



the dme

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Minerals and Energy
REPUBLIC OF SOUTH AFRICA

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Reference:
Date:

EC 30/5/1/3/3/2/1/0409 EM
21 January 2010

South African Heritage Resources Agency
P.O. Box 758
GRAHAMSTOWN
6140

CaseID: 2431

ATTENTION: MR. T. LUNGILE

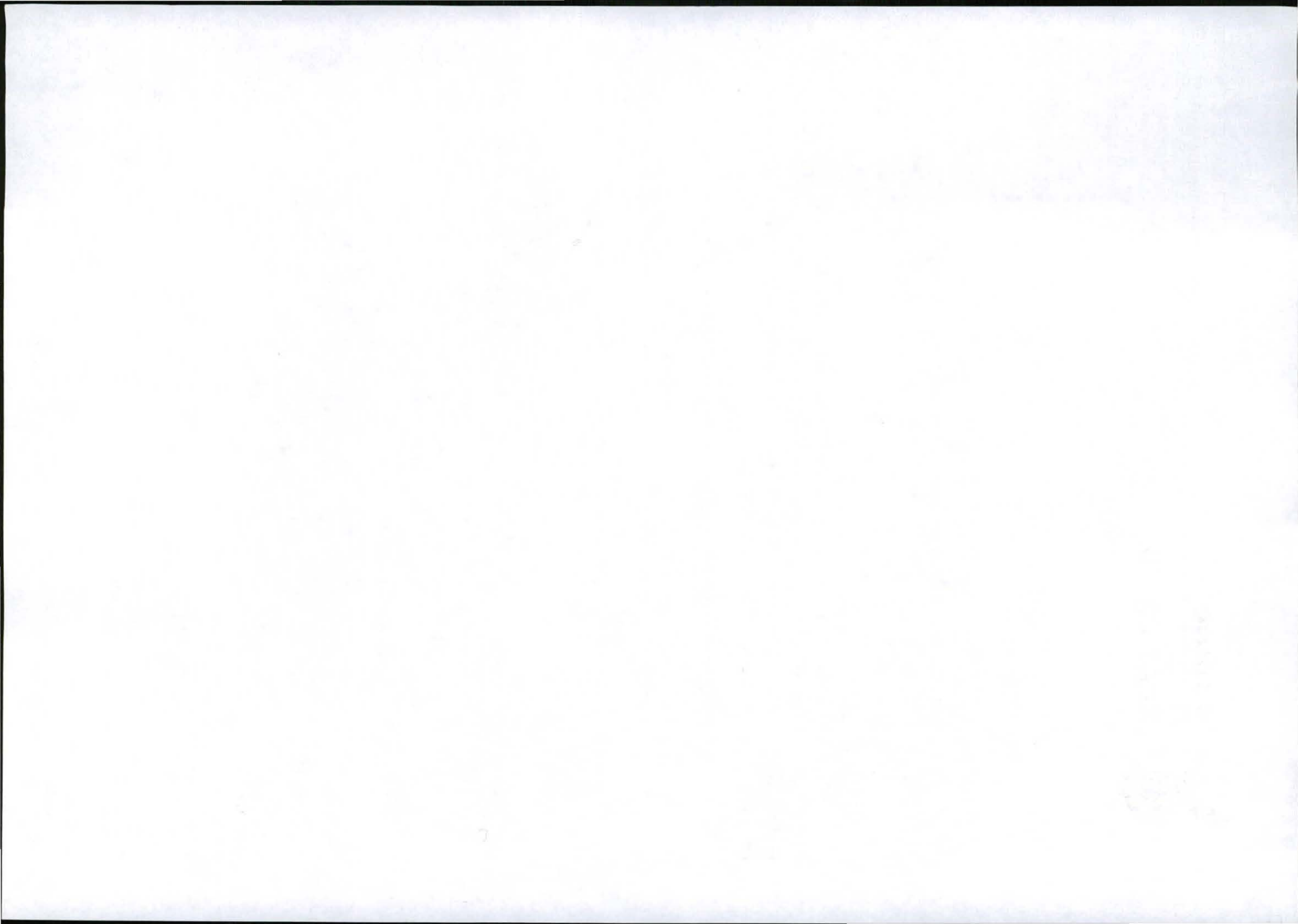
Sir

**CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002:
ENVIRONMENTAL MANAGEMENT PLAN (EMP); BORROW PITS ASSOCIATED
WITH THE ROAD REHABILITATION PROJECT OF THE DR08012 ROAD
BETWEEN MALUTI AND QACHAS NEK**

1. Attached herewith, please find a copy of a EMP received from Department of Roads and Transport for your comments.
2. Please forward any written comments or requirements your department may have in this regard, to this office not later than **22 March 2010**. Failure to do so, will lead to the assumption that your department has no objection(s) or comments with regard to the said document.
3. Consultation in this regard has also been initiated with other relevant State Departments.
4. Please use the reference number (EC) 30/5/1/3/3/2/1(0409) EM in all future correspondence.
5. Your co-operation is appreciated.

Sincerely,

**REGIONAL MANAGER
EASTERN CAPE**





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Minerals and Energy
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E-mail: deidre.watkins@dme.gov.za

Reference:
Date:

EC30/5/1/3/3/2/1/0409EM
21 January 2010

The Regional Manager
Department of Water Affairs
P/Bag X5296
UMTATA
5100

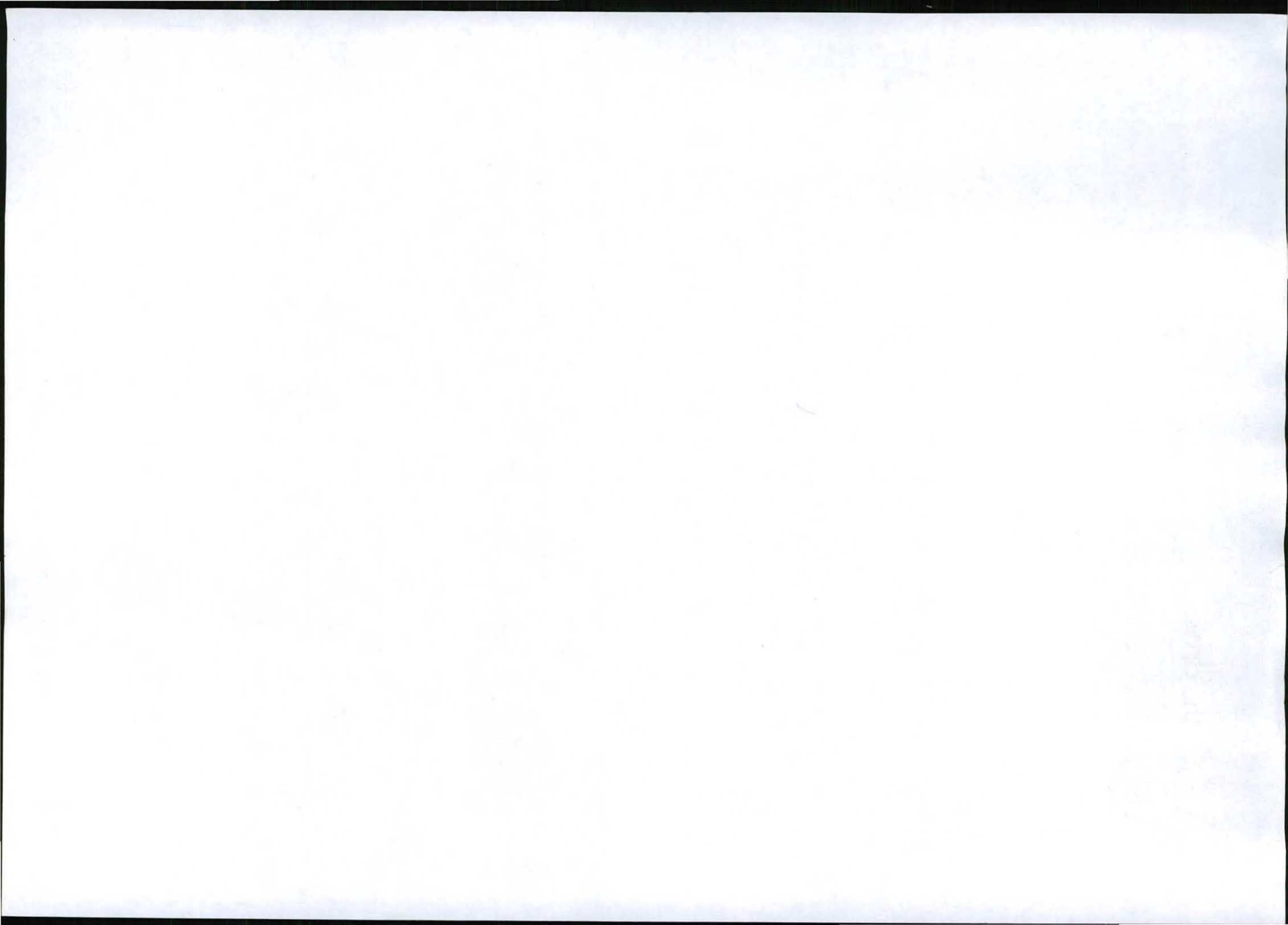
Sir/Madam

**CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002:
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5. Your co-operation is appreciated.

Sincerely,

**REGIONAL MANAGER
EASTERN CAPE**



**ENVIRONMENTAL MANAGEMENT PLAN FOR THE
PROPOSED BORROW PITS ASSOCIATED WITH
THE UPGRADING OF THE ROAD BETWEEN
MALUTI AND QACHAS NEK IN THE EASTERN
CAPE**

NOVEMBER 2009

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ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED BORROW PITS ASSOCIATED WITH THE UPGRADING OF THE ROAD BETWEEN MALUTI AND QACHAS NEK IN THE EASTERN CAPE

1 INTRODUCTION

1.1 BACKGROUND

Terratest (Pty) Ltd was appointed by HHO Africa Consulting Engineers on behalf of the Eastern Cape Department of Roads and Transport (DoRT), to undertake the environmental work that forms part of the mining permit authorisation for the utilisation of borrow pits. The material from these borrow pits is to be used in the road upgrading project of the road between Maluti and Qachas Nek in the Eastern Cape Province.

The applicant regarding the mining permits for the borrow pits is the DoRT, who are exempt from the application process for the mining permits. No application for mining permits has been lodged with the Eastern Cape Department of Minerals and Energy (DME).

This report constitutes the Environmental Management Plan (EMP), as required by the DME.

The EMP was undertaken as per the regulations promulgated under Section 22 of the Minerals and Petroleum Resources Development Act, (Act 28 of 2002).

1.2 TERMS OF REFERENCE

The objectives of the EMP are to:

- Provide a description of the proposed activity and the current environment on and around the site;
- Identify Interested and Affected Parties (IAPs), inform them of the proposed development and identify key concerns;

- Identify potential impacts and environmental issues that need further investigation;
- Recommend appropriate mitigation measures and management measures.

1.3 APPROACH

In order to meet the objectives of the EMP, the following activities were undertaken:

- An initial baseline desk survey to determine the nature of the affected environment and to identify potential issues of concern;
- A site investigation;
- Consultation with the client;
- Consultation with key stakeholders;
- The identification and assessment of potential environmental issues;
- The compilation of this EMP.

2 LEGISLATION

2.1 MINERALS AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 OF 2002)

The Minerals and Petroleum Resources Development Act, (Act 28 of 2002) makes provision for the environmental work requirements and steps to be taken in the application and obtaining of a mining right.

2.2 NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

The National Heritage Resources Act, (Act 25 of 1999) makes provisions for any archaeological remains or areas of special concern, such as gravesites, to be protected. South African Heritage Resources Association (SAHRA) is the leading authority at national level. Heritage KwaZulu-Natal (AMAFA) is the leading authority at provincial level.

2.3 NATIONAL WATER ACT (ACT 36 OF 1998)

The National Water Act, (Act 36 of 1998) makes provision for the sustainable management of all water resources in South Africa.

2.4 OTHER APPLICABLE LEGISLATION

The applicant must take cognisance of the provisions of other legislation dealing with matters relating to conservation, and which include, inter alia, the following:

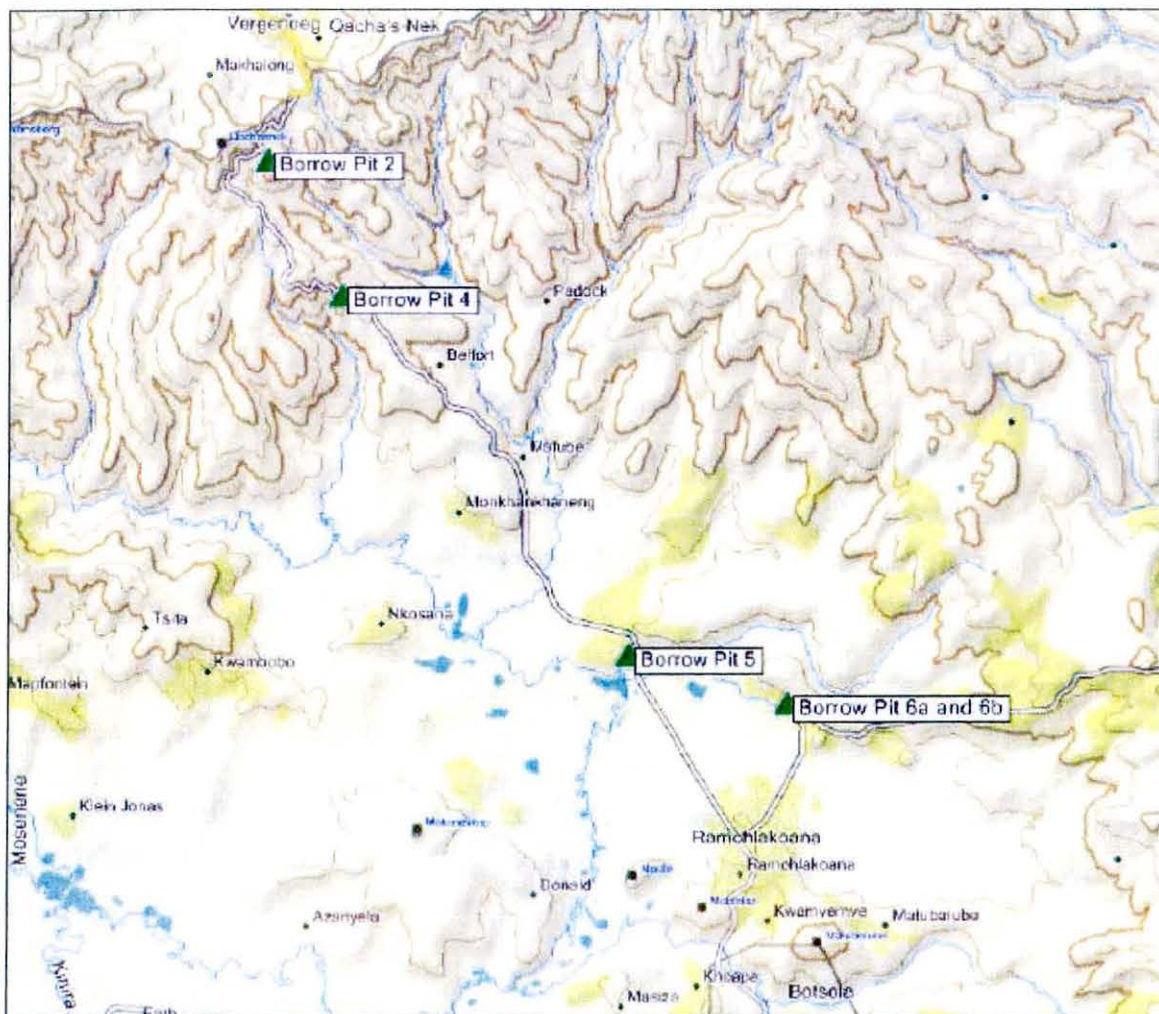
- National Parks Act, (Act 57 of 1976)
- Environmental Conservation Act, (Act 73 of 1989)
- National Environmental Management Act, (Act 107 of 1998)
- Atmospheric Pollution Prevention Act, (Act 45 of 1965)
- Mine Safety and Health Act, (Act 29 of 1996)
- Occupational Health & Safety Act, (Act 85 of 1993)
- The Conservation of Agricultural Resources Act, (Act 43 of 1983).

3 GENERAL SITE LOCATION AND PROJECT DESCRIPTION

All the proposed borrow pits, with the exception of Borrow pits 6A and 6B, are located along the DR08012 road between Maluti and the Qachas Nek Border Post in the Eastern Cape Province. Borrow pits 6A and 6B are located in the proximity of the Hardenberg community on the outskirts of the town of Maluti.

The borrow pits lie within two traditional authorities, namely, the Msibi and Malubelube Traditional Areas.

The materials sourced from these borrow pits will only be used for the upgrading of the DR08012 road between Maluti and the Qachas Nek Border Post. This road upgrade project includes structural maintenance, improvements, short re-alignments and the surfacing of the road to a black-top road.



Locality Plan showing the position of the proposed borrow pits

All the sites have in the past been used for the sourcing of road building and other construction material on an informal basis. As far as can be determined none of these borrow pits were previously permitted.

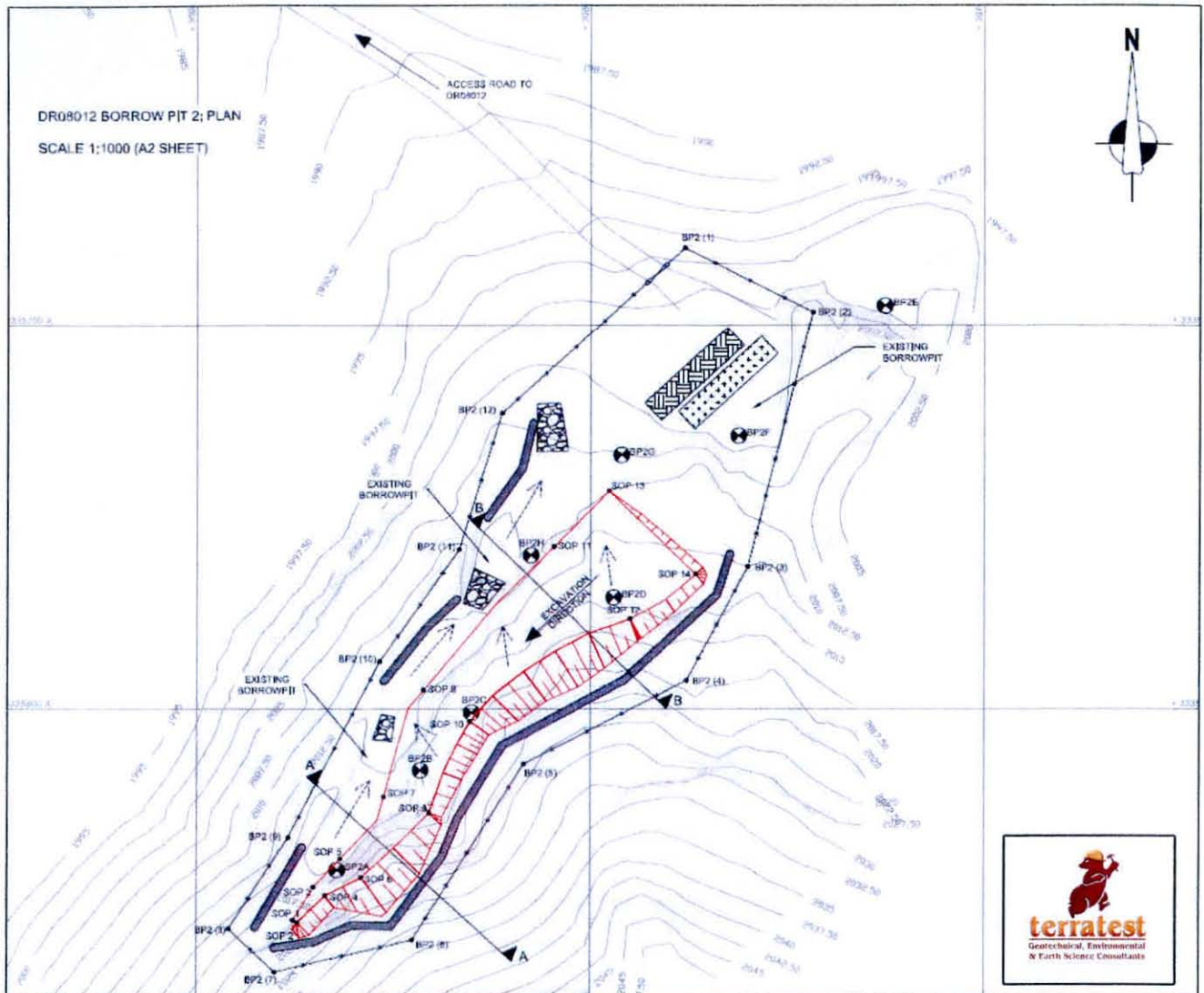
The regional geology of the area comprises dark grey shales overlying sandstone of the Ecca Group, which has been extensively intruded by post Karoo Dolerite. A thin layer of colluvial and residual soils overlies the weathered shale bedrock. The colluvial and residual soils are comprised of thin silty gravelly materials. A Geological Map is given in Figure 3, Appendix A.

The topography of the area varies from being hilly and undulating in the areas along the road associated with the Qachas Nek Pass, to relatively flat in the areas associated with the floodplains at the foothills of the Maluti Mountains.

Extent

The total extent of the mining area will be approximately 1.5ha between the corner points given in the attached table. Detailed surveyor drawings showing the exact layout and operational directions of the borrow pit are attached in Appendix A.

Corner Point	Latitude (S)	Longitude (E)
BP2(1)	S 30° 08' 30.62"	E 28° 40' 50.09"
BP2(2)	S 30° 08' 31.17"	E 28° 40' 51.31"
BP2(3)	S 30° 08' 26.83"	E 28° 40' 50.70"
BP2(4)	S 30° 08' 27.79"	E 28° 40' 50.12"
BP2(5)	S 30° 08' 28.49"	E 28° 40' 48.56"
BP2(6)	S 30° 08' 30.62"	E 28° 40' 47.50"
BP2(7)	S 30° 08' 30.24"	E 28° 40' 46.20"
BP2(8)	S 30° 08' 29.88"	E 28° 40' 45.77"
BP2(9)	S 30° 08' 29.13"	E 28° 40' 53.73"
BP2(10)	S 30° 08' 27.62"	E 28° 40' 47.20"
BP2(11)	S 30° 08' 26.68"	E 28° 40' 47.95"
BP2(12)	S 30° 08' 25.53"	E 28° 40' 48.37"



Site plan of Borrow Pit 2

A detailed surveyor drawing of the layout of the borrow pit is attached in Appendix A.

Material Standards

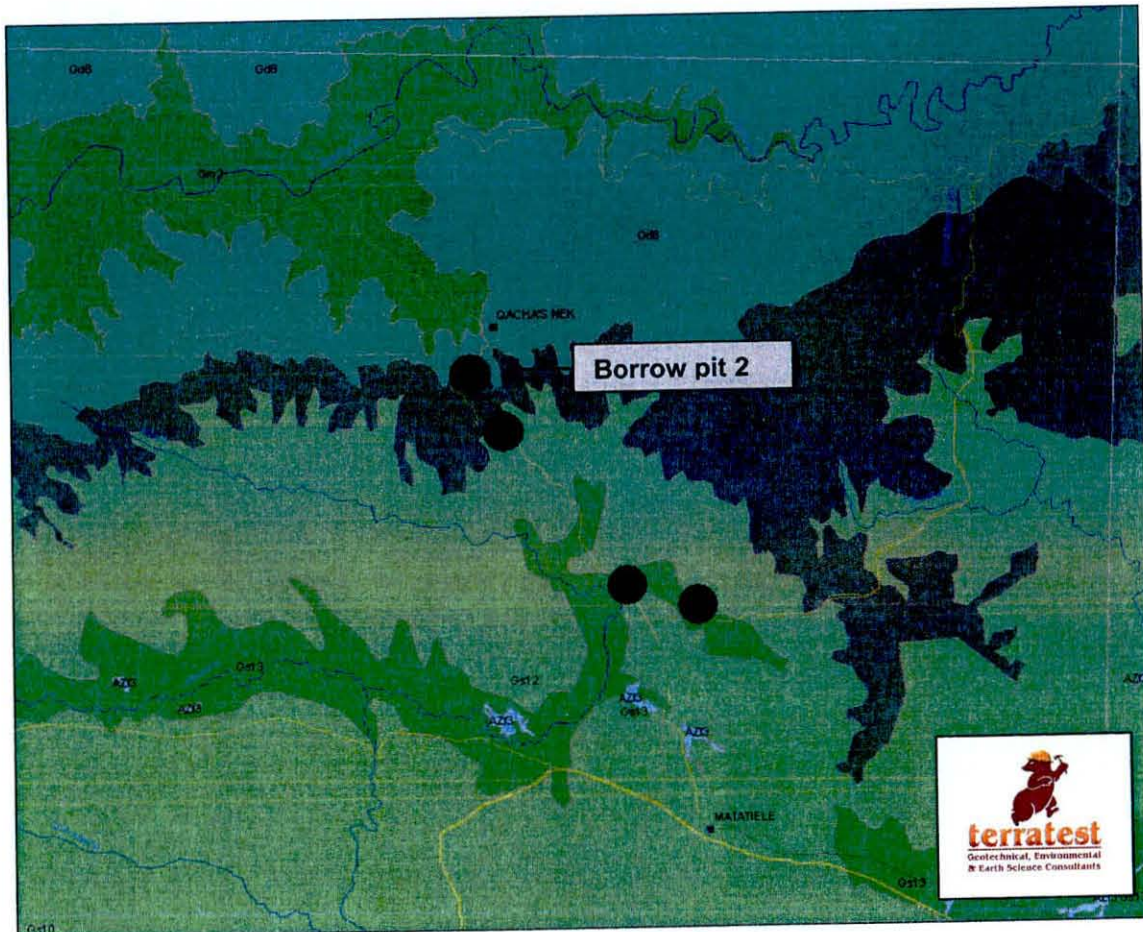
The material to be mined from the borrow pit is basalt. The full Geotechnical Report containing the material testing results is attached in Appendix D.

