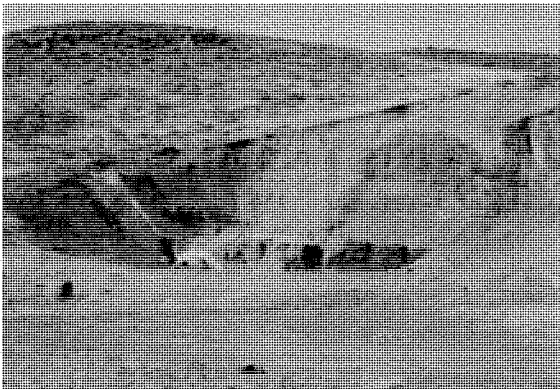
DR08015  
BP6 - 33.0KM  
S30°42'04.9"  
E28°51'47.7"  
South West  
Face - bottom of borrowpit



DR08015  
BP6 - 33.0KM  
S30°42'04.8"  
E28°51'47.5"  
South East  
Face - top of borrowpit



DR08015  
BP6 - 33.0KM  
S30°42'04.6"  
E28°51'47.5"  
South East  
Floor - with small face behind



DR08015  
BP6 - 33.0KM  
S30°42'03.8"  
E28°51'46.6"  
South West  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	<b>Kilometres</b>	<b>South</b>	<b>East</b>
Local Municipality	Umzimvubu	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 38.3KM - RHS	<b>Borrow Pit Co - ordinates :</b>
KM Log from Start co-ord :	38.3KM - Right Hand Side	S <u>30</u> ° <u>41</u> ' <u>00.4</u> "
Estimated Yield :	Fair to high	E <u>28</u> ° <u>51</u> ' <u>59.8</u> "
Type of Material :	<b>Sandstone + dec Dol</b>	

**Description of Source :**

Existing Borrow Pit	<b>X</b>
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Owner: Not identified.

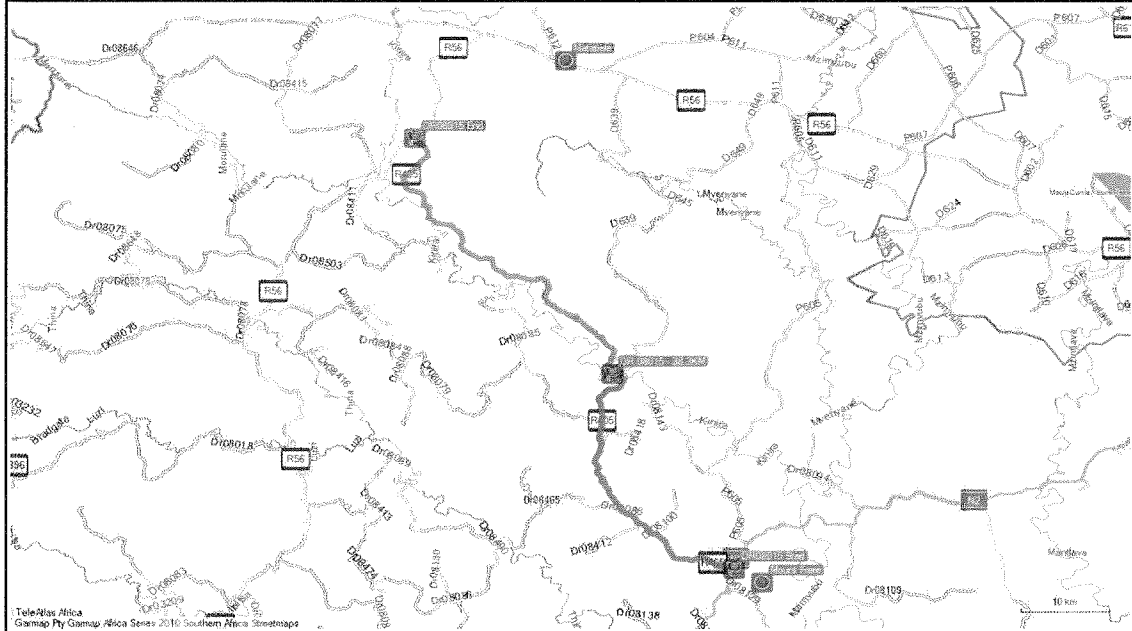
Good potential source.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

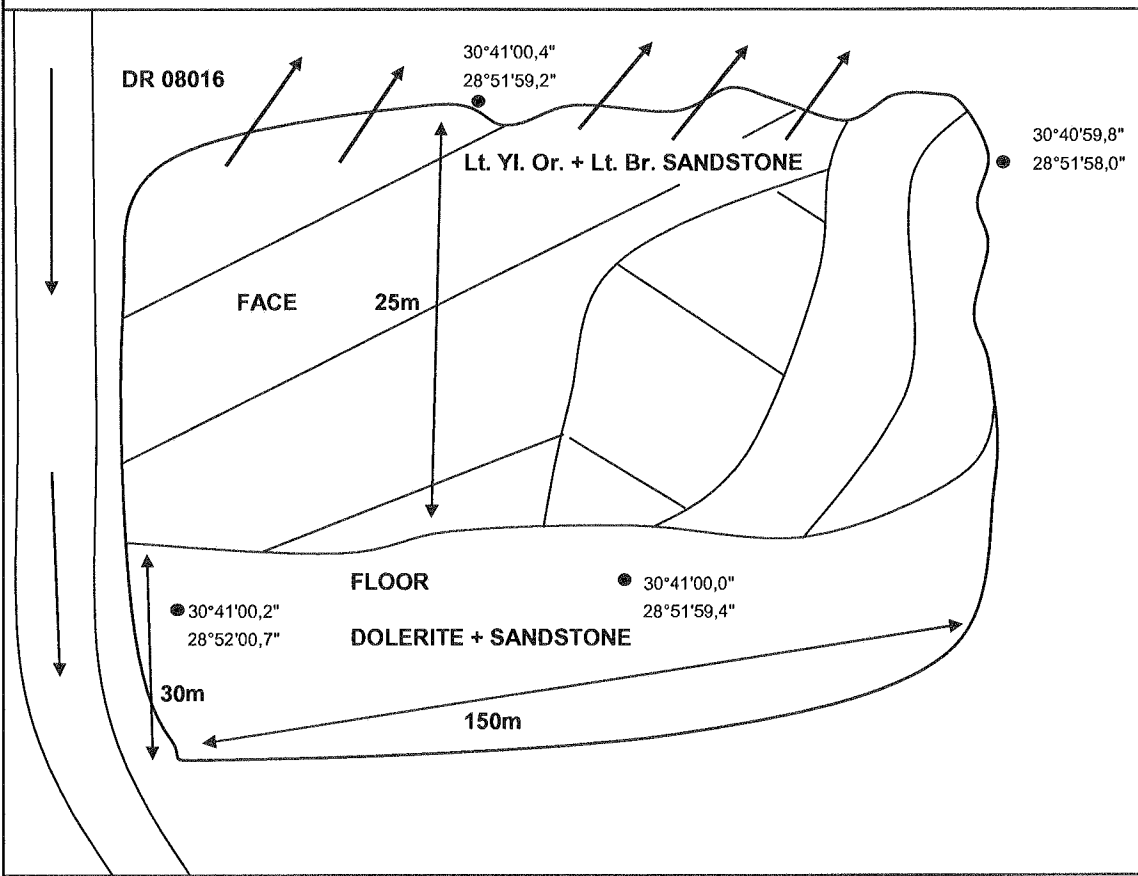
### 1. Initial Assessment Stage

#### 1.1 Locality Map





**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : lt Y O + lt Br ss + dec Dol

b) Depth of Overburden : 300mm

c) Ave Height / Length of Existing Face : 25m/150m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can

be extended parallel to road into hillside.

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**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

Comments :

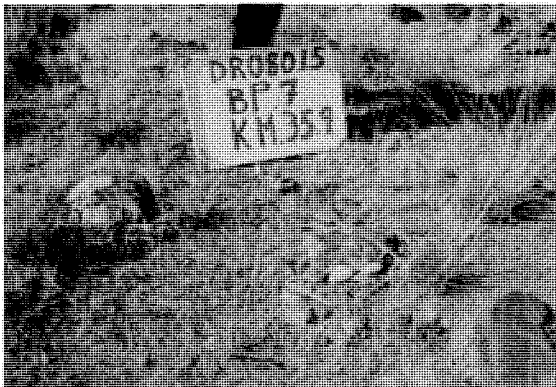
1.4 Photo Report



DR08015  
BP7 - 38.3KM  
S30°40'54.2"  
E28°51'38.1"  
North East  
Face - stockpile at top



DR08015  
BP7 - 38.3KM  
S30°40'54.5"  
E28°51'38.2"  
North West  
Face



DR08015  
BP7 - 38.3KM  
S30°40'54.5"  
E28°51'38.0"  
South  
Floor



DR08015  
BP7 - 38.3KM  
S30°40'54.9"  
E28°51'38.2"  
North East  
General view



**PROVINCE OF EASTERN CAPE**  
**BORROW PIT MANAGEMENT SYSTEM FOR THE**  
**DEPARTMENT OF ROADS AND TRANSPORT**



BORROW PIT DATA INPUT SHEET

**Road Information**

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

**Borrow Pit Information**

Borrow Pit No. or Source No. :	DR08015 - 39.5KM - RHS	Borrow Pit Co - ordinates :		
KM Log from Start co-ord :	39.5KM - Right Hand Side	S	30 °	40 ' 50.4 "
Estimated Yield :	High	E	28 °	51 ' 41.6 "
Type of Material :	Shale + sandstone + dec Dol			

**Description of Source :**

Existing Borrow Pit	<b>X</b>
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

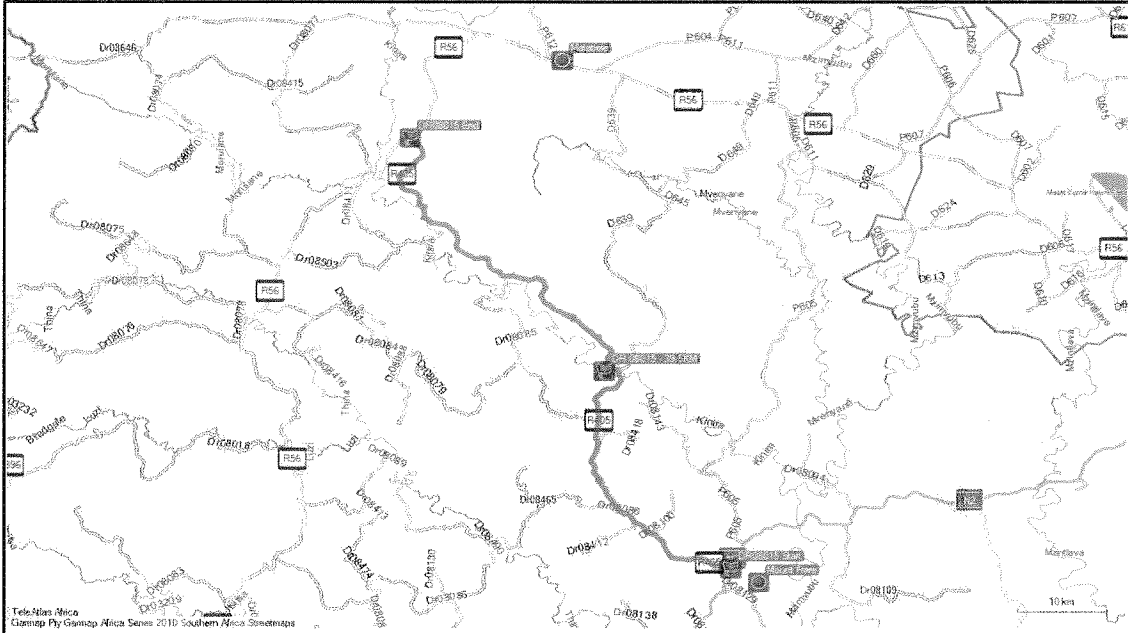
Owner: Not identified.  
 Good potential source.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

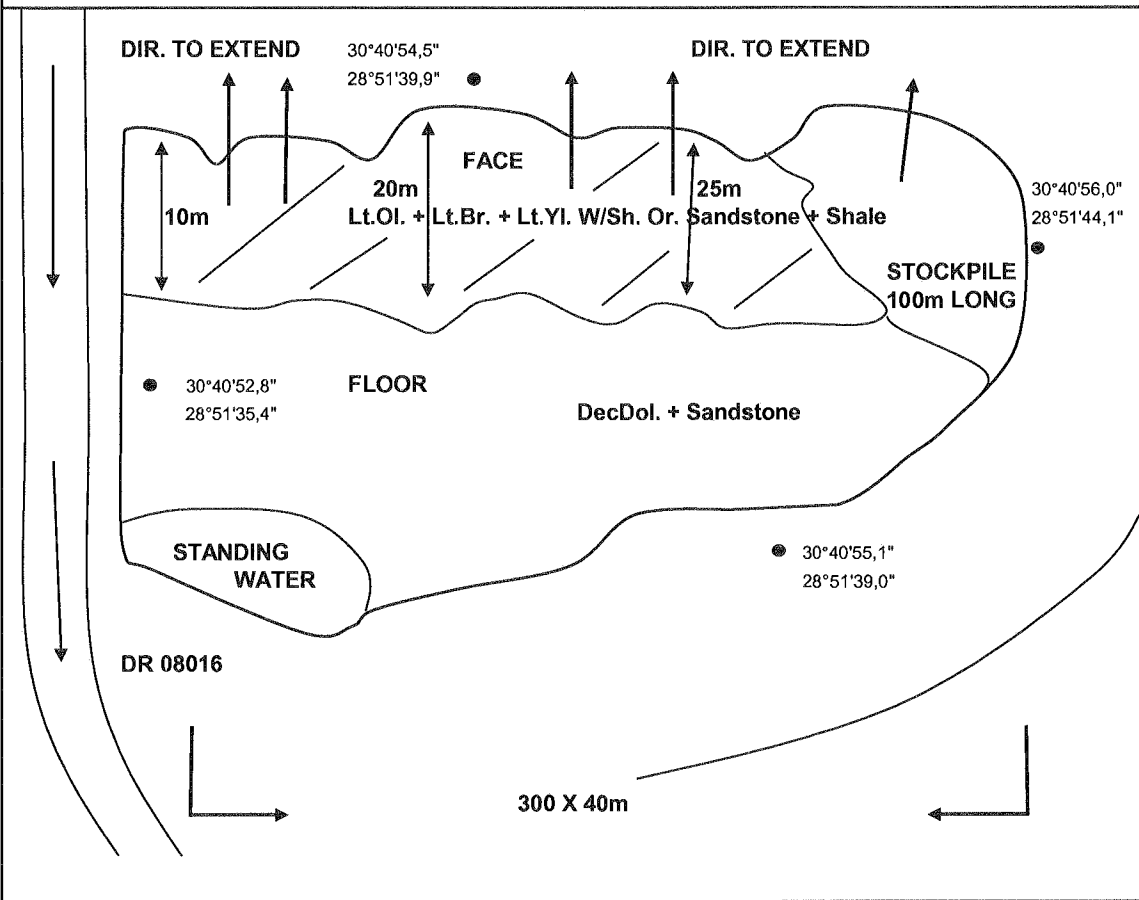
**1. Initial Assessment Stage**

**1.1 Locality Map**



TeleAtlas Africa  
 Geomap Pty Geomap Africa Series 2010 Southern Africa Streetmaps

**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : Lt Ol + Lt Br + Lt Y O ss + sh + dk Br dec Dol

b) Depth of Overburden : 300mm

c) Ave Height / Length of Existing Face : 25m/150m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended into existing face. Some drainage necessary.

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water	X		
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

1.4 Photo Report



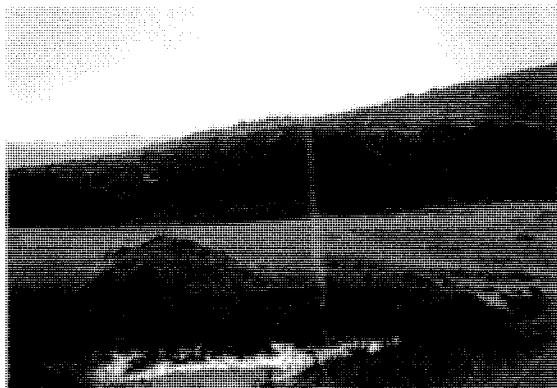
DR08015  
BP8 - 39.5KM  
S30°39'18.0"  
E28°52'09.7"  
South West  
Face - top of borrowpit



DR08015  
BP8 - 39.5KM  
S30°39'17.9"  
E28°52'10.4"  
West  
Face - bottom of borrowpit



DR08015  
BP8 - 39.5KM  
S30°39'18.3"  
E28°52'09.0"  
South East  
Floor



DR08015  
BP8 - 39.5KM  
S30°39'19.7"  
E28°52'09.3"  
South West  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 44.8KM - LHS	Borrow Pit Co - ordinates :
KM Log from Start co-ord :	44.8KM - Left Hand Side	S 30 ° 38 ' 36 "
Estimated Yield :	Fair	E 28 ° 51 ' 19.4 "
Type of Material :	dec Dol	

**Description of Source :**

Existing Borrow Pit	X
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Owner: Not identified.

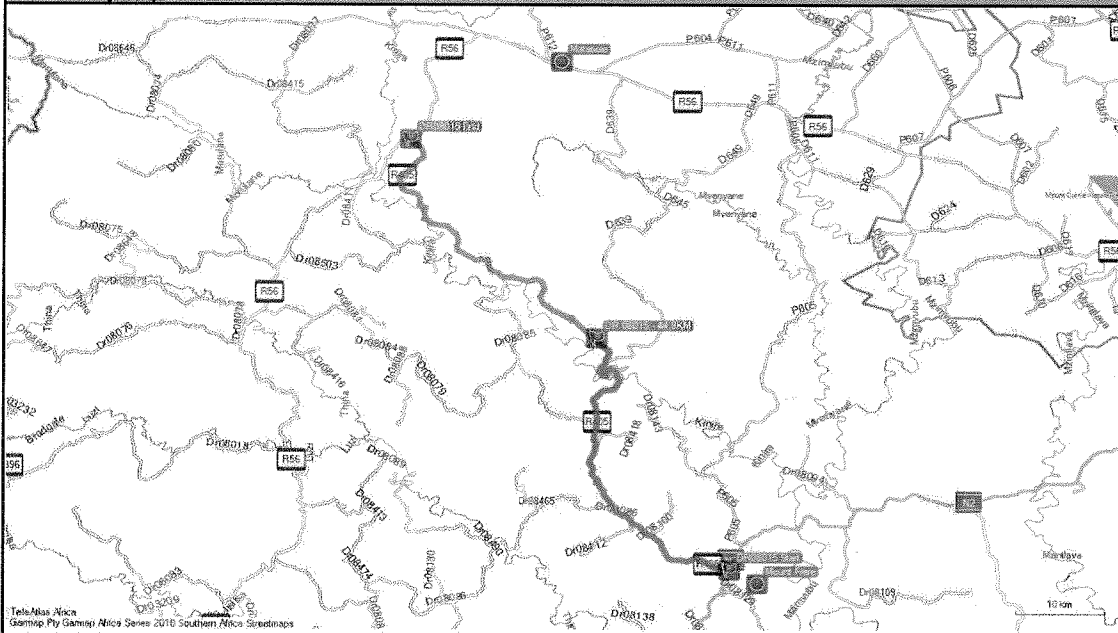
Investigated further.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

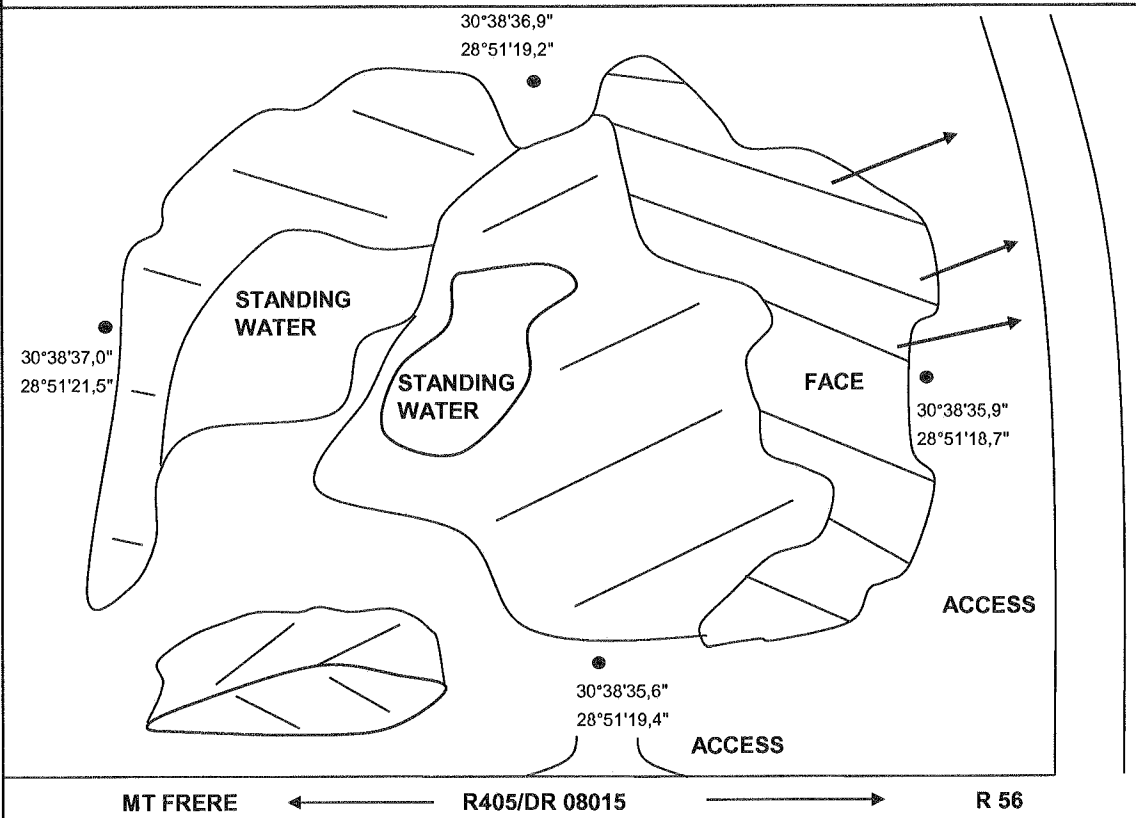
### 1. Initial Assessment Stage

#### 1.1 Locality Map





**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



MT FRERE ←

R405/DR 08015

→ R 56

**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : lt R Br dec Dol

b) Depth of Overburden : -

c) Ave Height / Length of Existing Face : 4m/2m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended into existing face. Lots of small boulders. Drainage needs attention.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water	X		
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

Comments :

1.4 Photo Report



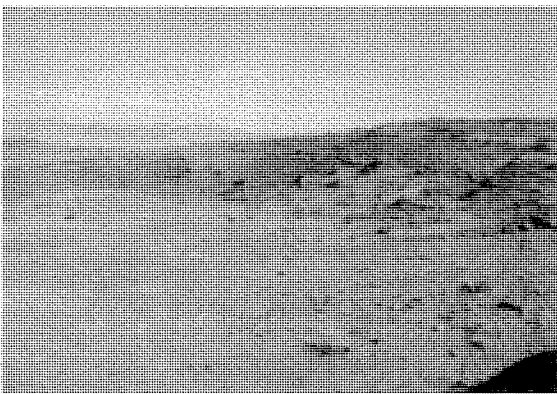
DR08015  
BP9 - 44.8KM  
S30°38'36.7"  
E28°51'19.1"  
North West  
Face



DR08015  
BP9 - 44.8KM  
S30°38'36.4"  
E28°51'18.8"  
North West  
Face



DR08015  
BP9 - 44.8KM  
S30°38'36.0"  
E28°51'19.1"  
South West  
Floor



DR08015  
BP9 - 44.8KM  
S30°38'35.9"  
E28°51'19.6"  
South East  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. : <u>DR08015 - 47.1KM - RHS</u>	Borrow Pit Co - ordinates :
KM Log from Start co-ord : <u>47.1KM - Right Hand Side</u>	S <u>30</u> ° <u>31</u> ' <u>51.1</u> "
Estimated Yield : <u>High</u>	E <u>30</u> ° <u>50</u> ' <u>18.8</u> "
Type of Material : <u>dec Dol some mudstone</u>	

**Description of Source :**

Existing Borrow Pit	<b>X</b>
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Owner: Not identified.

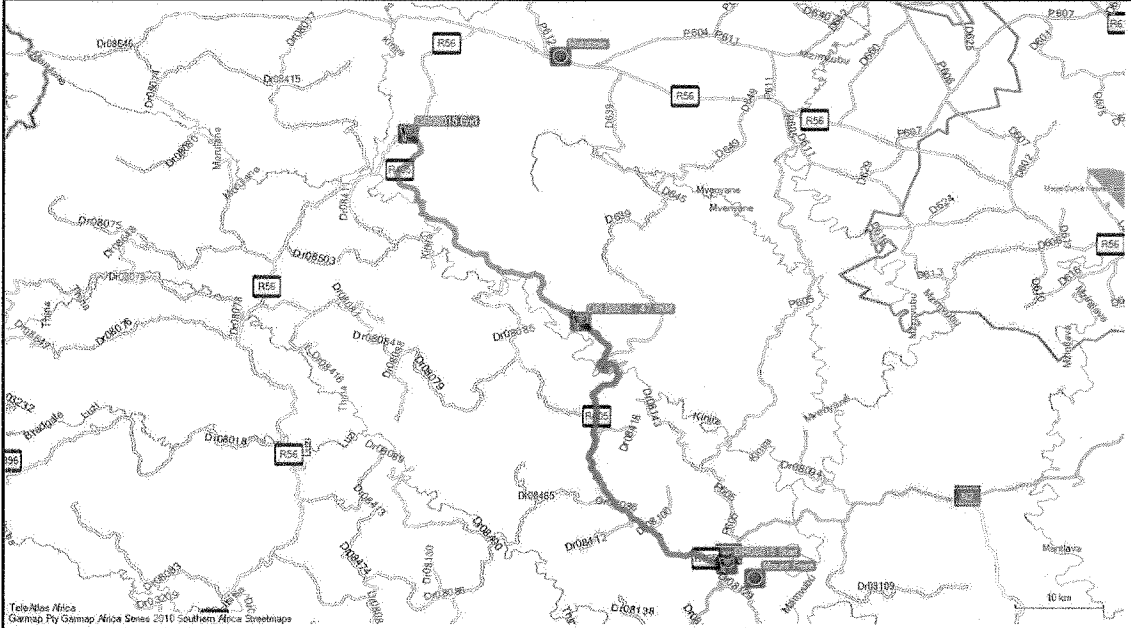
Good potential source.

SIGNATURE \_\_\_\_\_

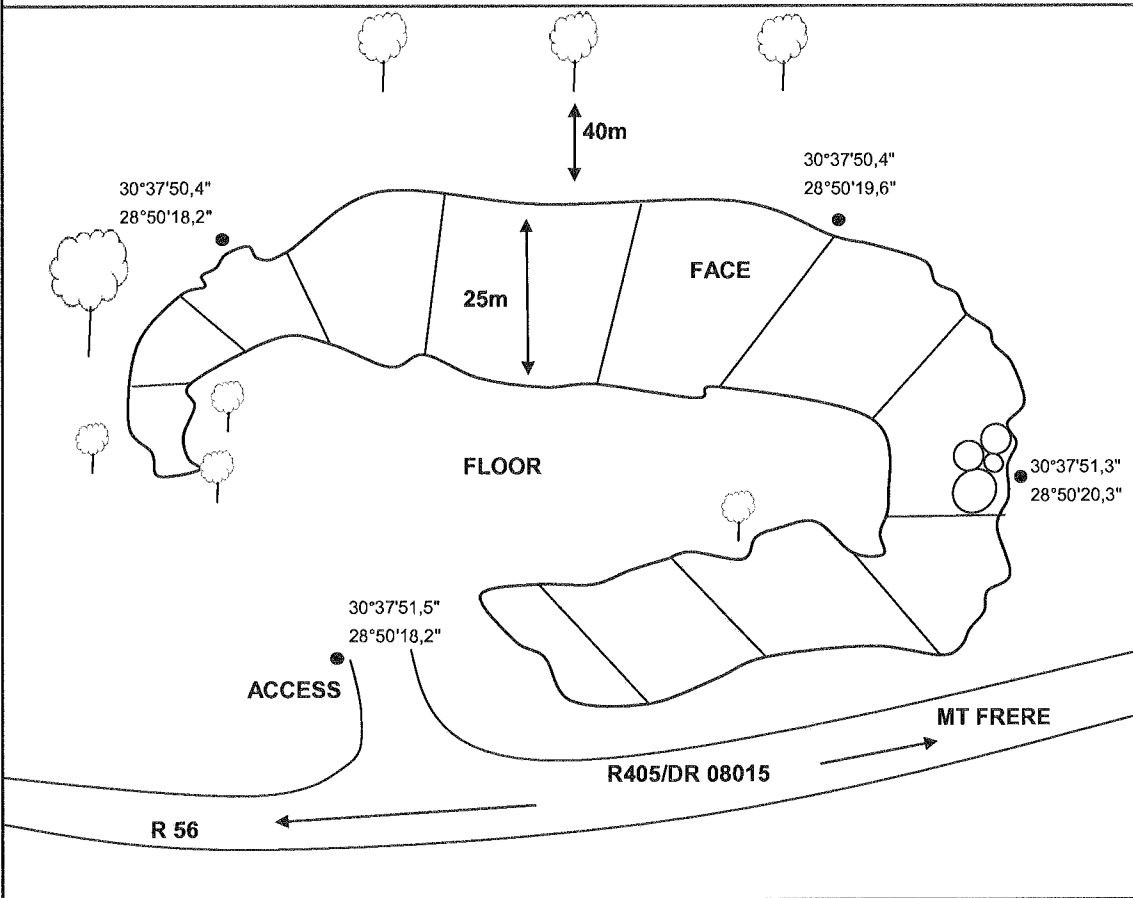
DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

#### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk R Br dec Dol + Y Br ms

b) Depth of Overburden : 400mm

c) Ave Height / Length of Existing Face : 25m/35m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended on all sides into existing face.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water	X		
Boreholes		X	
Indigenous plant species			X
Environmental sensitive locations			X
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

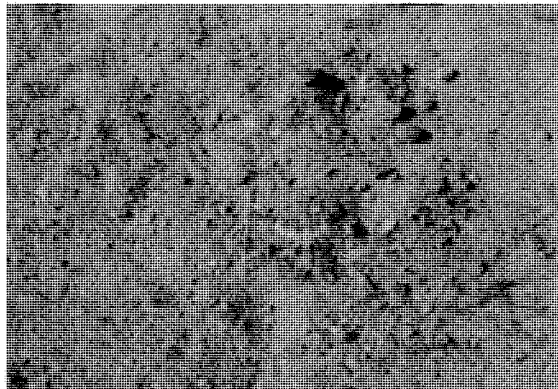
1.4 Photo Report



DR08015  
BP10 - 47.1KM  
S30°37'50.8"  
E28°50'18.5"  
South West  
Face



DR08015  
BP10 - 47.1KM  
S30°37'50.8"  
E28°50'19.2"  
West  
Face



DR08015  
BP10 - 47.1KM  
S30°37'51.2"  
E28°50'19.0"  
South East  
Floor



DR08015  
BP10 - 47.1KM  
S30°37'51.3"  
E28°50'18.5"  
East  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	<b>Kilometres</b>	<b>South</b>	<b>East</b>
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 51.2KM - RHS	<b>Borrow Pit Co - ordinates :</b>
KM Log from Start co-ord :	51.2KM - Right Hand Side	S <u>30</u> ° <u>36</u> ' <u>59</u> "
Estimated Yield :	Fair	E <u>28</u> ° <u>48</u> ' <u>56.9</u> "
Type of Material :	<b>Sandstone &amp; mudstone</b>	

**Description of Source :**

Existing Borrow Pit	<input checked="" type="checkbox"/>
Cutting in Road	<input type="checkbox"/>
Exposed out Crop	<input type="checkbox"/>
New	<input type="checkbox"/>

**Comments :**

Chief: Mrs Matandela (Tel: 076 349 0103)

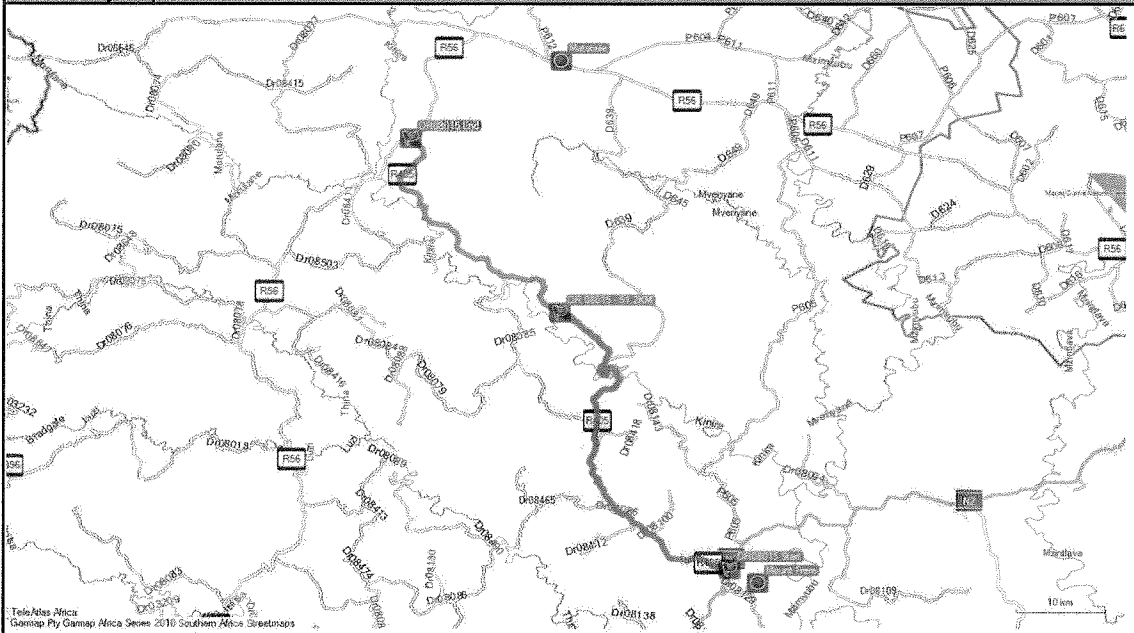
Investigated further.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

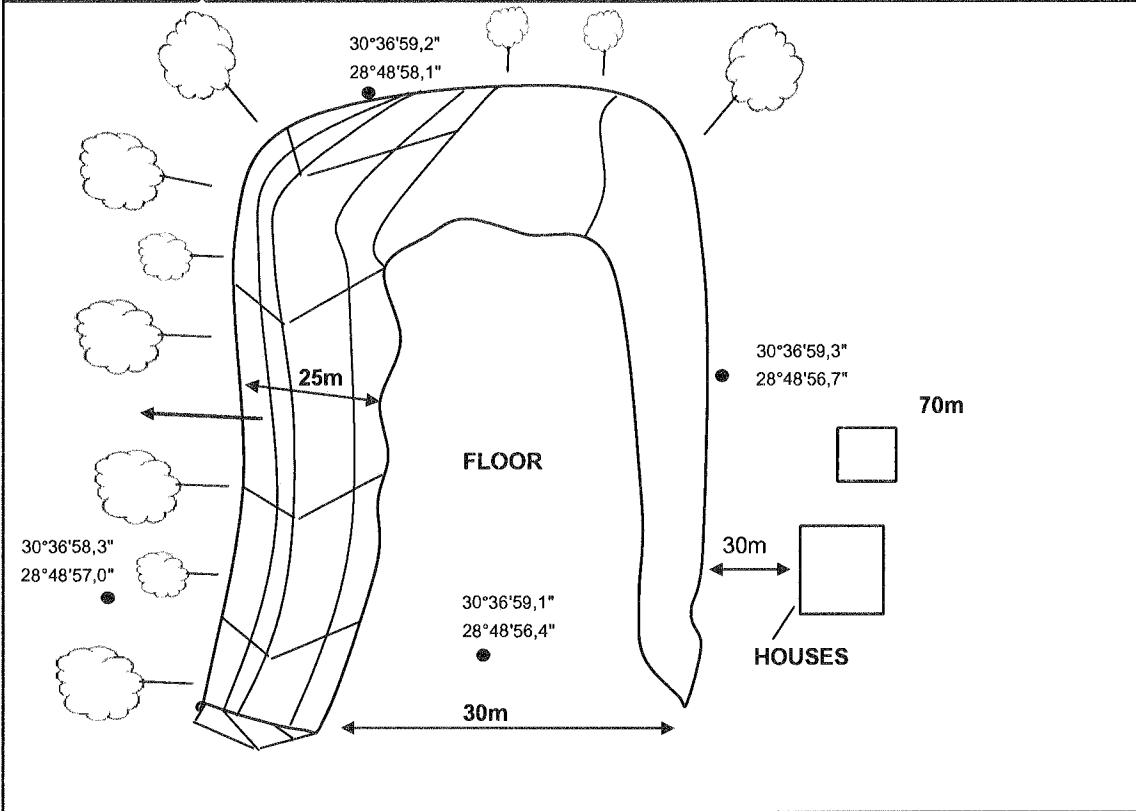
### 1. Initial Assessment Stage

#### 1.1 Locality Map





**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



R 56

DR 08015

MT FRERE

**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : lt R Br + lt Ol ss + dk R Br ms

b) Depth of Overburden : 200mm

c) Ave Height / Length of Existing Face : 25m/40m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be

extended into existing face away from  
houses. Heavy tree growth in places.

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**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation	X		
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species			X
Environmental sensitive locations			X
Any other restraints such as uncooperative landowners etc		X	

Comments :

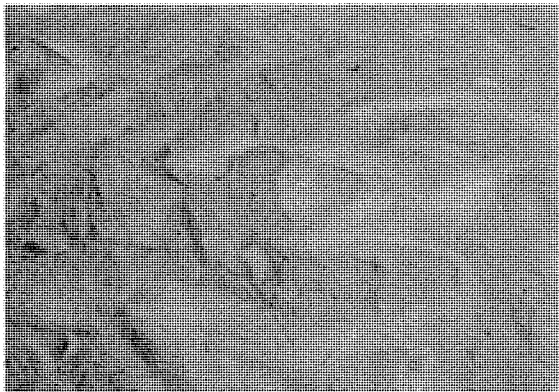
1.4 Photo Report



DR08015  
BP11 - 51.2KM  
S30°36'58.4"  
E28°48'56.8"  
South  
Face - lots of trees



DR08015  
BP11 - 51.2KM  
S30°36'59.1"  
E28°48'57.3"  
North West  
Face



DR08015  
BP11 - 51.2KM  
S30°36'59.0"  
E28°48'56.9"  
South East  
Floor



DR08015  
BP11 - 51.2KM  
S30°36'58.8"  
E28°48'56.5"  
North East  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. :	DR08015 - 56.4KM - LHS	Borrow Pit Co - ordinates :
KM Log from Start co-ord :	56.4KM - Left Hand Side	S <u>30</u> ° <u>34</u> ' <u>59.4</u> "
Estimated Yield :	Poor	E <u>28</u> ° <u>47</u> ' <u>50.6</u> "
Type of Material :	Decomposed Dolerite	

**Description of Source :**

Existing Borrow Pit	<input checked="" type="checkbox"/>
Cutting in Road	<input type="checkbox"/>
Exposed out Crop	<input type="checkbox"/>
New	<input type="checkbox"/>

**Comments :**

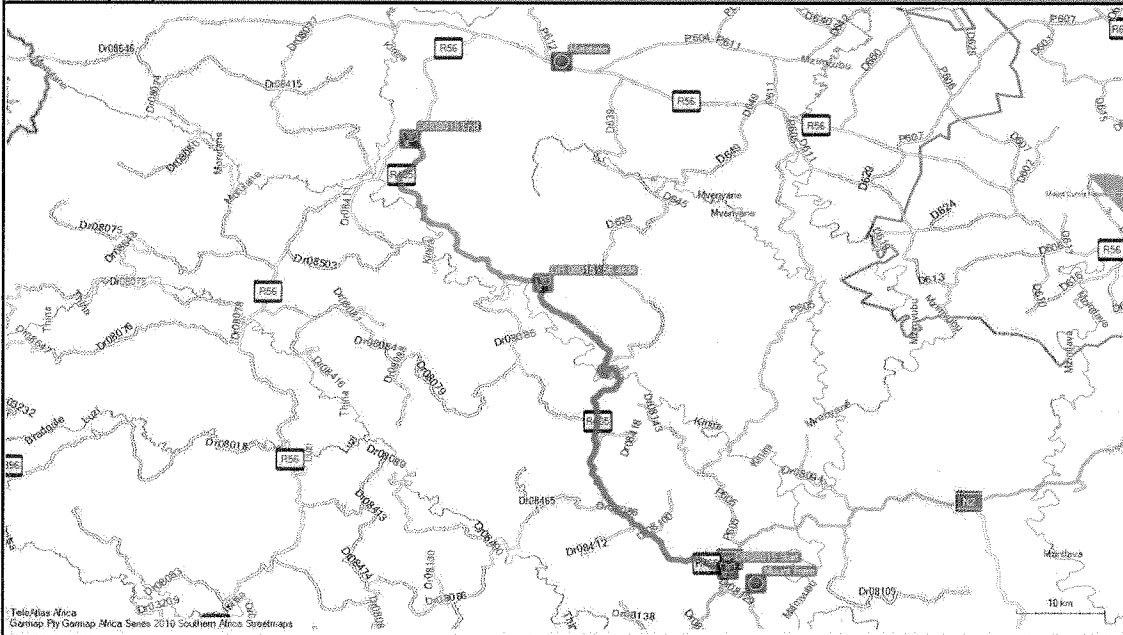
Chief: Mrs Matandela (Tel: 076 349 0103)  
Not worthwhile considering at this stage.

SIGNATURE \_\_\_\_\_

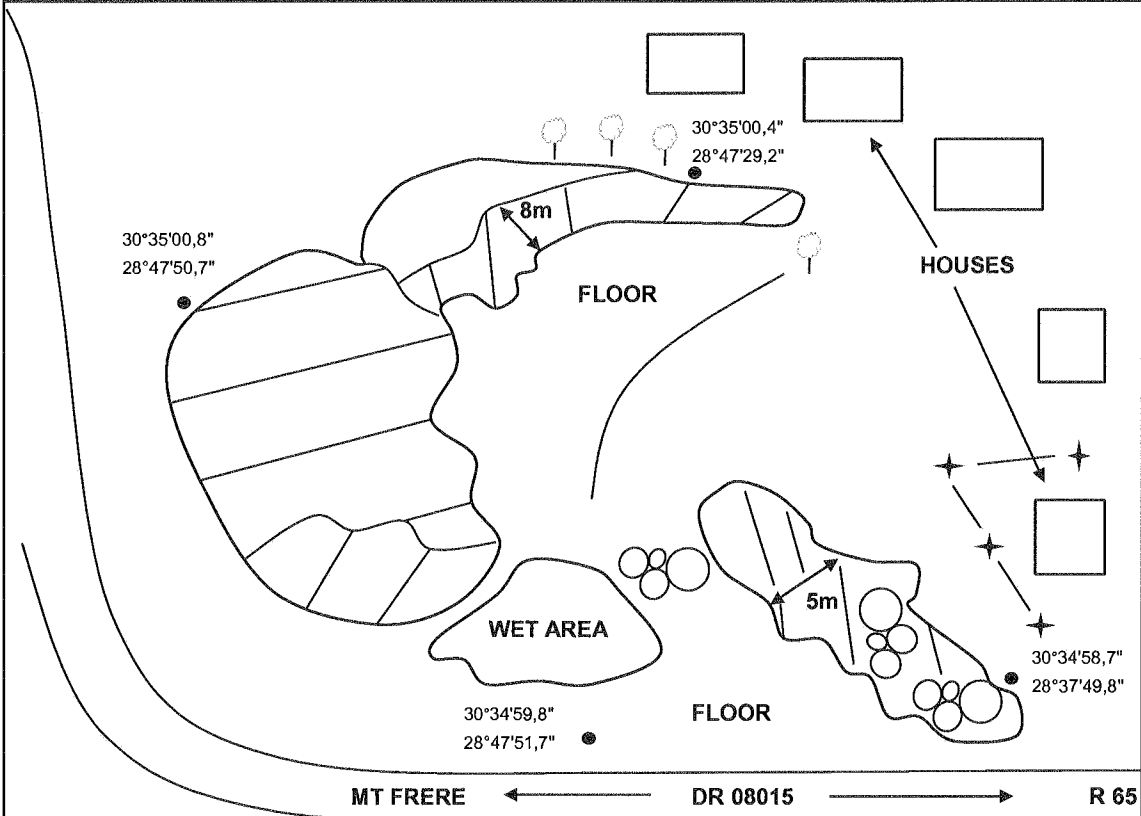
DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

#### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk R O + dk Br dec Dol

b) Depth of Overburden : 200mm

c) Ave Height / Length of Existing Face : 6m/15m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Limited

extended only due to existing houses and road.