Community comments and Land ownership

A community meeting was held on 4 November 2008 regarding the road upgrade project and the possible use of certain areas along the road for the sourcing of road building material. The community had no objections to these activities. Minutes of this meeting are attached in Appendix B of this report.

Biophysical Description

The location of Borrow pit 2 is within the Southern Drakensberg Highland Grassland veldtype according to the classification, *The Vegetation of South Africa, Lesotho and Swaziland* (Mucina and Rutherford, 2006). The areas surrounding the borrow pit site are typical of this veldtype with vegetation dominated by tussock grassland and an occasional dwarf shrub component in some of the more rocky areas.



Veldtype Map

The grassland is dominated by *Festuca* species and other grasses such as *Themeda triandra* (Red Grass), *Heteropogon contortus* (Spear Grass), *Eragrostis racemosa* (Narrow Heart Love Grass), *Eragrostis chloromelas* (Curly Leaf), *Eragrostis curvula* (Weeping Love Grass), *Elionurus muticus* (Wire Grass), *Trachypogon spicatus* (Giant Spear Grass), *Harpochloa falx* (Caterpillar Grass) and *Tristachya leucothrix* (Hairy Trident Grass).

The vegetation on the site has been disturbed by previous mining operations which have caused an irregular mosaic of grasses on the site. The shrubs that occur on

the site, *Leucosidea sericea* (Oldwood), are associated with the stockpile of stone that is a remnant of the old mining operations.

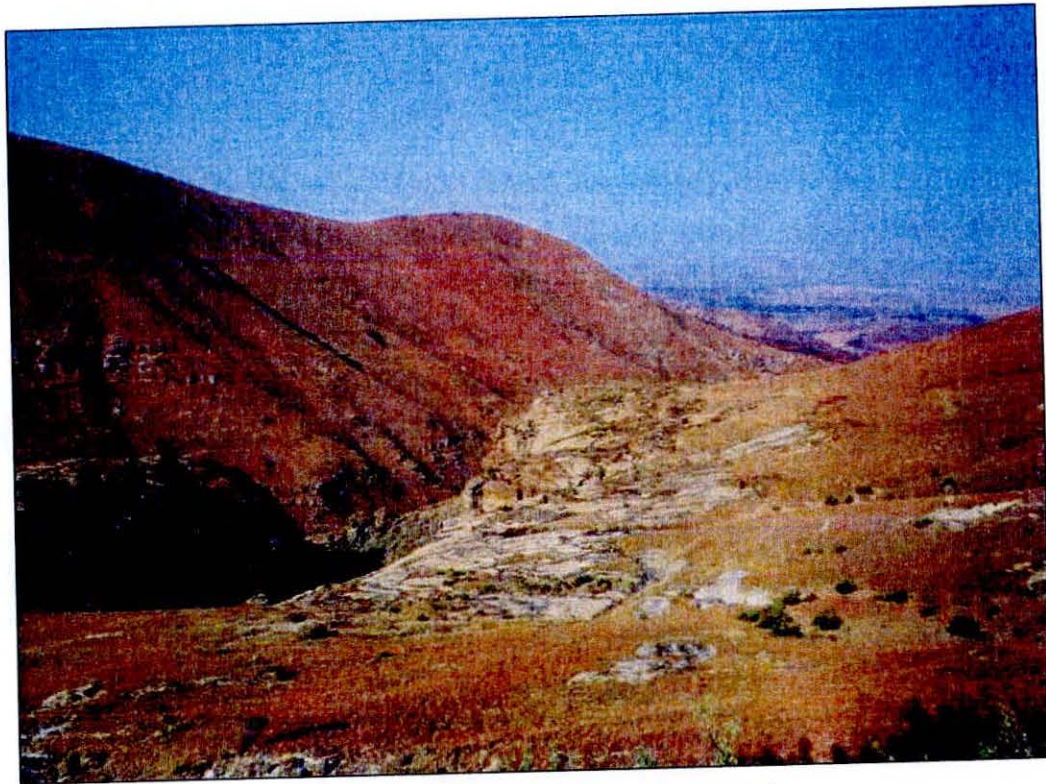


View of the tussock grassland with small shrubs

No signs of wildlife were seen during the site visit.

Topography

The topography of the surrounding area is characterized by steep slopes associated with the mountainous landscape. The borrow pit is located on the north-eastern gradient of one of these steep slopes.



View of the surrounding environment

Drainage

There are no natural drainage lines that start on the site or run through the site. Due to the location of the site on the steep gradient on the side of a hill, the inundation created by the mining activity will act as a reservoir for rain water run-off off the slope.

Social Environment

The borrow pit is located in vacant land in the Maluti Mountains with the registered land owner being the Republic of South Africa. The closest built up area to the borrow pit is the Border Post at the top of the pass (Qachas Nek Border Post) that is approximately 1km away.

Heritage Resources

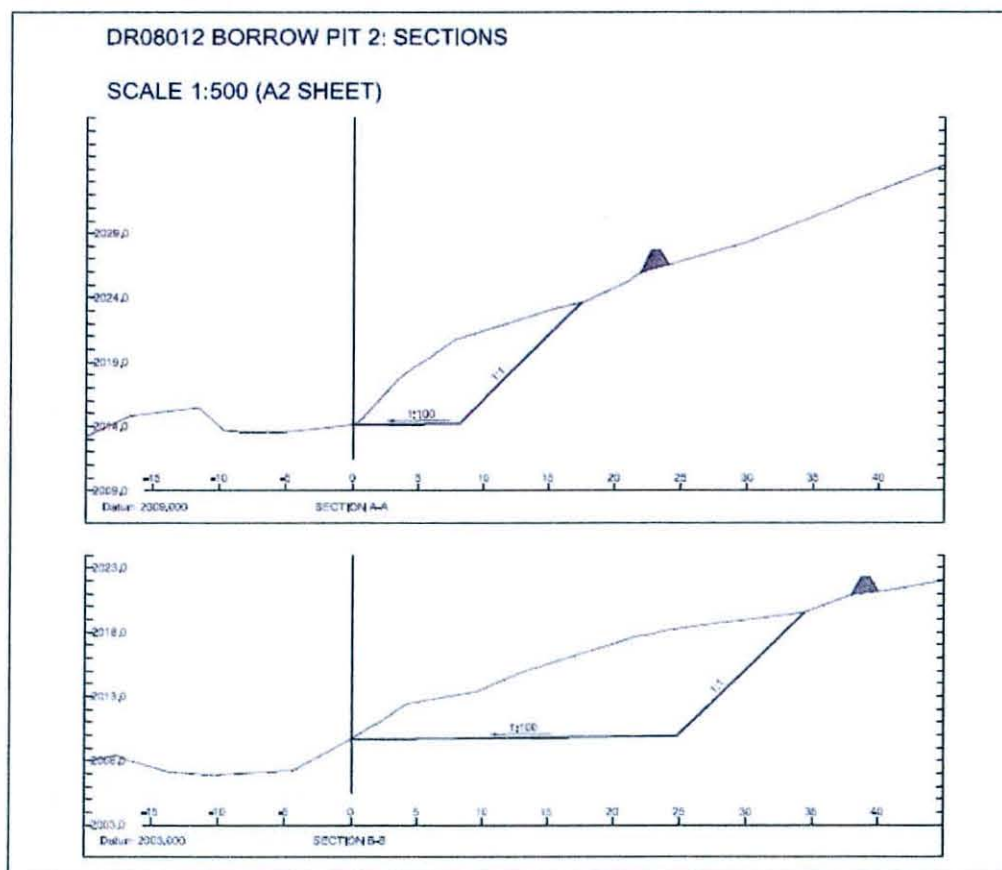
The South African Heritage Resources Association (SAHRA) required the completion of a Heritage Impact Assessment for the road alignment. The assessment of the possible heritage importance of the borrow pits was included in the consultant's terms of reference. No artifacts of heritage importance were identified by the consultant. A copy of the Heritage Impact report is attached in Appendix E of this report.

Impacts

Visual

The visual impact of the borrow pit could possibly be significant without any rehabilitation since the borrow pit site is situated on a high elevation along the Qachas Nek Pass. The borrow pit will therefore be clearly visible to the road users.

Recommendations: Care must be taken in the layout and design to ensure that the working of the borrow pit is done in definite mining directions which can be rehabilitated successfully. The rehabilitation should include the shaping and the rehabilitation of the benches formed by the mining operation. This should happen on an ongoing basis as the mining operation proceeds through the site. A full surveyor drawing showing the profile and mining plan is attached in Appendix B.



Planned final profile

Overhead Services

There are no overhead services that will be affected by the borrow pit operation.

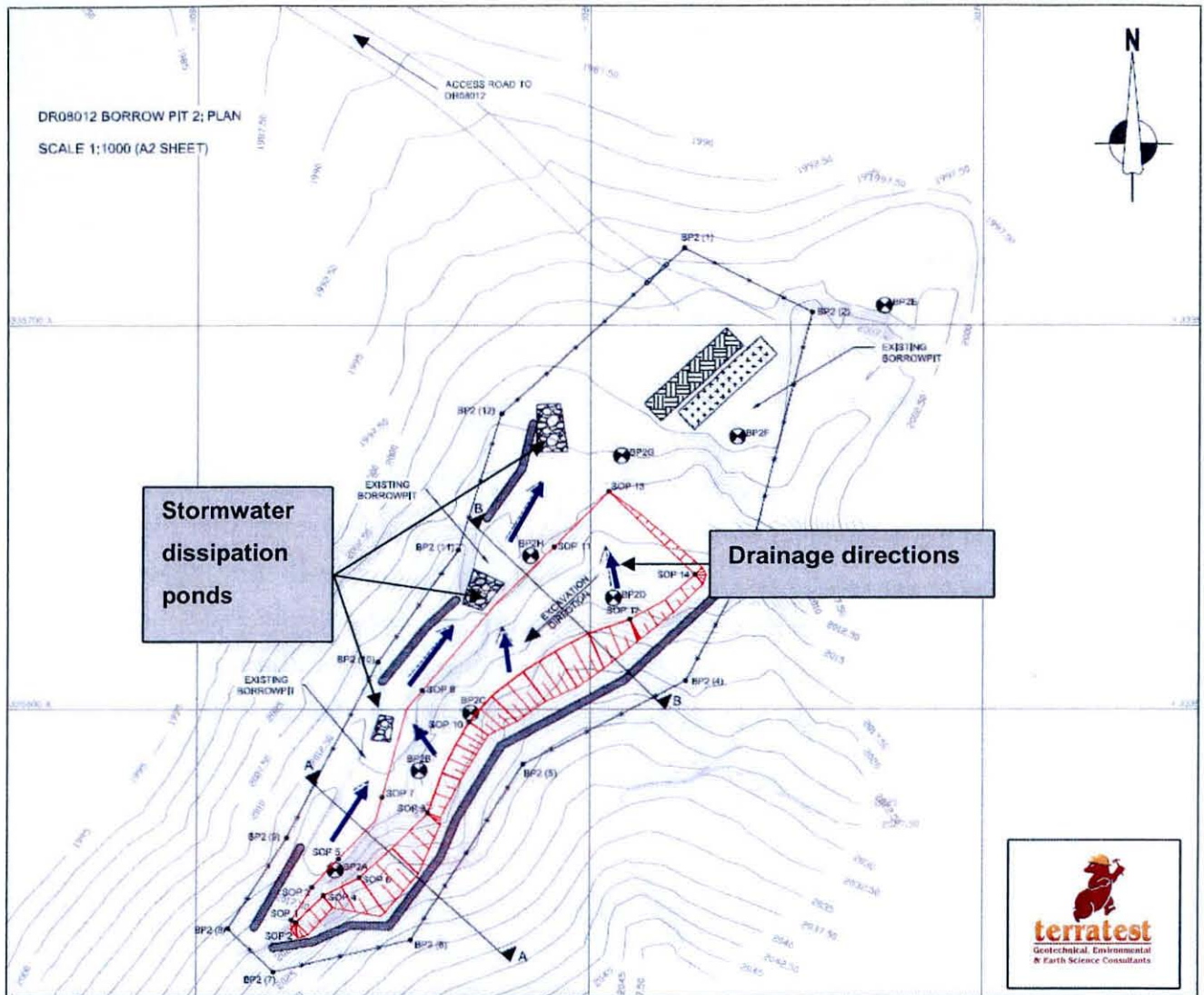
Fences

There are no fences in the vicinity of the borrow pit that will be affected by the borrow pit operation.

Natural Drainage

There are no drainage lines that originate or run through the site. The rainwater run-off from the site will however need to be managed due to the topography of the site and the surrounding area.

Recommendations: An earth berm must be put in place along the up-slope boundaries of the excavation area of the borrow pit to prevent any rainwater run-off from up-slope of the borrow pit to accumulate in the excavated area. Any rainwater that accumulates within the excavated area must be channeled off site through rock filled stormwater dissipation ponds. Stormwater management and erosion control measures must be put in place along the access road to the borrow pit.



Drainage plan for Borrow Pit 2

Vegetation

The vegetation that will be disturbed during the mining activity is limited to grasses and small woody shrubs that occur on the site. None of the species that will be affected are endangered or threatened.

Recommendations: The vegetation that will be disturbed during the mining operation will be replanted on the re-sloped, topsoiled areas during the rehabilitation phase. The following grass seed mix will be used for the revegetation of the site.

SUMMER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Themeda triandra</i>	Red Grass	5
<i>Heteropogon contortus</i>	Spear Grass	4
<i>Eragrostis racemosa</i>	Weeping Love Grass	4
<i>Eragrostis chloromelas</i>	Curly Leaf	5
<i>Eragrostis teff</i>	Giant Spear Grass	8
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	4
TOTAL		34
WINTER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	15
<i>Digitaria eriantha</i>	Smutsfinger Grass	8
<i>Eragrostis curvula</i>	Weeping Love Grass	4
<i>Panicum maximum</i>	Guinea Grass	4
TOTAL		35

It is clear that some of these grass species are not indigenous but it has to be stressed that the primary function of this seed mix is the stabilisation of disturbed and denuded areas. None of the grasses are invasives and will over time be naturally out competed by the local indigenous grasses.

Noise

The noise that is generated during the operational phase of the borrow pit will have little or no impact on the surrounding area as there is little or no inhabitants to experience this noise. The noise might however have a possible impact on the employees on site.

Recommendations: The machinery used for the excavations and the trucks used for the transporting must be fitted with the stock-standard noise dampening equipment to limit the noise generated as much as possible. The employees must be supplied with hearing protection equipment for use during the operational phase of the borrow pit.

Other

Due to the shallowness of the material to be mined relative to the surface, very little topsoil is present on the site.

Recommendations: The topsoil that can be salvaged during the first stage of the mining operation must be stockpiled and vegetated with *Panicum maximum* (Guinea Grass) or a similar grass species. This will ensure that the collected topsoil's fertility will be sustained during the stockpile period.

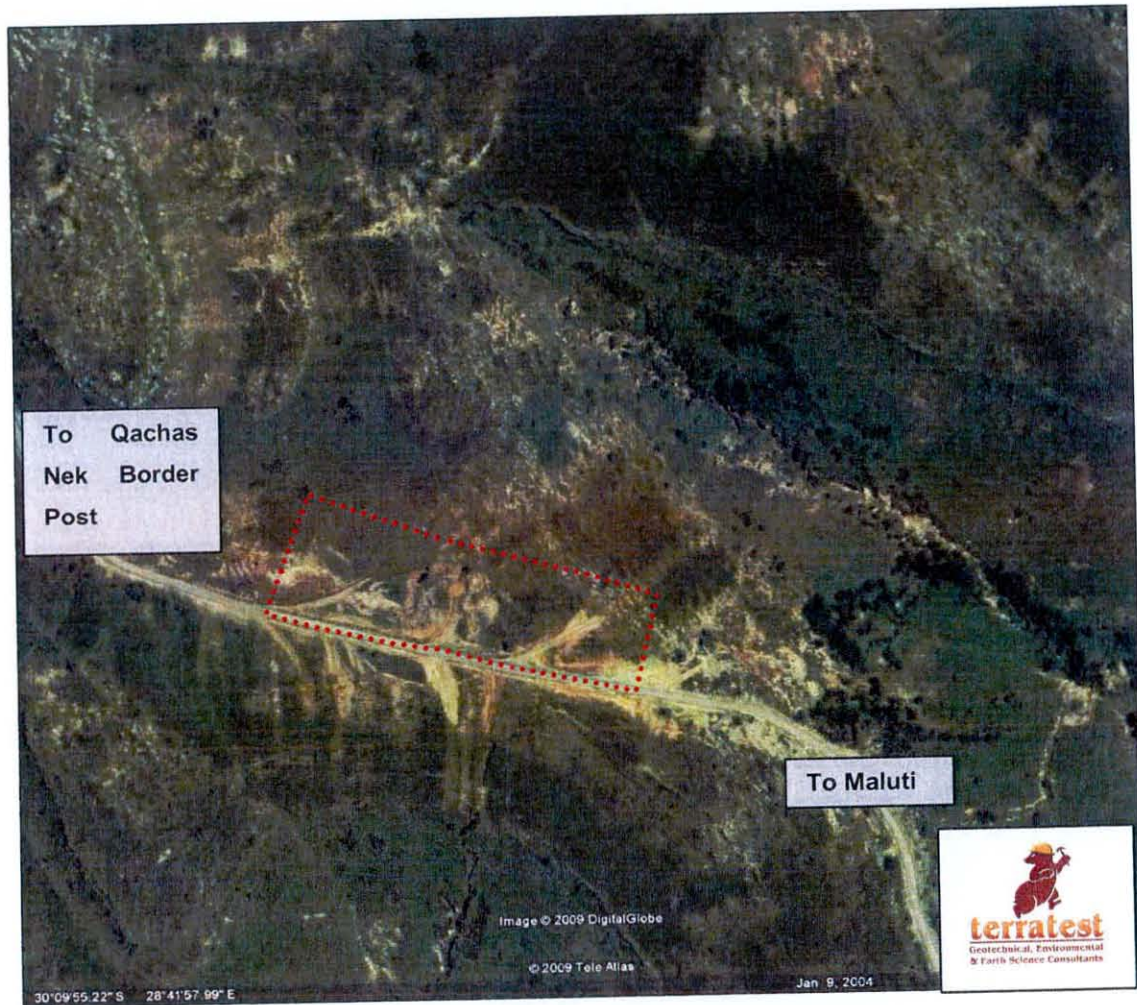
Dust will be generated during the mining activity and might have an impact on the employees on site.

Recommendations: Dust suppression measures such as spraying of the operational areas with water when necessary and/or providing the employees with dust masks if so required must be employed.

5.2 BORROW PIT 4

Location

The borrow pit is located in the Qachas Nek pass approximately 7.4km from the Qachas Nek Border Post. Access to the site is gained directly off the DR08012. The center point coordinate of the borrow pit site is S30° 10' 00.15", E28° 42' 04.93".

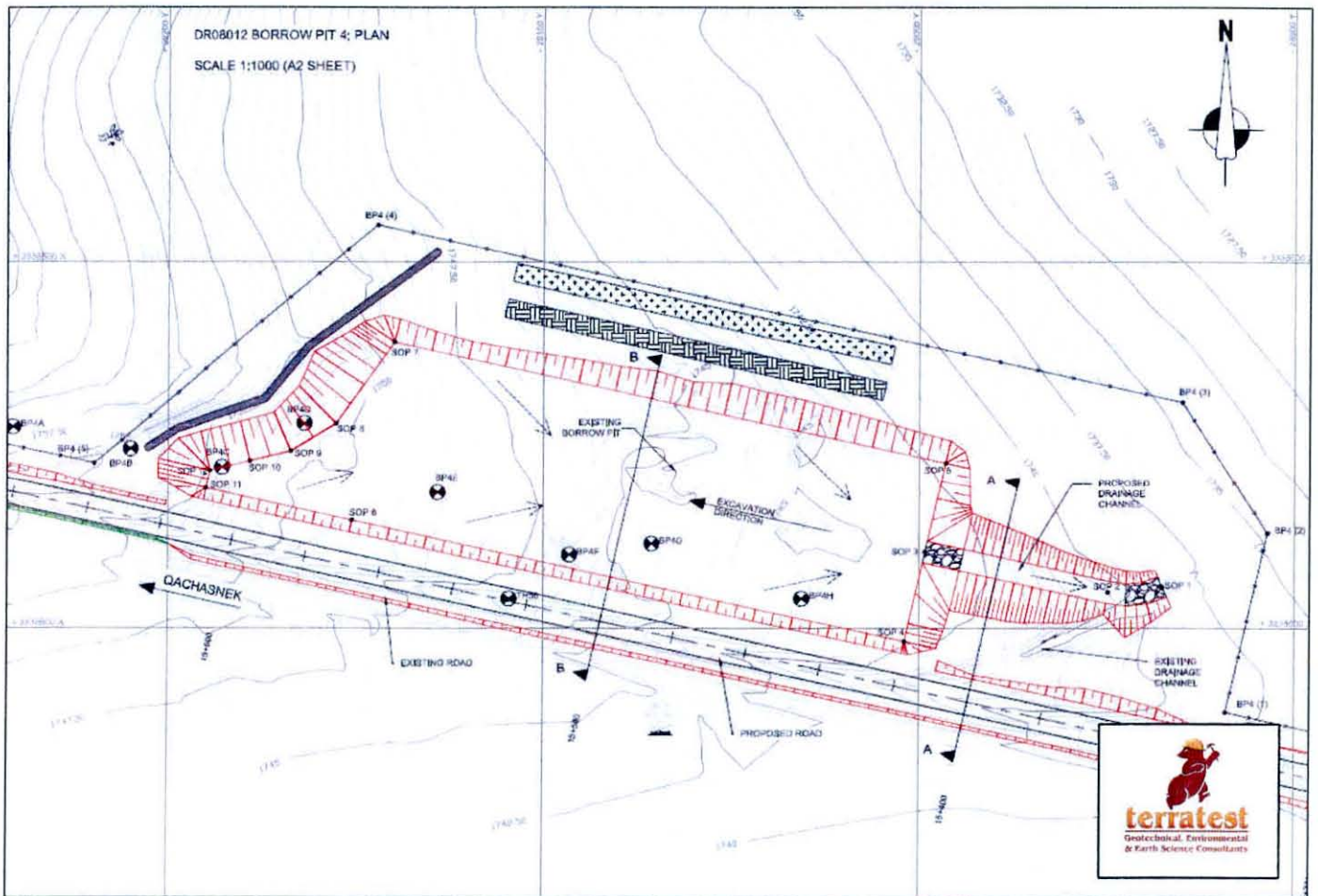


Locality of borrow pit 4 along the DR08012

Extent

The total extent of the mining area will be approximately 1.5ha between the corner points given in the attached table. A detailed surveyor drawing of the layout of the borrow pit is attached in Appendix A.