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**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation	X		
Power or telephone lines, overhead		X	
Railways		X	
Surface water	X		
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

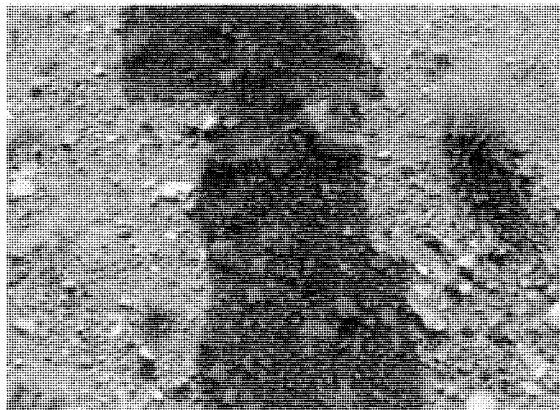
1.4 Photo Report



DR08015  
BP12 - 56.4KM  
S30°34'59.8"  
E28°47'50.3"  
North West  
Face - trees in distance



DR08015  
BP12 - 56.4KM  
S30°34'59.4"  
E28°47'50.2"  
South West  
Face - second face in background



DR08015  
BP12 - 56.4KM  
S30°34'59.4"  
E28°47'50.6"  
North West  
Floor



DR08015  
BP12 - 56.4KM  
S30°34'59.8"  
E28°47'51.9"  
North West  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. : <u>DR08015 - 63.3KM - LHS</u>	Borrow Pit Co - ordinates :
KM Log from Start co-ord : <u>63.3KM - Left Hand Side</u>	S <u>30</u> ° <u>34</u> ' <u>07.1</u> "
Estimated Yield : <u>Fair to High</u>	E <u>28</u> ° <u>44</u> ' <u>27.6</u> "
Type of Material : <u>Decomposed Dolerite</u>	

**Description of Source :**

Existing Borrow Pit	<b>X</b>
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Chief: Mrs Matandela (Tel: 076 349 0103)

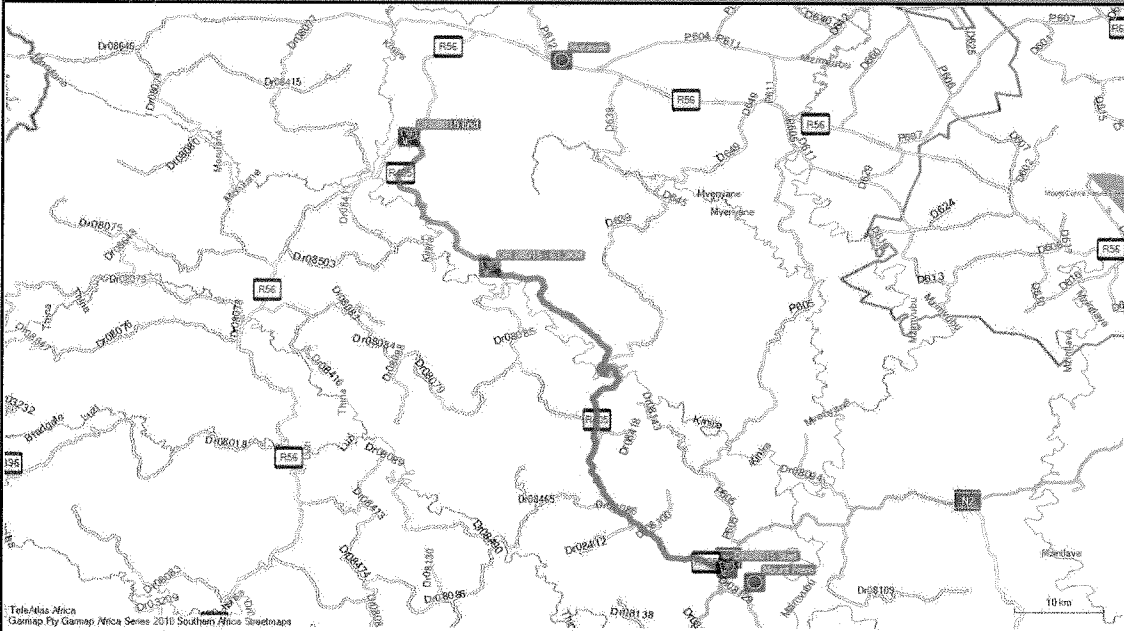
Needs further investigation.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

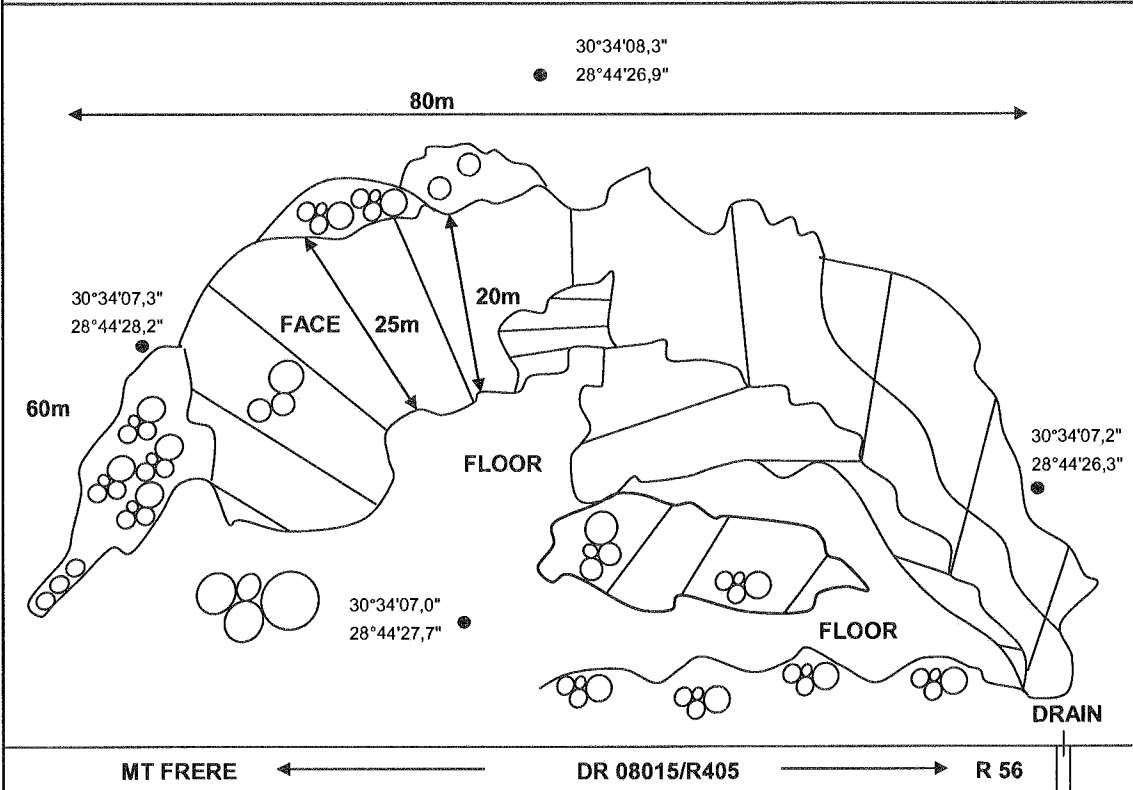
#### 1.1 Locality Map



Tele/Mas Africa  
Cammap Pty Cammap/MISA Series 2010 Southern Africa Streetmaps



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk R O + lt Br dec Dol

b) Depth of Overburden : -

c) Ave Height / Length of Existing Face : 20m/40m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended in existing face. Lots of boulders which may require crushing.

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**1.3 Possible Constraints**

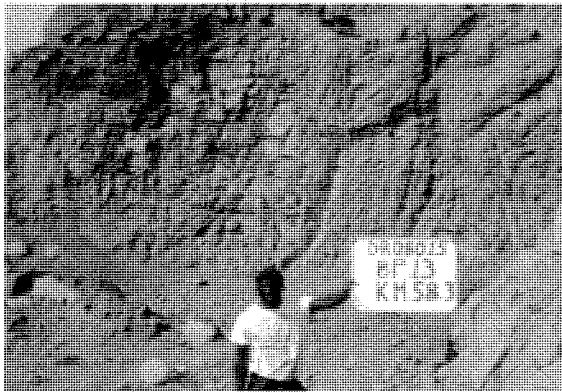
Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

1.4 Photo Report



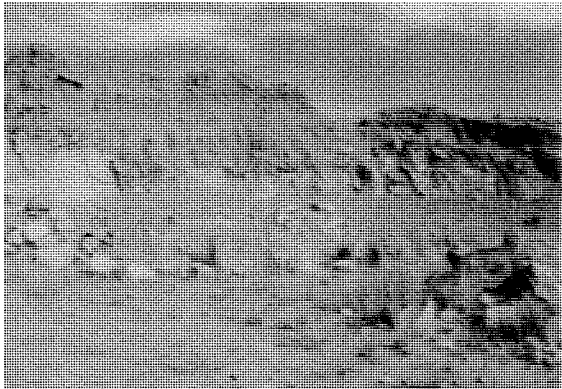
DR08015  
BP13 - 63.3KM  
S30°34'07.3"  
E28°44'27.8"  
North West  
Face



DR08015  
BP13 - 63.3KM  
S30°34'07.4"  
E28°44'27.2"  
South  
Face - second face in background



DR08015  
BP13 - 63.3KM  
S30°34'07.0"  
E28°44'27.7"  
South West  
Floor



DR08015  
BP13 - 63.3KM  
S30°34'06.2"  
E28°44'28.2"  
South West  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. : <u>DR08015 - 63.4KM - LHS</u>	Borrow Pit Co - ordinates :
KM Log from Start co-ord : <u>63.4KM - Left Hand Side</u>	S <u>30</u> ° <u>34</u> ' <u>07.1</u> "
Estimated Yield : <u>High</u>	E <u>28</u> ° <u>44</u> ' <u>27.6</u> "
Type of Material : <u>Sandstone, shale and mudstone</u>	

**Description of Source :**

Existing Borrow Pit	<input checked="" type="checkbox"/>
Cutting in Road	<input type="checkbox"/>
Exposed out Crop	<input type="checkbox"/>
New	<input type="checkbox"/>

**Comments :**

Chief: Mrs Matandela (Tel: 076 349 0103)

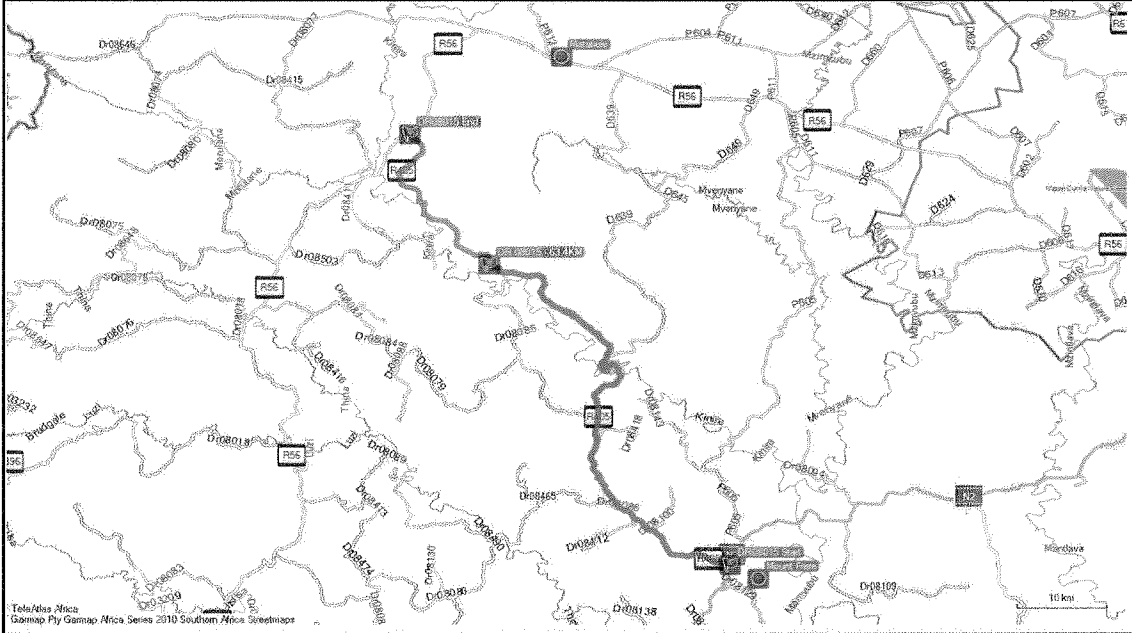
Good potential source

SIGNATURE \_\_\_\_\_

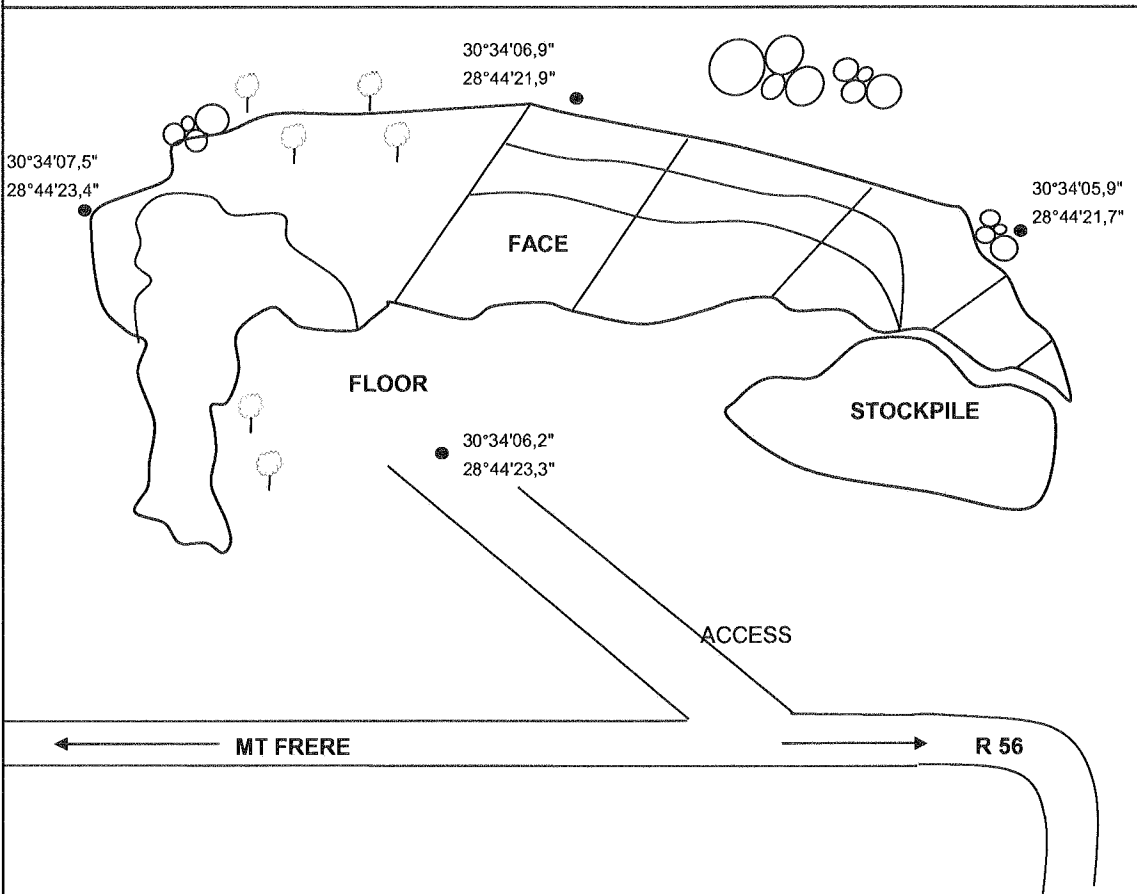
DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

#### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : lt R B ss + lt Ol sh + dk Y Br ms

b) Depth of Overburden : 400mm

c) Ave Height / Length of Existing Face : 10m/20m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be

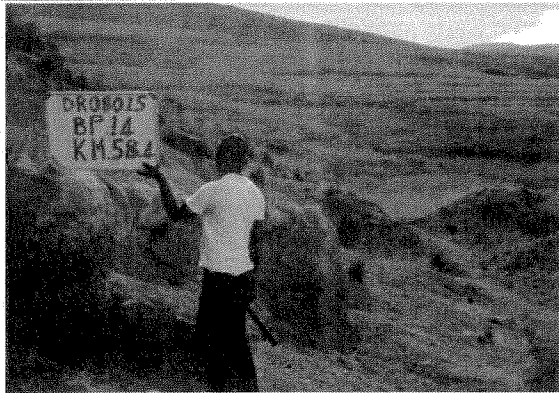
extended into existing face away from  
road.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

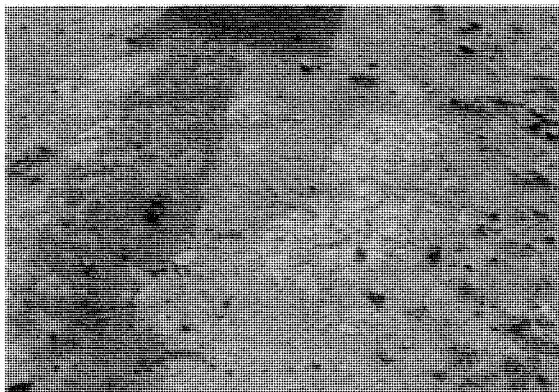
1.4 Photo Report



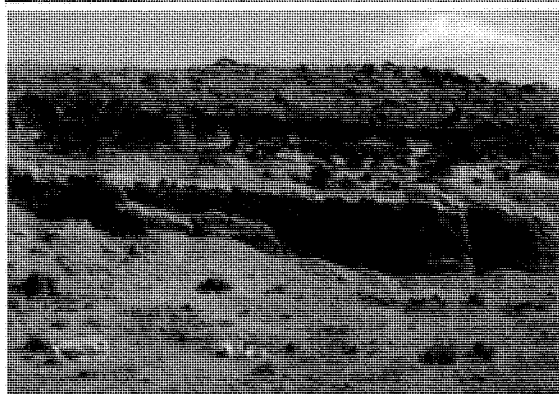
DR08015  
BP14 - 63.4KM  
S30°34'06.6"  
E28°44'22.2"  
North West  
Face - stockpile



DR08015  
BP14 - 63.4KM  
S30°34'06.5"  
E28°44'22.0"  
South  
Face



DR08015  
BP14 - 63.4KM  
S30°34'06.4"  
E28°44'22.5"  
South West  
Floor



DR08015  
BP14 - 63.4KM  
S30°34'06.2"  
E28°44'23.0"  
South West  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 23 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. : <u>DR08015 - 66.0KM - RHS</u>	Borrow Pit Co - ordinates :
KM Log from Start co-ord : <u>66.0KM - Right Hand Side</u>	S <u>30</u> ° <u>33</u> ' <u>29.9</u> "
Estimated Yield : <u>High</u>	E <u>28</u> ° <u>43</u> ' <u>37.1</u> "
Type of Material : <u>Mudstone</u>	

**Description of Source :**

Existing Borrow Pit	<b>X</b>
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Chief: Mrs Matandela (Tel: 076 349 0103)

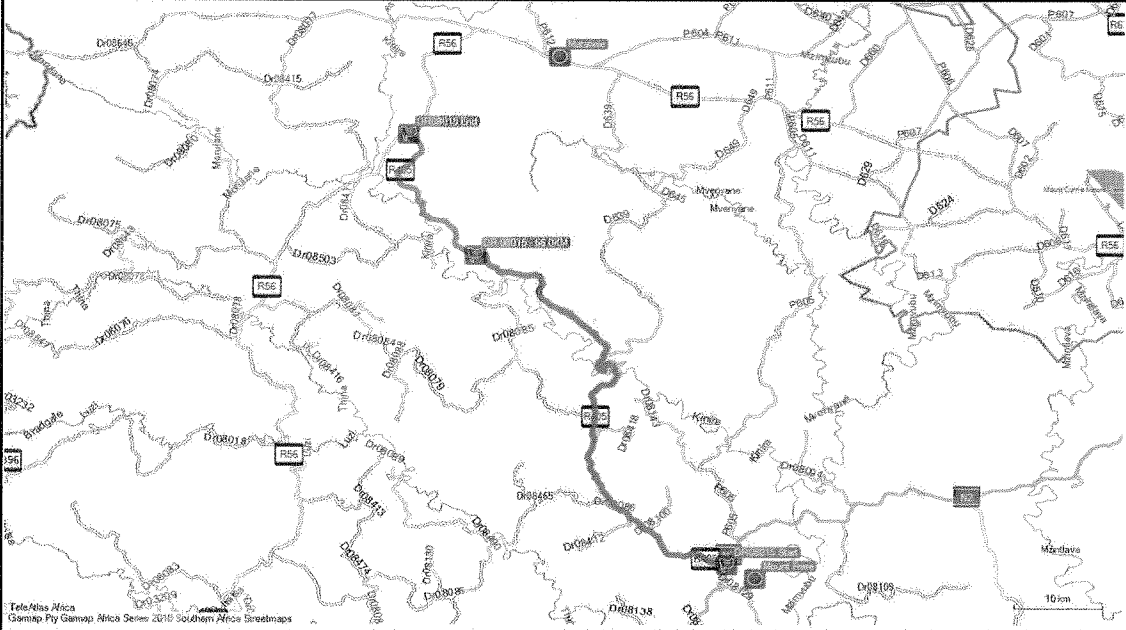
Good potential source.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

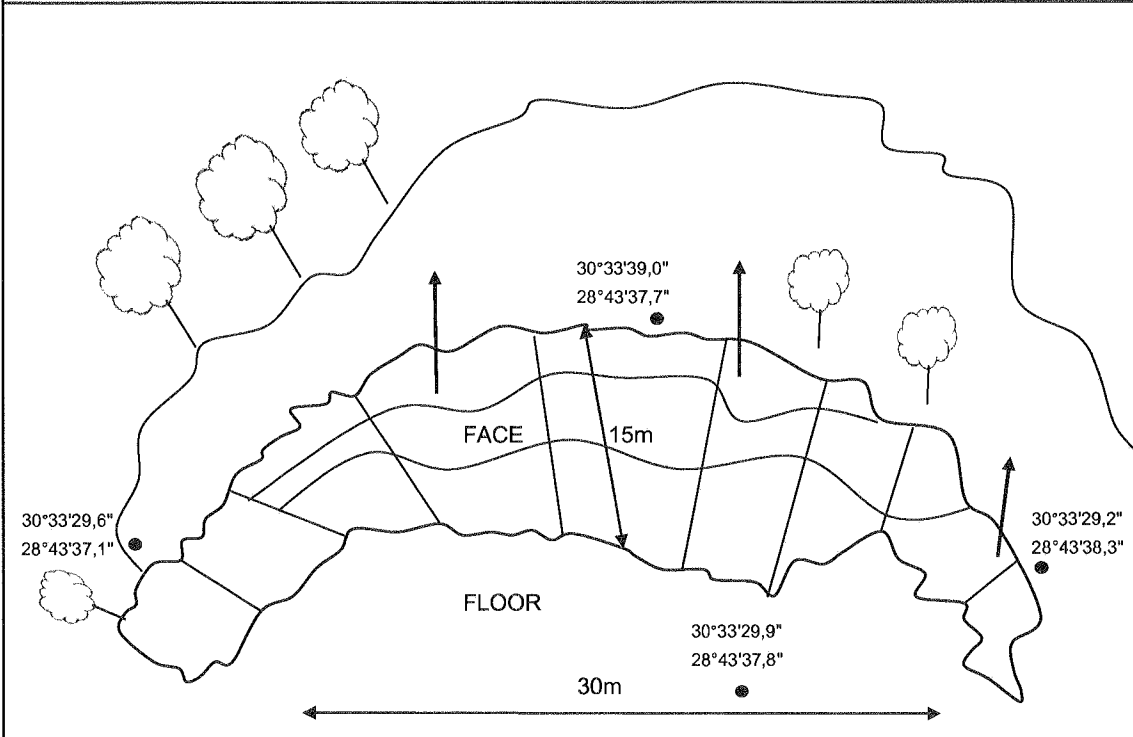
#### 1.1 Locality Map



TeleAtlas Africa  
Garmin Pty Gamap Africa Series 2010 Southern Africa Streetmaps



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



R 56 ← R405/DR 08015 ← MT FRERE

**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : P + It Ol + Y ms

b) Depth of Overburden : 500mm

c) Ave Height / Length of Existing Face : 25m/30m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended into existing face away from road.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**1.3 Possible Constraints**

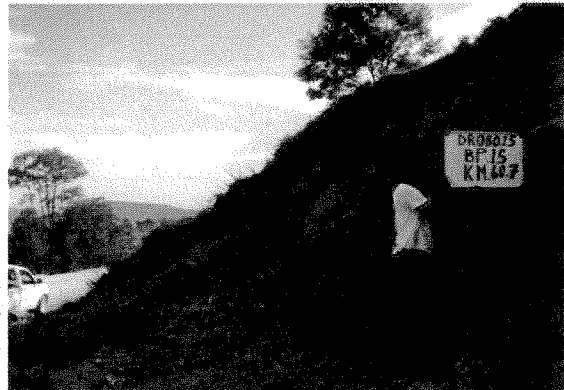
Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species			X
Environmental sensitive locations			X
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

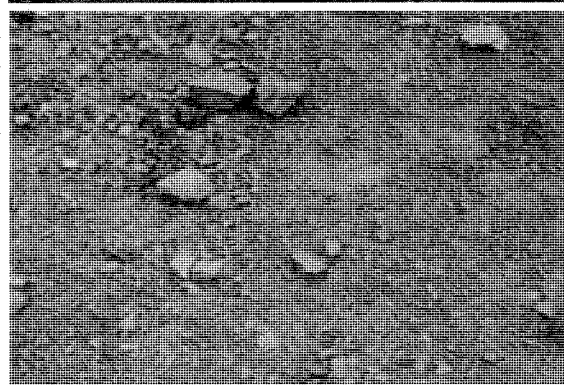
1.4 Photo Report



DR08015  
BP15 - 66.0KM  
S30°33'29.3"  
E28°43'37.5"  
South East  
Face and road



DR08015  
BP15 - 66.0KM  
S30°33'29.6"  
E28°43'37.8"  
South West  
Face and trees



DR08015  
BP15 - 66.0KM  
S30°33'29.6"  
E28°43'37.7"  
North West  
Floor



DR08015  
BP15 - 66.0KM  
S30°33'29.3"  
E28°43'37.9"  
North West  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



BORROW PIT DATA INPUT SHEET

### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

### Borrow Pit Information

Borrow Pit No. or Source No. :	<u>DR08015 - 67.4KM - RHS</u>	Borrow Pit Co - ordinates :		
KM Log from Start co-ord :	<u>67.4KM - Right Hand Side</u>	S	<u>30</u> ° <u>33</u> ' <u>08.3</u> "	
Estimated Yield :	<u>Fair to High</u>	E	<u>28</u> ° <u>42</u> ' <u>51.8</u> "	
Type of Material :	<u>dec Dol</u>			

#### Description of Source :

Existing Borrow Pit	<input checked="" type="checkbox"/>
Cutting in Road	<input type="checkbox"/>
Exposed out Crop	<input type="checkbox"/>
New	<input type="checkbox"/>

#### Comments :

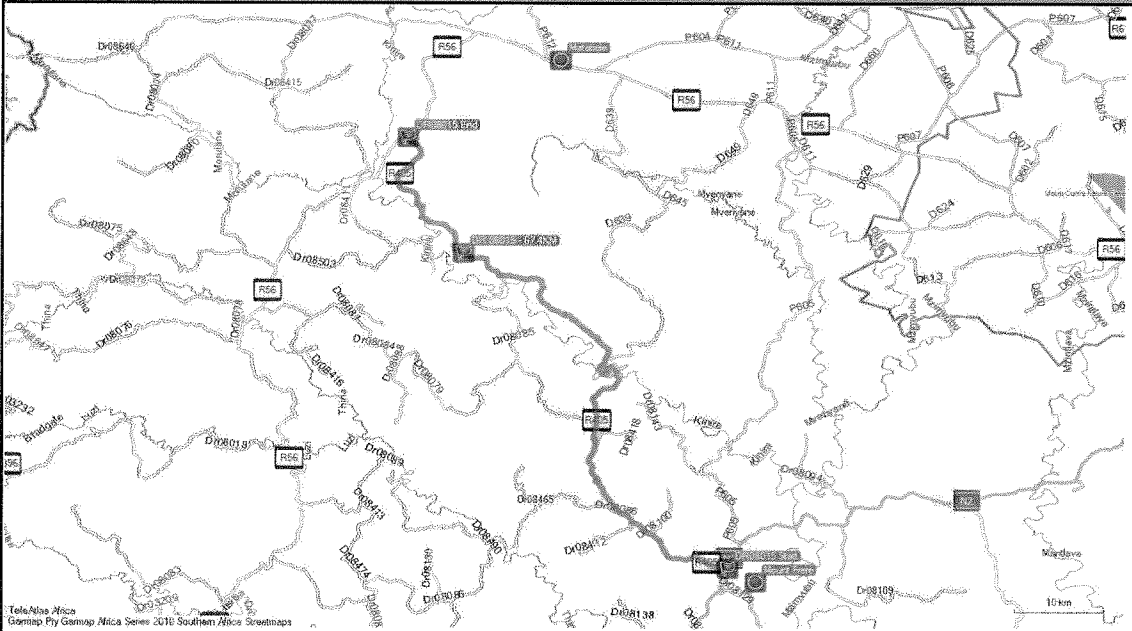
Chief: Mrs Matandela (Tel: 076 349 0103)  
Good potential source.