Corner Point	Latitude (S)	Longitude (E)
BP4(1)	S 30° 09' 59.86"	E 28° 41' 59.22"
BP4(2)	S 30° 09' 58.28"	E 28° 41' 59.64"
BP4(3)	S 30° 09' 57.11"	E 28° 41' 58.80"
BP4(4)	S 30° 09' 55.53"	E 28° 41' 50.81"
BP4(5)	S 30° 09' 57.63"	E 28° 41' 47.97"



Site plan of Borrow Pit 4

Detailed surveyor drawings showing the exact layout and operational directions of the borrow pit is attached in Appendix A.

Material Standards

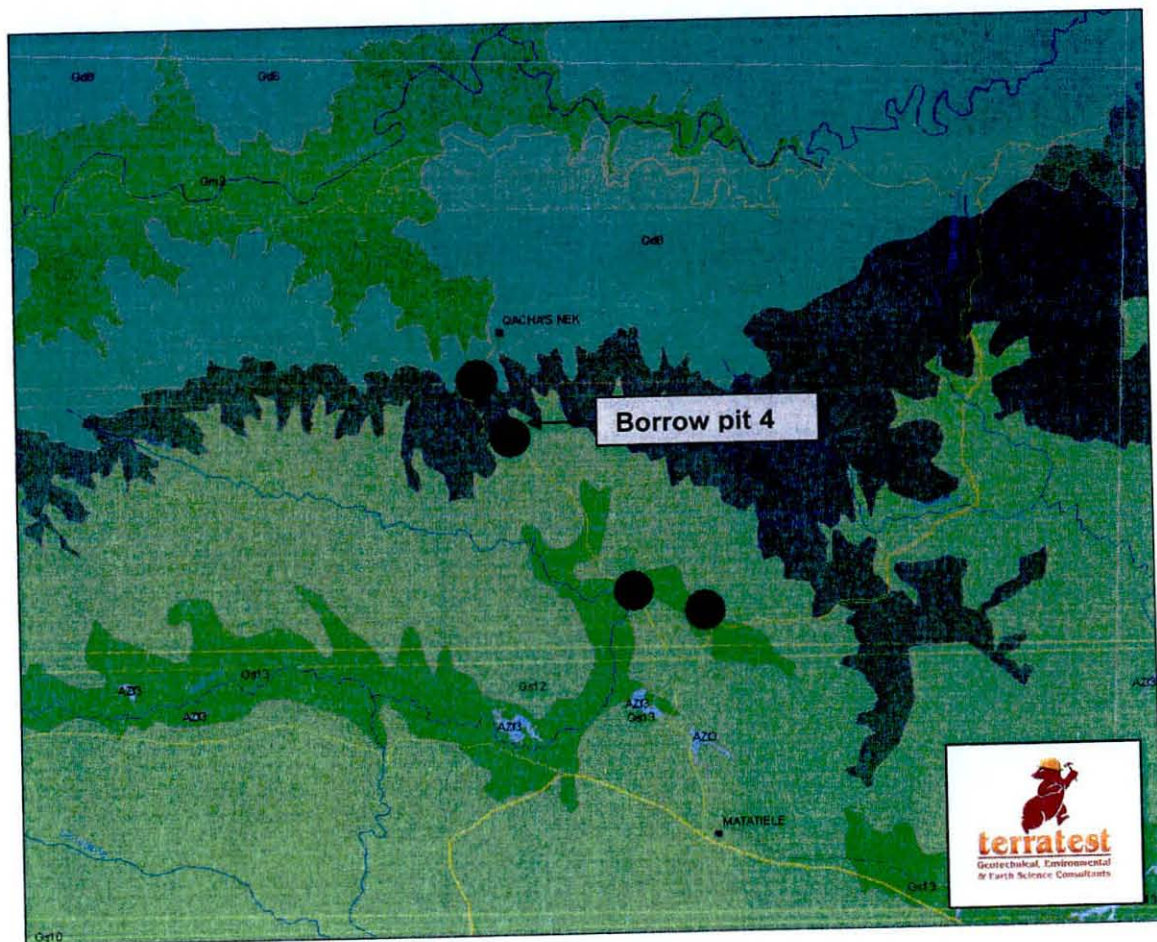
The material to be mined from the borrow pit is maroon mudstone. The full Geotechnical Report containing the material testing results is attached in Appendix D.

Community comments and Land ownership

A community meeting was held on 4 November 2008 regarding the road upgrade project and the possible use of certain areas along the road for the sourcing of road building material. The community had no objections to these activities. Minutes of this meeting are attached in Appendix B of this report.

Biophysical Description

Borrow pit 4 is located within the East Griqualand Grassland veldtype according to the classification, *The Vegetation of South Africa, Lesotho and Swaziland* (Mucina and Rutherford, 2006). The veldtype is characterized by the presence of dominating grassland species comprising *Aristida junciformis* (Ngongoni Grass), *Aristida congesta* (Tassel Three-awn) and *Elionurus muticus* (Wire Grass) and patches of bush clumps made up of *Acacia karroo* (Sweet Thorn) and *Diospyros lycioides* (Blue Bush).

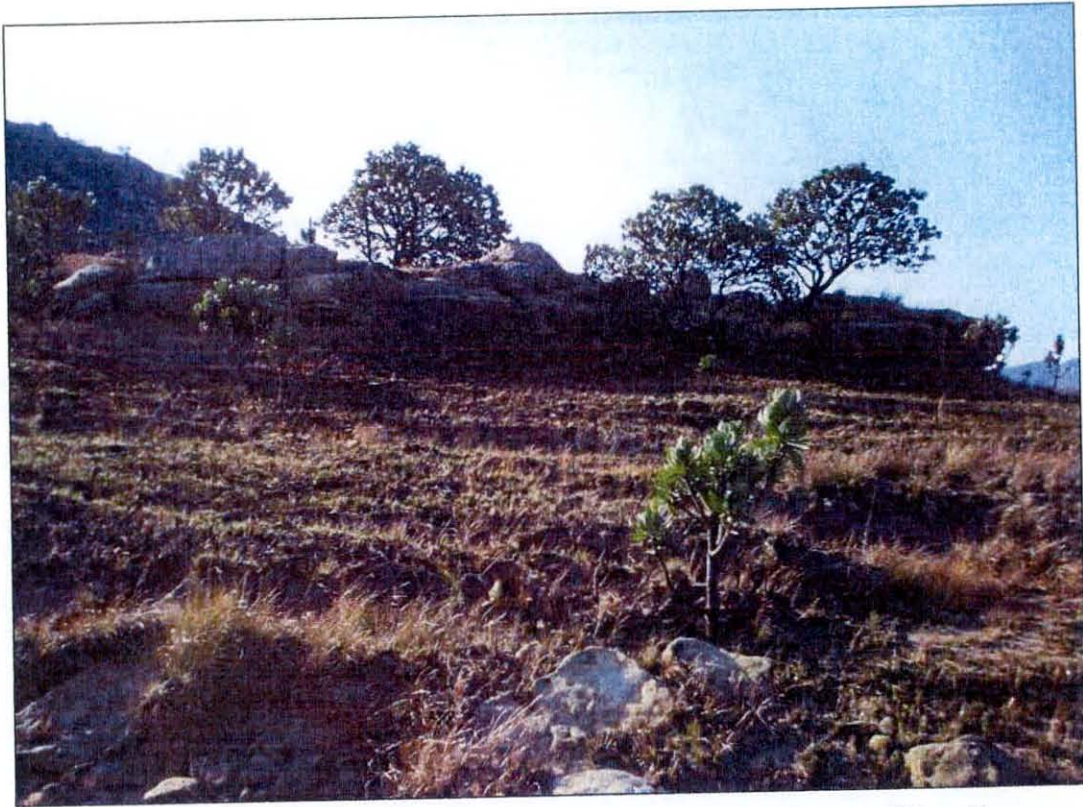


Veldtype Map



View over the borrow pit site

There are several clumps of *Protea* species occurring immediately to the northwest of the site which is the lower limits of the larger *Protea* community that occurs along the D08012.



View of the stand of *Protea* species immediately northwest of the site

The areas to the northwest of the borrow pit site are typical this vegetation type with the southeast of the area denuded of most of the occurring vegetation due to the site being illegally mined. This removal of vegetation from the site has caused parts of the site to be severely eroded. A small stand of exotic *Acacia dealbata* (Silver Wattle) has also encroached on the disturbed areas on the site.



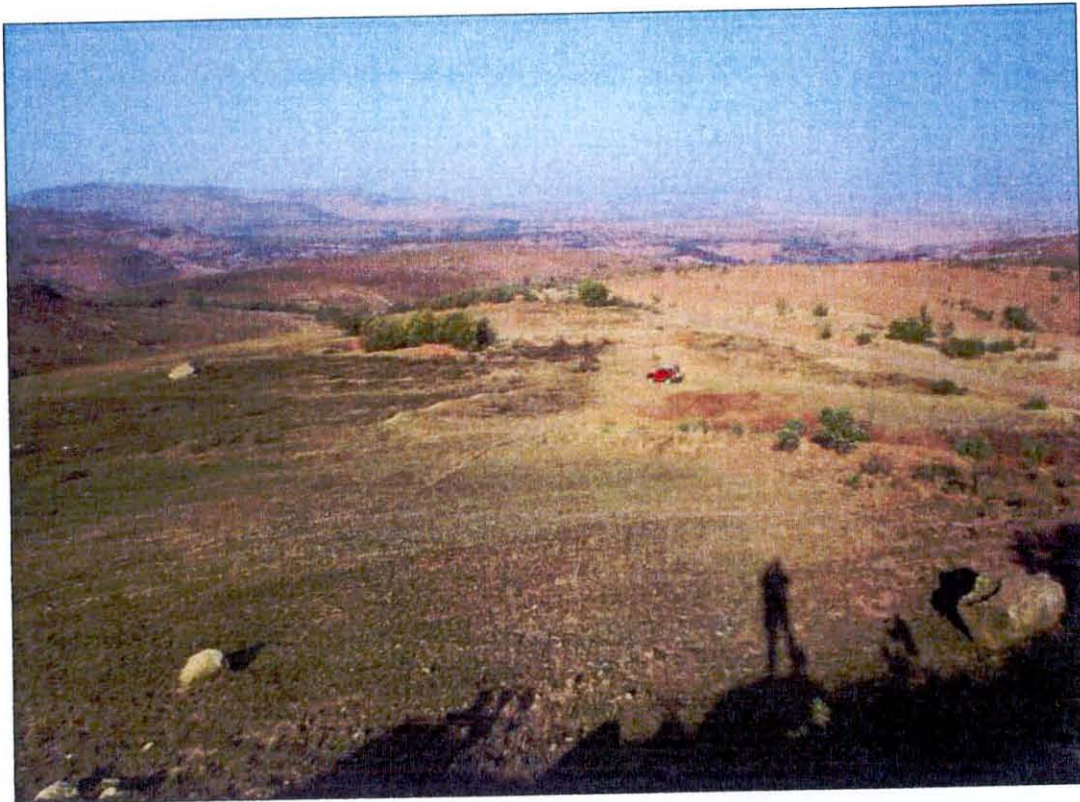
View of the severe erosion within the borrow pit site

The illegal mining on the site has resulted in the presence of various scars being present on the borrow pit site. Some of these mining scars have resulted in erosion dongas on site. It is conceivable that the mining authorization could possibly improve the overall environmental features of the site as the contractors will be held to a strict rehabilitation plan upon completion of the operation on the site.

No signs of wildlife were seen during the site visit.

Topography

The topography of the surrounding area is characterized by medium to steep slopes associated with the foothills of the Maluti Mountains lying to the north of the site. The borrow pit is located on a gentle, relatively flat northeastern facing slope.



View of the topography of the site

Drainage

There are no natural drainage lines that start or run through the site. The erosion dongas that are on the site are as a result of the removal of vegetation on the site and do not represent a natural drainage course in any way. The nearest natural drainage line is located approximately 340m to the east and northeast of the site. Due to the location of the site on a relatively flat area surrounded by medium to steep slopes it should be possible to rehabilitate the borrow pit site to be free draining with limited or no ponding upon completion of the mining activity.

Social Environment

The borrow pit is located on vacant land on the foothills of the Maluti Mountains with the registered landowner being the Republic of South Africa. The closest build up area to the borrow pit is estimated to be approximately 2.5km to the south and southeast of the site.

Heritage Resources

The South African Heritage Resources Association (SAHRA) required the completion of a Heritage Impact Assessment for the road alignment. The assessment of the possible heritage importance of the borrow pits was included in the consultant's

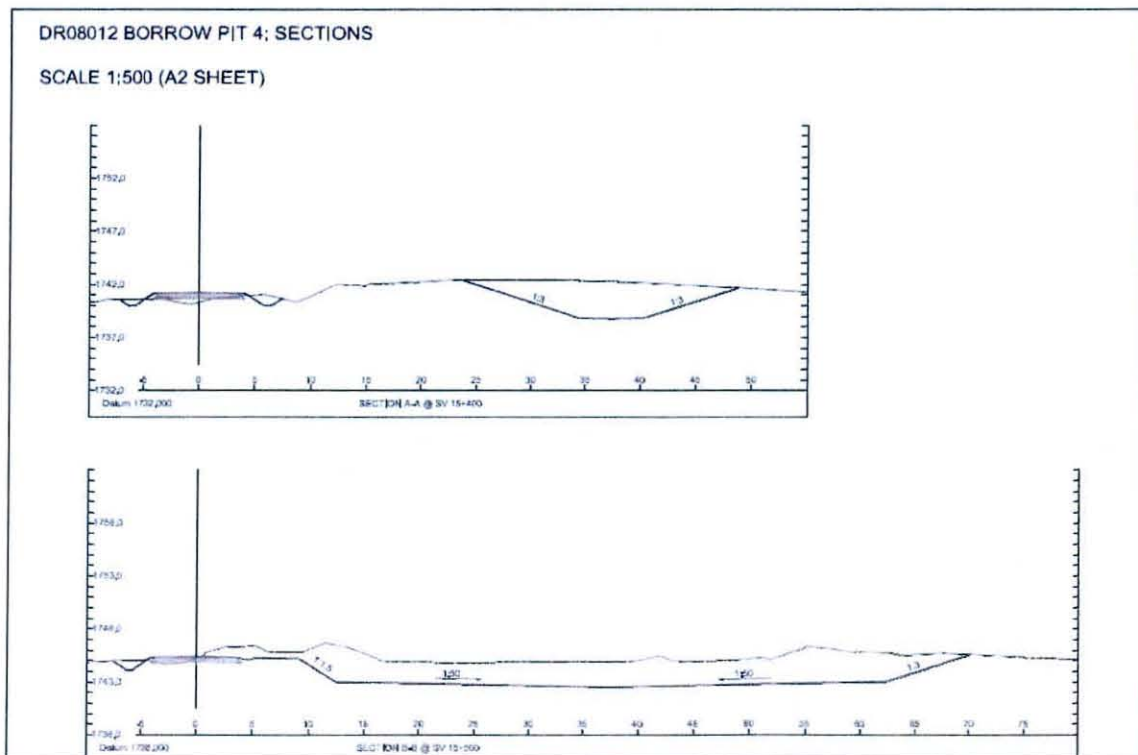
terms of reference. No artifacts of heritage importance were identified by the consultant. A copy of the Heritage Impact report is attached in Appendix C of this report.

Impacts

Visual

The visual impact of the borrow pit could possibly be significant without any rehabilitation since the borrow pit is situated immediately to the northeast of the D08012 road. The borrow pit and the operations within will be clearly visible to the road users. Currently the borrow pit is characterised by erosion dongas as a result of previous illegal mining activities which result in a current visual impact.

Recommendations: Care must be taken in the layout and design to ensure that the working of the borrow pit is done in defined mining directions which can be rehabilitated successfully. The rehabilitation must include the shaping of the topography of the borrow pit upon completion of the operations. This should take place on an ongoing basis as the mining operation proceeds through the site. The site must also be vegetated with an indigenous grass seed mix upon completion of the operations. A full surveyor drawing showing the profile and mining plan is attached in Appendix B.



Planned final profile

Overhead Services

There are no overhead services that will be affected by the borrow pit operation.

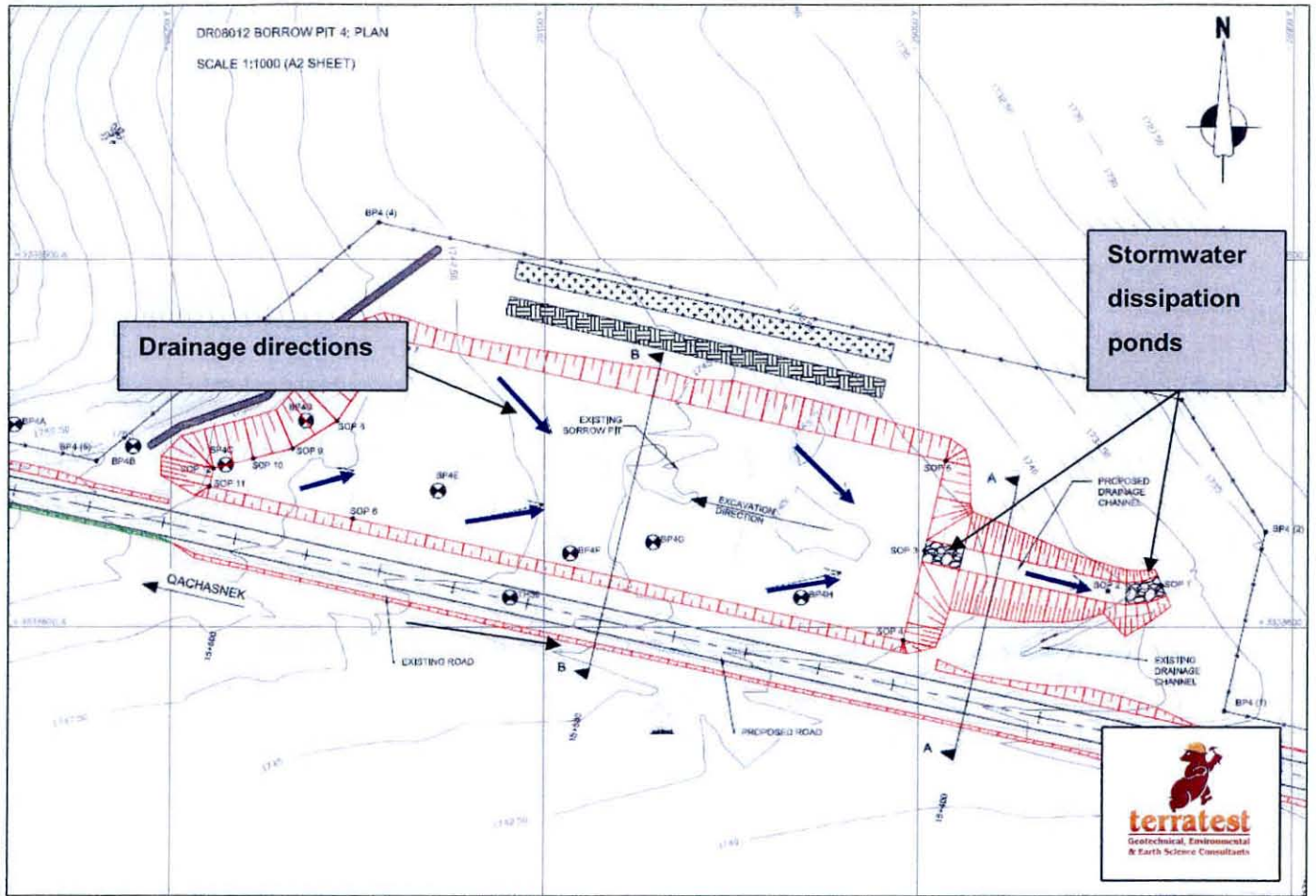
Fences

There are no fences in the vicinity of the borrow pit that will be affected by the borrow pit operation.

Natural Drainage

There are no drainage lines that originate or run through the site. The onsite erosion dongas are as a result of the illegal mining activities that have taken place on the site. The rainwater run-off from the site will however need to be managed due to the topography of the site and the surrounding area.

Recommendations: An earth berm must be put in place along the up-slope boundaries of the excavation area of the borrow pit to prevent any rainwater run-off from up-slope of the borrow pit to accumulate in the excavated area. Any rainwater that accumulates within the excavated area must be channeled off site through rock filled stormwater dissipation ponds.



Drainage plan for Borrow Pit 4

Vegetation

The vegetation that will be disturbed during the mining activity is limited to grasses, small woody shrubs and some exotic small tree species. None of the species that will be affected are endangered or threatened.

Recommendations: The vegetation that will be disturbed during the mining operation will be replanted on the re-sloped, topsoiled areas during the rehabilitation phase of the project. The following grass seed mix will be used for the revegetation of the site.

SUMMER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Themeda triandra</i>	Red Grass	5
<i>Heteropogon contortus</i>	Spear Grass	4
<i>Eragrostis racemosa</i>	Weeping Love Grass	4
<i>Eragrostis chloromelas</i>	Curly Leaf	5

<i>Eragrostis teff</i>	Giant Spear Grass	8
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	4
TOTAL		34
WINTER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	15
<i>Digitaria eriantha</i>	Smutsfinger Grass	8
<i>Eragrostis curvula</i>	Weeping Love Grass	4
<i>Panicum maximum</i>	Guinea Grass	4
TOTAL		35

Please note that some of these grass species are not indigenous but it has to be stressed that the primary function of this seed mix is the stabilisation of disturbed and denuded areas for protection against erosion. None of the grasses are invasives and will over time be naturally out competed by the local indigenous grasses.

Noise

The noise that is generated during the operational phase of the borrow pit will have little or no impact on the surrounding area as there are little or no inhabitants within a 2.5km radius of the site. The noise might however have a possible impact on the employees on site.

Recommendations: The machinery used for the excavations and the trucks used for the transporting of the materials must be fitted with the stock-standard noise dampening equipment to limit the noise generated as much as possible. The employees must be supplied with hearing protection equipment for use during the operational phase of the borrow pit.

Other

Due to the shallowness of the material to be mined relative to the surface, very little topsoil is present on the site.

Recommendations: The topsoil that can be salvaged during the first stage of the mining operation must be stockpiled and vegetated with *Panicum maximum* (Guinea Grass) or a similar grass species. This will ensure that the collected topsoil's fertility will be sustained during the stockpile period.

Dust will be generated during the mining activity and might have an impact on the employees on site.

Recommendations: Dust suppression measures such as spraying of the operational areas with water when necessary and/or providing the employees with dust masks if so required must be employed.

5.3 BORROW PIT 5

Location

The borrow pit is located along the DR08012 road, approximately 4.5km from the town of Maluti. Access to the site is gained directly off the DR08012. The center point coordinate of the borrow pit is S30° 13' 54.89", E28° 45' 39.45".