SIGNATURE \_\_\_\_\_

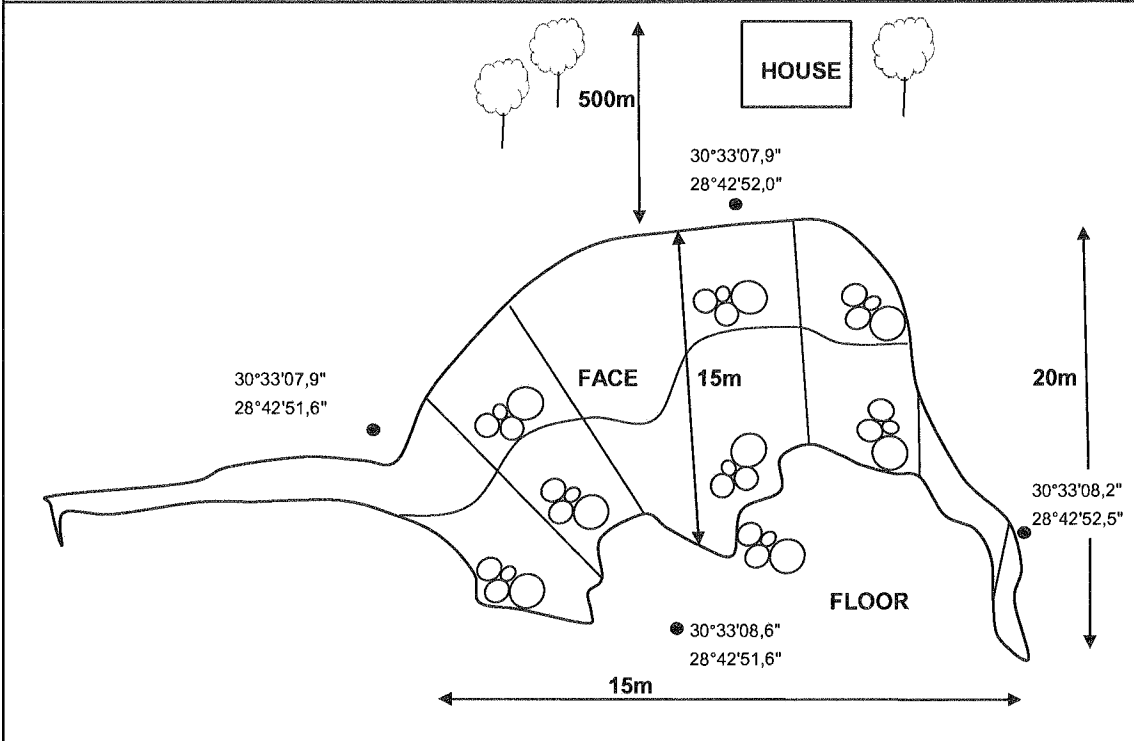
DATE: \_\_\_\_\_

## 1. Initial Assessment Stage

### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



R 56 ← DR 08015 → MT FRERE

**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk Br dec Dol

b) Depth of Overburden : 300mm

c) Ave Height / Length of Existing Face : 15m/20m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	
Weathered	X
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be

extended into hillside. Some small  
boulders.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation	X		
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

Comments :

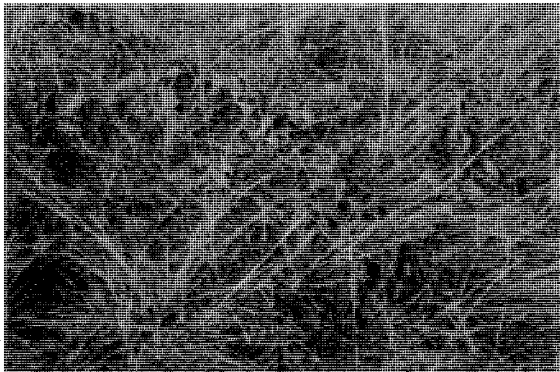
1.4 Photo Report



DR08015  
BP16 - 67.4KM  
S30°33'08.2"  
E28°42'51.9"  
South East  
Face



DR08015  
BP16 - 67.4KM  
S30°33'08.1"  
E28°42'52.1"  
North West  
Face



DR08015  
BP16 - 67.4KM  
S30°33'08.3"  
E28°42'51.8"  
South East  
Floor



DR08015  
BP16 - 67.4KM  
S30°33'08.6"  
E28°42'52.0"  
North East  
General view

# PROVINCE OF EASTERN CAPE



## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. : DR08015	Borrow Pit Co - ordinates :
KM Log from Start co-ord : DR08015 - 69.7KM - RHS	S 30 ° 32 ' 12.2 "
Estimated Yield : Fair	E 28 ° 42 ' 23.4 "
Type of Material : <b>Mudstone and sandstone</b>	

**Description of Source :**

Existing Borrow Pit	X
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

Chief: Mrs Matandela (Tel: 076 349 0103)

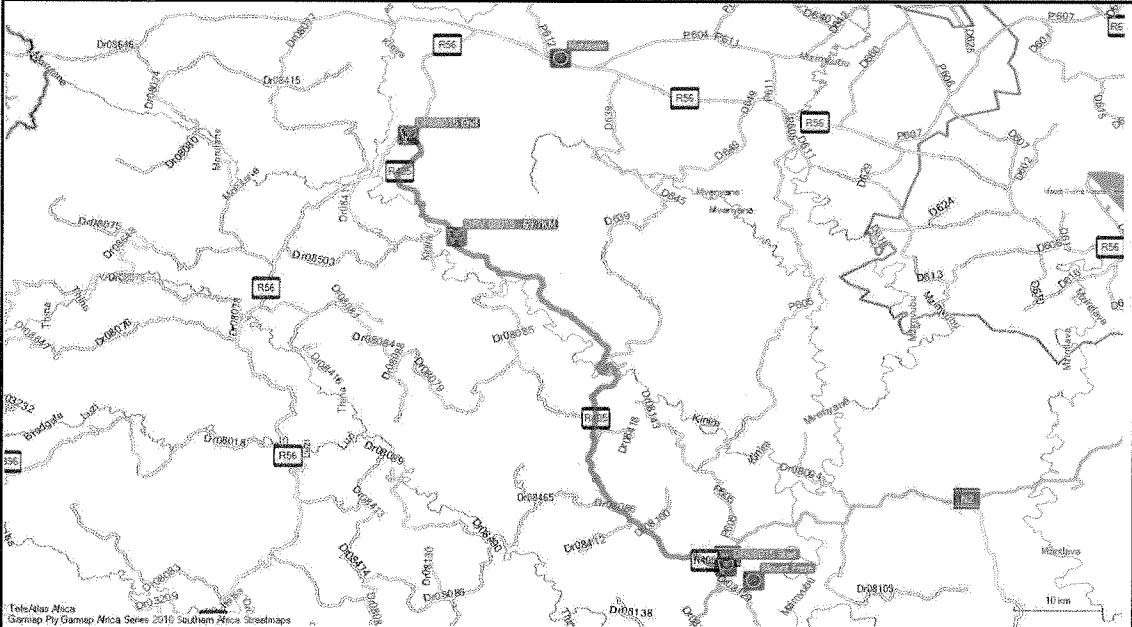
Investigate further.

SIGNATURE \_\_\_\_\_

DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

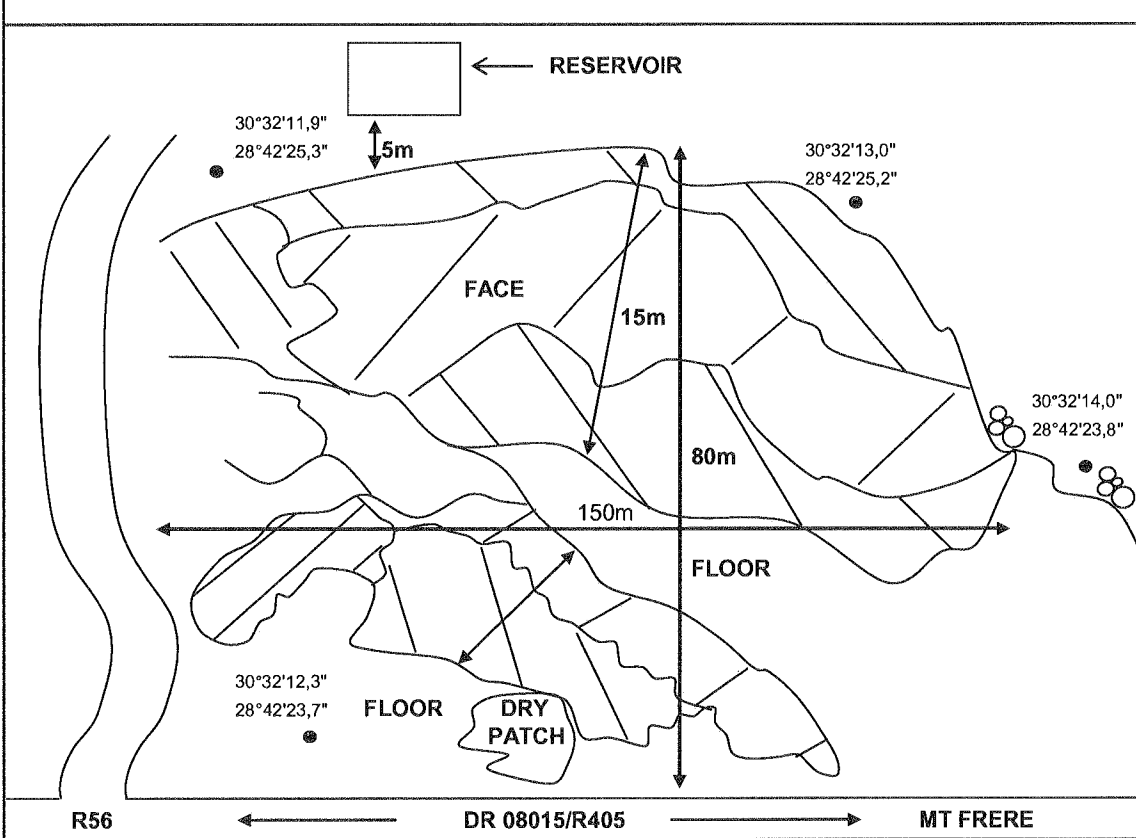
#### 1.1 Locality Map



Telo/Atlas Africa  
GISmap Pty Gamsap Africa Series 2010 Southern Africa Streetmaps



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : P + YO + Br ms + It R + Y Br ss

b) Depth of Overburden : 200mm

c) Ave Height / Length of Existing Face : 15m/40m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

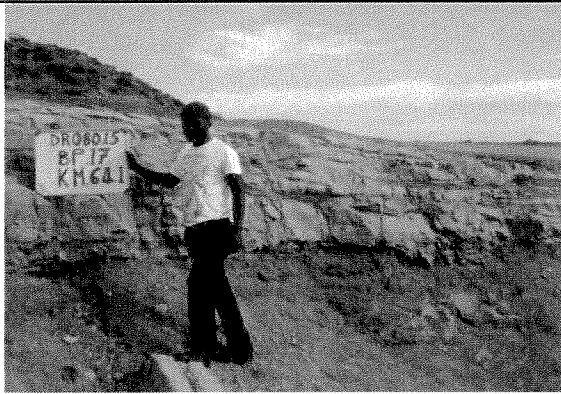
h) Other observations : Can be extended away from reservoir into existing face. Some very hard sandstone layers.

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation	X		
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

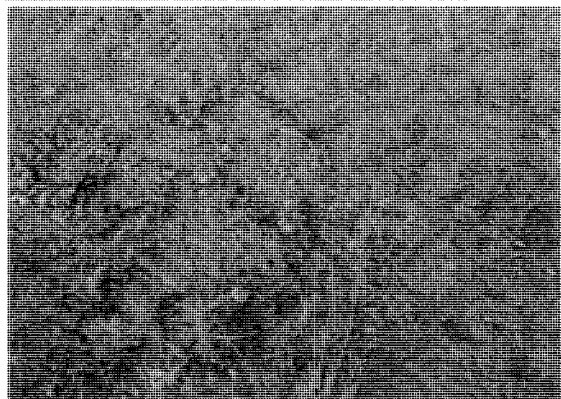
#### 1.4 Photo Report



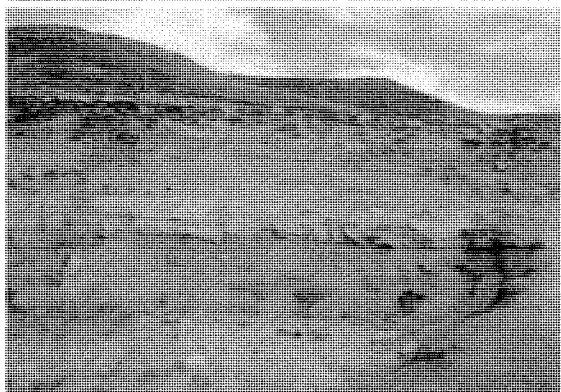
DR08015  
BP17 - 69.7KM  
S30°32'12.5"  
E28°42'23.9"  
South West  
Face - road



DR08015  
BP17 - 69.7KM  
S30°32'12.7"  
E28°42'23.6"  
South East  
Face



DR08015  
BP17 - 69.7KM  
S30°32'12.8"  
E28°42'23.6"  
South East  
Floor



DR08015  
BP17 - 69.7KM  
S30°32'12.4"  
E28°42'23.5"  
South East  
General view

# PROVINCE OF EASTERN CAPE

## BORROW PIT MANAGEMENT SYSTEM FOR THE DEPARTMENT OF ROADS AND TRANSPORT



CONTROLAB

### BORROW PIT DATA INPUT SHEET

#### Road Information

District Municipality	Alfred Nzo	Kilometres	South	East
Local Municipality	Matatiele	Start	30 ° 53 ' 48 "	28 ° 59 ' 45 "
Road Number	DR08015	End	30 ° 25 ' 35 "	28 ° 29 ' 19 "

#### Borrow Pit Information

Borrow Pit No. or Source No. : <u>DR08015 - 74.0KM - RHS</u>	Borrow Pit Co - ordinates :
KM Log from Start co-ord : <u>74.0KM - Right Hand Side</u>	S <u>30</u> ° <u>30</u> ' <u>58.7</u> "
Estimated Yield : <u>Fair to High</u>	E <u>28</u> ° <u>40</u> ' <u>35.5</u> "
Type of Material : <u>Mudstone and decomposed Dolerite</u>	

**Description of Source :**

Existing Borrow Pit	<b>X</b>
Cutting in Road	
Exposed out Crop	
New	

**Comments :**

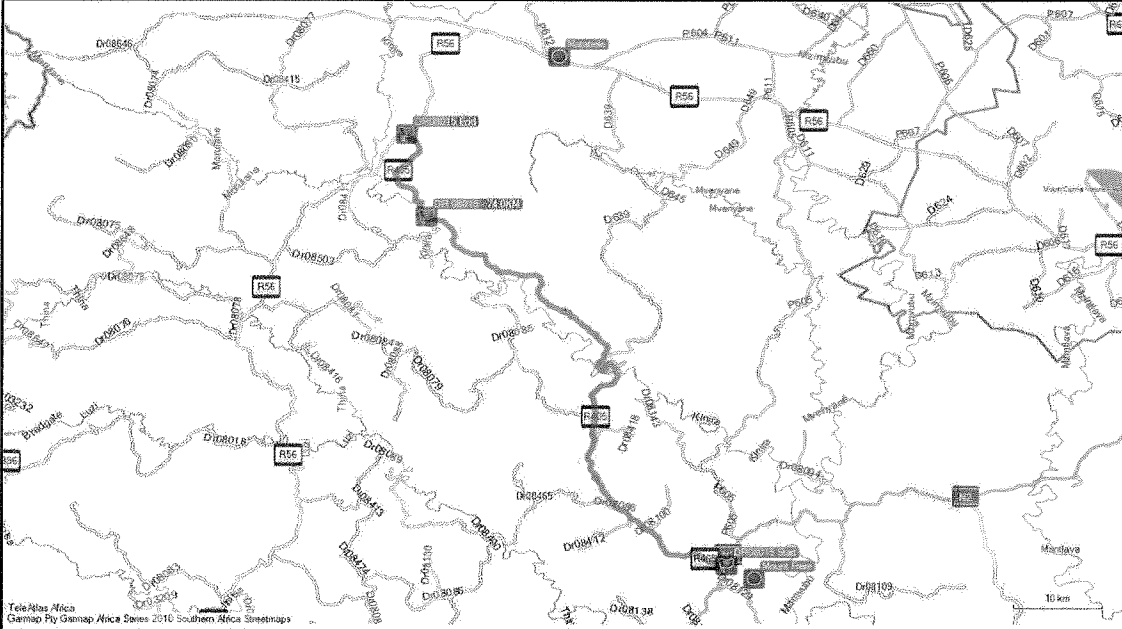
Chief: Mrs Matandela (Tel: 076 349 0103)  
Good potential source.

SIGNATURE \_\_\_\_\_

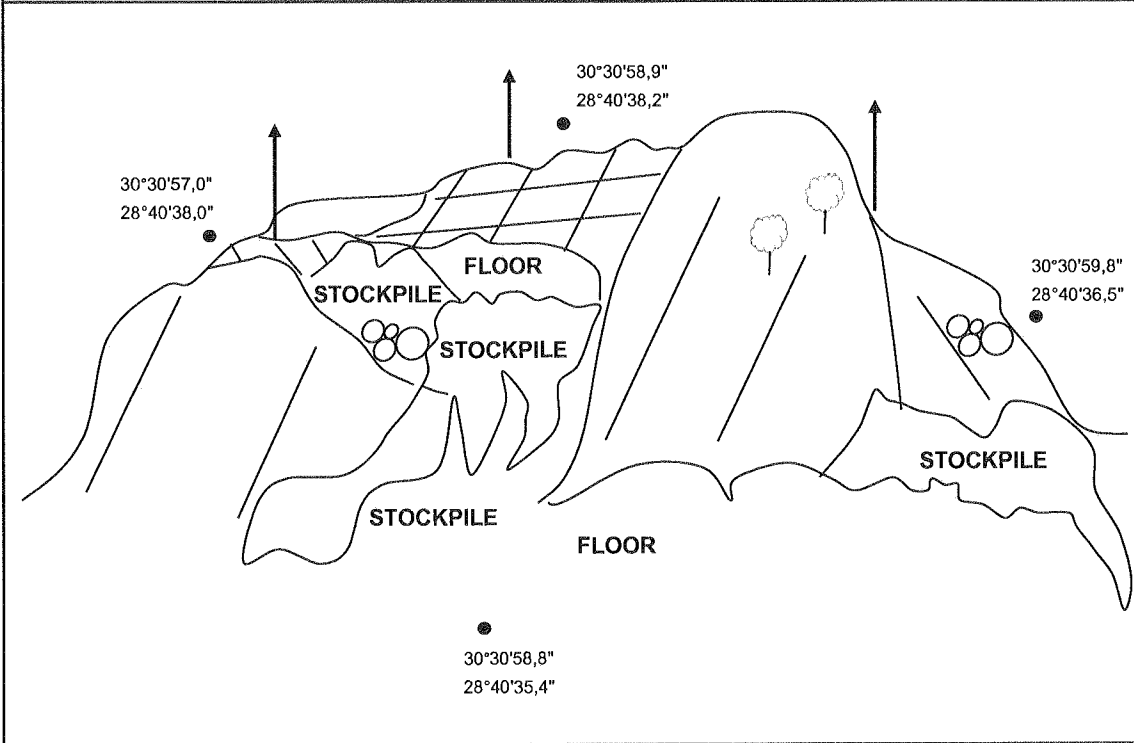
DATE: \_\_\_\_\_

### 1. Initial Assessment Stage

#### 1.1 Locality Map



**1.2 Sketch of Borrow Pit Area - With Perimeter GPS co-ordinates**



R56



DR08015/R405



MT FRERE

**DESCRIPTION OF BORROW PIT MATERIAL**

a) Type of Material : dk R Br dec Dol + P + Gr ms

b) Depth of Overburden : -

c) Ave Height / Length of Existing Face : 6m/8m

d) Consistency of Face :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

e) Consistency of Floor :

Loose	
Dense	
Highly Weathered	X
Weathered	
Unweathered	

f) Excavation in Face :

TLB	
Excavator	X
Drill & Blast	

g) Excavation in Floor :

TLB	
Excavator	X
Drill & Blast	

h) Other observations : Can be extended into existing hillside.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**1.3 Possible Constraints**

Item	Problem		
	Yes	No	Don't Know
Grave sites		X	
Fauna		X	
Sites with archaeological significance		X	
Buildings, structures or human habitation		X	
Power or telephone lines, overhead		X	
Railways		X	
Surface water		X	
Boreholes		X	
Indigenous plant species		X	
Environmental sensitive locations		X	
Any other restraints such as uncooperative landowners etc		X	

**Comments :**

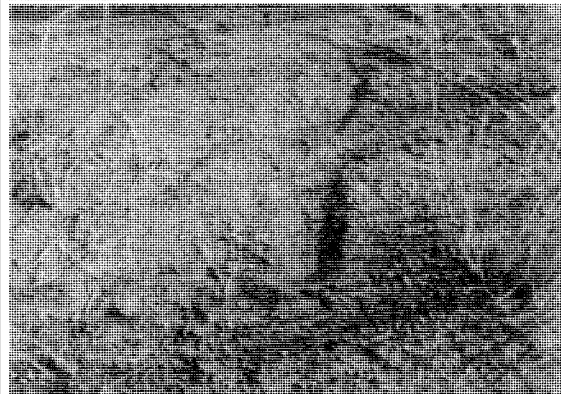
1.4 Photo Report



DR08015  
BP18 - 74.0KM  
S30°30'58.7"  
E28°40'37.9"  
South West  
Face



DR08015  
BP18 - 74.0KM  
S30°30'59.1"  
E28°40'37.1"  
South East  
Face



DR08015  
BP18 - 74.0KM  
S30°30'58.7"  
E28°40'37.5"  
South West  
Floor



DR08015  
BP18 - 74.0KM  
S30°30'58.1"  
E28°40'35.6"  
North East  
General view

HERITAGE IMPACT ASSESSMENT OF  
BORROW PITS IN ALFRED NZO DISTRICT MUNICIPALITY,  
EASTERN CAPE PROVINCE, SOUTH AFRICA

Prepared for

**Terratest (Pty) Ltd**

Box 794 Hilton 3245  
Telephone Magnus van Rooyen 033 343 6789  
Fax 033 343 6788 vanrooyenm@jgi.co.za

Prepared by

**eThembeni Cultural Heritage**

Len van Schalkwyk and Beth Wahl  
Box 20057 Ashburton 3213 Pietermaritzburg  
Telephone 033 326 1136 / 082 655 9077 / 082 529 3656  
Fax 086 672 8557 thembeni@iafrica.com

**14 June 2011**



## **Management summary**

eThembeni Cultural Heritage was appointed by Terratest (Pty) Ltd to undertake a heritage impact assessment of various borrow pits in the Eastern Cape Province, in terms of the National Environmental Management Act 107 of 1998 as amended, in compliance with Section 38 of the National Heritage Resources Act 25 of 1999. eThembeni staff members inspected the area from 23 to 26 May 2011 and completed controlled-exclusive surface surveys.