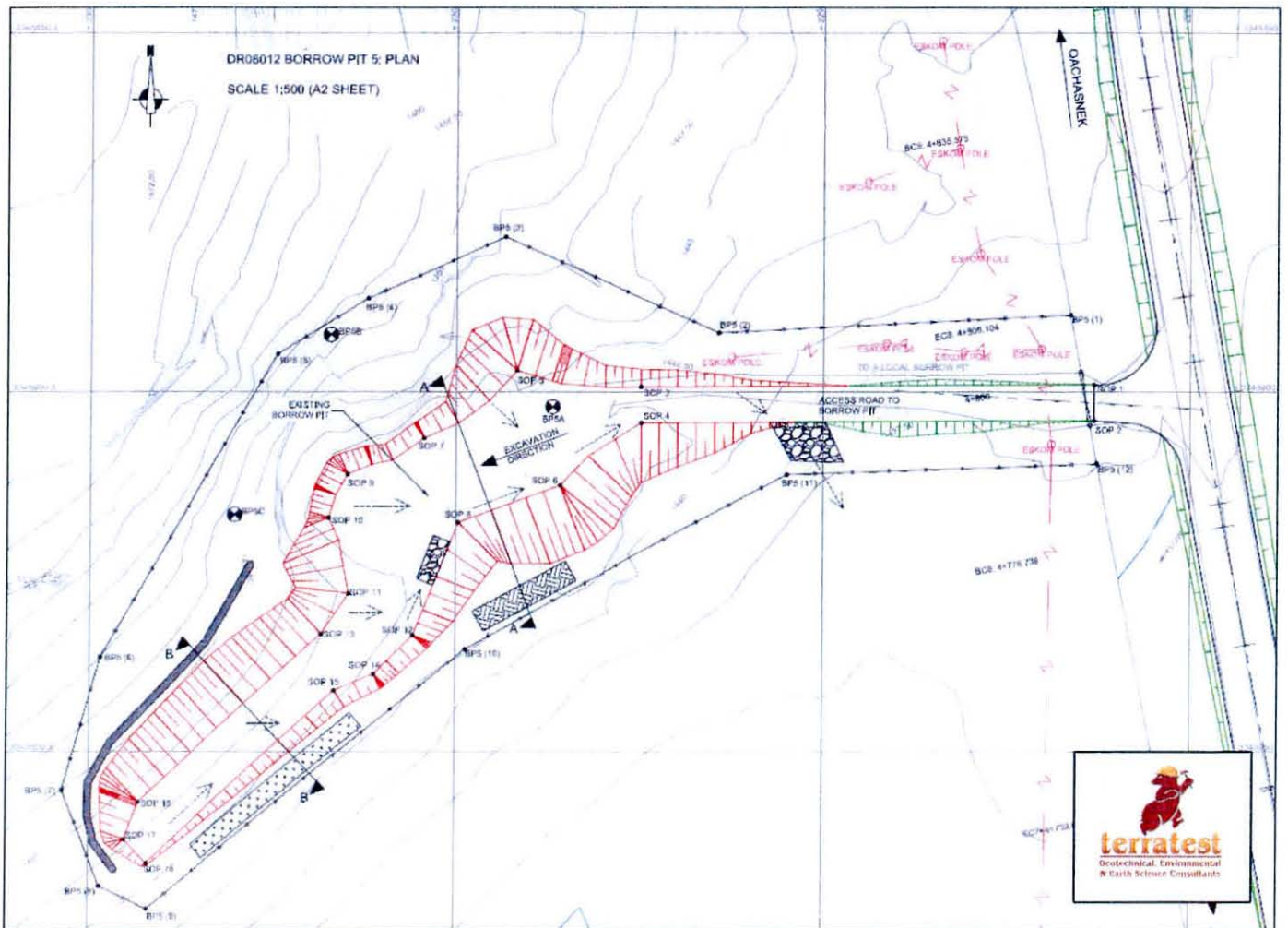


Locality of borrow pit 5 along the DR08012

Extent

The total extent of the mining area will be approximately 1.5ha between the corner points given in the attached table. A detailed surveyor drawing of the layout of the borrow pit is attached in Appendix A.

Corner Point	Latitude (S)	Longitude (E)
BP5(1)	S 30° 13' 56.29"	E 28° 45' 42.97"
BP5(2)	S 30° 13' 56.37"	E 28° 45' 41.18"
BP5(3)	S 30° 13' 55.94"	E 28° 45' 40.08"
BP5(4)	S 30° 13' 56.21"	E 28° 45' 39.39"
BP5(5)	S 30° 13' 56.46"	E 28° 45' 38.93"
BP5(6)	S 30° 13' 57.83"	E 28° 45' 38.02"
BP5(7)	S 30° 13' 58.43"	E 28° 45' 37.83"
BP5(8)	S 30° 13' 58.86"	E 28° 45' 38.02"
BP5(9)	S 30° 13' 58.97"	E 28° 45' 38.26"
BP5(10)	S 30° 13' 57.80"	E 28° 45' 39.88"
BP5(11)	S 30° 13' 57.01"	E 28° 45' 41.52"
BP5(12)	S 30° 13' 56.96"	E 28° 45' 43.10"



Site plan of Borrow Pit 5

Detailed surveyor drawings showing the exact layout and operational directions of the borrow pit are attached in Appendix A.

Material Standards

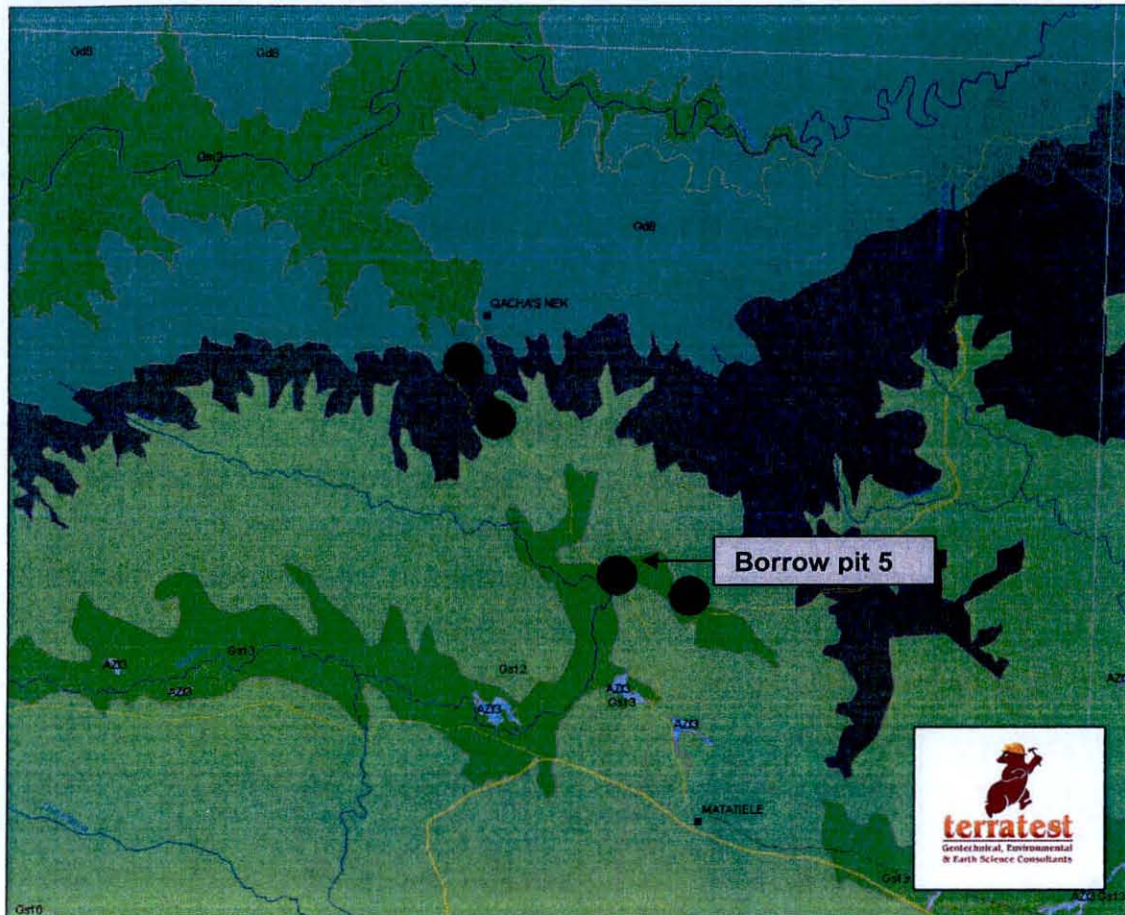
The material to be mined from the borrow pit is mudstone and weathered dolerite. The full Geotechnical Report containing the material testing results is attached in Appendix D.

Community comments and Landownership

A community meeting was held on 4 November 2008 regarding the road upgrade project and possible use of certain areas along the road for the sourcing of road building material. The community had no objections to these activities. Minutes of this meeting are attached in Appendix B of this report.

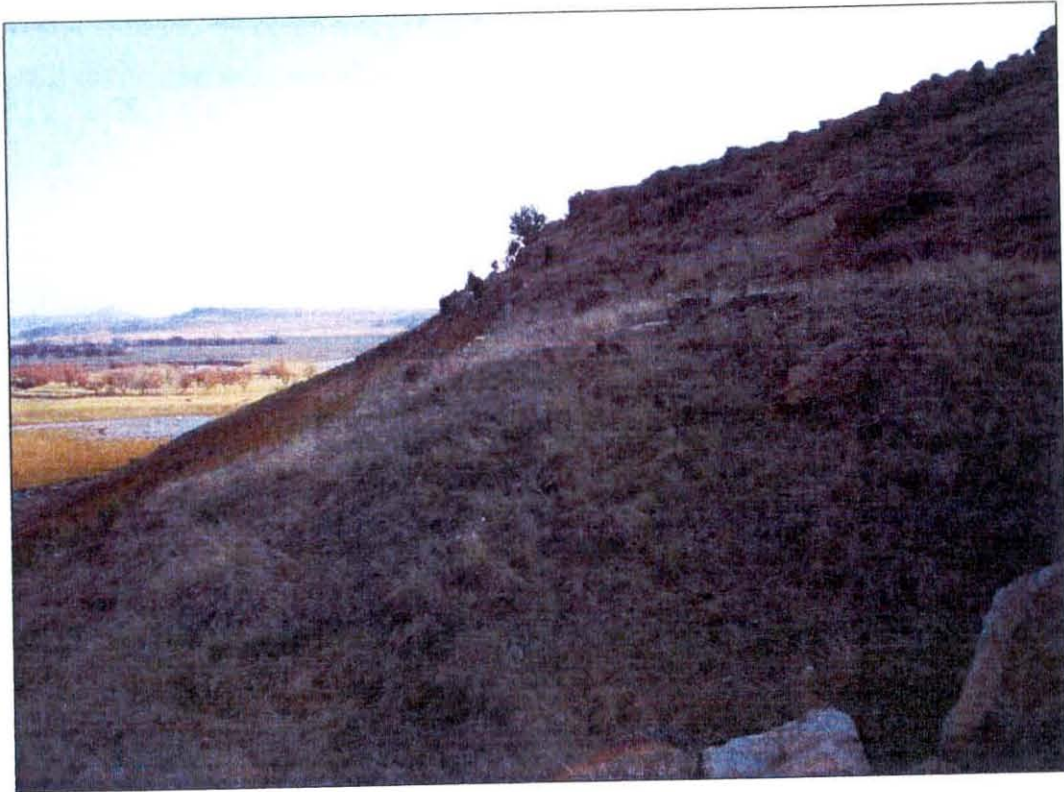
Biophysical Description

Borrow pit 5 is located on the boundary between the East Griqualand Grassland and the Mabela Sandy Grassland veldtypes. The latter veldtype occurs within flat valley basins. The borrow pit is located on the verge of such a valley basin. This aspect and the vegetation that occur on the borrow pit site is an indication that the borrow pit is located within the former veldtype.



Veldtype Map

The vegetation on the site is characterized by the presence of grass species which are limited to *Aristida junciformis* (Ngongoni Grass), *Aristida congesta* (Tassel Three-awn) and *Elionurus muticus* (Wire Grass). There are no woody shrubs present on the site. This is possibly the result of these plants being utilized for firewood by the nearby local community.



View over the borrow pit site



View over the borrow pit site

The illegal mining on the site has resulted in the presence of various scars being present on the borrow pit site. Some of these mining scars have resulted in erosion

dongas on site. It is conceivable that the mining authorization could possibly improve the overall environmental features of the site as the contractors will be held to a strict rehabilitation plan upon completion of the operation on the site.

No signs of wildlife were seen during the site visit.

Topography

The topography of the surrounding area is characterized by a medium slope towards the north and a floodplain towards the south. The borrow pit is located on the medium slope on the boundary with the floodplain.



View of the topography of the site

Drainage

There are no natural drainage lines that originate or run through the site. The erosion dongas that are on the site are as a result of the illegal mining operations that have taken place on the site and do not represent a natural drainage course in any way. The nearest natural drainage line is located immediately south of the borrow pit and is the flood plain associated with the Kinira River.



View of the flood plain associated with the Kinira River

Social Environment

The borrow pit is located on vacant land on the approaches to the foothills of the Maluti Mountains with the registered landowner being the Republic of South Africa. Residential houses from a section of the Nchodu local community are in very close proximity to the proposed borrow pit.

Heritage Resources

The South African Heritage Resources Association (SAHRA) required the completion of a Heritage Impact Assessment for the road alignment. The assessment of the possible heritage importance of the borrow pits was included in the consultant's terms of reference. No artifacts of heritage importance were identified by the consultant. A copy of the Heritage Impact report is attached in Appendix E of this report.

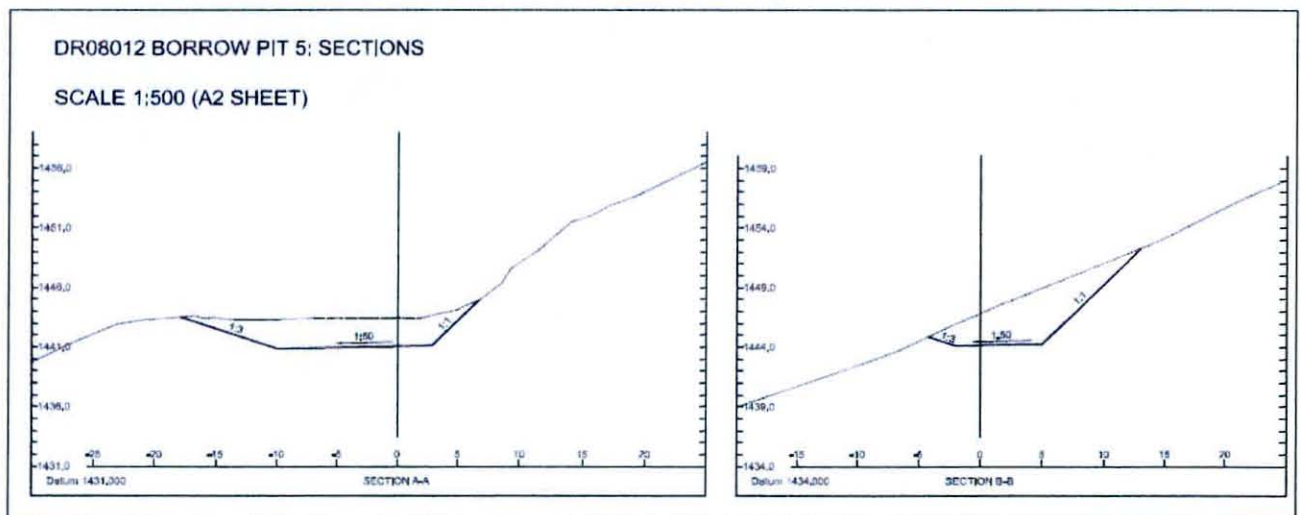
Impacts

Visual

The visual impact of the borrow pit could possibly be significant without any rehabilitation since the borrow pit is situated immediately to the west of the D08012

road. The borrow pit and operations within will be clearly visible to the road users. Currently the borrow pit area is characterised by erosion dongas as a result of previous illegal mining activities which resulted in a current visual impact.

Recommendations: Care must be taken in the layout and design to ensure that the working of the borrow pit is done in defined mining directions which can be rehabilitated successfully. The rehabilitation must include the shaping of the topography of the borrow pit upon completion of the operations. This should take place on an ongoing basis as the mining operation proceeds through the site. The site must also be vegetated with an indigenous grass seed mix upon completion of the operations. A full surveyor drawing showing the profile and mining plan is attached in Appendix B.



Planned final profile

Overhead Services

There are no overhead services that will be affected by the borrow pit operation.

Fences

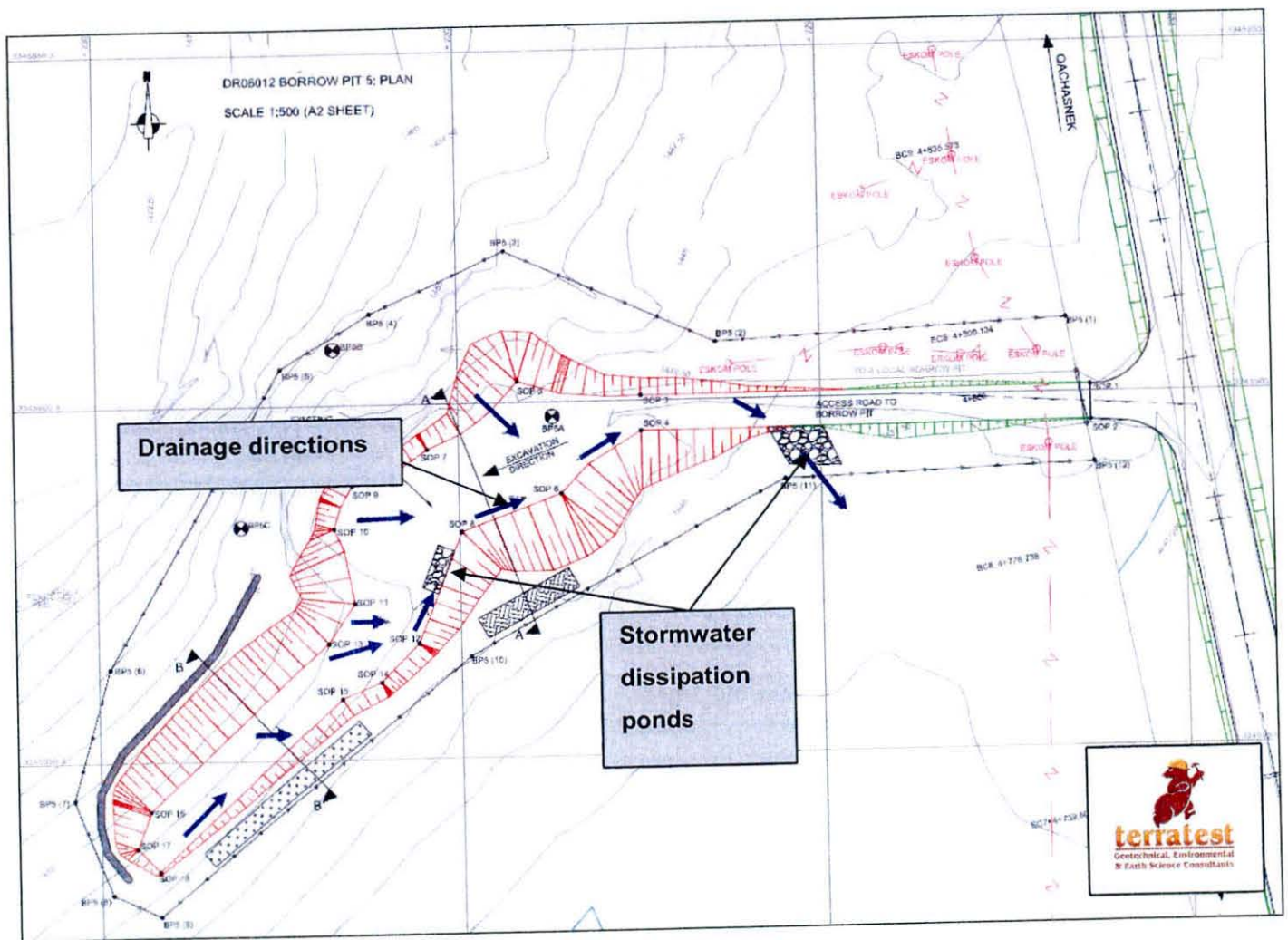
There are no fences in the vicinity of the borrow pit that will be affected by the borrow pit operation.

Natural Drainage

There are no drainage lines that originate or run through the site. The floodplain of the Kinira River is located immediately to the south of the borrow pit site which might be impacted upon by the run-off from the operational areas of the borrow pit. These

impacts might include siltation and possible contamination of the water from petrochemicals spillages within the borrow pit.

Recommendations: An earth berm must be created along the southern boundary of the borrow pit which will prevent any uncontrolled run-off from the borrow pit to flow into the floodplain area. The run-off from the site must be channeled into a stormwater dissipation pond from where the water must be released into the neighbouring natural drainage system. All possible spillages must be contained immediately within the borrow pit, collected and disposed off at a landfill facility that is registered to accommodate these materials.



Drainage plan for Borrow Pit 5

Vegetation

The vegetation that will be disturbed during the mining activity is limited to grasses and other small herbaceous species. None of the species that will be affected are endangered or threatened.

Recommendations: The vegetation that will be disturbed during the mining operation will be replanted on the re-shaped, topsoiled areas during the rehabilitation phase of the project. The following grass seed mix will be used for the revegetation of the site.

SUMMER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Heteropogon contortus</i>	Spear Grass	4
<i>Eragrostis racemosa</i>	Weeping Love Grass	4
<i>Eragrostis chloromelas</i>	Curly Leaf	5
<i>Eragrostis teff</i>	Giant Spear Grass	8
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	4
TOTAL		29
WINTER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	15
<i>Digitaria eriantha</i>	Smutsfinger Grass	8
<i>Eragrostis curvula</i>	Weeping Love Grass	4
<i>Panicum maximum</i>	Guinea Grass	4
TOTAL		35

Please note that some of these grass species are not indigenous but it has to be stressed that the primary function of this seed mix is the stabilisation of disturbed and denuded area for protection against erosion. None of the grasses are invasives and will over time be naturally out competed by the local indigenous grasses.

Noise

The noise that is generated during the operational phase of the borrow pit will have an effect on the surrounding area since the nearest residential houses are

approximately 100m away from the site. The noise might also have an impact on the employees on site.

Recommendations: Operations must be limited to normal working hours (07:00 – 17:00) from Monday to Friday and from 07:00 – 15:00 on Saturdays. No operations in the borrow pit will be allowed on Sundays and Public Holidays. The machinery used for the operations and the trucks used for the transporting of the materials must be fitted with the stock-standard noise dampening equipment to limit the noise generated as much as possible. The employees must be supplied with hearing protection for use during the operational phase of the borrow pit.

Other

Due to the shallowness of the material to be mined relative to the surface, very little topsoil is present on the site.

Recommendations: The topsoil that can be salvaged during the first stage of the mining operation must be stockpiled and vegetated with *Panicum maximum* (Guinea Grass) or a similar grass species. This will ensure that the collected topsoil's fertility will be sustained during the stockpile period.

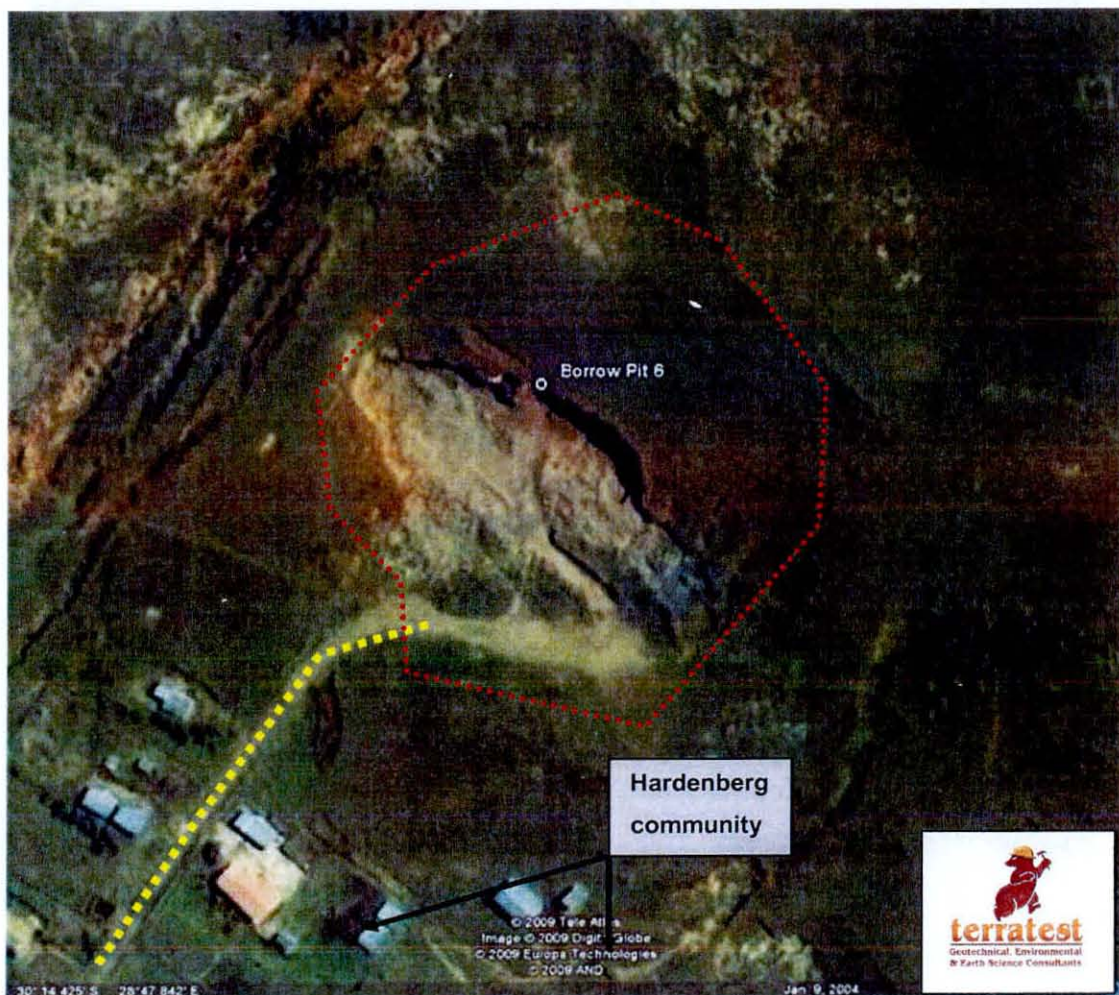
Dust will be generated during the mining activity and might have an impact on the employees and the nearby residents.

Recommendations: Dust suppression measures such as spraying of the operational areas with water when necessary and/or providing the employees with dust masks if so required must be employed.

5.4 BORROW PIT 6A

Location

The borrow pit is located in close proximity of the Hardenberg community, approximately 3.5km from the settlement of Maluti. Access to the site is gained via a short access road off the Hardenberg – Maluti connecting road. The center point coordinate of the borrow pit is S30° 14' 24.90", E28° 47' 50.00".

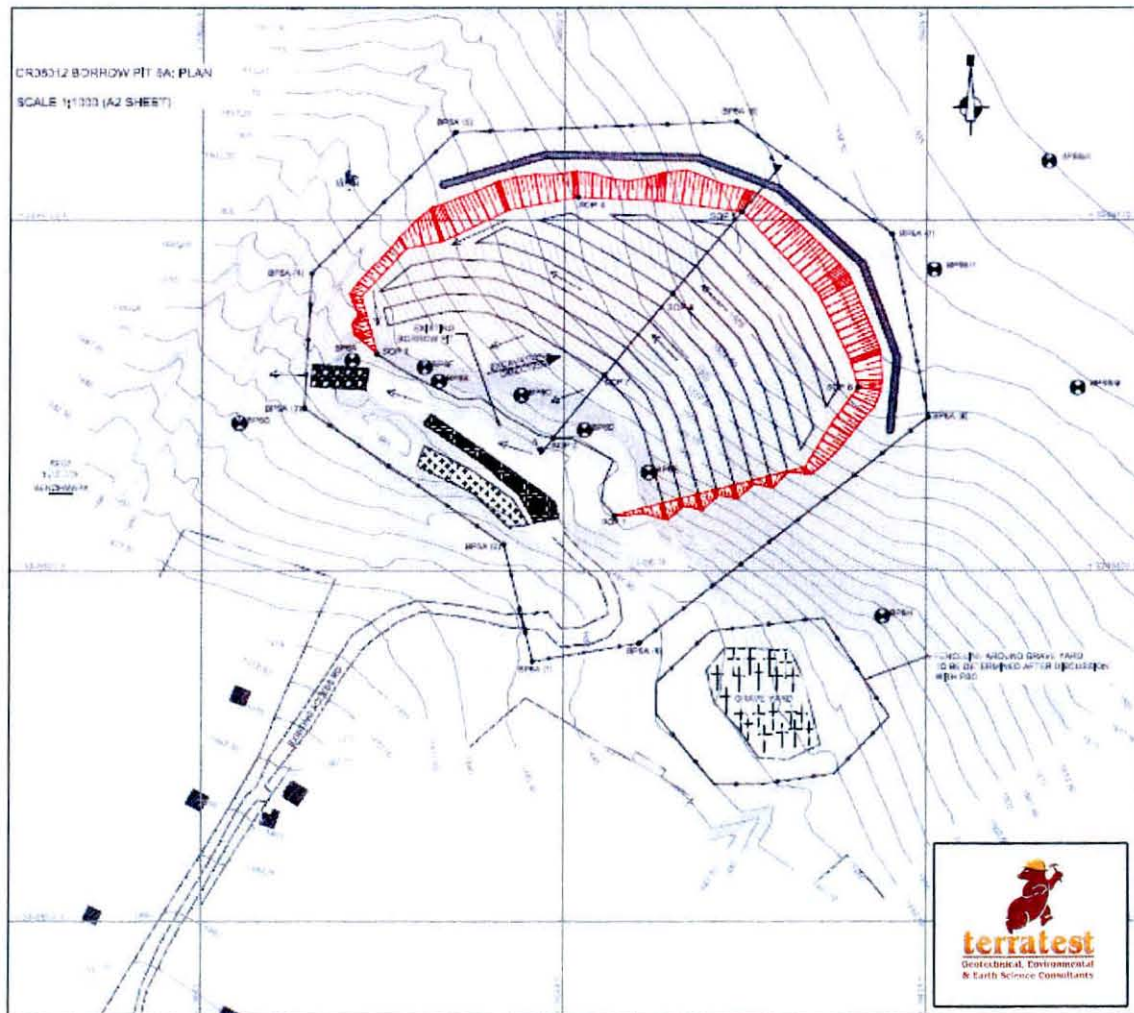


Locality of borrow pit 6A on the verges of the Hardenberg community

Extent

The total extent of the mining area will be approximately 1.5ha between the corner points given in the attached table. A detailed surveyor drawing of the layout of the borrow pit is attached in Appendix A.

Corner Point	Latitude (S)	Longitude (E)
BP6A (1)	S 30° 14' 26.92"	E 28° 47' 50.34"
BP6A (2)	S 30° 14' 25.84"	E 28° 47' 50.05"
BP6A (3)	S 30° 14' 24.58"	E 28° 47' 47.97"
BP6A (4)	S 30° 14' 23.33"	E 28° 47' 48.05"
BP6A (5)	S 30° 14' 22.02"	E 28° 47' 49.53"
BP6A (6)	S 30° 14' 21.93"	E 28° 47' 52.47"
BP6A (7)	S 30° 14' 22.97"	E 28° 47' 54.06"
BP6A (8)	S 30° 14' 24.67"	E 28° 47' 58.18"
BP6A (9)	S 30° 14' 26.76"	E 28° 47' 51.47"



Site plan of Borrow pit 6A

Detailed surveyor drawings showing the exact layout and operational directions of the borrow pit are attached in Appendix A.

Material Standards

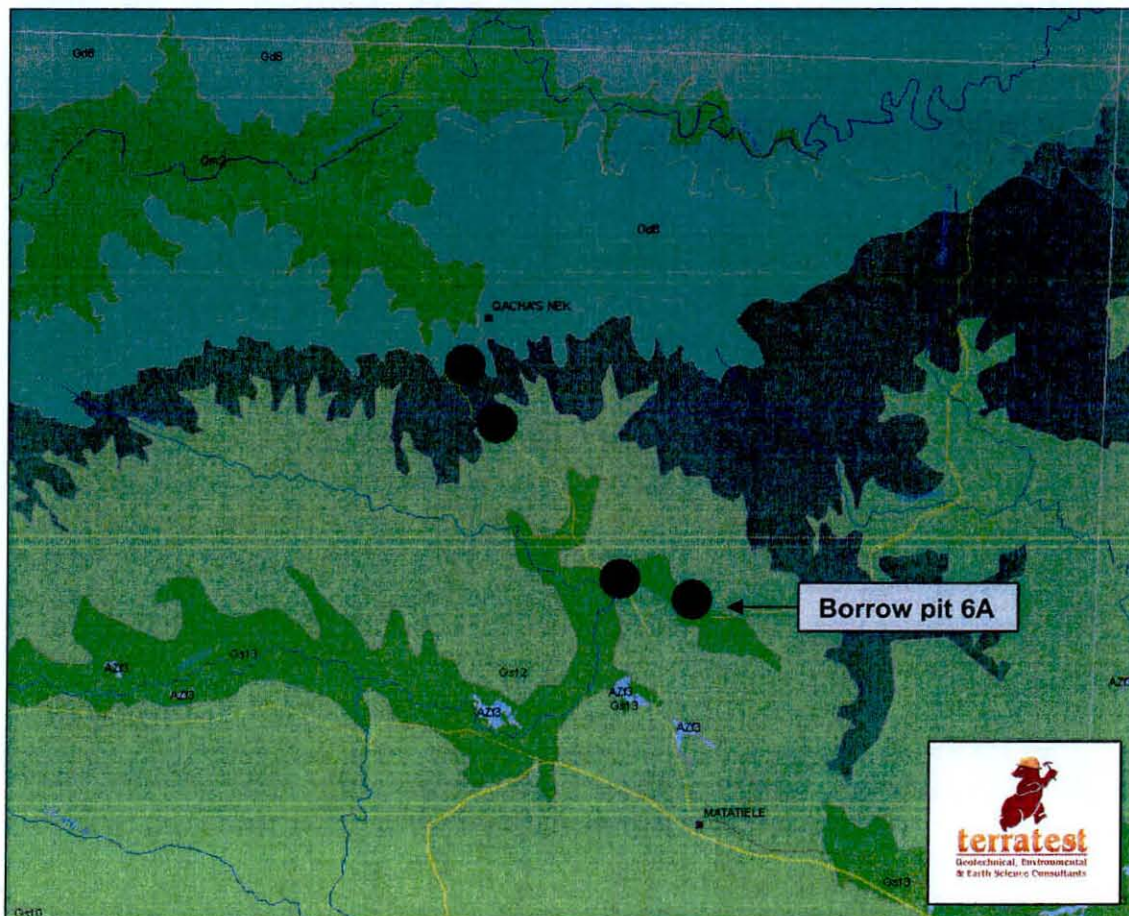
The material to be mined from the borrow pit is weathered dolerite. The full Geotechnical Report containing the material testing results is attached in Appendix D.

Community comments and Landownership

A community meeting was held on 4 November 2008 regarding the road upgrade project and possible use of certain areas along the road for the sourcing of road building material. The community had no objections to these activities. Minutes of this meeting are attached in Appendix B of this report.

Biophysical Description

Borrow pit 6A is located on the boundary between the East Griqualand Grassland and the Mabela Sandy Grassland veldtypes. The latter veldtype occurs within flat valley basins. The borrow pit is located on the verge of such a valley basin. This aspect and the vegetation that occurs on the borrow pit site is an indication that the borrow pit is located within the former veldtype.



Veldtype Map

The vegetation on the site is characterized by the presence of grass species which are limited to *Aristida junciformis* (Ngongoni Grass), *Aristida congesta* (Tassel Three-awn) and *Elionurus muticus* (Wire Grass). There are no woody shrubs present on the site. This is possibly the result of these plants being utilized for firewood by the nearby local community and the relative exposed area on and surrounding the site.



View over the borrow pit site



View over the borrow pit site

Previous mining activities on the site have resulted in the presence of a high vertical mining face which is deemed to be very unsafe. The site is currently used as grazing for the livestock from the local community.



View of the dangerous vertical face

No signs of wildlife were seen during the site visit.

Topography

The topography of the surrounding area is characterized by steep slopes to the northeast and the southwest with a relatively flat plateau extending between the 1500m contour. It is the intention to extend the planned benches of the borrow pit into these slopes in a southwesterly direction.



View of the topography of the site

Drainage

There are no natural drainage lines that originate or run through the site. The nearest natural drainage line is located approximately 35m to the northwest of the site. Water from this drainage line feeds into the Kinira River approximately 550m to the northwest of the site.



View of the flood plain associated with the Kinira River

Social Environment

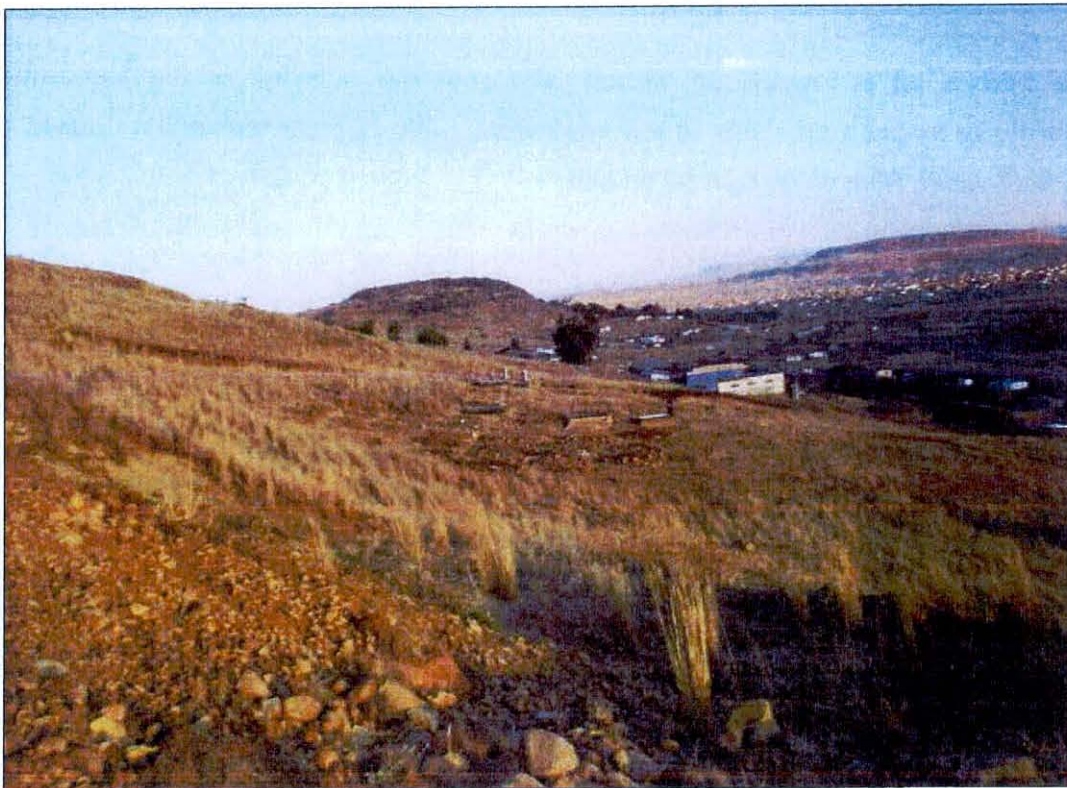
The borrow pit is located on vacant land with the outskirts of the Hardenberg community in close proximity to the southwest. The nearest residential houses are situated within 50m of the borrow pit site.

Heritage Resources

The South African Heritage Resources Association (SAHRA) required the completion of a Heritage Impact Assessment for the road alignment. The assessment of the possible heritage importance of the borrow pits was included in the consultant's terms of reference. No artifacts of heritage importance were identified by the consultant. However, a communal gravesite is in the proximity (to the southeast) of the borrow pit, but the operation of the borrow pit will not extend towards these graves.



Close up view of the gravesite



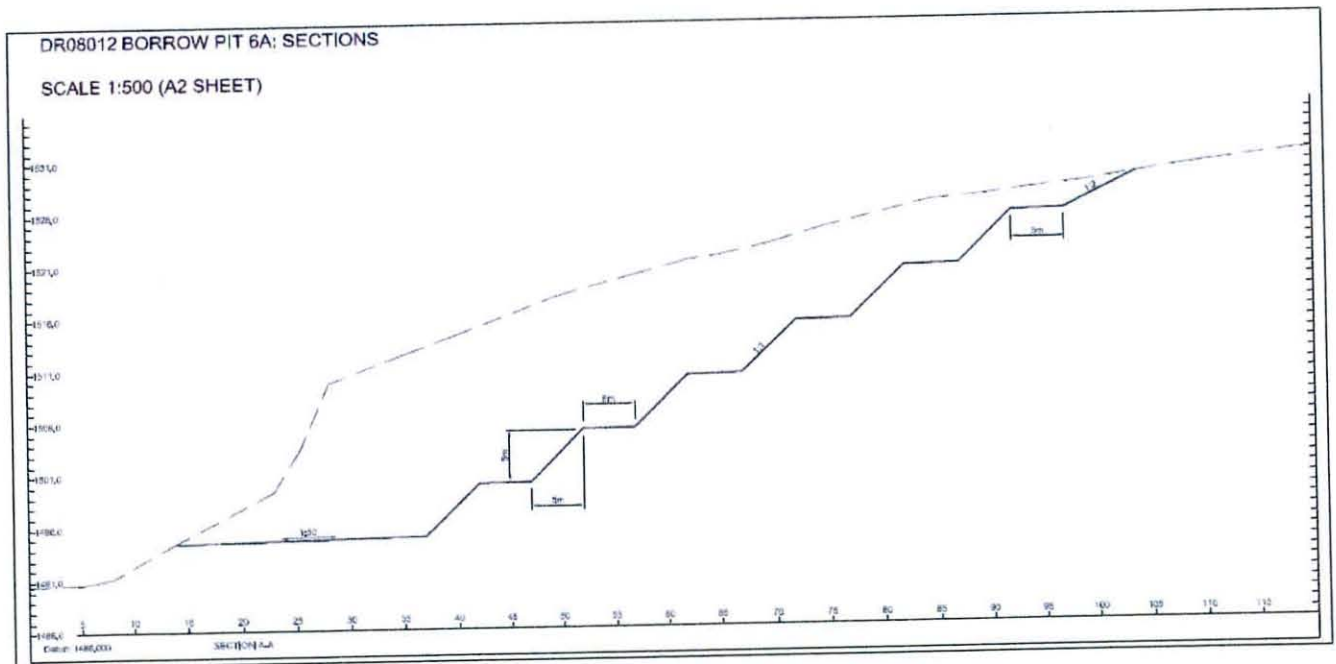
View of the gravesite to the southeast of the borrow pit

Impacts

Visual

The visual impact of the borrow pit could possibly be significant without any rehabilitation due to its locality on a high lying plateau which forms a prominent feature in the local landscape. The borrow pit and its operations will be in clear view to the members of the Hardenberg community that live in proximity to the borrow pit. Currently the view of the exiting mine workings is characterised by a relatively large, southwest facing scar.

Recommendations: Care must be taken in the layout and design to ensure that the working of the borrow pit is done in defined mining directions which can be rehabilitated successfully. The mining face of the borrow pit must be benched during the operations which will enable successful shaping upon completion. The site must be revegetated with an indigenous grass seed mix upon completion of the operations to aid in the blending of the site with the surrounding environment. A full surveyor drawing showing the profile and mining plan is attached in Appendix B.



Planned benching of the borrow pit

Overhead Services

There are no overhead services that will be affected by the borrow pit operation.

Fences

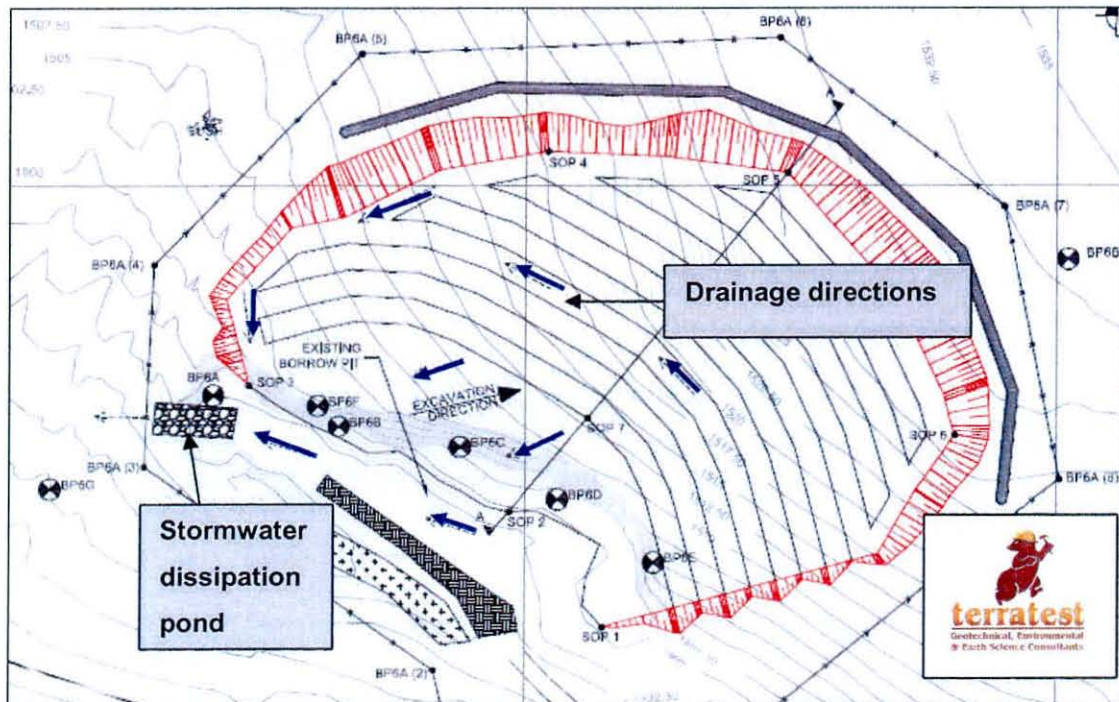
There are no fences in the vicinity of the borrow pit that will be affected by the borrow pit operation.

Natural Drainage

There are no drainage lines that originate or run through the site. The river system associated with the Kinira River is a sufficient enough distance away from the site not to be affected by any run-off from the site.

Care must however be taken that no run-off from the site will affect any of the houses in the down-slope proximity from the borrow pit.

Recommendations: An earth berm will be constructed along the northeastern boundary of the site to limit any run-off from the surrounding areas entering the borrow pit. The stormwater run-off from within the site will be collected in the bottom of the borrow pit and channeled towards a stone filled stormwater dissipation pond which will release the water to the northwest in the direction of the nearby drainage line. In this way the run-off will be re-introduced into the natural water cycle of the area. A full surveyor drawing showing the layout of the planned stormwater drainage on the site is attached in Appendix A.



View of the proposed drainage for the borrow pit

Vegetation

The vegetation that will be disturbed during the mining activity is limited to grasses and other small herbaceous species. None of the species that will be affected are endangered or threatened.

Recommendations: The vegetation that will be disturbed during the mining operation will be replanted on the re-shaped, topsoiled areas during the rehabilitation phase of the project. The following grass seed mix will be used for the revegetation of the site.

SUMMER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Heteropogon contortus</i>	Spear Grass	4
<i>Eragrostis racemosa</i>	Weeping Love Grass	4
<i>Eragrostis chloromelas</i>	Curly Leaf	5
<i>Eragrostis teff</i>	Giant Spear Grass	8
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	4
TOTAL		29
WINTER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	15
<i>Digitaria eriantha</i>	Smutsfinger Grass	8
<i>Eragrostis curvula</i>	Weeping Love Grass	4
<i>Panicum maximum</i>	Guinea Grass	4
TOTAL		35

Please note that some of these grass species are not indigenous but it has to be stressed that the primary function of this seed mix is the stabilisation of disturbed and denuded area for protection against erosion. None of the grasses are invasives and will over time be naturally out competed by the local indigenous grasses.

Noise

The noise that is generated during the operational phase of the borrow pit will have an affect on the surrounding area with residential housing being in the proximity of the site. The noise might also have an impact on the employees on site.

Recommendations: Operations must be limited to normal working hours (07:00 – 17:00) from Monday to Friday and from 07:00 – 15:00 on Saturdays. No operations in the borrow pit will be allowed on Sundays and Public Holidays. The machinery used for the operations and the trucks used for the transporting of the materials must be fitted with the stock-standard noise dampening equipment to limit the noise generated as much as possible. The employees must be supplied with hearing protection for use during the operational phase of the borrow pit.

Other

Due to the shallowness of the material to be mined relative to the surface, very little topsoil is present on the site.

Recommendations: The topsoil that can be salvaged during the first stage of the mining operation must be stockpiled and vegetated with *Panicum maximum* (Guinea Grass) or a similar grass species. This will ensure that the collected topsoil's fertility will be sustained during the stockpile period.

Dust will be generated during the mining activity and might have an impact on the employees and the nearby residents.

Recommendations: Dust suppression measures such as spraying of the operational areas with water when necessary and/or providing the employees with dust masks if so required must be employed.