### **Description of heritage resources and significance assessment**

#### **– Landscapes and natural features**

Borrow pit DR8646/BP03 is located within a few hundred metres of the formally proclaimed and protected landscape of Ongeluksnek Nature Reserve. The borrow pit is clearly visible from the reserve entrance and from certain accommodation facilities. The reserve has high heritage significance at local, regional and provincial levels for its aesthetic, scientific and social (including economic) values.

#### **– Graves and burial grounds**

Ancestral graves occur immediately adjacent to the following borrow pits:

- |             |                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| DR8015/BP05 | A group of more than 16 stone-packed graves and one grave with a granite headstone is located within 30 metres of the existing southern borrow pit face. |
| DR8015/BP06 | Various family graves are located within a fenced homestead precinct within 5 metres of the existing southern/south-western borrow pit face.             |
| DR8015/BP18 | At least three stone-packed graves are located across the road from and directly opposite the borrow pit.                                                |

All human remains have high heritage significance at all levels for their spiritual, social and cultural values.

### **Assessment of impacts**

#### **– Landscapes and natural features**

The impact of the exploitation of DR8646/BP03 on the protected landscape of Ongeluksnek Nature Reserve can be considered of medium consequence and high probability, with MEDIUM significance overall.

#### **– Graves and burial grounds**

None of the graves near DR8015/BP05 and DR8015/BP06 will be affected directly by borrow pit extensions or rehabilitation. Accordingly, the impact on these graves is LOW. However, it is very likely that the graves near DR8015/BP018 will be altered or destroyed inadvertently by construction activities, since they are not easily noticeable and no next-of-kin reside nearby. Accordingly, the impact on these graves could be HIGH.

## **Recommended mitigation measures**

### **– Landscapes and natural features**

Borrow pit DR8646/BP03 should be decommissioned permanently and rehabilitated as soon as possible according to approved environmental standards.

### **– Graves and burial grounds**

DR8015/BP05           The existing borrow pit face may extend no further southwards in the direction of the homestead and graves.

DR8015/BP06           The existing borrow pit face adjacent to the homestead may not be extended further and must be stabilized urgently to prevent further erosion and undermining of the graves located within the homestead precinct.

DR8015/BP18           The area between the coordinates  
S30 30 58.3; E28 40 35.3  
S30 30 57.4; E28 40 35.4  
S30 30 57.1; E28 40 35.1  
S30 30 58.1; E28 40 34.8

should be fenced permanently in the following manner:

- Preferred fencing materials are metal corner and straining posts and fencing wire, to a minimum height of 1.2 metres.
- The fence must have an access gate.
- No construction may occur within a minimum distance of 10-15 metres from the edge of the fence.
- The developer must obtain a permit from SAHRA to undertake fencing prior to the start of any construction activities. The permit application should include clear photographs of the grave location relative to the proposed development, as well as a letter from the next-of-kin endorsing the fencing.
- The developer must submit a report to SAHRA upon the completion of the fencing, including clear descriptions and photographs of the work undertaken.
- If these management measures are not attainable due to development constraints or due to dissatisfaction on the part of the next-of-kin, a SAHRA staff member or appropriately qualified heritage practitioner should be appointed to negotiate alternatives.

## **Recommended monitoring**

A SAHRA staff member or appropriately qualified heritage practitioner should be appointed to ensure that all mitigation measures are implemented appropriately.

## **Conclusion**

We recommend that the development proceed with the proposed heritage mitigation and have submitted this report to SAHRA in fulfilment of the requirements of the National Heritage Resources Act. Relevant staff members may be contacted at the SAHRA Cape Town head office (Mariagrazia Galimberti telephone 021 462 4502; MGALIMBERTI@sahra.org.za).

If permission is granted for development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and follow the protocol contained in Section 9 of this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

**Contents**

	Page
1. Introduction	6
2. Terms of reference	6
3. Project description	7
4. Receiving environment	7
4.1 Project location	7
4.2 Environmental description	8
5. Cultural context of the study area	9
6. Observations	9
6.1 Description and significance assessment	10
6.2 Assessment of impacts	11
7. Recommended mitigation measures	11
8. Recommended monitoring	12
9. Protocol for the identification, protection and recovery of heritage resources during construction and operation	13
10. Summary of findings in terms of the National Heritage Resources Act 1999 Section 38(3)	14
11. Conclusion	15
12. Bibliography	16
Appendix A Statutory requirements	17
Appendix B Archaeological and historical context of the study area	22
Appendix C Ongeluksnek Nature Reserve	27
Appendix D Methodology	31
Appendix E Photographs	36
Appendix F Specialist competency and Declaration of independence	39

**List of tables**

Table 1	Locations of borrow pits in Alfred Nzo Municipality, Eastern Cape Province.	7
Table 2	Typical heritage resources and mitigation measures associated with the project area.	7
Table 3	Heritage resources and observations: Alfred Nzo Municipality borrow pits, Eastern Cape Province.	9

## **1. Introduction**

eThembeni Cultural Heritage was appointed by Terratest (Pty) Ltd to undertake a heritage impact assessment of various borrow pits in the Eastern Cape Province, in terms of the National Environmental Management Act 107 of 1998 as amended, in compliance with Section 38 of the National Heritage Resources Act 25 of 1999 (refer to Appendix A).

South Africa's heritage resources are both rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based upon their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representivity of a particular time period; their rarity; and their sphere of influence.

The integrity and significance of heritage resources can be jeopardized by natural (e.g. erosion) and human (e.g. development) activities. In the case of human activities, a range of legislation exists to ensure the timeous identification and effective management of heritage resources for present and future generations.

This report represents compliance with a full Heritage Impact Assessment, excluding a specialist palaeontological study, for the proposed development.

## **2. Terms of reference**

A Heritage Impact Assessment must address the following key aspects:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

### 3. Project description

The Eastern Cape Department of Roads and Public Works wishes to assess and utilise and/or rehabilitate various existing borrow pits in the Alfred Nzo District Municipality in the vicinity of the towns of Matatiele, Mt Ayliff and Mt Fletcher.

### 4. Receiving environment

#### 4.1 Project location

The borrow pit locations are summarized in Table 1. Available maps are too large to reproduce in this report and SAHRA is referred to the digitized information submitted by the client.

**Table 1** Locations of borrow pits in Alfred Nzo Municipality, Eastern Cape Province.

Road No	BP No	Coordinates	
D611/D629	BP01A	S30° 26' 53.0" E29° 10' 43.5"	
	BP01B	S30° 26' 56.3" E29° 10' 47.3"	
	BP03	S30° 30' 10.6" E29° 10' 39.0"	
D660	BP01	S30° 23' 38.3" E29° 07' 27.6"	
	BP02	S30° 23' 26.4" E29° 07' 31.2"	
	BP03	S30° 18' 32.5" E29° 10' 30.9"	
D639	BP03	S30° 23' 37.4" E28° 52' 19.6"	
DR08015	BP01	S30° 53' 43.1" E28° 59' 00.5"	
	BP03	S30° 44' 31.9" E28° 51' 09.4"	
	BP04	S30° 43' 49.5" E28° 51' 12.0"	
	BP05	S30° 42' 34.3" E28° 51' 11.3"	
	BP06	S30° 42' 04.1" E28° 51' 47.1"	
	BP07	S30° 41' 00.4" E28° 51' 59.8"	
	BP08	S30° 40' 50.4" E28° 51' 41.6"	
	BP09	S30° 38' 36.0" E28° 51' 19.4"	
	BP10	S30° 31' 51.1" E30° 50' 18.8"	
	BP11	S30° 36' 59.0" E28° 48' 56.9"	
	BP13	S30° 34' 07.1" E28° 44' 27.6"	
	BP14	S30° 34' 07.1" E28° 44' 27.6"	
	BP15	S30° 33' 29.9" E28° 43' 37.1"	
	BP16	S30° 33' 08.3" E28° 42' 51.8"	
	BP17	S30° 32' 12.2" E28° 42' 23.4"	
	BP18	S30° 30' 58.7" E28° 40' 35.5"	
	DR08016	BP01	S30° 39' 41.1" E28° 53' 38.9"
		BP03A	S30° 39' 10.8" E28° 54' 23.2"
BP03B		S30° 39' 10.2" E28° 54' 26.7"	
BP04		S30° 36' 52.9" E28° 55' 22.3"	
BP05		S30° 35' 25.1" E28° 53' 45.2"	
BP06		S30° 34' 31.2" E28° 52' 27.8"	
DR08017	BP02	S30° 47' 58.4" E28° 58' 58.9"	
	BP03	S30° 42' 06.8" E29° 02' 23.7"	
	BP04	S30° 38' 56.1" E29° 02' 23.0"	
	BP05	S30° 38' 03.2" E29° 03' 10.4"	
	BP06	S30° 32' 40.8" E29° 04' 16.9"	
	BP07	S30° 32' 00.3" E29° 04' 02.4"	
	DR08077	BP01	S30° 23' 51.0" E28° 30' 55.9"
BP02		S30° 24' 50.1" E28° 35' 58.6"	
BP03		S30° 25' 10.2" E28° 35' 41.6"	
DR08079	BP01	S30° 40' 19.2" E28° 46' 08.8"	

DR08084	BP01	S30° 37' 10.6" E28° 33' 24.2"
	BP02	S30° 39' 19.5" E28° 37' 52.6"
DR08086	BP01A	S30 °49' 39.7" E28 °51' 22.9"
	BP01B	S30 °49' 39.5" E28 °51' 19.6"
	BP02	S30 °50' 19.4" E28 °46' 58.8"
DR08094	BP01	S30° 49' 46.4" E29° 07' 35.7"
	BP03	S30° 48' 08.4" E29° 05' 52.3"
	BP04	S30° 48' 01.7" E29° 05' 06.4"
DR08102	BP01	S30° 48' 10.5" E29° 22' 40.1"
	BP02	S30° 48' 14.8" E29° 23' 09.4"
DR08125	BP01	S30° 59' 23.5" E28° 59' 02.1"
	BP02	S31° 00' 04.8" E28° 59' 28.6"
DR08129	BP01	S30° 55' 18.6" E28° 59' 46.0"
	BP02	S30° 55' 26.3" E29° 00' 48.8"
	BP03	S30° 55' 43.1" E29° 01' 15.9"
	BP04	S31° 00' 16.0" E29° 00' 48.6"
DR08412	BP01	S30° 52' 15.3" E28° 51' 04.3"
DR08415	BP01	S30° 22' 18.3" E28° 30' 31.4"
	BP02	S30° 21' 14.8" E28° 24' 54.3"
DR08646	BP01	S30° 18' 19.1" E28° 38' 23.2"
	BP02	S30° 17' 46.6" E28° 36' 01.7"
	BP03	S30° 19' 37.6" E28° 22' 15.5"
P604	BP01	S30° 20' 09.5" E28° 53' 11.9"
	BP03	S30° 18' 26.9" E28° 57' 43.5"
	BP04	S30° 16' 36.2" E29° 00' 21.0"
	BP05	S30° 16' 23.7" E29° 00' 06.2"
	BP06	S30° 15' 56.7" E29° 00' 30.7"
	BP07	S30° 15' 13.2" E29° 00' 52.4"
	BP08	S30° 15' 16.8" E29° 01' 03.7"

#### 4.2 Environmental description

Most of the areas in which the borrow pits occur comprise communally owned land with human settlement in small villages surrounded by extensive rangelands. Services are basic and roads are generally poorly maintained gravel surfaces. Around the towns of Matatiele and Cedarville land use comprises extensive commercial agriculture.

## 5. Cultural context of the study area

Appendix B summarises the archaeological and historical context of the study area and readers are referred to the bibliography section for primary sources. Heritage resources in such areas of the Eastern Cape that could require the modification and/or relocation of a proposed development project and/or significant mitigation procedures are listed in the following table. The client is advised that subsurface remains of heritage resources might be uncovered during the construction phase of the proposed project, and is referred to the protocol contained in Section 9 below.

**Table 2 Typical heritage resources and mitigation measures associated with the project area.**

Heritage resource	Typical mitigation measures
Open air scatters of Stone Age stone artefacts and Iron Age archaeological sites with ceramic sherds, probably with low heritage significance, could occur in areas with minimal environmental disturbance.	Test excavations to determine site extent and significance. If necessary, full systematic archaeological excavations requiring permit from heritage authority and significant financial expenditure.
Ancestral graves, typically located within homestead precincts. Often associated with abandoned homesteads; may be difficult to identify if unmarked.	All human remains have high heritage significance and conservation in situ is always preferred. Exhumation and reburial require procedures described in Appendix A and are costly and time-consuming.

## 6. Observations

Various borrow pits are being utilised at present. The following table summarises the heritage resources assessed, and our observations.

**Table 3 Heritage resources and observations: Alfred Nzo Municipality borrow pits, Eastern Cape Province.**

Heritage resource type	Observation
Living heritage	Much of the project area is one of living heritage, but no specific places associated with living heritage were identified.
Ecofacts	None were identified within the proposed development area.
Places, buildings, structures and equipment	None were identified within the proposed development area.
Places to which oral traditions are attached or which are associated with living heritage	The entire proposed area is one of living heritage, but no specific places associated with living heritage were identified.
Historical settlements and townscapes	None were identified within the proposed development area.
Landscapes and natural features	See below.
Geological sites of scientific or cultural importance	None were identified within the proposed development area.
Archaeological sites	None were identified within the proposed development area.
Graves and burial grounds	See below.
Movable objects excluding any object made by a living person	None were identified within the proposed development area.
Public monuments and memorials	None were identified within the proposed development area.
Battlefields	None were identified within the proposed development area.
Traditional building techniques	None were identified within the proposed development area.



## 6.1 Description and significance assessment

### – Landscapes and natural features

Borrow pit DR8646/BP03 is located within a few hundred metres of the formally proclaimed and protected landscape of Ongeluksnek Nature Reserve. It is clearly visible from the reserve entrance and from certain accommodation facilities. The degree of government investment in this protected area and the nature of such investment (see Appendix C) suggests that Ongeluksnek Nature Reserve has high heritage significance at local, regional and provincial levels for its aesthetic, scientific and social (including economic) values.

### – Graves and burial grounds

Ancestral graves occur immediately adjacent to the following borrow pits:

DR8015/BP05 A group of more than 16 stone-packed graves and one grave with a granite headstone is located within 30 metres of the existing southern borrow pit face, at S30 42 36.0; E28 51 08.5. An occupied homestead is nearby but the graves are not enclosed within the homestead precinct. No-one was home at the time of our visit therefore the family names and ages of most of the burials are unknown. The headstone is inscribed:

**MGWATYU**  
**In loving memory of**  
**Our father and grandfather**  
**MZOMKHULU**  
**SKEYI**  
**\*26-01-1926**  
**†21-01-2000**  
**PHUMLA NGOXOLO**  
**TSHEZI**

DR8015/BP06 Various family graves are located within a fenced homestead precinct within 5 metres of the existing southern/south-western borrow pit face.

DR8015/BP18 At least three stone-packed graves are located across the road from and directly opposite the borrow pit, within the coordinates given in Section 7 below. The closest grave is situated 7 metres from the road edge. No homesteads are located nearby.

All human remains have high heritage significance at all levels for their spiritual, social and cultural values.

## **6.2 Assessment of impacts**

### **– Landscapes and natural features**

The impact of the exploitation of DR8646/BP03 on the protected landscape of Ongeluksnek Nature Reserve would be:

- Of a negative nature (the visual intrusion of a quarry in an otherwise tranquil, rural landscape, with concomitant dust, noise and increased traffic in the form of heavy plant and trucks);
- Local in extent (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
- Of low duration (presumably exploitation for current road upgrades may be expected to cease after four years); and
- Of medium intensity, measurably reducing its significance and economic value (associated with tourism) in the short to medium term such that considerable marketing efforts will be required to re-establish its desirability as a tourist destination.

These impacts can therefore be considered of medium consequence and high probability, with MEDIUM significance overall.

### **– Graves and burial grounds**

None of the graves near DR8015/BP05 and DR8015/BP06 will be affected directly by borrow pit extensions or rehabilitation. Accordingly, the impact on these graves is LOW.

However, it is very likely that the graves near DR8015/BP018 will be altered or destroyed inadvertently by construction activities, since they are not easily noticeable and no next-of-kin reside nearby. Accordingly, the impact on these graves could be HIGH.

## **7. Recommended mitigation measures**

The purpose of mitigation measures is to reduce impacts on heritage resources to such an extent that their significance is retained at acceptable levels to the communities' concerned. All mitigation measures are for the cost of the developer in terms of extant heritage legislation.

### **– Landscapes and natural features**

Borrow pit DR8646/BP03 should be decommissioned permanently and rehabilitated as soon as possible according to approved environmental standards.

– **Graves and burial grounds**

DR8015/BP05	The existing borrow pit face may extend no further southwards in the direction of the homestead and graves.
DR8015/BP06	The existing borrow pit face adjacent to the homestead may not be extended further and must be stabilized urgently to prevent further erosion and undermining of the graves located within the homestead precinct.
DR8015/BP18	The area between the coordinates S30 30 58.3; E28 40 35.3 S30 30 57.4; E28 40 35.4 S30 30 57.1; E28 40 35.1 S30 30 58.1; E28 40 34.8 should be fenced permanently in the following manner:

- Preferred fencing materials are metal corner and straining posts and fencing wire, to a minimum height of 1.2 metres.
- The fence must have an access gate.
- No construction may occur within a minimum distance of 10-15 metres from the edge of the fence.
- The developer must obtain a permit from SAHRA to undertake fencing prior to the start of any construction activities. The permit application should include clear photographs of the grave location relative to the proposed development, as well as a letter from the next-of-kin endorsing the fencing.
- The developer must submit a report to SAHRA upon the completion of the fencing, including clear descriptions and photographs of the work undertaken.
- If these management measures are not attainable due to development constraints or due to dissatisfaction on the part of the next-of-kin, a SAHRA staff member or appropriately qualified heritage practitioner should be appointed to negotiate alternatives.

**8. Recommended monitoring**

A SAHRA staff member or appropriately qualified heritage practitioner should be appointed to ensure that all mitigation measures are implemented appropriately.

## **9. Protocol for the identification, protection and recovery of heritage resources during construction and operation**

It is possible that sub-surface heritage resources will be encountered during the construction phase of this project. The Project Engineer, Environmental Control Officer and all other persons responsible for site management and excavation should be aware that indicators of sub-surface sites could include:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments, including potsherds;
- Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial); and
- Fossilised remains of fauna and flora, including trees.

In the event that such indicator(s) of heritage resources are identified, the following actions should be taken immediately:

- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone or stone.
- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible.
- If no heritage practitioner has been appointed to monitor the project, Dr Mariagrazia Galimberti at SAHRA's Cape Town head office should be contacted (telephone 021 462 4502).
- The South African Police Services should be notified by a SAHRA staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.

**10. Summary of findings in terms of the National Heritage Resources Act 1999  
Section 38(3)**

- The identification and mapping of all heritage resources in the area affected  
See Section 6.1.
- An assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations  
See Section 6.1.
- An assessment of the impact of development on such heritage resources  
See Section 6.2.
- An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development  
The proposed development cannot be considered sustainable unless the mitigation measures proposed in Section 7 are implemented.
- The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources  
The client has undertaken such consultation in terms of statutory requirements and retains the relevant documentation.
- If heritage resources will be adversely affected by the proposed development, the consideration of alternatives  
See Section 7.
- Plans for mitigation of any adverse effects during and after completion of the proposed development  
See Section 8.

## **11. Conclusion**

We recommend that the development proceed with the proposed heritage mitigation and have submitted this report to SAHRA in fulfilment of the requirements of the National Heritage Resources Act. According to Section 38(4) of the Act the report shall be considered timeously by the Council which shall, after consultation with the person proposing the development, decide –

- whether or not the development may proceed;
- any limitations or conditions are to be applied to the development;
- what general protections in terms of this Act apply, and what formal protections may be applied to such heritage resources;
- whether compensatory action shall be required in respect of any heritage resources damaged or destroyed as a result of the development; and
- whether the appointment of specialists is required as a condition of approval of the proposal.

Relevant staff members may be contacted at the SAHRA Cape Town head office (Mariagrazia Galimberti telephone 021 462 4502; MGALIMBERTI@sahra.org.za).

If permission is granted for development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and follow the protocol contained in Section 9 of this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

## 12. Bibliography

### Appendix B

- Prins, F. E. 1994-95. Climate, vegetation and early agriculturist communities in Transkei and KwaZulu-Natal. *Azania* **29-30**: 179-186.
- Prins, F. E. and Granger, J. E. 1993. Early farming communities in northern Transkei: the evidence from Ntsitsana and adjacent areas. *Southern African Humanities* **5**: 153-174.
- Whitelaw, G. 1991. Precolonial iron production around Durban and in southern Natal. *Natal Museum Journal of Humanities* **3**: 29-39.
- Whitelaw, G. 1997. What Da Gama missed on his way to Sofala. *Natalia* **27**: 30-41.
- Whitelaw, G. 2009. An Iron Age fishing tale. *Southern African Humanities* **21**: 195-212.

### Appendix C (Methodology)

- Aldenderfer, M.S. and Hale-Pierce, C.A. 1984. *The Small-Scale Archaeological Survey Revisited*. *American Archaeology* 4(1): 4-5.
- Butler, W. 1984. *Cultural Resource Management: The No-Collection Strategy in Archaeology*. *American Antiquity* 44(4): 795-799.
- Deacon, J. 1996. *Archaeology for Planners, Developers and Local Authorities*. National Monuments Council. Publication No. PO21E.
- Deacon, J. 1997. *Report: Workshop on Standards for the Assessment of Significance and Research Priorities for Contract Archaeology*. In: Newsletter No. 49, September 1998. South African Association of Archaeology.
- Dunnell, R.C. and Dancey, W.S. 1983. *The Siteless Survey: A Regional Scale Data Collection Strategy*. In: *Advances in Archaeological Method and Theory* 6: 267-287. M.B. Schiffer, ed. Academic Press, New York.
- King, T.F. 1978. *The Archaeological Survey: Its Methods and Uses*. Interagency Archaeological Services, Department of the Interior, Washington, D.C.
- Lightfoot, K.G. 1989. *A Defense of Shovel Test Sampling: A Reply to Short*. *American Antiquity* 54(2): 413-416.
- McManamon, F.P. 1984. *Discovering Sites Unseen*. In *Advances in Archaeological Method and Theory* 8: 223-292, M.B. Schiffer, ed. Academic Press, New York.
- Schiffer, M. B., Sullivan A.P. and Klinger T.C. 1978. *The Design of Archaeological Surveys*. *World Archaeology* 10: 1-28.
- Zubrow, E.B.A. 1984. *Small-Scale Surveys: A Problem for Quality Control*. *American Archeology* 4(1): 16-27.

## APPENDIX A

### STATUTORY REQUIREMENTS

#### GENERAL

The identification, evaluation and management of heritage resources in South Africa is required and governed by the following legislation:

- National Environmental Management Act (NEMA) 107 of 1998
  - a. Basic Environmental Assessment – Section (23)(2)(d)
  - b. Environmental Scoping Report – Section (29)(1)(d)
  - c. Environmental Impacts Assessment – Section (32)(2)(d)
  - d. Environmental Management Plan – Section (34)(b)
- KwaZulu-Natal Heritage Act 4 of 2008
  - a. Protection of heritage resources – Chapters 8 and 9
  - b. Heritage Resources Management – Chapter 10
- National Heritage Resources Act (NHRA) Act 25 of 1999
  - a. Definition and management of the national estate – Chapter I
  - b. Protection and management of heritage resources – Chapter II
  - c. Heritage Resources Management – Section 38
- Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
  - a. Section 39(3)
- Development Facilitation Act (DFA) Act 67 of 1995.
  - a. The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995 Section 31.

#### KWAZULU-NATAL HERITAGE ACT 4 OF 2008

This Act is implemented by Amafa aKwaZulu-Natali / Heritage KwaZulu-Natal, a statutory organization charged to provide for the conservation, protection and administration of both the physical and the living or intangible heritage resources of the province; along with a statutory Council to administer heritage conservation in the Province.