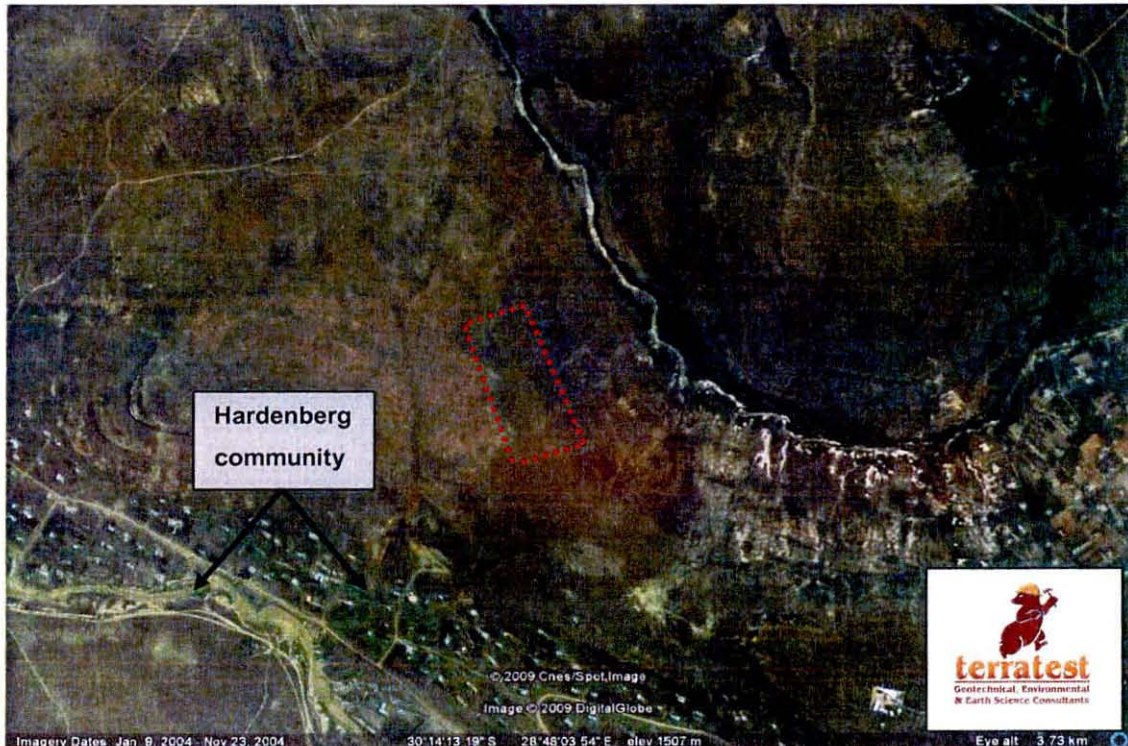
The proximity of the gravesite to the southeast of the borrow pit is on concern. No operations will be done in the direction of the gravesite.

Recommendations: No operation will be allowed towards the gravesite. A fence must be put in place around the gravesite in consultation with the local community. This fence must be in place before any operations are to take place in the borrow pit. The Public Steering Committee must engage the local community in this regard.

5.5 BORROW PIT 6B

Location

The borrow pit is located in close proximity to the Hardenberg community, approximately 3.5km from the settlement of Maluti. Access to the site is gained via a short access road off the Hardenberg – Maluti connecting road. The center point coordinate of the borrow pit is S30° 14' 06.77", E28° 47' 59.14".



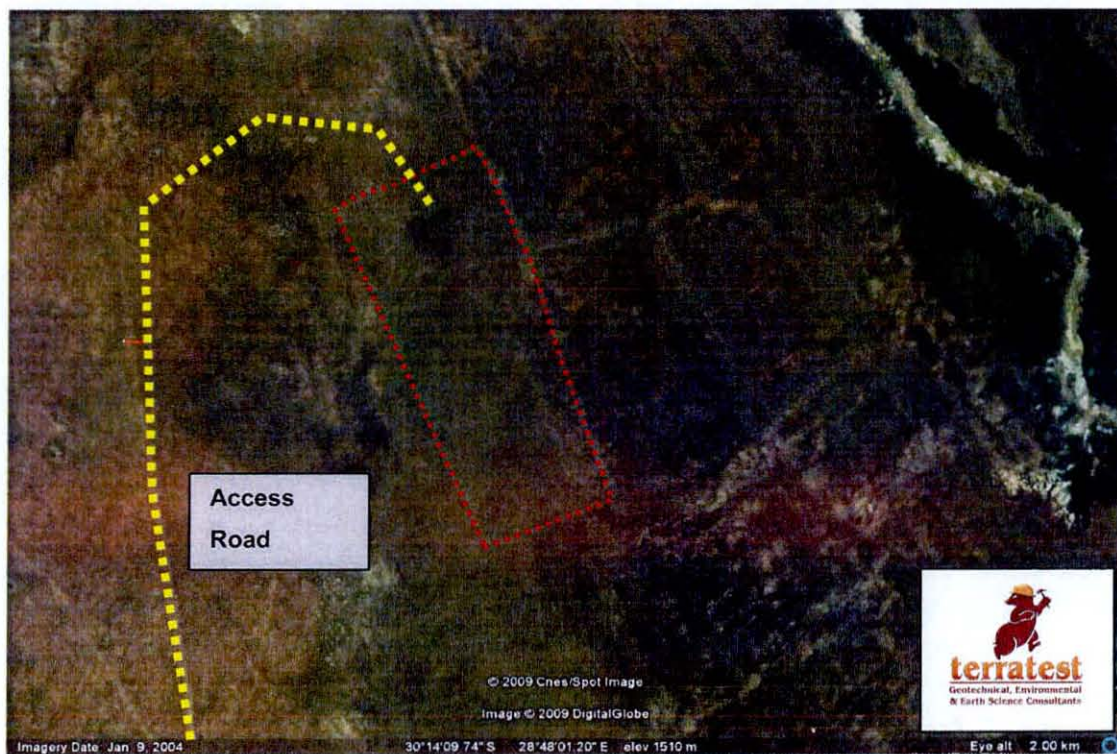
Locality of borrow pit 6B to the northeast of the Hardenberg community

Extent

The total extent of the mining area will be approximately 1.5ha between the corner points given in the attached table. A detailed surveyor drawing of the layout of the borrow pit is attached in Appendix A.

Corner Point	Latitude (S)	Longitude (E)
BP6B (1)	S 30° 14' 05.13"	E 28° 47' 59.99"
BP6B (2)	S 30° 14' 05.78"	E 28° 47' 57.10"
BP6B (3)	S 30° 14' 11.46"	E 28° 47' 58.08"

BP6B (4)	S 30° 14' 18.05"	E 28° 48' 00.41"
BP6B (5)	S 30° 14' 21.57"	E 28° 48' 01.82"
BP6B (6)	S 30° 14' 22.85"	E 28° 48' 02.96"
BP6B (7)	S 30° 14' 22.24"	E 28° 47' 50.27"
BP6B (8)	S 30° 14' 19.23"	E 28° 48' 04.30"
BP6B (9)	S 30° 14' 14.38"	E 28° 48' 02.66"
BP6B (10)	S 30° 14' 10.14"	E 28° 48' 01.75"



Site plan of Borrow pit 6B

Detailed surveyor drawings showing the exact layout and operational directions of the borrow pit is attached in Appendix A.

Material Standards

The material to be mined from the borrow pit is weathered dolerite. The full Geotechnical Report containing the material testing results is attached in Appendix D.

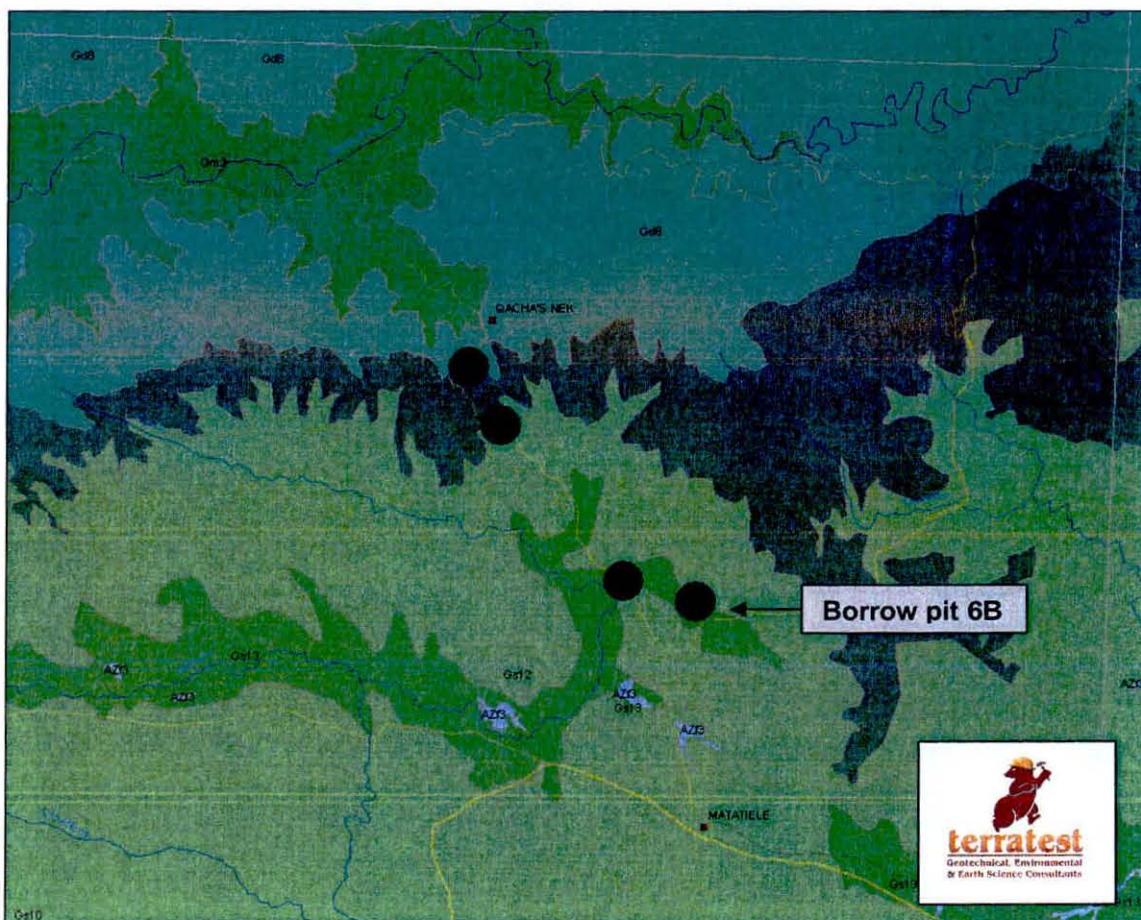
Community comments and Landownership

A community meeting was held on 4 November 2008 regarding the road upgrade project and possible use of certain areas along the road for the sourcing of road

building material. The community had no objections to these activities. Minutes of this meeting are attached in Appendix B of this report.

Biophysical Description

Borrow pit 6B is located on the boundary between the East Griqualand Grassland and the Mabela Sandy Grassland veldtypes. The latter veldtype occurs within flat valley basins and are characterized by sandy soil conditions. The borrow pit is located on the slope of a ridge above such a valley basin and is underlain by soils derived from the underlying weathered dolerite. This aspect and the vegetation that occur on the site is an indication that the borrow pit is located within the former veldtype mentioned above.



Veldtype Map

The vegetation on the site is characterized by the presence of grass species which are limited to *Aristida junciformis* (Ngongoni Grass), *Aristida congesta* (Tassel Three-awn) and *Elionurus muticus* (Wire Grass). There are no woody shrubs present on

the site. This is possibly the result of these plants being utilized for firewood by the nearby local community and the relative exposed area on, and surrounding the site.



View over the borrow pit site



View over the borrow pit site

The vegetation on the borrow pit area is also showing signs of heavy overgrazing by the livestock from the local community. This has resulted in the grass on the site having a low grazing quality.

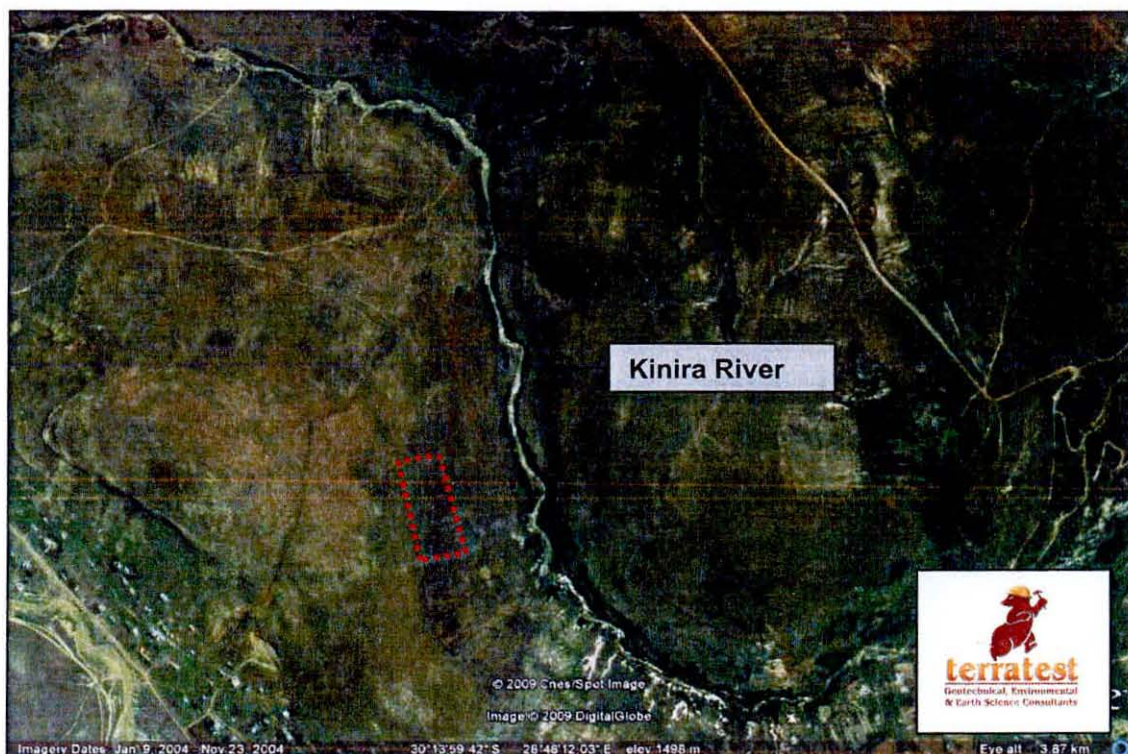
No signs of wildlife were seen during the site visit.

Topography

The topography of the surrounding area is characterized by a relatively steep ridge rising to the south, southwest and southeast. The borrow pit is located on the north-eastern slope of this ridge. A tributary of the Kinira River runs approximately 200m east of the borrow pit.

Drainage

There are no clear natural drainage lines that originate or run through the site. Due to the location of the borrow pit it can be assumed that rainwater run-off will occur off the site towards the nearby tributary of the Kinira River. This tributary is located approximately 200m to the east of the site.



View of the drainage of the area surrounding the borrow pit site

Social Environment

The borrow pit is located on vacant land with the outskirts of the Hardenberg community approximately 700m to the southwest. The nearest residential houses are situated in the Hardenberg community.

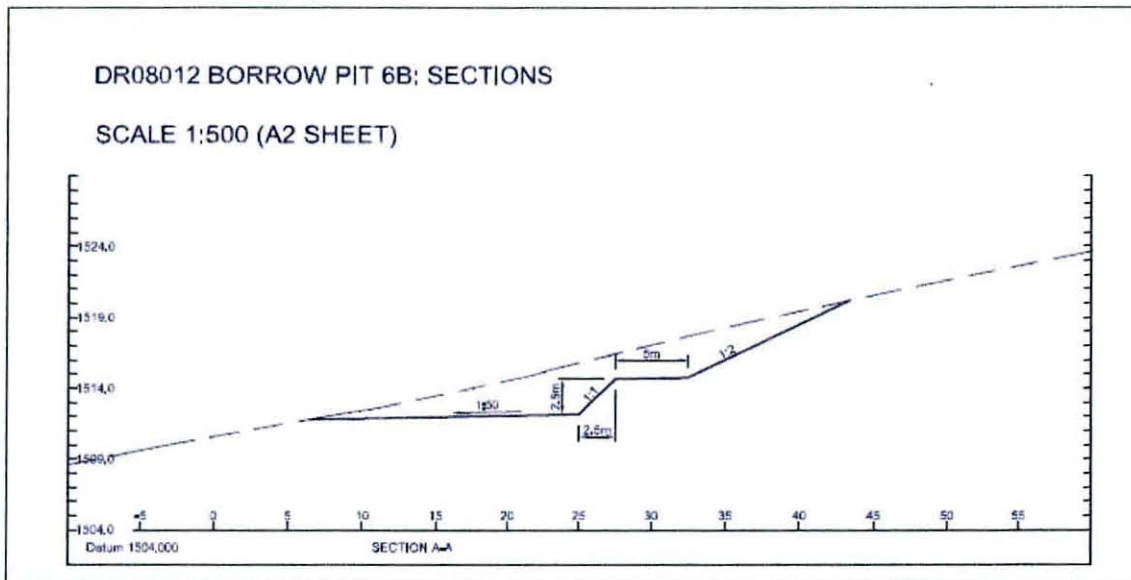
Heritage Resources

The South African Heritage Resources Association (SAHRA) required the completion of a Heritage Impact Assessment for the road alignment. The assessment of the possible heritage importance of the borrow pits was included in the consultant's terms of reference. No artifacts of heritage importance were identified by the consultant.

ImpactsVisual

The visual impact of the borrow pit will not be significant as the closest residential houses are on the opposite side of the ridge that the borrow pit is located upon. Irrespective of the limited visual impact mitigation measures must still be included to limit any possible future visual impacts of the borrow pit.

Recommendations: Care must be taken in the layout and design to ensure that the working of the borrow pit is done in defined mining directions which can be rehabilitated successfully. The mining face of the borrow pit must be benched during the operations which will enable successful shaping upon completion. The site must be revegetated with an indigenous grass seed mix upon completion of the operations to aid in the blending of the site with the surrounding environment. A full surveyor drawing showing the profile and mining plan is attached in Appendix B.



Planned benching of the borrow pit

Overhead Services

There are no overhead services that will be affected by the borrow pit operation.

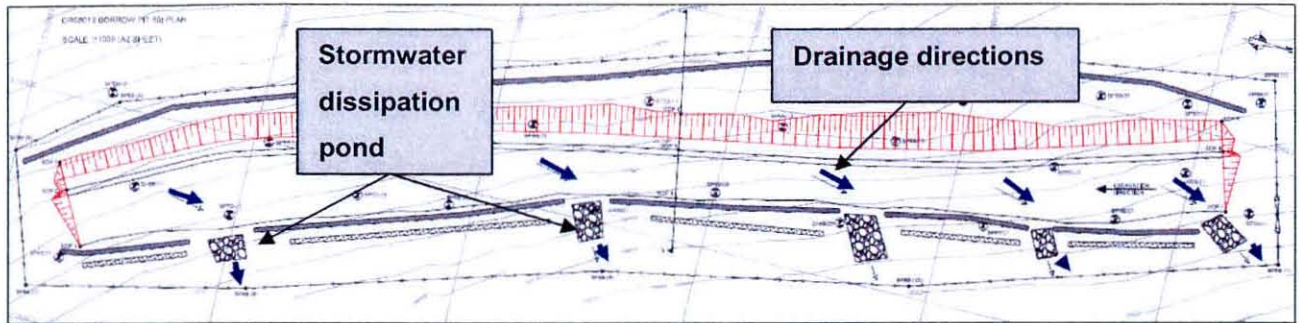
Fences

There are no fences in the vicinity of the borrow pit that will be affected by the borrow pit operation.

Natural Drainage

There are no drainage lines that originate or run through the site. The Kinira River is situated approximately 200m to the east of the borrow pit site. Since the proposed borrow pit is located on the slope of a ridge above the Kinira River, care must be taken in the planning and design of the borrow pit. The design should make provision for the run-off from the site towards the Kinira River to be controlled.

Recommendations: An earth berm will be constructed along the northwestern (up-slope) boundary of the site. This berm will prevent any run-off from the surrounding area to enter the site. The stormwater run-off from within the site will be collected in the bottom of the borrow pit and channeled towards a stone filled stormwater dissipation pond which will release the water to the northeast in the direction of the nearby Kinira River. A full survey drawing showing the layout of the planned stormwater drainage on the site is attached in Appendix A.



View of the proposed drainage for the borrow pit

Vegetation

The vegetation that will be disturbed during the mining activity is limited to grasses and other small herbaceous species. None of the species that will be affected are endangered or threatened.

Recommendations: The vegetation that will be disturbed during the mining operation will be replanted on the re-shaped, topsoiled areas during the rehabilitation phase of the project. The following grass seed mix, or similar, will be used for the revegetation of the site.

SUMMER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Heteropogon contortus</i>	Spear Grass	4
<i>Eragrostis racemosa</i>	Weeping Love Grass	4
<i>Eragrostis chloromelas</i>	Curly Leaf	5
<i>Eragrostis teff</i>	Giant Spear Grass	8
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	4
TOTAL		29
WINTER MIX		
Grass species	Common name	Application rate (kg/ha)
<i>Harpochloa falx</i>	Caterpillar Grass	4
<i>Tristachya leucothrix</i>	Hairy Trident Grass	15
<i>Digitaria eriantha</i>	Smutsfinger Grass	8
<i>Eragrostis teff</i>	Weeping Love Grass	4
<i>Panicum maximum</i>	Guinea Grass	4
TOTAL		35

Please note that some of these grass species are not indigenous but it has to be stressed that the primary function of this seed mix is the stabilisation of disturbed and denuded area for protection against erosion. None of the grasses are invasives and will over time be naturally out competed by the local indigenous grasses.

Noise

The noise that is generated during the operational phase of the borrow pit will have little or no effect on the surrounding residents since the housing closest to the site is situated approximately 700m from the site. Any noise generated will therefore be assimilated in the ambient noise in the area. The noise might have an impact on the employees on site.

Recommendations: Operations must be limited to normal working hours (07:00 – 17:00) from Monday to Friday and from 07:00 – 15:00 on Saturdays. No operations in the borrow pit will be allowed on Sundays and Public Holidays. The machinery used for the operations and the trucks used for the transporting of the materials must be fitted with stock-standard noise dampening equipment to limit the noise generated as much as possible. The employees must be supplied with hearing protection for use during the operational phase of the borrow pit.

Other

Due to the shallowness of the material to be mined relative to the surface, very little topsoil is present on the site.

Recommendations: The topsoil that can be salvaged during the first stage of the mining operation must be stockpiled and vegetated with *Panicum maximum* (Guinea Grass) or a similar grass species. This will ensure that the collected topsoil's fertility will be sustained during the stockpile period.

Dust will be generated during the mining activity and might have an impact on the employees.

Recommendations: Dust suppression measures such as spraying the operational areas with water when necessary and/or providing the employees with dust masks if so required must be employed.

6 GENERAL ENVIRONMENTAL MANAGEMENT PLAN

The following management principles are pertinent to all the borrow pit sites included in this document.

This General Environmental Management Plan outlined below has been designed to ameliorate/maintain the existing condition of the environment by working to a plan that will affect rehabilitation after mining.

This Environmental Management Plan contains guidelines, operating procedures and rehabilitation/pollution control requirements, which will be legally binding on the applicant immediately upon approval of the Environmental Management Plan. It is essential that this section be carefully studied, understood, implemented and adhered to at all times.

It is the responsibility of the Applicant to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to commence mining, which includes the implementation of this EMP.

6.1 CONSTRUCTION PHASE

6.1.1 Access to Site

All sites, except Borrow Pits 6a and 6b, are located adjacent to the D08012 road. It is therefore not necessary to construct long access roads to these borrow pits. Even though Borrow Pit 6a and 6b are not situated in the vicinity of the D08012 road, it is serviced by an existing access road.

The construction vehicles entering and exiting the borrow pit sites shall adhere to the statutory speed limits in the area. Appropriate signage shall be put in place to warn motorists of vehicles turning in and out of the borrow pit area.

The speed limit on and around the site shall be reduced to 40km/hour to prevent and minimise potential traffic accidents.

6.1.2 Demarcation of the Mining Area

The mining areas must be clearly demarcated by means of beacons at the corners, and along the boundaries, if there is no visibility between the corner beacons.

Permanent beacons must be firmly erected and maintained in their correct position throughout the life of the operation. Mining and resultant operations shall only take place within this demarcated area.

The borrow pits must be fenced for the duration of their operation and provided with gates that can be locked when not in use.

6.1.3 Sanitation

One chemical toilet will be placed at each site in such a way that it does not cause water or other pollution. Due to the relatively small size of the sites the specific positioning of the toilets will be left to the contractor's discretion as it might be required to move as the continuous mining and rehabilitation progresses over the site. The chemical toilet will be kept on site and serviced during the entire life of the mining operation. The chemical toilet will be serviced by a specialised Contractor as per the manufacturer's instructions, during the entire life of the mining operation. Under no circumstances should the effluent from the chemical toilet be disposed off anywhere, except at an approved facility for such effluent disposal.

Weigh bills for servicing shall be kept by the Contractor as proof of servicing and must be available for inspection by the environmental control officer.

The construction of "long drop" toilets is forbidden. Under no circumstances may open areas or the surrounding bush be used as a toilet facility. Penalties/fines will be imposed if these conditions are not upheld.