#### NATIONAL HERITAGE RESOURCES ACT 25 OF 1999

##### Heritage Impact Assessments

Section 38(1) of the National Heritage Resources Act of 1999 requires a heritage impact assessment in case of:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;
- any development or other activity which will change the character of a site—
  - (i) exceeding 5 000m<sup>2</sup> in extent; or
  - (ii) involving three or more existing erven or subdivisions thereof; or
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or



- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- the re-zoning of a site exceeding 10 000m<sup>2</sup> in extent; or
- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Reports in fulfilment of Section 38(3) of the Act must include the following information:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on such heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

### **Definitions of heritage resources**

The Act defines a heritage resource as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes, but is not limited to, the following wide range of places and objects:

- living heritage as defined in the National Heritage Council Act No 11 of 1999 (cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships);
- ecofacts (non-artefactual organic or environmental remains that may reveal aspects of past human activity; definition used in KwaZulu-Natal Heritage Act 2008);
- places, buildings, structures and equipment;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds;
- public monuments and memorials;
- sites of significance relating to the history of slavery in South Africa;
- movable objects, but excluding any object made by a living person;
- battlefields; and
- traditional building techniques.

Furthermore, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—

- its importance in the community, or pattern of South Africa’s history;
- its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.

**‘Archaeological’** means –

- material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

**‘Palaeontological’** means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

A **‘place’** is defined as:

- a site, area or region;
- a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures;
- an open space, including a public square, street or park; and
- in relation to the management of a place, includes the immediate surroundings of a place.

**'Public monuments and memorials'** means all monuments and memorials—

- erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government; or
- which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual;

**'Structures'** means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

## **MANAGEMENT OF GRAVES AND BURIAL GROUNDS**

- **Graves younger than 60 years** are protected in terms of Section 2(1) of the Removal of Graves and Dead Bodies Ordinance 7 of 1925 as well as the Human Tissues Act 65 of 1983. Such graves are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial Member of the Executive Council for Local Government and Planning, or in some cases the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains the institution conducting the relocation should be authorised under Section 24 of the Human Tissues Act 65 of 1983.

- **Graves older than 60 years situated outside a formal cemetery administered by a local authority** are protected in terms of Section 36 of the National Heritage Resources Act 25 of 1999 as well as the Human Tissues Act of 1983. Accordingly, such graves are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of NHRA) is applicable to graves older than 60 years that are situated outside a formal cemetery administered by a local authority. Graves in the category located inside a formal cemetery administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

The **protocol for the management of graves older than 60 years situated outside a formal cemetery administered by a local authority** is detailed in Section 36 of the NHRA:

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

**APPENDIX B****ARCHAEOLOGICAL AND HISTORICAL CONTEXT OF THE STUDY AREA****The Stone Age<sup>1</sup>**

No systematic Early and Middle Stone Age research has been undertaken in the proposed development area, hence the general nature of this section. Open air scatters of stone artefacts, probably with low heritage significance, could be expected in areas with minimal environmental disturbance.

South Africa's prehistory has been divided into a series of phases based on broad patterns of technology. The primary distinction is between a reliance on chipped and flaked stone implements (the Stone Age) and the ability to work iron (the Iron Age). Spanning a large proportion of human history, the Stone Age in Southern Africa is further divided into the Early Stone Age, or Paleolithic Period (about 2 500 000–150 000 years ago), the Middle Stone Age, or Mesolithic Period (about 150 000–30 000 years ago), and the Late Stone Age, or Neolithic Period (about 30 000–2 000 years ago). The simple stone tools found with australopithecine fossil bones fall into the earliest part of the Early Stone Age.

- The Early Stone Age

Most Early Stone Age sites in South Africa can probably be connected with the hominin species known as *Homo erectus*. Simply modified stones, hand axes, scraping tools, and other bifacial artifacts had a wide variety of purposes, including butchering animal carcasses, scraping hides, and digging for plant foods. Most South African archaeological sites from this period are the remains of open camps, often by the sides of rivers and lakes, although some are rock shelters, such as Montagu Cave in the Cape region.

- The Middle Stone Age

The long episode of cultural and physical evolution gave way to a period of more rapid change about 200 000 years ago. Hand axes and large bifacial stone tools were replaced by stone flakes and blades that were fashioned into scrapers, spear points, and parts for hafted, composite implements. This technological stage, now known as the Middle Stone Age, is represented by numerous sites in South Africa.

Open camps and rock overhangs were used for shelter. Day-to-day debris has survived to provide some evidence of early ways of life, although plant foods have rarely been preserved. Middle Stone Age bands hunted medium-sized and large prey, including antelope and zebra, although they tended to avoid the largest and most dangerous animals, such as the elephant and the rhinoceros. They also ate seabirds and marine mammals that could be found along the shore and sometimes collected tortoises and ostrich eggs in large quantities.

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<sup>1</sup> <http://www.britannica.com>; article authored by Colin J. Bundy, Julian R. D. Cobbing, Martin Hall and Leonard Monteath Thompson

- The Late Stone Age

Basic toolmaking techniques began to undergo additional change about 40 000 years ago. Small finely worked stone implements known as microliths became more common, while the heavier scrapers and points of the Middle Stone Age appeared less frequently. Archaeologists refer to this technological stage as the Late Stone Age. The numerous collections of stone tools from South African archaeological sites show a great degree of variation through time and across the subcontinent.

The remains of plant foods have been well preserved at such sites as Melkhoutboom Cave, De Hangen, and Diepkloof in the Cape region. Animals were trapped and hunted with spears and arrows on which were mounted well-crafted stone blades. Bands moved with the seasons as they followed game into higher lands in the spring and early summer months, when plant foods could also be found. When available, rock overhangs became shelters; otherwise, windbreaks were built. Shellfish, crayfish, seals, and seabirds were also important sources of food, as were fish caught on lines, with spears, in traps, and possibly with nets.

Dating from this period are numerous engravings on rock surfaces, mostly on the interior plateau, and paintings on the walls of rock shelters in the mountainous regions, such as the Drakensberg and Cederberg ranges. The images were made over a period of at least 25 000 years. Although scholars originally saw the South African rock art as the work of exotic foreigners such as Minoans or Phoenicians or as the product of primitive minds, they now believe that the paintings were closely associated with the work of medicine men, shamans who were involved in the well-being of the band and often worked in a state of trance. Specific representations include depictions of trance dances, metaphors for trance such as death and flight, rainmaking, and control of the movement of antelope herds.

### **Iron Age<sup>2</sup>**

Archaeological evidence shows that Bantu-speaking agriculturists first settled in southern Africa around AD 300. Bantu-speakers originated in the vicinity of modern Cameroon from where they began to move eastwards and southwards, some time after 400 BC, skirting around the equatorial forest. An extremely rapid spread throughout much of sub-equatorial Africa followed: dating shows that the earliest communities in Tanzania and South Africa are separated in time by only 200 years, despite the 3 000 km distance between the two regions. It seems likely that the speed of the spread was a consequence of agriculturists deliberately seeking iron ore sources and particular combinations of soil and climate suitable for the cultivation of their crops.

The earliest agricultural sites in KwaZulu-Natal date to between AD 400 and 550. All are situated close to sources of iron ore, and within 15 km of the coast. Current evidence suggests it may have been too dry further inland at this time for successful cultivation. From 650 onwards, however, climatic conditions improved and agriculturists expanded into the valleys of KwaZulu-Natal, where they settled close to rivers in savanna or bushveld environments. There is a considerable body of information available about these early agriculturists.

Seed remains show that they cultivated finger millet, bulrush millet, sorghum and probably the African melon. It seems likely that they also planted African groundnuts and cowpeas, though

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<sup>2</sup> Whitelaw (1997). See also Prins and Granger (1993), Whitelaw (1991, 2009).

direct evidence for these plants is lacking from the earlier periods. Faunal remains indicate that they kept sheep, cattle, goats, chickens and dogs, with cattle and sheep providing most of the meat. Men hunted, perhaps with dogs, but hunted animals made only a limited contribution to the diet in the region.

Metal production was a key activity since it provided the tools of cultivation and hunting. The evidence indicates that people who worked metal lived in almost every village, even those that were considerable distances from ore sources.

Large-scale excavations in recent years have provided data indicating that first-millennium agriculturist society was patrilineal and that men used cattle as bridewealth in exchange for wives. On a political level, society was organised into chiefdoms that, in our region, may have had up to three hierarchical levels. The villages of chiefs tended to be larger than others, with several livestock enclosures, and some were occupied continuously for lengthy periods. Social forces of the time resulted in the concentration of unusual items on these sites. These include artefacts that originated from great distances, ivory items (which as early as AD 700 appear to have been a symbol of chieftainship), and initiation paraphernalia.

This particular way of life came to an end around AD 1000, for reasons that we do not yet fully understand. There was a radical change in the decorative style of agriculturist ceramics at this time, while the preferred village locations of the last four centuries were abandoned in favour of sites along the coastal littoral. In general, sites dating to between 1050 and 1250 are smaller than most earlier agriculturist settlements. It is tempting to see in this change the origin of the Nguni settlement pattern. Indeed, some archaeologists have suggested that the changes were a result of the movement into the region of people who were directly ancestral to the Nguni-speakers of today. Others prefer to see the change as the product of social and cultural restructuring within resident agriculturist communities.

Whatever the case, it seems likely that this new pattern of settlement was in some way influenced by a changing climate, for there is evidence of increasing aridity from about AD 900. A new pattern of economic inter-dependence evolved that is substantially different from that of earlier centuries, and is one that continued into the colonial period nearly 500 years later.

### **Colonial rule<sup>3</sup>**

By the closing decades of the 18th century, South Africa had fallen into two broad regions: west and east. Colonial settlement dominated the west, including the winter rainfall region around the Cape of Good Hope, the coastal hinterland northward toward the present-day border with Namibia, and the dry lands of the interior. Trekboers took increasingly more land from the Khoekhoe and from remnant hunter-gatherer communities, who were killed, were forced into marginal areas, or became labourers tied to the farms of their new overlords. Indigenous farmers controlled both the coastal and valley lowlands and the Highveld of the interior in the east, where summer rainfall and good grazing made mixed farming economies possible.

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<sup>3</sup> <http://www.britannica.com>; article authored by Colin J. Bundy, Julian R. D. Cobbing, Martin Hall and Leonard Monteath Thompson

A large group of British settlers arrived in the eastern Cape in 1820; this, together with a high European birth rate and wasteful land usage, produced an acute land shortage, which was alleviated only when the British acquired more land through massive military intervention against Africans on the eastern frontier. Until the 1840s the British vision of the colony did not include African citizens (referred to pejoratively by the British as "Kaffirs"), so, as Africans lost their land, they were expelled across the Great Fish River, the unilaterally proclaimed eastern border of the colony.

The first step in this process included attacks in 1811–12 by the British army on the Xhosa groups, the Gqunukhwebe and Ndlambe. An attack by the Rharhabe-Xhosa on Graham's Town in 1819 provided the pretext for the annexation of more African territory, to the Keiskamma River. Various Rharhabe-Xhosa groups were driven from their lands throughout the early 1830s. They counterattacked in December 1834, and Governor Benjamin D'Urban ordered a major invasion the following year, during which thousands of Rharhabe-Xhosa died. The British crossed the Great Kei River and ravaged territory of the Gcaleka-Xhosa as well; the Gcaleka chief, Hintsa, invited to hold discussions with British military officials, was held hostage and died trying to escape. The British colonial secretary, Lord Glenelg, who disapproved of D'Urban's policy, halted the seizure of all African land east of the Great Kei. D'Urban's initial attempt to rule conquered Africans with European magistrates and soldiers was overturned by Glenelg; instead, for a time, Africans east of the Keiskamma retained their autonomy and dealt with the colony through diplomatic agents.

However, after further fighting with the Rharhabe-Xhosa on the eastern frontier in 1846, Governor Colonel Harry Smith finally annexed, over the next two years, not only the region between the Great Fish and the Great Kei rivers (establishing British Kaffraria) but also a large area between the Orange and Vaal rivers, thus establishing the Orange River Sovereignty. These moves provoked further warfare in 1851–53 with the Xhosa (joined once more by many Khoes), with a few British politicians ineffectively trying to influence events.

Between 1811 and 1858 colonial aggression deprived Africans of most of their land between the Sundays and Great Kei rivers and produced poverty and despair. From the mid-1850s British magistrates held political power in British Kaffraria, destroying the power of the Xhosa chiefs. Following a severe lung sickness epidemic among their cattle in 1854–56, the Xhosa killed many of their remaining cattle and in 1857–58 grew few crops in response to a millenarian prophecy that this would cause their ancestors to rise from the dead and destroy the whites. Many thousands of Xhosa starved to death, and large numbers of survivors were driven into the Cape Colony to work. British Kaffraria fused with the Cape Colony in 1865, and thousands of Africans newly defined as Fingo resettled east of the Great Kei, thereby creating Fingoland. The Transkei, as this region came to be known, consisted of the hilly country between the Cape and Natal. It became a large African reserve and grew in size when those parts that were still independent were annexed in the 1880s and '90s (Pondoland lost its independence in 1894).

Under apartheid blacks were treated like "tribal" people and were required to live on reserves under hereditary chiefs except when they worked temporarily in white towns or on white farms. The government began to consolidate the scattered reserves into 8 (eventually 10) distinct territories, designating each of them as the "homeland," or Bantustan, of a specific black ethnic community. The government manipulated homeland politics so that compliant chiefs controlled the administrations of most of those territories. Arguing that Bantustans



matched the decolonization process then taking place in tropical Africa, the government devolved powers onto those administrations and eventually encouraged them to become "independent." Between 1976 and 1981 four accepted independence—Transkei, Bophuthatswana, Venda, and Ciskei—though none was ever recognized by a foreign government. Like the other homelands, however, they were economic backwaters, dependent on subsidies from Pretoria.

Conditions in the homelands continued to deteriorate, partly because they had to accommodate vast numbers of people with minimal resources. Many people found their way to the towns; but the government, attempting to reverse this flood, strengthened the pass laws by making it illegal for blacks to be in a town for more than 72 hours at a time without a job in a white home or business. A particularly brutal series of forced removals were conducted from the 1960s to the early '80s, in which more than 3.5 million blacks were taken from towns and white rural areas (including lands they had occupied for generations) and dumped into the reserves, sometimes in the middle of winter and without any facilities.

**APPENDIX D****ONGELUKSNEK NATURE RESERVE, EASTERN CAPE PROVINCE****ONGELUKSNEK NATURE RESERVE  
GENERAL TOURISM PRODUCT INFORMATION<sup>4</sup>  
www.ongeluksnek.com**

The 13 000 ha reserve is located in the steep mountain grassland of the southern Drakensberg, on the Lesotho border. It was proclaimed as a protected area in 1976, and forms an important part of the upper catchment of the Kinira River, which feeds the greater Umzimvubu basin. The reserve is drained by the perennial Lebelles and Jordan Rivers. Rainfall is in the region of 750mm per annum, and the area has verdant green summers and snowy winters.

**TOPOGRAPHY & CLIMATE**

The area lies in rugged mountainous terrain, dropping-off steeply from the Maluti/Drakensberg Escarpment. It is mainly underlain by basaltic lavas of the Drakensberg Group of the Karoo Super group. In the eastern lowlands around 1600m, fingers of fine grained sandstones of the Clarens Formation are exposed, along with Quaternary alluvium, Molteno sandstones and mudstones, with Elliot mudstones extending westwards in to the basalt. (Lechmere-Oertel, 2006).

The steep gradients and shallow soils of the Drakensberg result in almost half of the rainfall leaving the area as run-off (MDTP, 2008). If the soils are bound by intact indigenous vegetation, the surface flow is rapidly absorbed, and controlled gradual water yield will be released throughout the year. Under these ideal conditions, high quality sediment-free water will reach streams. This situation is demonstrated by the presence of alpine wetlands in the upper reaches of the reserve, and the high water quality captured in the Lebelles stream weir which supplies the Thaba Chicha bulk regional water supply to villages adjacent to the reserve. Average minimum temperatures in summer range between 6 and 12°C. Daytime summer temperatures range between 20 and 28°C. Winters are cold with night temperatures frequently dropping below 0°C and a high frequency of frost nights, with occasional snow and ice creating a challenging climatic environment. Maximum winter temperature rarely goes above 18°C. Annual rainfall is in the region of 750mm, occurring mainly in the summer months, with February rainfall levels reaching 125 mm. Some parts of the escarpment have recorded 1800mm per annum (MDTP, 2006), resulting in extreme run-off events. This indicates high run-off capacity during concentrated periods, resulting in increased erosion and topsoil loss where groundcover is insufficient. Precipitation also occurs in the form of mist and snow.

**VEGETATION & FAUNA**

The topography reflects the area's position on the escarpment with Lesotho, and is mainly covered by grassland defined in Camp's newer veld classification as *Drakensberg foothills moist sourveld*. The Nature Reserve is mainly composed of impressive rolling valleys and spurs running up to the escarpment. The road corridor climbs from East Griqualand grassland (vegetation type Gs12) dominated by tropical and temperate bunch grasses such as *Themeda*, which have been degraded through livestock pressure to become dominated by wire grasses and scattered Karroid shrubs (MDTP, 2008). At higher altitudes, the grasslands shift to become more alpine in nature, underlain by basalts with less grass cover and greater percentage of shrubby fynbos and karroid species, which have been allowed to increase through decreased grass competition from overgrazing. This has reduced soil cover and allowed an increase in erodibility, resulting in increased run-off and erosivity of rainfall.

A good representation of grassland flowering species occurs in the area, and was documented by studies undertaken by the Maloti Drakensberg Transfrontier project (MDTP) in the early 2000s. Biodiversity is however threatened by the annual veld fires which sweep through the area, despite attempts by the Reserve to establish fire breaks and control wildfires.

<sup>4</sup> <http://www.dedea.gov.za/Media%20Releases/Ongeluksnek%20Nature%20Reserve%20Fast%20Facts.pdf>

The Reserve has a range of raptors and large birds, including the Bearded and Cape Vulture. There is no available bird list for the reserve, but the area provides a habitat for a combination of grassland and alpine species, including Orange throated longclaw, pipits, larks, chats, etc. These seed and insect eaters assist with pollination.

The Reserve has never been stocked with wildlife, but has provided a fairly safe habitat for existing species in the upper catchment, although poaching has been problematic. There is a limited representation of wildlife, however some successful breeding populations include Mountain Reedbuck, Grey Rhebok, duiker, hyrax/dassie, jackals, caracal / rooikat, water and grey mongoose, hares, porcupines, aardvark and baboons have left evidence of their activities. Some good birding opportunities exist – see activities section below.

#### **ACCESS**

3 hours from Durban via N2 and R56 to Matatiele. The R56 leading west from Matatiele towards ONR is 12km tar (R56) plus 38km of challenging gravel (DR08646, with signboard to reserve), with fantastic views of the southern berg. Approx 1 hr (Matatiele is the closest town). Road from the Eastern Cape (western) side is via Maclear and Mt Fletcher along the R56, with no signboard for reserve at the gravel road turn-off marked "Farview/Xaxazana". Approx 1hr along gravel to reserve through scenic villages. Approx 5-6 hours from East London. Very scenic drive.

The reserve is bisected by the DR08646, a public gravel road, which leads up the impressive Ongeluksnek Pass between SA and Lesotho. An SA border post is located at the base of the pass (08h00 to 16h00).

The pass has a 1000m rise (equivalent to Table Mountain), and was first driven in an old Land Rover by Matatiele resident Lionel Whittle, via the stock trails in the early 1950s. A simple hand built road was developed as a trading route between Matatiele and Mt Moorosi in the late 1960s by a local trader. The old trading store ruins can still be seen alongside the road half way up the pass on the western side. The road was properly shaped and built in 1991 by the then Transkei Roads Department, and was under renovation in February 2009. The route leads through to Mphaki in southern Lesotho, via the spectacular Lake Letsie wetland area, which is a declared RAMSAR site.

#### **ACCOMMODATION:**

##### **GATEWAY LODGE**

The sandstone lodge is an old renovated farmhouse, built in the early 1900s, located at the entrance to the reserve. It has 3 rooms, with two doubles, 6 singles, 2 sleeper couches, and can sleep a total of 12. It has solar lighting and plugs, plus gas fridge, stove and geyser. The kitchen is fitted for self-catering guests, and a cook can also be arranged.

The large covered porch with a great view of the mountains is an ideal spot to unwind.

Chopped firewood is supplied for the outside braai area, as well as the lounge's open fireplace.

Also has a conference/dining room for mini meetings of up to 20 people, which can be catered for.

Please note septic tank cannot take any foreign matter, so please respect this.

Gas appliances should be used with care, especially the stove.

Solar lighting and plugs – please follow directions on wall-mounted instructions in kitchen and lounge to prolong the life of the system.

Local village shops have basic supplies if required. Catering can be arranged.

##### **BUSHCAMP**

The **Tweespruit bushcamp** has 4 shady well grassed campsites located along the Jordan river. Has a covered open plan boma with potable running water, sink, tables, stone benches, overlooking campsite with great view of the mountains. Has gents and ladies ablutions with flush water and hot showers, with a bath for children. Hot water supplied by donkey boiler

The camp is a good base for hiking or mountain biking up into the catchment where high altitude wetlands are found, and for visiting the interesting and ancient volcanic basalt rock formations.

Has 4x4 or hiking, mountain bike or horseback access (from the main gateway lodge where vehicles can be safely left), with 4 vehicle sites next to the Jordan river, and a capacity of 24 (4 parties) people using own tents.

##### **ACTIVITIES**

From the lodge or bushcamp, visitors can explore the beautiful sandstone **Mariazell Mission**, built in 1904, either on a day walk or vehicle accessible, with its self-sufficient hydro electrical

system, high school (which Patrick Mosiua Lekota attended) and farm. Guided tours could be arranged via the reserve staff.

**Hiking** - lots, for beginners to experienced, guided or self-exploratory with a map. Great swimming pools in Jordan river, at waterfall near reserve HQ (short walk from lodge west along road towards pass), old grave sites, ruins, rock art, etc can be visited. Grassland has wonderful flowers in summer. Some indigenous forests in gorges north of HQ, and Lot's Wife pillar (basalt formation) accessed from bushcamp in the Jordan valley. Drive around to Tweespruit bushcamp site, leave a vehicle and hike along old track leading west towards picnic site at Charles Mills – old homestead ruins and fruit trees, graves sites, swimming upstream of site, etc.

**Horse riding** - horse can be hired, with a guide, from the local Mabenyeng Horse Association. Arrange via reserve manager. Visitors pay horse owners directly in cash.

**Rock paintings** - guided walks or on horse back.

**Mountain biking** - the surrounding villages have a myriad of footpaths which make for excellent single track riding. The reserve has good riding up the pass, with some loops and links for the adventurous and technically skilled rider, allowing exploration of the little known southern berg/Lesotho border area, such as Nene's pass.

**Mehloding Hiking Trail** - based from a community-operated chalet adjacent to the reserve just beyond the mission. Can do day walks or a 4 day uni-directional trail leading east. Also provide traditional and conventional catering by prior arrangement.

**4x4 trails** up Ongeluksnek pass or along northern bushcamp track along Jordan river to picnic sites. Can drive through border up into Lesotho to the spectacular Lake Letsie wetland area (24km from lodge).

**Birding** - The reserve and Matatiele access route along the valley have great birdwatching (Blue and Crowned cranes, Southern ground hornbills, Denham's bustard, Cape vulture, Lammergeier, secretary birds - all of which are endangered) plus Lanner Falcons, Marsh Owls etc. Sighting of a European Roller as well - very rare here!

A trained THETA accredited local guide can also be arranged (via reserve manager), who is very knowledgeable of the area, has a driver's license, and is a birding enthusiast. R100 for half day, R200 for full day, payable directly to the guide.

Five trainee guides are also being supported to gain experience.

#### **LESOTHO / TRANSFRONTIER ACCESS**

The pass up into Lesotho has been upgraded (leads from lodge through reserve for 16km up to physical border), and is accessible by vehicles with clearance (4x4 pref but only necessary in wet weather).

Need a passport to go through SA border at base of pass. Lesotho border post still being renovated.

The road leads into Lesotho, through to Mphaki village (fuel, food, rustic lodging) or to Mt Moorosi (fuel, food, lodging, basic shops, historical sites, community chalets).

The A1, main road through Lesotho which passes through Mphaki and Mt Moorosi, is tarred, and leads on towards Maseru in a north westerly direction. The roads to these towns are very scenic, through rural landscape.

Could also make a circular route, via Qachas Nek pass to the east or Rhodes area to west. Check out the Maloti Route [www.malotiroute.co.za](http://www.malotiroute.co.za) on the web for more transfrontier travel planning info.

**Please notify the reserve manager, duty staff or gate keeper regarding any problems or queries.**

**Please feel welcome to provide any feedback or comments in the visitors book and attached comment sheets, so that we can improve our service and your experience.**

**We trust you will enjoy your stay.**

Reserve manager contact: Mr Harold Mdhluli 039 256 4888 / 082 345 3709

EC Parks Central Reservations: 043 701 9600 Friends of Ongeluksnek: Nicky McLeod 082 782 6067

## **DEDEA spends R2, 25M in Ongeluksnek Nature Reserve<sup>5</sup>**

**9/29/2010**

DEDEA Media Release

The Department of Economic Development and Environmental Affairs (DEDEA) has been spent about R2, 25 million to renovate the Ongeluksnek Nature Reserve at Matatiele in Alfred Nzo District Municipality (ADM).

The success of this nature reserve, which is a catalyst for economic development, poverty alleviation and employment creation in the region, has been realised through involvement of the community in the management of parks. The community has been instrumental in the functionality of the reserve through providing horses for guiding, fresh produce supply, and infrastructure and trail maintenance.

The MEC for Finance, Economic Development and Environmental Affairs Mr Mcebisi Jonas visited the Ongeluksnek community as part of the Eastern Cape Executive Council Outreach Programme in the ADM. Addressing the community, MEC Jonas commended the way the community has been proactive in preserving the nature reserve through working with the department.

"The project is very exciting as it brings new perspective whilst setting an encouraging precedence in the overall environmental management of the parks. In most instances the functionality of the nature reserve relies heavily on the external parties rather than the community itself. So we are encouraged by these new and positive developments. This work vindicates the view we have had that key to bringing solutions to the problems facing the parks and the surrounding communities is in the integration of communities in the activities of the nature reserves. Linked to this is the need of identifying other areas of involvement other than the all important economic development, these include areas like the existing culture of surrounding villages, the indigenous knowledge which will contribute in improving lives overall beneficitation by the communities", says Jonas.

Among the key deliverables of the project include the:

- Fencing of 4km to enclose the reserve entrance;
- Renovation of unused sandstone homestead ruins, to provide offices, ablutions, parking, water supply, gatehouse and a controlled entrance to the protected area via a stock grid;
- Renovation of a 3 bedroom self catering guest lodge, with solar lighting, gas supply for geyser and kitchen (fridge and stove), bedding, fully equipped kitchen, fireplace and veranda;
- Construction of a bushcamp in the Jordan valley with covered boma, water supply, comfortable ablutions, hot showers and shaded campsites;
- New reserve entrance gate above Motseng village, providing access to the northern portion of the reserve and controlled access to the bushcamp;
- Trail development, mapping and clearing of over 8km, with signage and markers;
- A website and marketing collateral for marketing;
- Training of over 100 workers and local people in basic Occupational Health and Safety, HIV awareness, , hospitality, hands-on construction skills, horse care, financial literacy, fire fighting, environmental awareness, guiding and tourism basics;
- Rehabilitation of 5km of access road and rebuilding of an extensive stream crossing / bridge to allow access to the bushcamp area for tourists and reserve management.

The Nature Reserve is managed by the Eastern Cape Parks and Tourism Agency – a DEDEA public entity mandated to manage all provincial protected areas and destination marketing with the objective of promoting and developing the tourism industry.

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<sup>5</sup> <http://www.dedea.gov.za/News/Pages/DEDEAspendsOngeluksnek.aspx>

## APPENDIX D

### METHODOLOGY

#### Site survey

eThembeni staff members inspected the area from 23 to 26 May 2011. We completed controlled-exclusive surface surveys, where 'sufficient information exists on an area to make solid and defensible assumptions and judgements about where [heritage resource] sites may and may not be' and 'an inspection of the surface of the ground, wherever this surface is visible, is made, with no substantial attempt to clear brush, turf, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident' (King 1978; see bibliography for other references informing methodological approach).

The site surveys comprised non-systematic or random walks around the existing borrow pits in an area extending approximately 100 metres from the points listed in Table 1. 67 of the 69 borrow pits were inspected; the exceptions were DR8015/BP10 and DR8017/BP02, which could not be accessed due to time constraints. Staff members examined these borrow pits using Google Earth imagery and are confident that the presence of heritage resources in their vicinity is very unlikely. Geographic coordinates were obtained using a handheld Garmin global positioning unit (WPG 84). Photographs were taken with a Nikon Coolpix camera and a representative selection is included in Appendix E.

#### Database and literature review

No databases were consulted due to the limited footprints of the proposed development areas, and the fact that physical examination of entire footprints was possible. A concise account of the pre and postcolonial history of the broader study area was compiled from sources including those listed in the bibliography and is included as Appendix B. Appendix C contains documents attesting to the significance of Ongeluksnek Nature Reserve.

#### Assessment of heritage resource value and significance

Heritage resources are significant only to the extent that they have public value, as implicitly demonstrated by the following guidelines for determining site significance developed by the South African Heritage Resources Agency and utilised during this assessment.

##### Type of Significance

1. Historical Value: It is important in the community, or pattern of history
  - Importance in the evolution of cultural landscapes and settlement patterns.
  - Importance in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, Province, region or locality.
  - Importance for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, Province, region or community.
  - Importance as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period
  - It has strong or special association with the life or work of a person, group or organisation of importance in history

- Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, Province, region or community.
  - Importance for a direct link to the history of slavery in South Africa.
2. Aesthetic Value: It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group
- Importance to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
  - Importance for its creative, design or artistic excellence, innovation or achievement.
  - Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
  - In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.
3. Scientific Value: It has potential to yield information that will contribute to an understanding of natural or cultural heritage
- Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
  - Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
  - Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
  - Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
  - It is important in demonstrating a high degree of creative or technical achievement at a particular period.
  - Importance for its technical innovation or achievement.
4. Social Value: It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
  - Importance in contributing to a community's sense of place.

#### Degrees of Significance

Rarity: It possesses uncommon, rare or endangered aspects of natural or cultural heritage

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

Representivity: It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects

- Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.

- Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, Province, region or locality.

Sphere of Significance: High, Medium, Low

- International; National; Provincial; Regional; Local

### Assessment of impacts

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource, by minimising natural site erosion or facilitating non-destructive public use, for example. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements that are out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect, as well as cumulative, as implied by the aforementioned examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process. The following assessment criteria have been used to assess the impacts of the proposed development on identified heritage resources:

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.
	Negative	
	Neutral	
Extent	Low	Site-specific, affects only the development footprint.
	Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	High	Regional (beyond a 10 km radius) to national.
Duration	Low	0-4 years (i.e. duration of construction phase).
	Medium	5-10 years.
	High	More than 10 years to permanent.
Intensity	Low	Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.
	Medium	Where the heritage resource is altered and its significance and value are measurably reduced.
	High	Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.
Potential for impact on irreplaceable resources	Low	No irreplaceable resources will be impacted.
	Medium	Resources that will be impacted can be replaced, with effort.
	High	There is no potential for replacing a particular vulnerable resource that will be impacted.



Consequence  (a combination of extent, duration, intensity and the potential for impact on irreplaceable resources).	Low	A combination of any of the following: - Intensity, duration, extent and impact on irreplaceable resources are all rated low. - Intensity is low and up to two of the other criteria are rated medium. - Intensity is medium and all three other criteria are rated low.
	Medium	Intensity is medium and at least two of the other criteria are rated medium.
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all of the other criteria being rated medium or higher.
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or less than 50 % likely that an impact will occur.
	Medium	It is between 50 and 70 % certain that the impact will occur.
	High	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance  (all impacts including potential cumulative impacts)	Low	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.
	Medium	Medium consequence and low probability. Medium consequence and medium probability. Medium consequence and high probability. High consequence and low probability.
	High	High consequence and medium probability. High consequence and high probability.

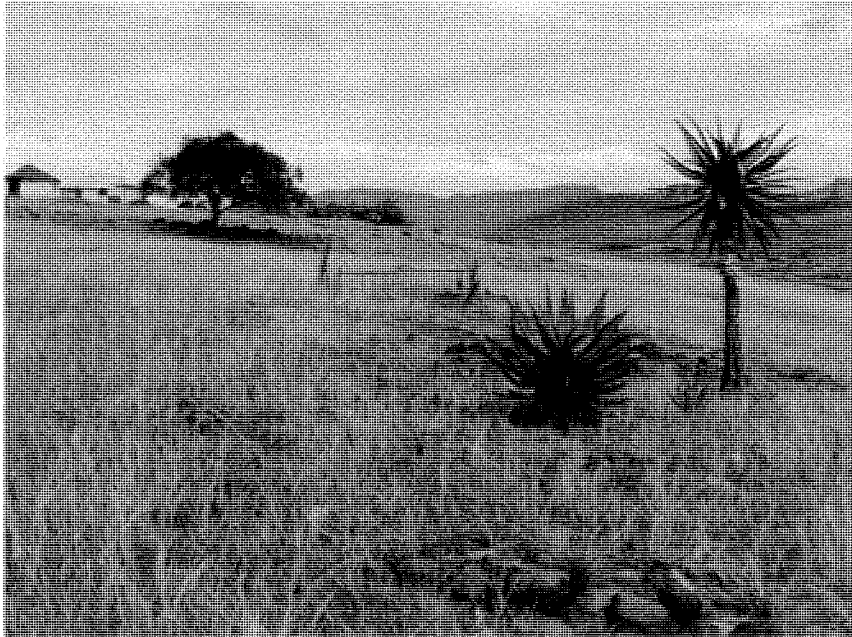
### Assumptions and limitations of this heritage impact assessment

- The description of the proposed project, provided by the client, is accurate.
- The public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the heritage impact assessment.
- Soil surface visibility was moderate to good. Heritage resources might be present below the surface or in areas of dense vegetation and we remind the client that the Act requires that a developer cease all work immediately and follow the protocol stipulated in Section 9 of this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource.
- eThembeni is not able to provide a specialist palaeontological assessment for this project and informed the client as much at the time of quotation.
- A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the context of development are as conservative as possible.
- Human sciences are necessarily both subjective and objective in nature. eThembeni staff members strive to manage heritage resources to the highest standards in accordance with national and international best practice, but recognise that their opinions might differ from those of other heritage practitioners.

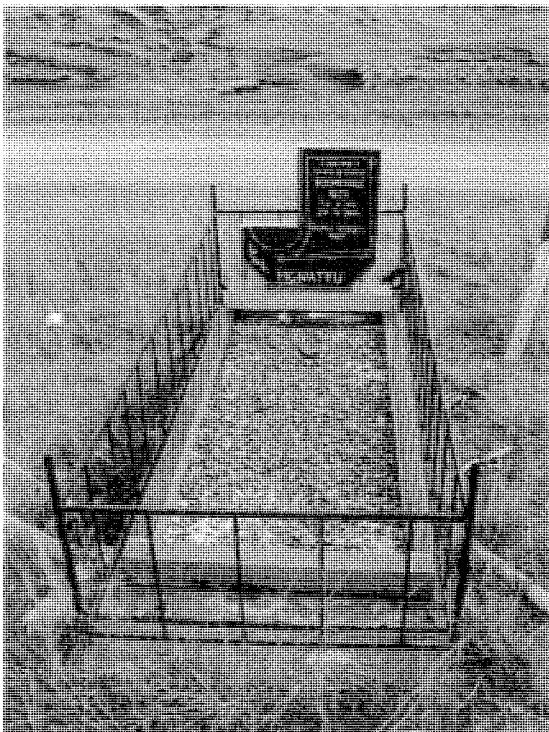
- Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the terms of reference (refer to Appendix F); and comply at all times with the Codes of Ethics and Conduct of the Association of Southern African Professional Archaeologists.
- eThembeni staff members take no personal or professional responsibility for the misuse of the information contained in this report, although they take all reasonable precautions against such misuse.

## APPENDIX E

### PHOTOGRAPHS



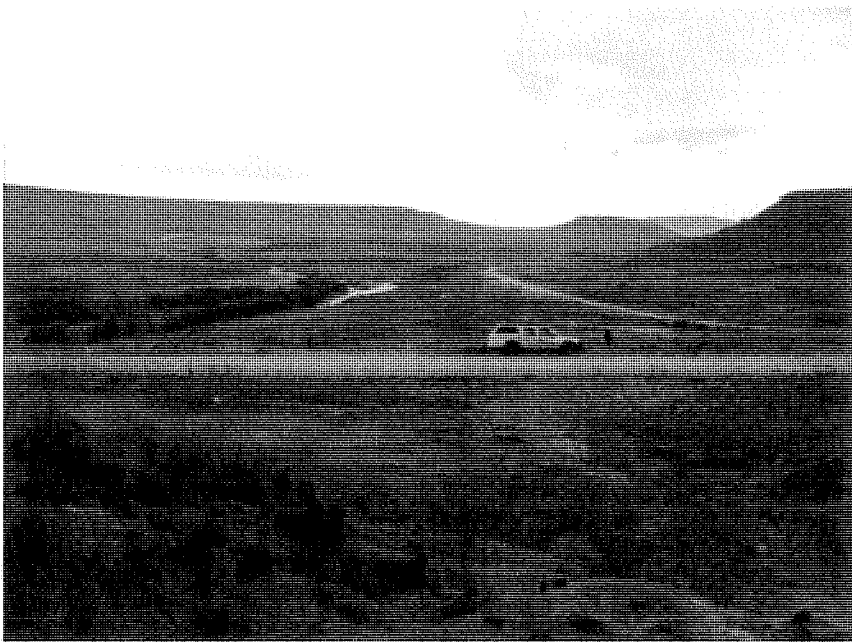
**Plate 1** Ancestral graves close to DR8015/BP05.



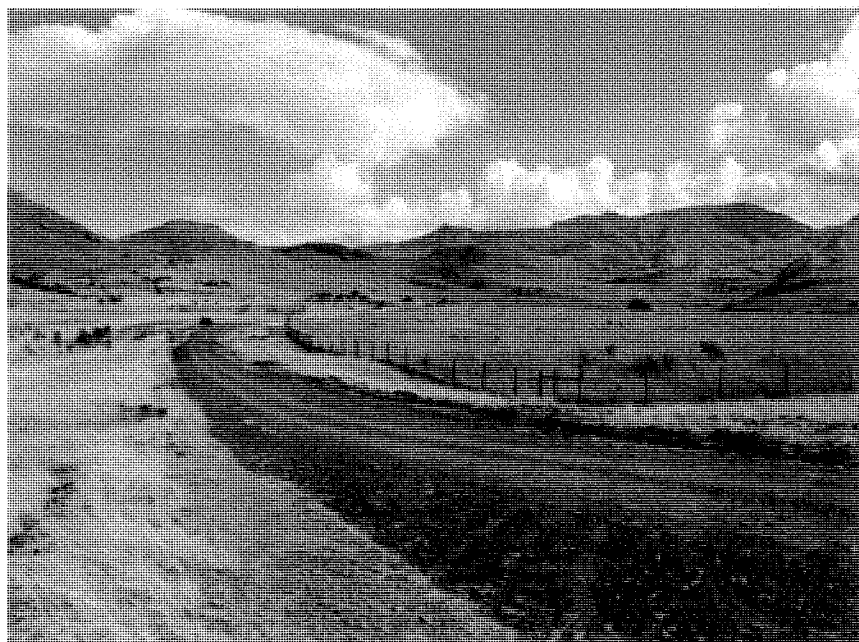
**Plate 2** Ancestral grave close to DR8015/BP05.



**Plate 3 Face of DR8015/BP06 requiring stabilisation to prevent undermining of ancestral graves.**



**Plate 4 Location of ancestral graves opposite DR8015/BP18 (beyond vehicle across the road).**



**Plate 5 View from DR8646/BP03 towards Ongeluksnek Nature Reserve.**



**Plate 6 Ongeluksnek Nature Reserve entrance indicated on left, with DR8646/BP03 on right.**

## **APPENDIX F**

### **SPECIALIST COMPETENCY AND DECLARATION OF INDEPENDENCE**

#### **Specialist competency**

Len van Schalkwyk is accredited by the Cultural Resources Management section of the Association of South African Professional Archaeologists to undertake heritage impact assessments in South Africa. Mr van Schalkwyk has a master's degree in archaeology (specialising in the history of early farmers in southern Africa) from the University of Cape Town and 25 years' experience in heritage management. He has worked on projects as diverse as the establishment of the Ondini Cultural Museum in Ulundi, the cultural management of Chobe National Park in Botswana and various archaeological excavations and oral history recording projects. He was part of the writing team that produced the KwaZulu-Natal Heritage Act 1997. He has worked with many rural communities to establish integrated heritage and land use plans and speaks good Zulu.

Mr van Schalkwyk left his position as assistant director of Amafa aKwaZulu-Natali, the provincial heritage management authority, to start eThembeni in partnership with Beth Wahl, who was head of archaeology at Amafa at the time. Over the past decade they have undertaken almost 1000 heritage impact assessments throughout South Africa, as well as in Mozambique.

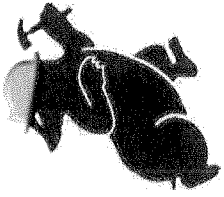
Beth Wahl has a BA Honours in African Studies from the University of Cape Town and has completed various Masters courses in Heritage and Tourism at the University of KwaZulu-Natal. She is currently studying for an MPhil in the Conservation of the Built Environment at UCT. She is a member of the Association of Southern African Professional Archaeologists.

Ms Wahl was an excavator and logistical coordinator for Glasgow University Archaeological Research Division's heritage programme at Isandlwana Battlefield; has undertaken numerous rock painting surveys in the uKhahlamba/Drakensberg Mountains, northern KwaZulu-Natal, the Cederberg and the Koue Bokkeveld in the Cape Province; and was the principal excavator of Scorpion Shelter in the Cape Province, and Lenjane and Crystal Shelters in KwaZulu-Natal. Ms Wahl compiled the first cultural landscape management plan for the Mnweni Valley, northern uKhahlamba/Drakensberg, and undertook an assessment of and made recommendations for cultural heritage databases and organisational capacity in parts of Lesotho and South Africa for the Global Environment Facility of the World Bank for the Maloti Drakensberg Transfrontier Conservation and Development Area. She developed the first cultural heritage management plan for the uKhahlamba Drakensberg Park World Heritage Site, following UNESCO recommendations for rock art management in southern Africa.

#### **Declaration of independence**

We declare that Len van Schalkwyk, Beth Wahl and eThembeni Cultural Heritage have no financial or personal interest in the proposed development, nor its developers or any of its subsidiaries, apart from in the provision of heritage impact assessment and management consulting services.

**APPENDIX D**  
**ENVIRONMENTAL AWARENESS PLAN**



Terratest: Environmental Management

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# ENVIRONMENTAL AWARENESS COURSE

DR08015

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# WHAT IS THE ENVIRONMENT?

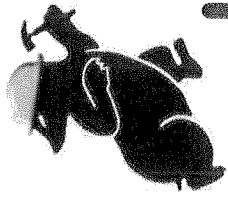
- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses





# WHY MUST WE LOOK AFTER THE ENVIRONMENT?

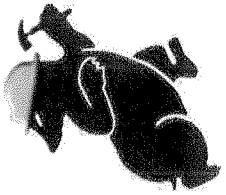
- It affects us all as well • Disciplinary action as future generations (e.g. construction could stop or fines issued)
  - We have a right to a healthy environment
  - A contract has been signed
- 
-



# HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP

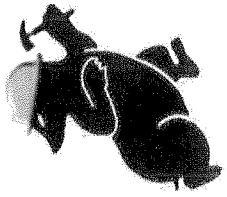




# WORKING AREAS

**Workers & equipment must  
stay inside the site  
boundaries at all times**





# RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream





# ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site

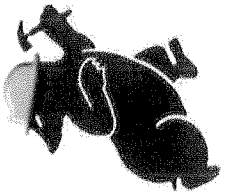




# TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers





# SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Report all fires
- Do not smoke near gas, paints or petrol
- Do not burn rubbish or vegetation without permission
- Do not light any fires without permission
- Know the positions of fire fighting equipment

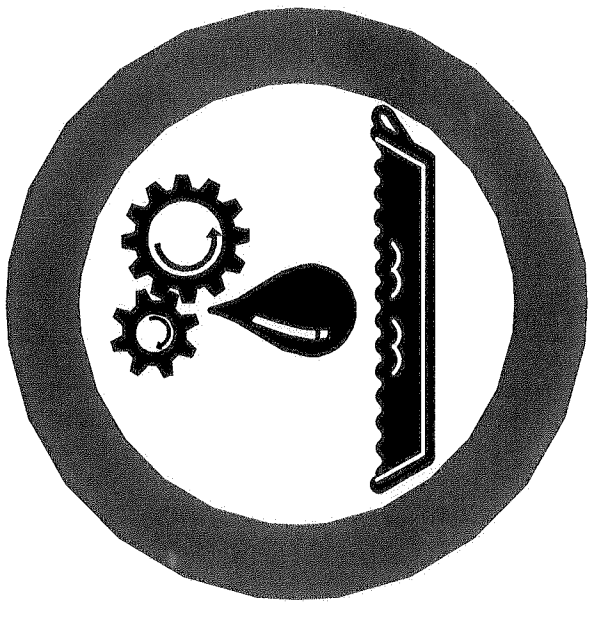


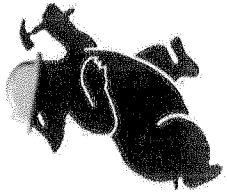




# PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray, banded area or plastic sheeting under vehicles, machinery & under all oil, diesel or petrol drums
- Empty drip trays after rain & throw away where instructed

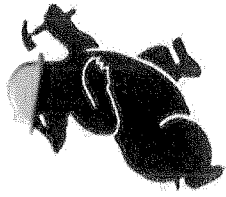




# DUST

Try to avoid producing dust -  
Use water to make ground &  
soil wet





# NOISE

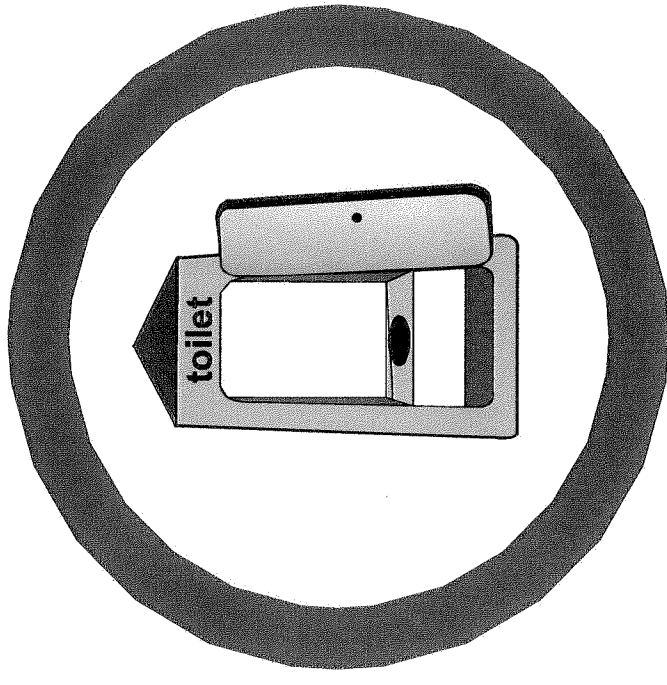
- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles

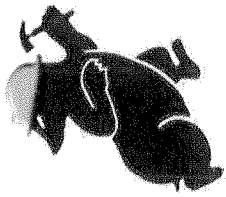




# TOILETS

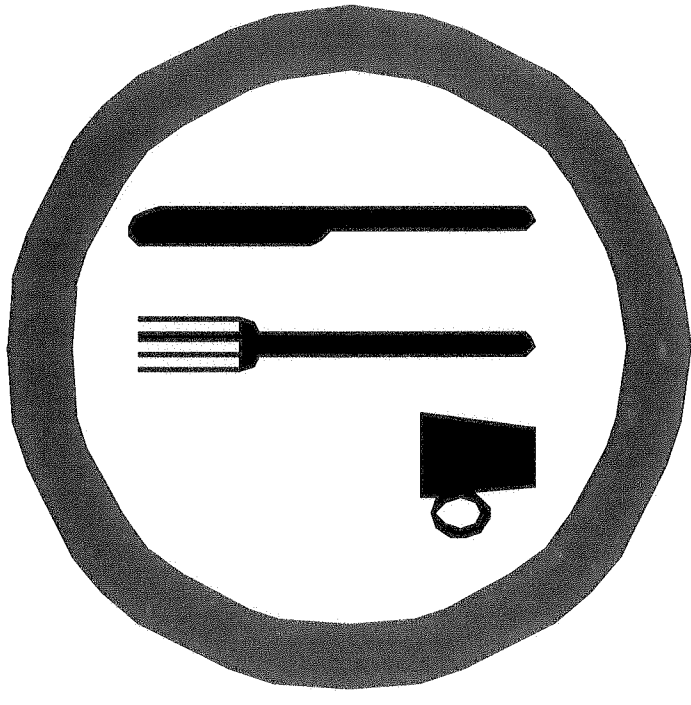
- Use the toilets provided
- Report full or leaking toilets