6.1.4 Topsoil Management

Topsoil shall be removed from all areas where physical disturbance of the surface will occur.

The topsoil will be stripped and stockpiled along the contours at heights restricted to 1.5m. If the topsoil is to be stockpiled for longer than six months it must be grassed

to maintain its fertility. The positioning of these stockpiles will be left to the discretion of the contractor since the continuous mining and rehabilitation process might require that they be moved as the process progresses over the site.

In any case the topsoil shall be adequately protected from being blown away or being eroded, by covering it with plastic sheeting or vegetating it. Driving over the topsoil stockpiles by vehicles shall be prohibited, to avoid compaction of the soils.

Topsoil shall be kept separate from overburden and shall not be used for any activity (such as building or berms). Topsoil shall be replaced during rehabilitation over all disturbed areas.

It is strongly recommended that rehabilitation is carried out concurrently with mining. To this end it is recommended that strip mining be engaged. One strip should be mined at any one time and once a strip is completely mined rehabilitation should occur concurrently with the mining of another strip.

6.1.5 Vegetation Management

The vegetation shall be cleared only on the areas that are to be mined, on the stockpiling area and only prior to mining of that section. No un-necessary vegetation clearance shall be carried out.

6.1.6 Alien Invaders Management

The Conservation of Agricultural Resources Act (Act 43/1983) shall be complied with, with regards to exterminating the alien invaders on the site.

Alien plants shall be prevented from spreading by using a registered herbicide such as "Garlon" or "Chopper". Alien plants were not identified during the site survey. Alien plants are opportunistic and could become established in areas disturbed by human activity.

Spraying in windy conditions must be avoided, as spray drift onto non-target species that may occur. Spraying onto drought stressed plants shall also be avoided, as the plants will not absorb a sufficiently lethal dose.

6.2 OPERATIONAL PHASE

6.2.1 Limitations on Mining

The applicant shall ensure that operations take place only in the demarcated areas as marked on the attached site plans.

6.2.2 Neighbours

Where there are residential properties in close proximity to borrow pits, residents shall be informed of all planned activities on the site before they actually commence. An open dialogue with neighbours shall be maintained throughout the mining operation so that there is the least possible disturbance to residents. In this regard the appointed community liaison officer will ensure that all affected parties are kept informed of progress with the borrow pits.

Any neighbours in close proximity to the site shall be informed of all activities to take place on site before these actually commence.

6.2.3 Establishment of Excavation Areas

The following operating procedures shall be adhered to with regards to the excavation of the materials:

Topsoil shall be handled as described in Section 6.1.4 above.

Excavations shall take place only within the approved demarcated mining area.

Overburden shall be placed in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the gravel has been excavated.

6.2.4 Geology

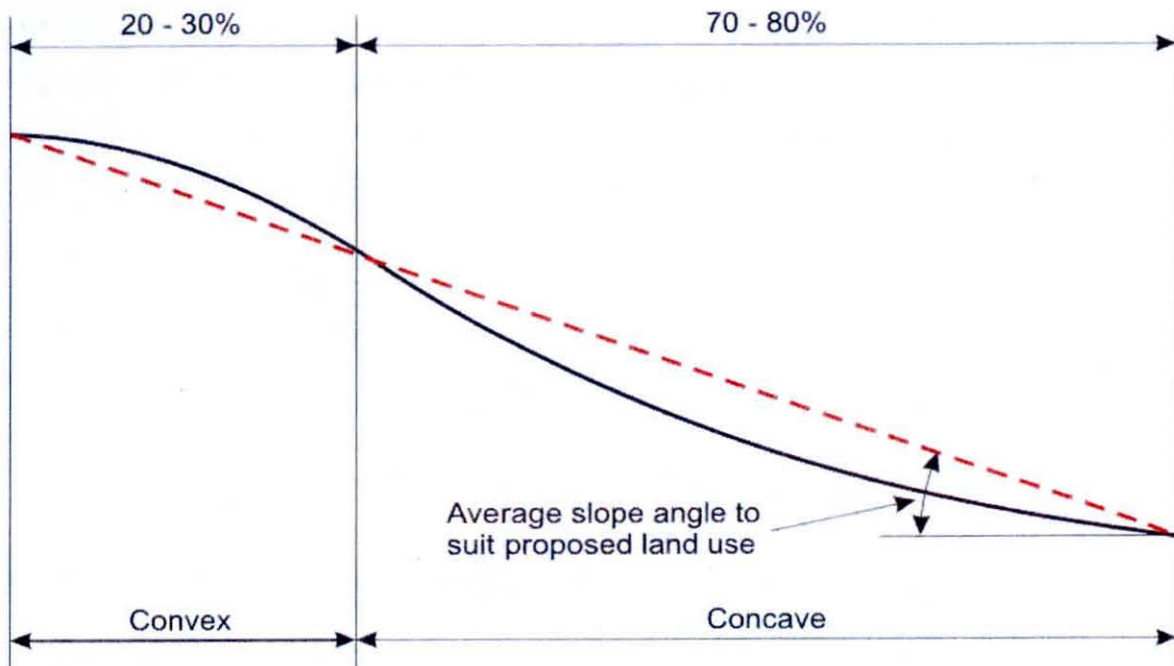
The extraction of gravel is irreversible. The cavity shall be rehabilitated in the manner and method outlined in the following sections.

6.2.5 Topography

The final borrow pit plan shall leave cut faces sloped at a gradient not steeper than 1:3, not steeper than 3m each and separated by benches (see sketch below). The general direction of the slope of the borrow pit will be in the direction of the existing ground contours, as indicated on the site plans.

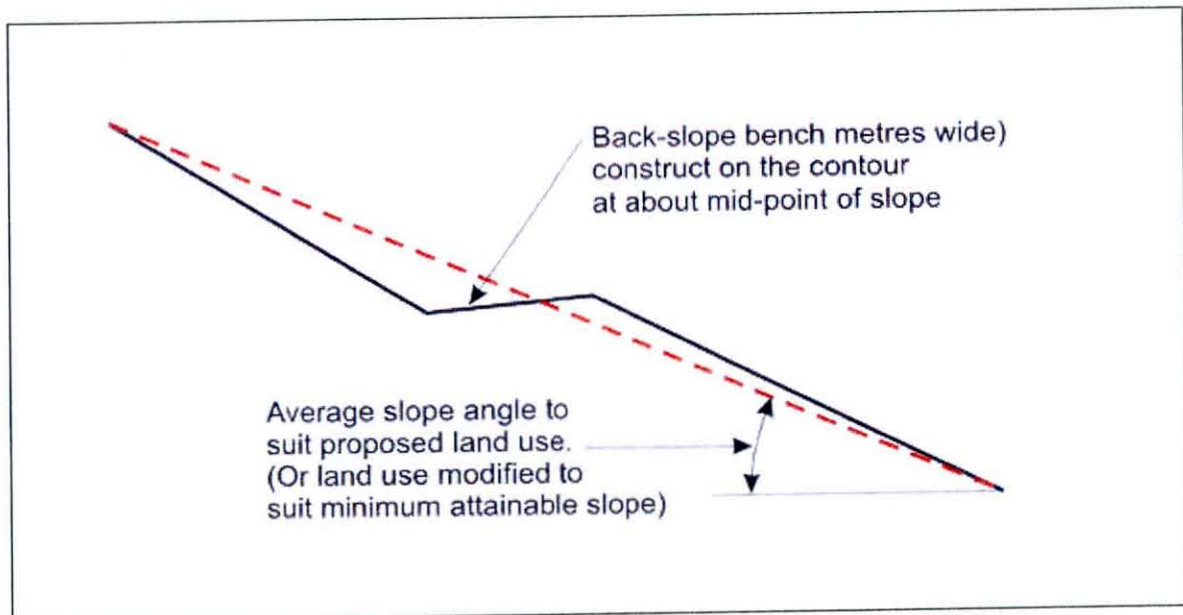
DESIGN OF SLOPE PROFILES (HANNAN, 1984)

(a) Preferred Profile



There will be a definite alteration of the topography/ landscape. Mitigation shall include reshaping (see sketch b below) the mined area to blend in as much as possible with the adjacent ground contour. After topsoiling and revegetation it is expected that the impact will be minimal.

(b) Profile design when external features limit spreading distance



The borrow pit floor shall be gently sloped so that water is not left to pond and which will allow for easy drainage.

Cross sections through each borrow pit are presented on the survey drawings of the borrow pits in Appendix A. These cross sections indicate the current ground profile and the ground profile after mining.

6.2.6 Maintenance of Vehicles and Equipment

There will be no maintenance of vehicles and equipment on the site. The contractor appointed for the road rehabilitation will establish its own Contractor's Camp, which is outside the scope of this EMP. This contractor's Camp will include a vehicle and equipment maintenance area.

The maintenance of vehicles and equipment used for any purpose during the mining operation will take place at the contractor's camp to be established for the road rehabilitation works or at an appropriate off site garage. Should emergency repairs need to be carried out on site, then a tarpaulin or other suitable plastic sheeting in conjunction with drip trays shall be placed over the ground where the repairs are to be carried out.

The trucks and excavators used in the mining process must be adequately maintained so that no oil, diesel, fuel, hydraulic fluid or other contaminant is spilled during the operations.

The trucks and excavators used on the mining area must not constitute a pollution hazard in respect of the above substances. The Project Engineer shall order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and / or irreparable.

6.2.7 Waste Disposal

One suitable covered container shall be available at all times and conveniently placed for the disposal of domestic waste. No other waste will be generated.

The domestic waste shall be taken away daily to the contractor's camp to be established for the road rehabilitation. No littering or illegal dumping of any waste material shall take place on site.

All accidental spillages shall be cleaned up immediately, to the satisfaction of the Project Engineer, by removing the spillage together with the polluted soil and by disposing of them at a recognised landfill facility.

6.2.8 Land Capability

The land capability over the area used for the mining activities will be changed to mining for the duration of the mining operation. The land capability of the site will revert to grazing after rehabilitation.

6.2.9 Land-Use

All of the proposed sites have previously been used for mining; hence the land-use will not change. Upon rehabilitation the sites shall revert back to grazing.

6.2.10 Natural Vegetation and Plant Life

The natural vegetation in the borrow pit areas will be disturbed. The overall aim of rehabilitation is to prepare the disturbed terrain to encourage restoration of the

natural vegetation. Rehabilitation will comprise the re-introduction of indigenous plant species.

Seeding should take place during the wet season, preferably at the beginning of summer.

Gathering of firewood, fruit, flowers, 'muthi' plants or any other natural materials from the site or the surrounding areas shall be strictly prohibited.

6.2.11 Alien Vegetation Monitoring

A programme to control alien invader species shall be implemented by the Contractor. This will involve the spraying of the target plants with a selective herbicide strictly in accordance with the manufacturer's instructions. Extra caution is to be taken around drainage lines to ensure that the herbicide is not dangerous to aquatic organisms. A maintenance programme will be drawn up to ensure that re-growth of alien vegetation is controlled until the indigenous grasses and other pioneers have had a chance to establish themselves. Effective control measures are prescribed by the Conservation of Agricultural Resources Act (Act 43/1983) and include the following:

The weeds concerned shall be uprooted, felled or cut off and shall be destroyed by burning or by another suitable method.

The weeds concerned shall be treated with a weed killer that is registered for use in connection therewith, in accordance with the directions for use of such weed killer. Any other recognised method of treatment that has as its' object the destruction of the weeds concerned shall be applied with regard thereto.

The measures referred to above shall be applied with regard to the seed, seedlings or re-growth of the weeds concerned in order to prevent them from running to seed or propagating otherwise.

6.2.12 Animal Life

No hunting will be permitted on the site or surrounds. No wildlife is to be disturbed or interfered with in any way.

No wildlife was observed in any of the site visits. Animal life will be affected by the mining operation. Once the mining operation has ceased it is likely that existing small animals (rodents, snakes, birds) will return to the site.

6.2.13 Surface Water & Erosion Control

The site shall be inspected after occurrences of rainfall that measures more than 30mm in 24 hours. If erosion is found to occur, remedial measures shall be undertaken and berms and drains shall be constructed where necessary. In addition, all erosion control measures shall be visually inspected once a month.

Possible ponding of water might occur in the bottom of some of the borrow pits, which poses a safety risk to children. These ponds must be drained at the start of site work. A rock lined channel can be constructed from the side of the pond to lead the water away and back into the natural drainage line.

To avoid surface water contamination a supply of absorbent material, such as "Peatzorb" or sawdust should be kept at the Contractor's Camp for the treatment of hydrocarbon accidental spillages. Contaminated material must be disposed of at a registered landfill site. Drip trays must always be used to contain and collect lubricants during emergency repairs which may occur in the field.

6.2.14 Air Quality

Air quality is influenced by factors like wind speed, wind direction, temperature and cloud cover and in this case by mining activities on the site. Mining and transporting of material may generate dust pollution.

Water spraying during the dry season or whenever dust pollution occurs shall be practised. Dust suppression can also be achieved using other dust-allaying agents. Weekly spraying during the dry season and daily spraying during windy conditions shall be carried out. During the rainy season the site shall be sprayed every 7 consecutive days without rain. No water abstraction shall be undertaken without a valid permit from DWAF.

The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

Fumes (and black smoke) emitted from vehicles and equipment must be mitigated & monitored and corrective action should be taken to avoid nuisance to the public. All construction vehicles must be regularly serviced so as not to emit excessive smoke.

Burning of domestic waste material shall not be allowed.

6.2.15 Noise

There is a possibility of noise pollution resulting from increased traffic. The noise will be kept within reasonable limits. The combined noise of a maximum of 2 trucks and one excavator is expected at any one time. It is likely that noise levels at peak working hours will be in the region of 40 decibels.

It is not expected that the noise level will exceed 85 decibels. Should the noise exceed the noise level of 85 decibels all staff shall be supplied with ear muffs (as per the Occupational Health & Safety Act, Act 85 of 1993).

Working hours shall be restricted to between 07:00 to 17:00. The neighbour's permission must be obtained for work during public holidays and weekends. The Inspector of Mines permission regarding the mine working hours shall also be sought.

6.2.16 Sites of Archaeological and Cultural Interest

A Heritage Impact Assessment was conducted as part of the Environmental Impact Assessment (EIA) associated with the road upgrade project. The Heritage Specialist conducting this study was asked to extend his terms of reference to include the borrow pit sites applied for. The Heritage Report has not found any sites or artefacts of cultural or archaeological importance either along the road alignment or the borrow pit sites. Please note that the gravesites near Borrow pit 6A does not fall within the boundaries of the borrow pit. The Heritage Impact Report is attached in Appendix E.

If any objects that are thought to be artefacts are unearthed during the mining of the borrow pits, all operations will cease immediately and the South African Heritage Resources Council (SAHRA) will be contacted to investigate the possible find.

6.2.17 Regional Economic Impact

The materials that will be mined from the borrow pits will be used in the upgrading of the Maluti to Qachas Nek Border Post road. This road forms the main access route between Lesotho and the town of Matatiele in South Africa. The upgrading of the road has large socio-economic implications for the residents of the towns of Matatiele and Maluti as well as the residents along the alignment of the road.

In addition to this long term importance of the road, temporary opportunities for job creation and skills will be developed during the construction phase of the road and associated mining activities at the borrow pits.

6.2.18 Social Issues

The Contractor must address any concerns / requests that interested and affected parties or the adjacent landowners may have during the mining period.

Access to private property and communal lands shall be undertaken only with permission from the relevant landowners.

The Project Engineer is responsible to ensure that the landowners, its representatives or the representatives of any affected communities have been informed before any work is carried out on site. Contractors must ensure that the same people or institutions have been informed before moving onto site.

The Contractor and associated employees may not cause damage to property, crops or animals. Activities that may cause conflict with the local community must be avoided. Should conflict arise it should be immediately reported to the Project Engineer.

Employees must at all times be courteous towards the neighbours, landowners and the local community.

Mining activities must be limited between 07:00 and 17:00 during working days to minimise the noise nuisance to neighbours.

The removal of agricultural products (e.g. fruits, vegetables, stock, and firewood) and equipment from the site will not be permitted.

The Contractor should ensure that access roads are maintained in good condition by attending to potholes, corrugations and storm water damage as soon as these develop.

Main causes of air pollution are dust from vehicle movements and stockpiles, vehicle emissions and fires.

Vehicles travelling to and from the site must adhere to speed limits so as to avoid producing excessive dust. A speed limit of 40km/hr must be adhered to on all dirt roads. Access routes and other cleared surfaces must be dampened whenever possible, especially in dry and windy conditions to avoid excessive dust.

All IAPs should be notified in advance of any known potential risks associated with the mining of the borrow pit and the activities on it.

The Contractor is to inform the neighbours in writing of disruptive activities at least 48 hours beforehand. This can take place by way of leaflets placed in public use areas (for example: shops, schools and community halls) giving the Project Engineer's and Contractor's details.

The Engineer and Contractor are responsible for ongoing communication with the people that are interested in and affected by the mining project. A complaints register should be kept at the site office. This should be in carbon copy format, with numbered pages. This register is to be tabled during monthly site meetings. All IAPs need to be made aware of the existence of the complaints book, and the methods in which they can communicate their complaints. Queries and complaints are to be handled by the Project Engineer and or the Contractor by:

- Documenting details of such communications
- Submitting these for inclusion in the complaints register

- Bringing issues to the Project Engineer's attention immediately
- Taking remedial action as per the Project Engineer's instruction

Selected staff is to be made available for formal consultation with IAPs to explain the mining process and to answer questions.

6.3 DECOMMISSIONING PHASE

6.3.1 Removal of Waste and Sanitation Equipment

The chemical toilets and the waste bins shall be removed from site. Waste material (if any) will be removed from the mining areas and disposed of at a recognised landfill facility. These materials shall not be buried or burned on the site. Final rehabilitation shall be completed within the period specified further on in this document.

6.3.2 Machinery/Plant Removal

All machinery and construction plant shall be removed from the site and taken to the Contractor's Camp. This will include any debris and waste material left by personnel.

6.3.3 Stockpile Erasure

On completion of mining, the surface of the stockpile area, especially if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 100mm and graded to an even surface condition. Prior to replacing the topsoil removed from the stockpile area any other materials left on site (gravel, oversized material, etc) will be spread evenly on the borrow pit floor.

The previously stored topsoil shall be returned to its original depth over the disturbed areas.

Following the placing of the topsoil, the area shall then be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a locally adapted indigenous seed mix.

Table: Proposed Monitoring Timetable

ACTIVITY	MONITORING FREQUENCY	RESPONSIBILITY
PUBLIC PARTICIPATION		
Public participation	Prior to moving onto site	Engineer / Contractor
Notification of I&APs 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
ROADS AND ASSOCIATED SERVICES		
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
STAFF EDUCATION AND AWARENESS		
Risks associated with materials being stockpiled on site	On staff induction and ongoing (monthly)	Contractor
Environmental education of staff	On staff induction	Contractor

ACTIVITY	MONITORING FREQUENCY	RESPONSIBILITY
Noise control (by staff)	On staff induction and ongoing (monthly)	Contractor
General Housekeeping	On staff induction and ongoing (monthly)	Contractor
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
CONSTRUCTION PHASE		
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

ACTIVITY	MONITORING FREQUENCY	RESPONSIBILITY
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
OPERATIONAL PHASE		
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)	Engineer / Contractor

ACTIVITY	MONITORING FREQUENCY	RESPONSIBILITY
	rainfall measures more than 30mm in 24 hours)	
Ensuring that natural water pathways are maintained	Ongoing during life of the mine (monthly)	Engineer / Contractor
Alien invader management plan	Twice monthly	Engineer / Contractor
DECOMMISSIONING		
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, etc to appropriate facilities)	On mine completion	Contractor
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

Table: The calculation for each borrow pit is as follows:

Steps	Borrow pit 2	Borrow pit 4	Borrow pit 5	Borrow pit 6A	Borrow pit 6f
1	Basalt	Maroon Mudstone	Mudstone and weathered dolerite	Weathered dolerite	Weathered dolerite
2	Class C	Class C	Class C	Class C	Class C
3	R20 000.00/ha	R20 000.00/ha	R20 000.00/ha	R20 000.00/ha	R20 000.00/h
4	1.115ha	2.188ha	0.53ha	1.81ha	4.94ha
Sub-total (excl. VAT)	R 22 300.00	R 43 760.00	R 10 600.00	R 36 200.00	R 98 800.00
VAT @ 14%	R 3 122.00	R 6 126.40	R 1 484.00	R 5 068.00	R 13 832.00
GRAND TOTAL	R 25 422.00	R 49 886.40	R 12 084.00	R 41 268.00	R 112 632.00

Table: Total Financial Provision for all the Borrow pits

Borrow pit no.	Grand Total(incl. VAT)
Borrow pit 2	R 25 422.00
Borrow pit 4	R 49 886.40
Borrow pit 5	R 12 084.00
Borrow pit 6A	R 41 268.00
Borrow pit 6B	R 112 632.00
TOTAL	R 241 292.40

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

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 meetings 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 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 with all 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, source of Satellite Imaginary.

UNDERTAKING

I,

the undersigned and duly authorised thereto by

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 this.....day of.....20.....

.....

Signature of applicant

.....

Designation

Agency declaration: This document was completed byon behalf
of.....