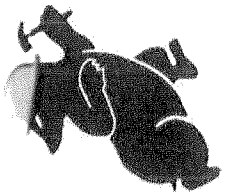




# EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins





# RUBBISH

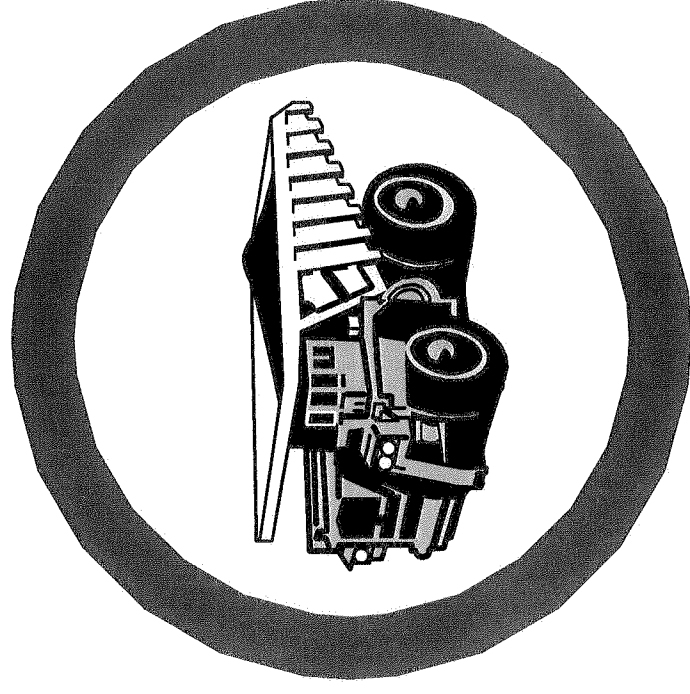
- Do not litter - put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly





# TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers - check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill





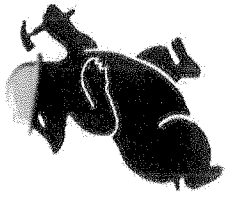
# EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance: [10111]
- Fire: [10111]
- Police: 10111
- CMC: 107

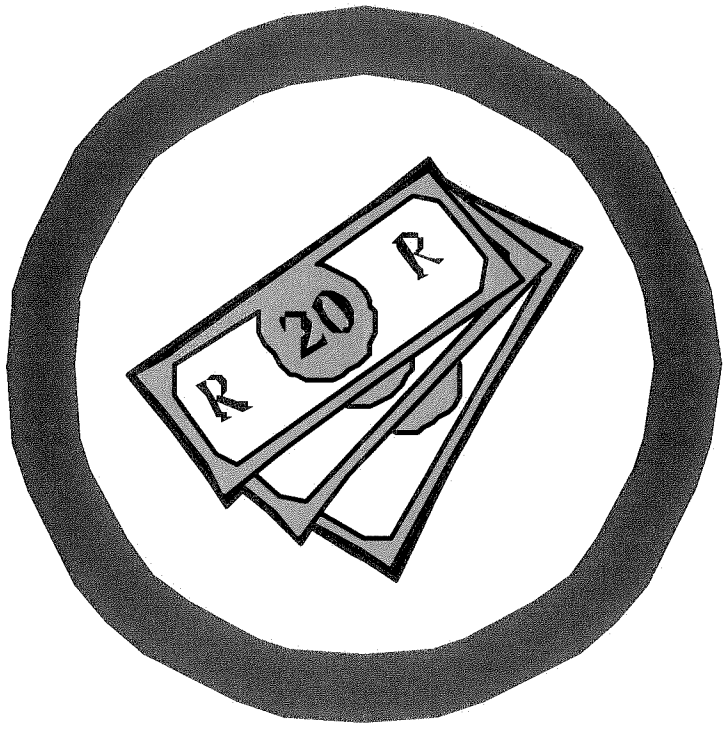


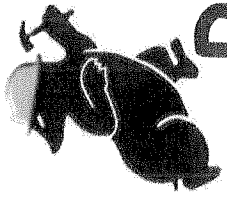




# FINES AND PENALTIES

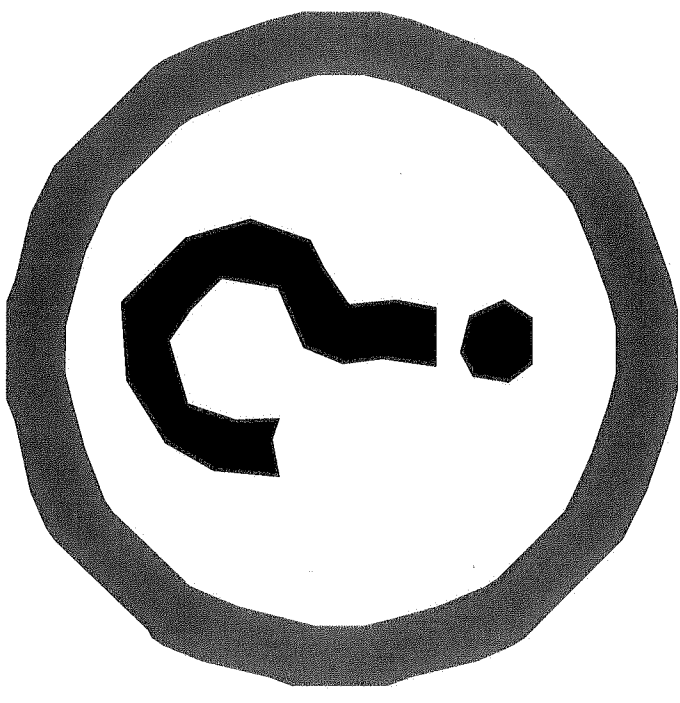
- Spot fines of between R20 and R2000
- Your company may be fined
- Removal from site
- Construction may be stopped





# PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!



**APPENDIX E**  
**GOOD PRACTICE GUIDE FOR STRIPPING SOILS**  
**GOOD PRACTICE GUIDE FOR HANDLING SOILS**



# **GOOD PRACTICE GUIDE FOR HANDLING SOILS**

**Sheet 13:**

**Soil Stripping with Bulldozers and Dump Trucks**

**Issued by the Farming and Rural Conservation Agency, Cambridge**

**April 2000**

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v04/00



## MAFF FOREWORD

Standards of restoration of minerals and waste sites have steadily improved in recent years, with operators increasingly aware of their environmental responsibilities. The industry is putting forward more imaginative restoration concepts to a variety of afteruses, and is more aware than ever that it will be judged on the standard of that restoration, and the sustainability of the development.

Sustainable mineral development means balancing economic, environmental and social needs, whilst using resources wisely. The UK Strategy for Sustainable Development recognises the importance of safeguarding agricultural land to meet the needs of future generations, and minimising the loss of soils to new development\*.

Improved restoration standards have sometimes enabled planning permission to be given for best and most versatile agricultural land to be worked for minerals, on the basis that it can be restored in a way that safeguards its long-term agricultural potential\*\*. Inherent in these high standards of restoration is the requirement to handle soils in such a way that damage to their structure is minimised. It is the aim of this Guide to provide comprehensive advice on soil handling "Good Practice" to operators, soil moving contractors, consultants and planning authorities.

The Guide is in the form of 15 Sheets giving advice on soil stripping, the forming and taking down of soil storage mounds, and soil replacement operations using excavators, earth scrapers or bulldozers. There are also four Guidance Sheets on remedial works involving the removal of stones and damaging materials, and decompaction during the replacement operations.

This document should be cited as MAFF (2000), Good Practice Guide for Handling Soils (version 04/00). FRCA, Cambridge.

**Any views expressed in the guidance are those of the consultant and do not necessarily represent the view of the Ministry of Agriculture, Fisheries and Food.**

\*(DETR, A Better Quality of Life, May 1999, paragraphs 6.66 and 8.50)

\*\*MPG7 (November 1996, paragraph 3).

### Acknowledgements

The Guide was written and prepared by Dr R N Humphries of Humphries Rowell Associates, Charnwood House, Loughborough, LE11 3NP, UK. The art work was by R Shenton of H J Banks & Co.

- the bed/strip system provides a basis to regulate the exposure of lower soil layers to periods of rain and a means of maintaining soil moisture contents. The soil profile within the active strip should be stripped to the basal layer before rainfall occurs and before stripping is suspended.
- measures are required to protect the face of the soil layer from ponding of water and maintain the basal layer in a condition capable of supporting dump trucks.
- the area to be stripped is to be protected from in-flow of water, ponding etc. Wet sites should be drained in advance.
- the maintenance of a transpiring crop is important, and an appropriate cropping regime should be established for the year of soil stripping. Before stripping, excess vegetation should be removed; in the case of grassland it should be cut or grazed short and arable crops should have been harvested.

### The Stripping Operation

- 13.1 The area to be stripped is to be protected from in-flow of water, ponding etc. Wet sites should be drained in advance.
- 13.2 Soil stripping operations should not start until the required soil moisture levels are reached (as determined by the agreed method), and should be suspended as soon as the water content returns to these levels. Prior to work commencing a Meteorological Office forecast should be obtained which gives reasonable confidence of soil stripping proceeding without interruptions from rainfall events. If significant rainfall is forecast or occurs during operations, the stripping must be suspended, and where the soil profile has been disturbed it

should be removed to base level. Stripping must not restart unless the weather is expected to be dry for at least a full day.

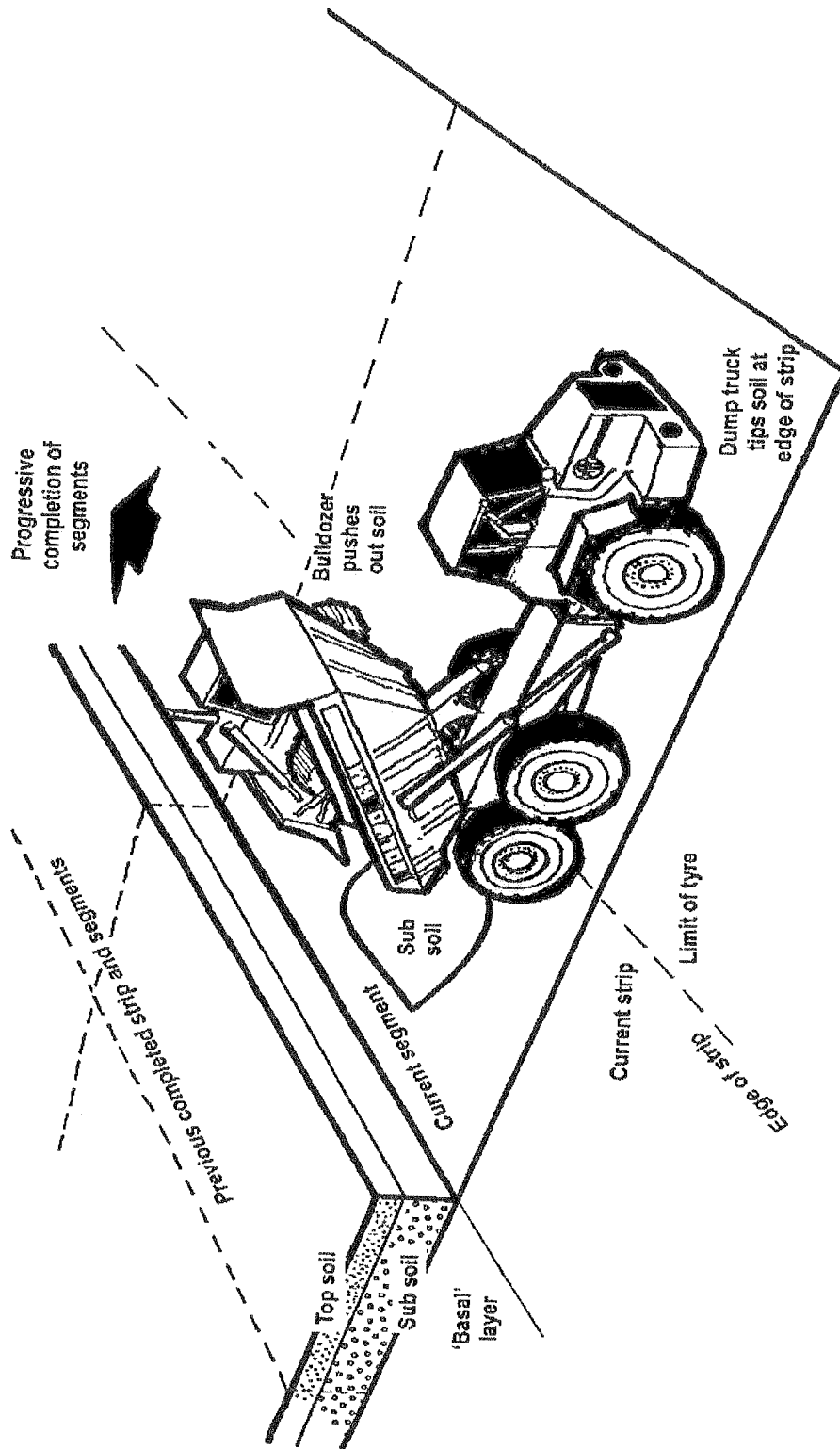
- 13.3 All machines must be in a safe and efficient working condition at all times. The machines are to only work when ground conditions enable their maximum operating efficiency. The operation is to be suspended before traction becomes a problem or the integrity of the basal layer and haul routes fails.
- 13.4 The operation should follow a detailed stripping plan showing soil units to be stripped, haul routes and the phasing of vehicle movements. The soil units should be defined on the site with information to distinguish types and layers, and ranges of thickness. Detailed daily records should be kept of operations undertaken, and site and soil conditions.
- 13.5 Within each soil unit the soil layers above the base/formation layer are to be stripped in sequential strips with the topsoil layer stripped first, followed by the subsoil layers; each layer stripped to its natural thickness without incorporating material from the lower layer. The next strip should not be started until the current strip is completely stripped to the basal layer. This is often referred to as the 'bed or strip system'. The system involves the progressive sequential stripping of the materials in strips (Figure 13.1). Where there is a gradient to the site, the main axis of the soil strips should be along the main axis of the slope.
- 13.6 The haul routes and storage areas must be defined, and should be stripped first in a similar manner.
- 13.7 The bulldozer is only to stand and work on the soil layer when stripping soils, otherwise it is to travel only on the basal/formation layer. The dump trucks are only to operate on the basal/formation layer. The excavator is only to stand and work on the mounded soil when loading the dump truck, otherwise it is to travel on the basal layer (Figure 13.1).

- 13.8 Demarcate an initial strip width of about 20m and divide the strip into 20m long segments.
- 13.9 The topsoil layer is to be pushed up in the thickest layer possible (eg 150-200mm thick), whilst maintaining operational efficiency of the bulldozer, to form a low mound (1-2m high) along the edge of the exposed soil profile (face). The soil nearest the exposed face should be pushed up first, progressively working to the back of the strip (Figure 13.2). The procedure is repeated in each successive segment until the strip is completed.
- 13.10 Topsoil should be recovered to the full width of the segment without contamination with subsoil (not more than 20% of the lower horizon should be exposed at the layer junction within the strip). This will necessitate some trafficking of the bulldozer on the adjacent strip to be able to mound the entire topsoil within the segment. The thickness and identification of the horizon junction must be verified before and during stripping. The full thickness of the topsoil horizon should normally be stripped progressively along the segments in the active strip before subsoil horizons are started (Figure 13.2). The full topsoil horizon should be stripped along the length of the active strip before the subsoil horizons are started.
- 13.11 The upper subsoil in the current strip is to be stripped and monitored in the same manner. The final 50cm of the subsoil layer should be left as a step to protect the adjacent topsoil horizon from local collapses. The process is to be repeated for the lower subsoil and any other lower layer to be recovered as a soil material (Figure 13.3).
- 13.12 With each successive lower layer taken the bulldozer must only work within the segment and not operate across the boundary of the next strip. This will initially result in a 'stand-off' (shelf) at the back of the strip to accommodate the bulldozer. Before the next layer is stripped, the soil layer in this shelf is to

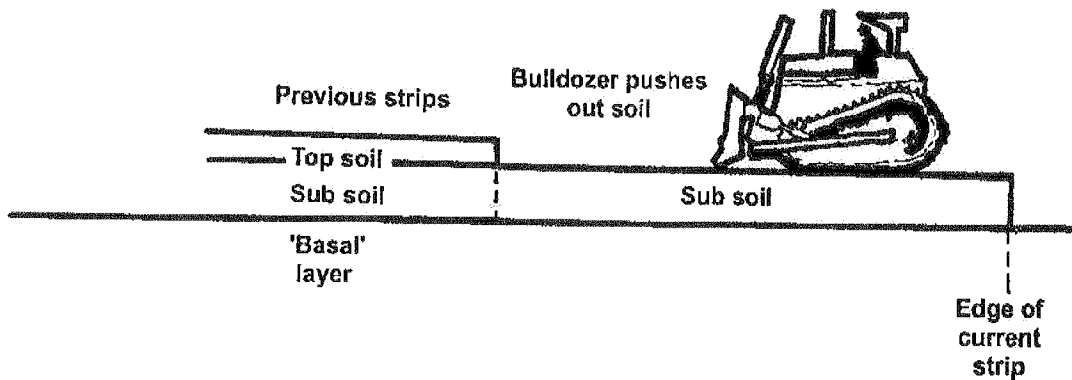
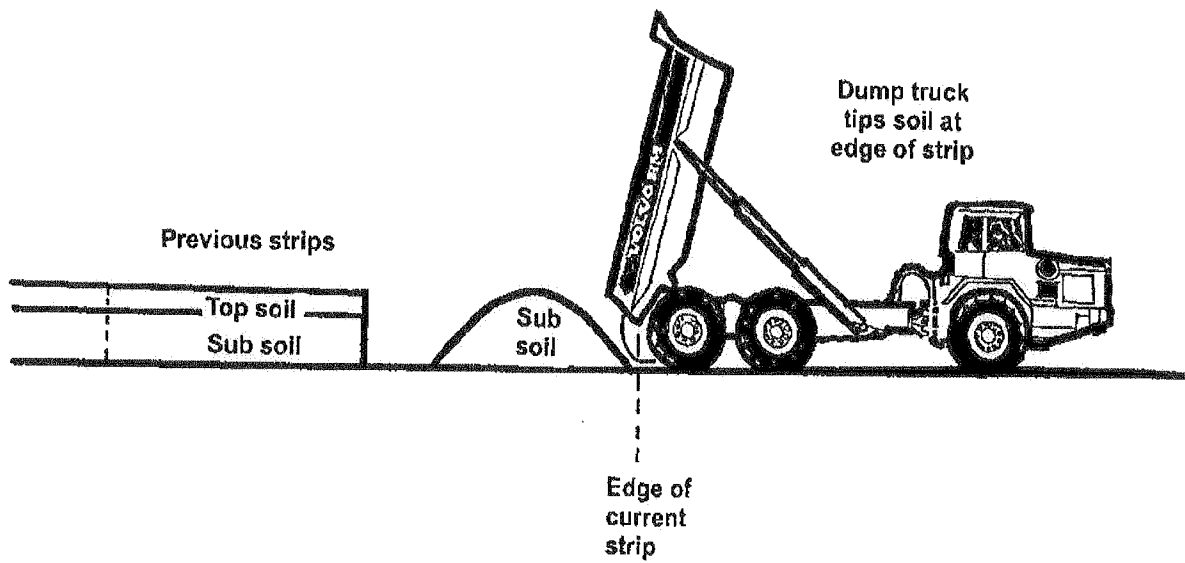


be mounded at the exposed side of the next segment for loading by the excavator into the trucks (Figure 13.4).

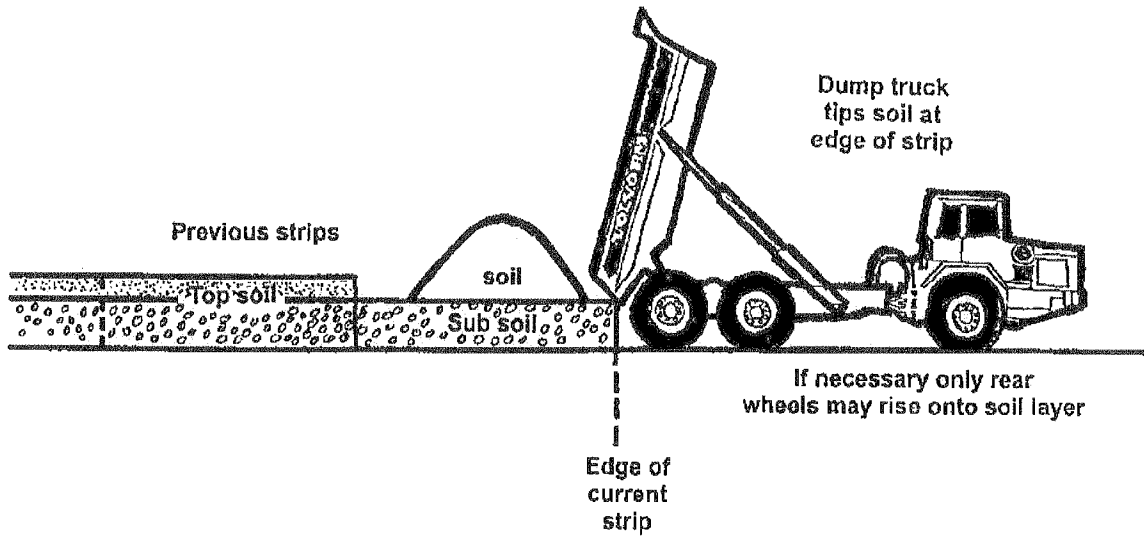
- 13.13 On completion of the strip, the procedures are repeated sequentially for each subsequent strip until the area is completely stripped.
- 13.14 Where the soils are to be directly replaced without storage in mounds, the initial strip of the upper horizons will have to be stored temporarily to release the lowest layer and enable the sequential movement of materials. The stored initial soil material would be placed on the lower layer removed from the final strip at the end of the programme or on partially completed profiles if rain was forecast.
- 13.15 Where the stripping operation is likely to be interrupted by rain or there is likely to be over-night rain remove any exposed subsoil down to the basal layer before suspending operations. Make provisions to protect base of current or next strip from ponding/runoff by sumps and grips, and also clean and level the basal layer. At the start of each day ensure there is no ponding in the current strip or operating areas, and the basal layer is to level with no ruts.



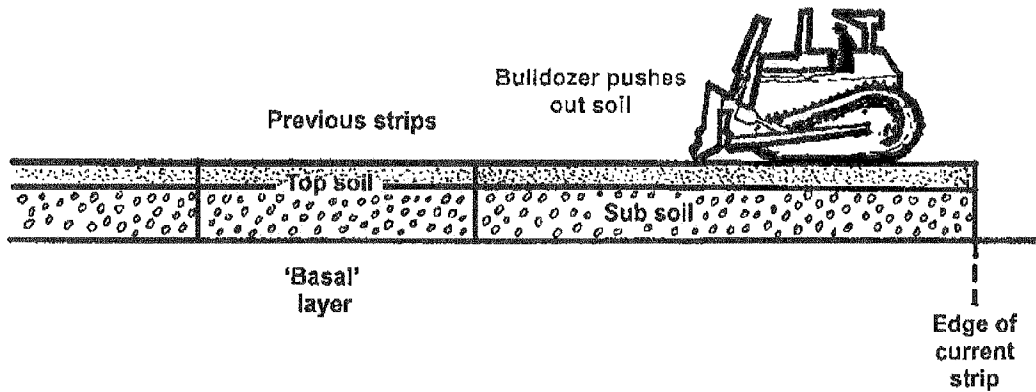
**Figure 15.1 Soil replacement by bulldozers  
 and dump trucks:  
 Sub soil layer**



**Figure 15.2 Soil replacement by bulldozers and dump trucks:  
Sub soil layer**



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**Figure 15.3 Soil replacement by bulldozers  
 and dump trucks:  
 Top soil layer**

**End**