APPROVAL

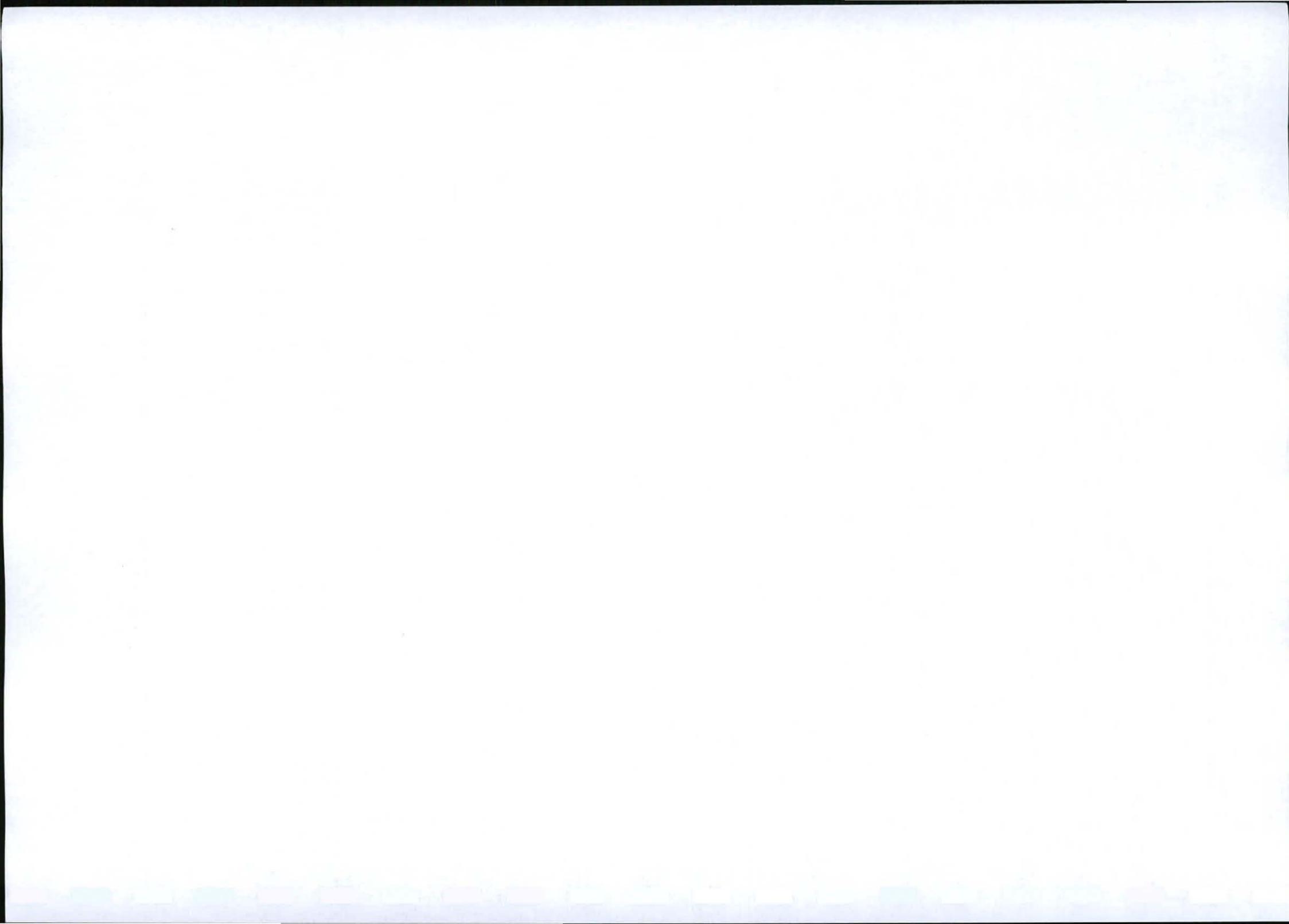
Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act,
2002 (Act 29 of 2002)

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

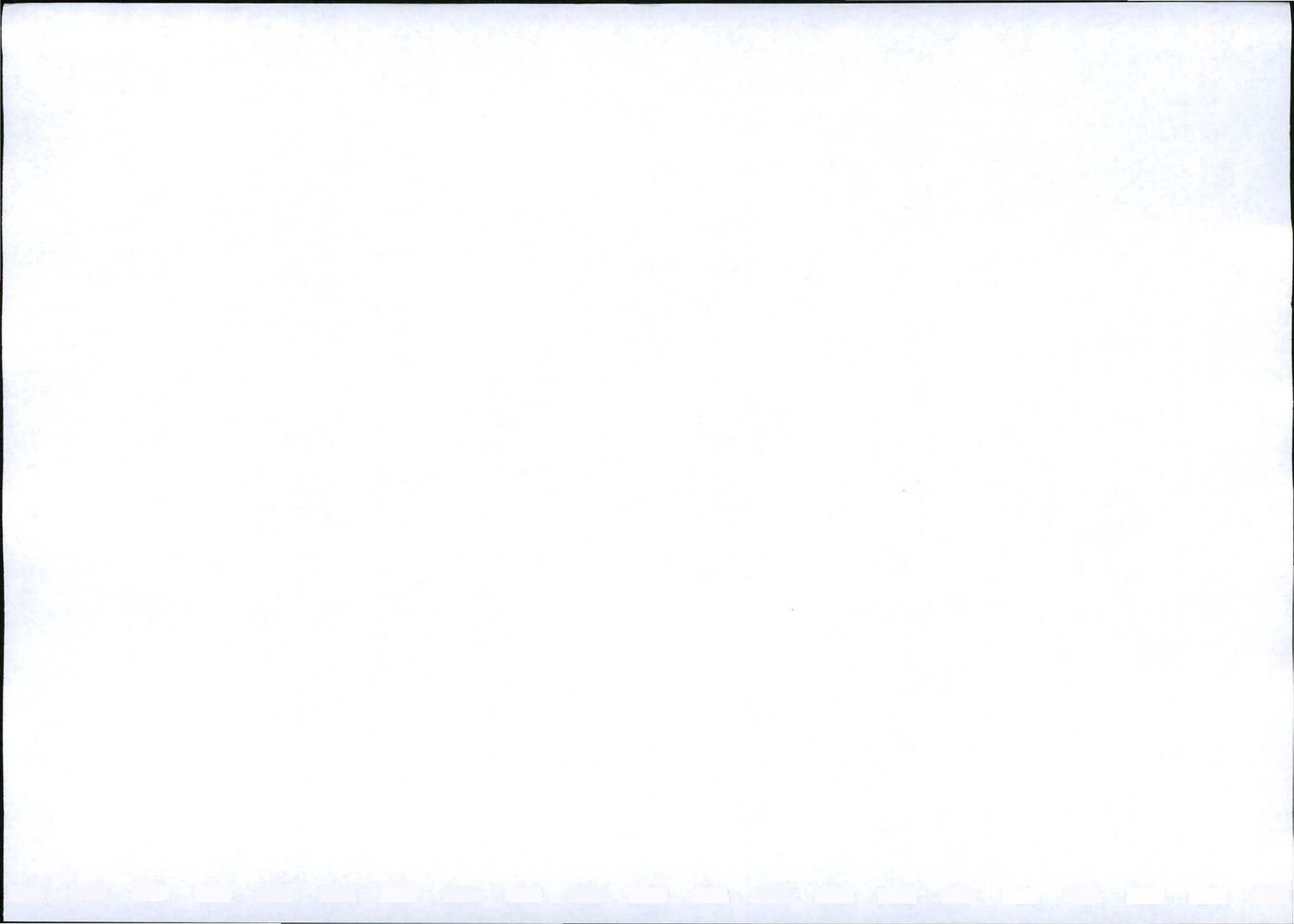
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REGIONAL MANAGER

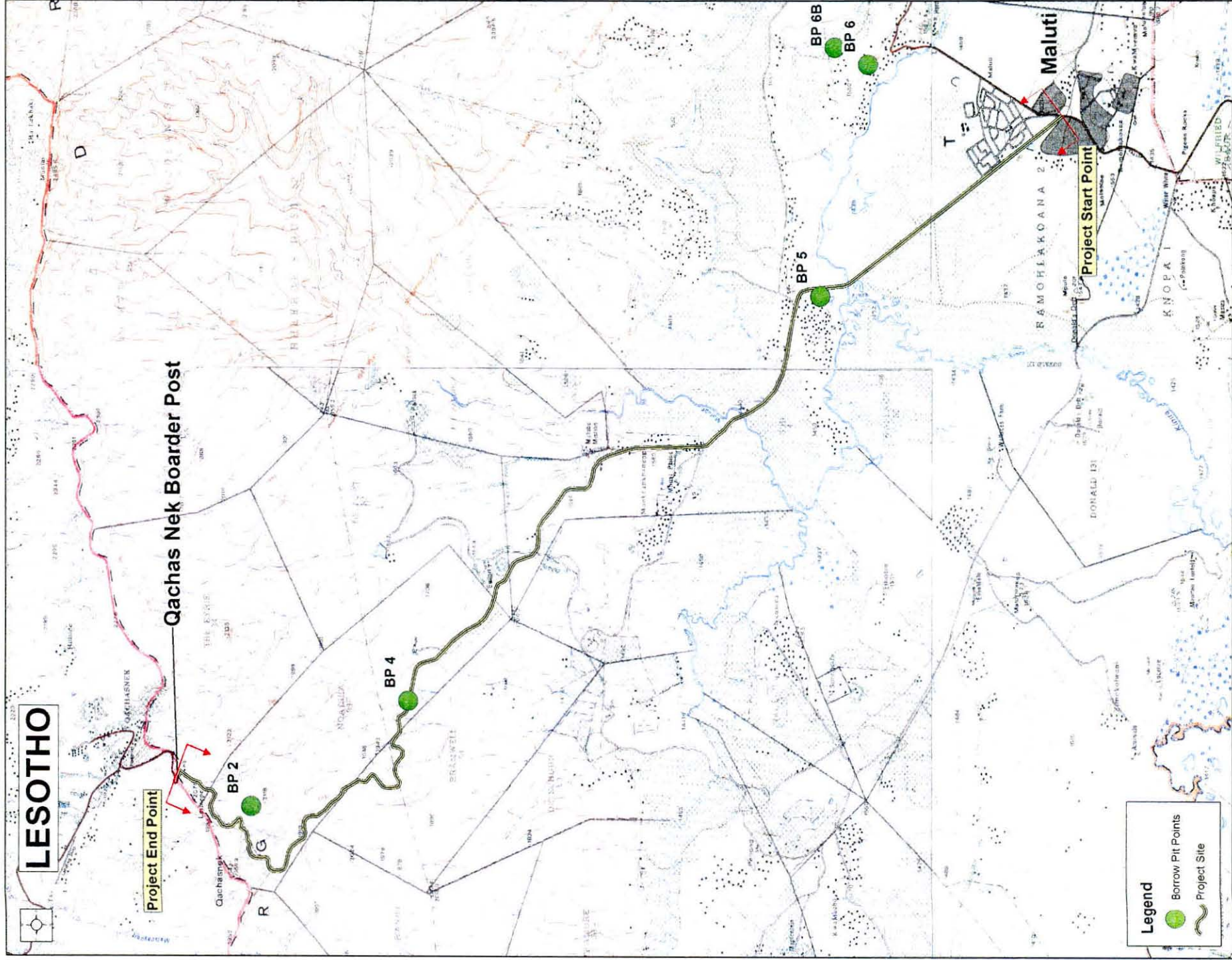
REGION:.....



APPENDIX A
AREA WIDE LOCALITY PLAN
AREA WIDE GEOLOGICAL MAP
LOCALISED LOCALITY PLANS
SURVEYOR DRAWINGS



Maluti to Qachas Nek
FIGURE 1- AREA WIDE LOCALITY OF BORROW PITS



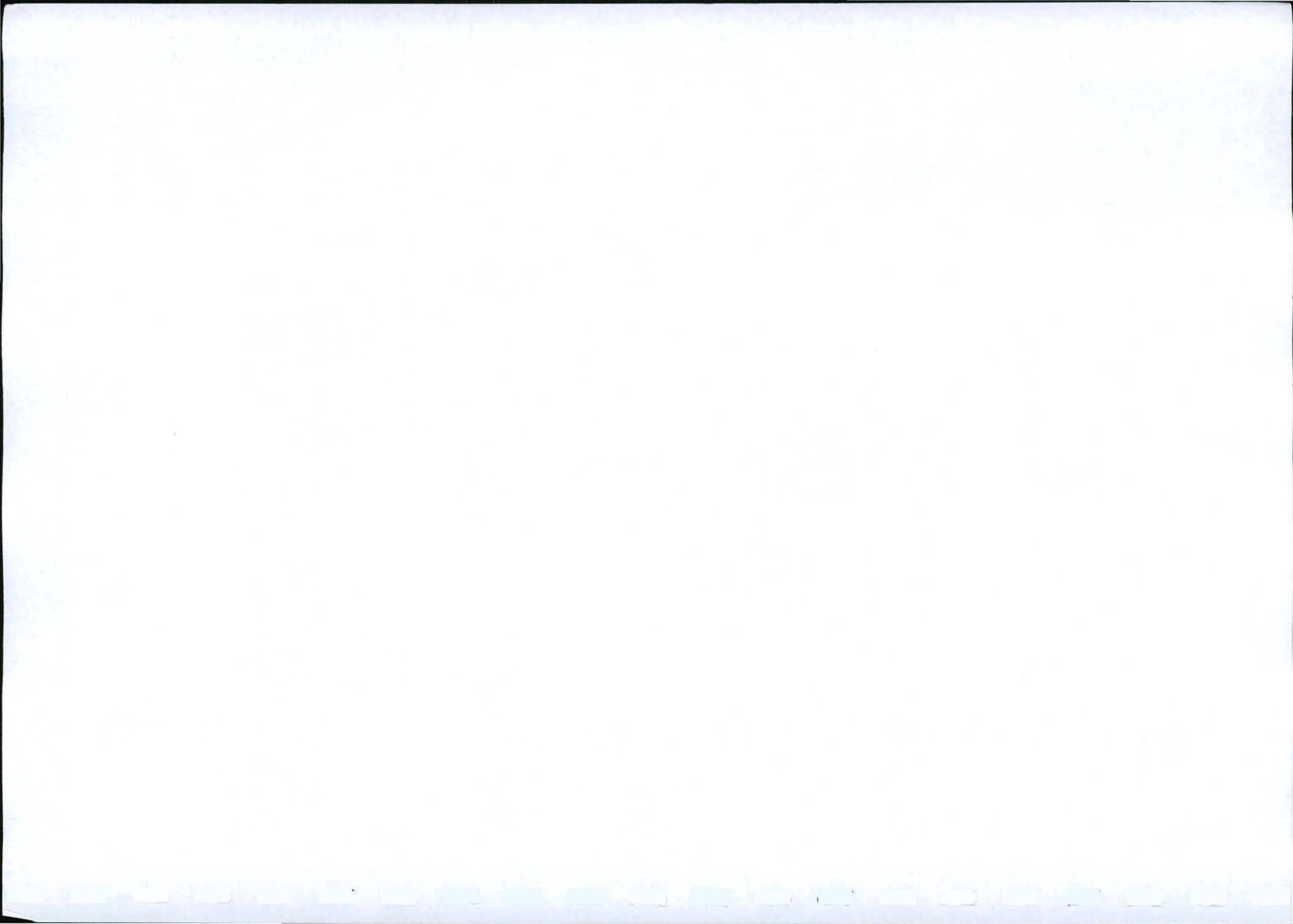
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 UTM Zone 34 S
 Datum: African South African
 Spheroid: Everest
 Units: Meter

Scale
 1:60,000

PRODUCTION DATE
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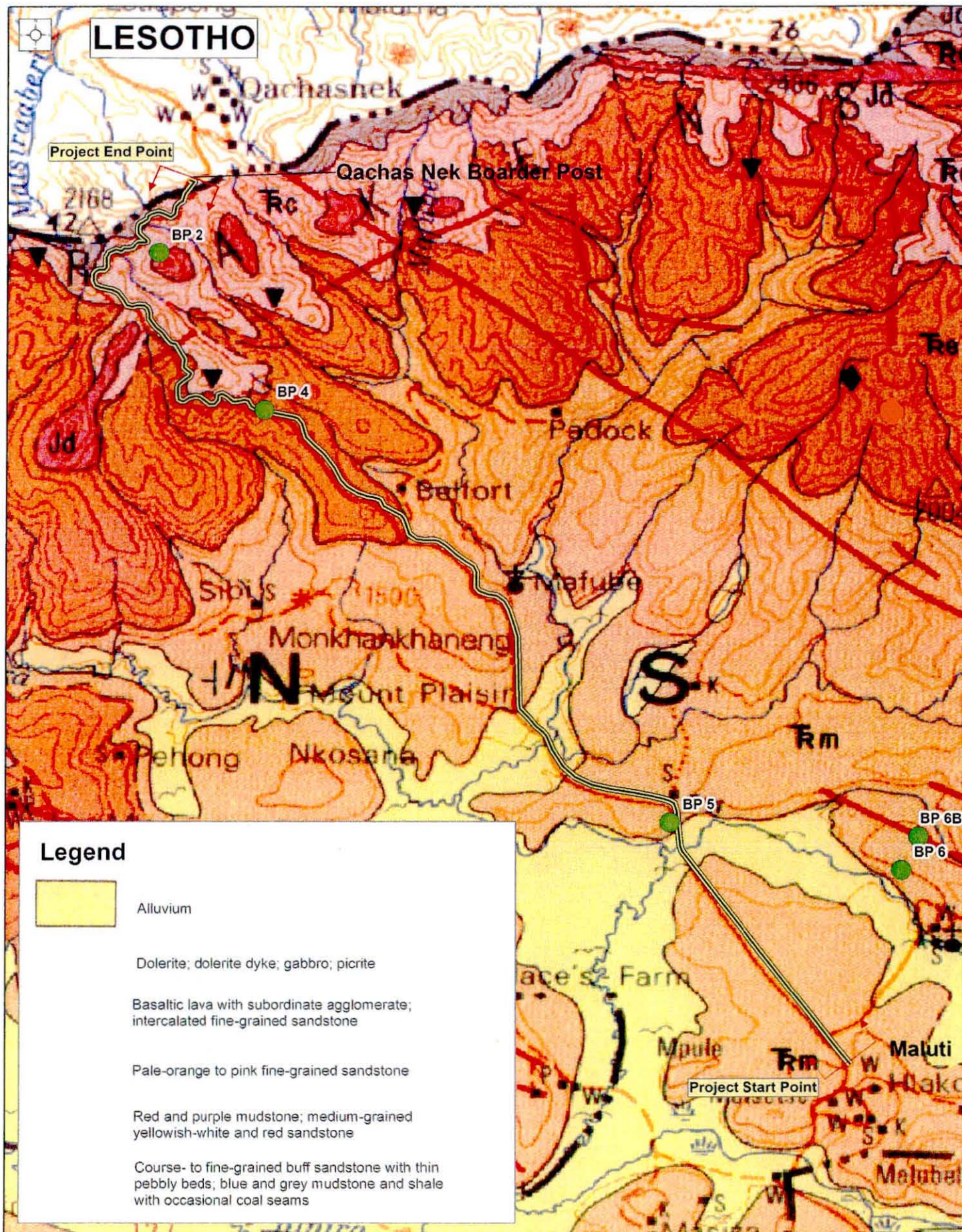
REFERENCE
 Copyright: Terracon Engineering Projects 2009
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 Hilton 3245 Fax: (031) 343 8788

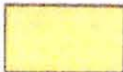


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FIGURE 2 - AREA WIDE GEOLOGICAL MAP



Legend



Alluvium

Dolerite; dolerite dyke; gabbro; picrite

Basaltic lava with subordinate agglomerate; intercalated fine-grained sandstone

Pale-orange to pink fine-grained sandstone

Red and purple mudstone; medium-grained yellowish-white and red sandstone

Course- to fine-grained buff sandstone with thin pebbly beds, blue and grey mudstone and shale with occasional coal seams

COORDINATE SYSTEM:
Transverse Mercator
1985 SA 1051
SOUTH AFRICAN 1949

PRODUCTION DATE:
November 2009

Scale:
1:60,000

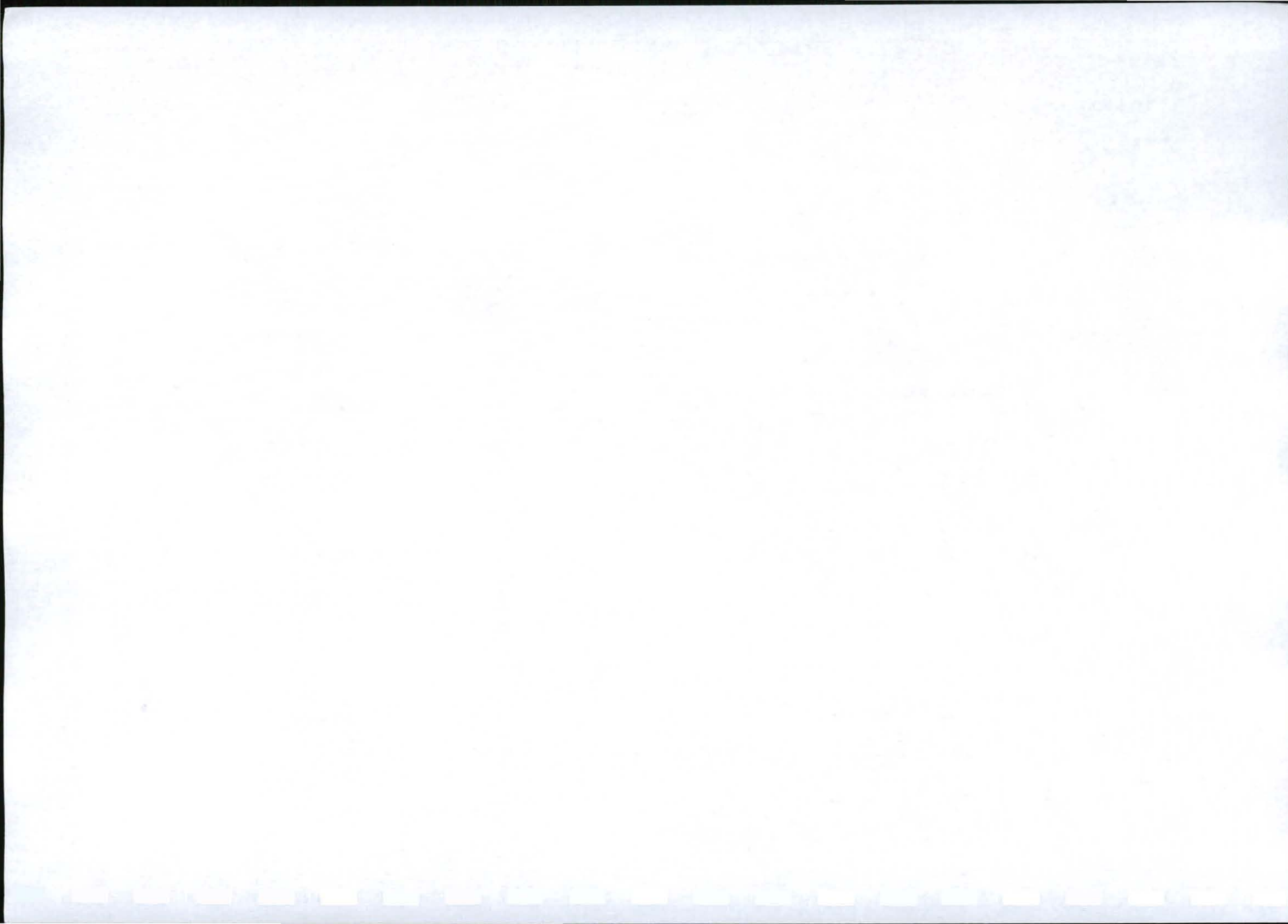
REFERENCE:
Copyright Terratest ACTIVE PROJECTS 19 - 1997
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Geotechnical, Environmental &
Soil Remediation Services

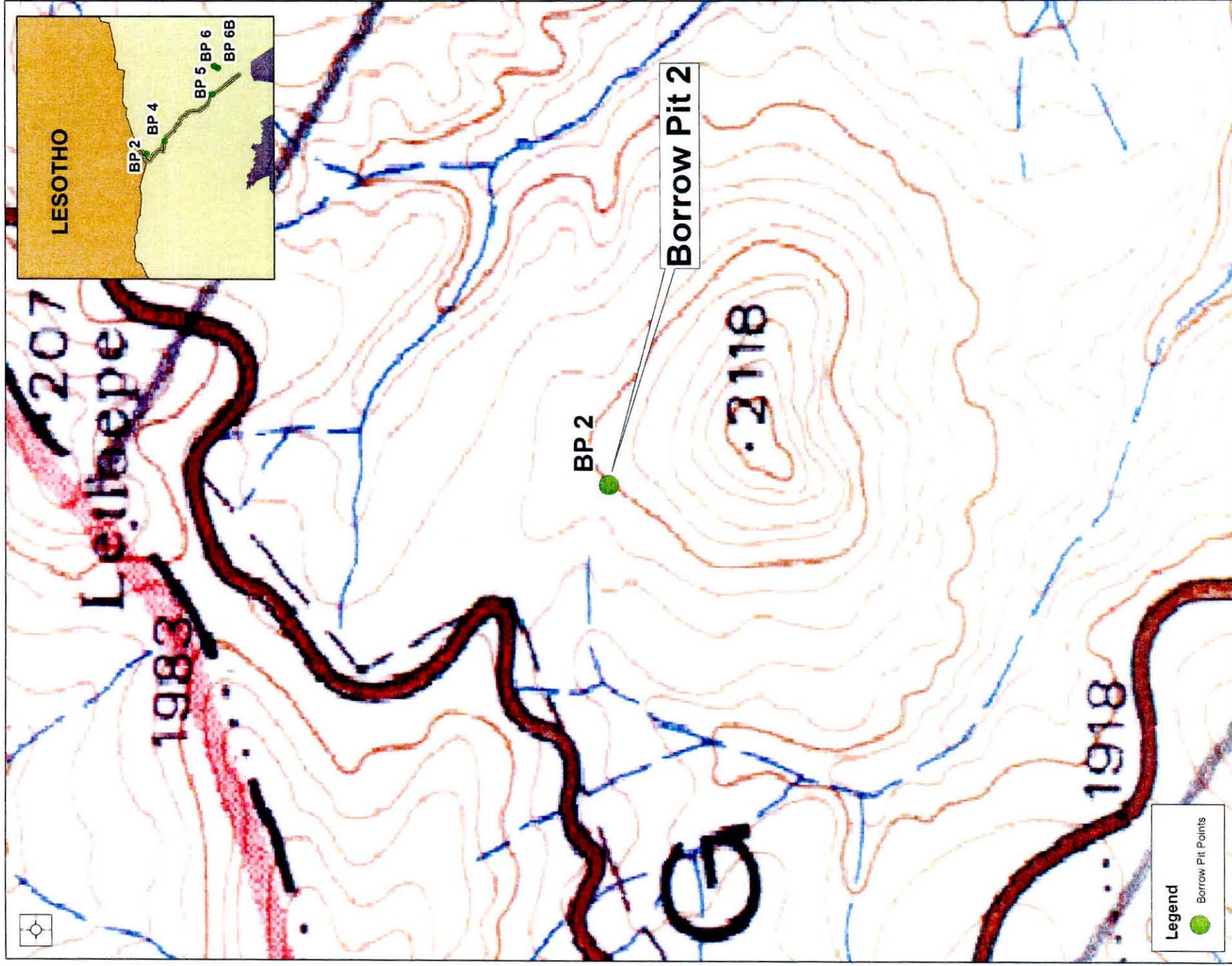
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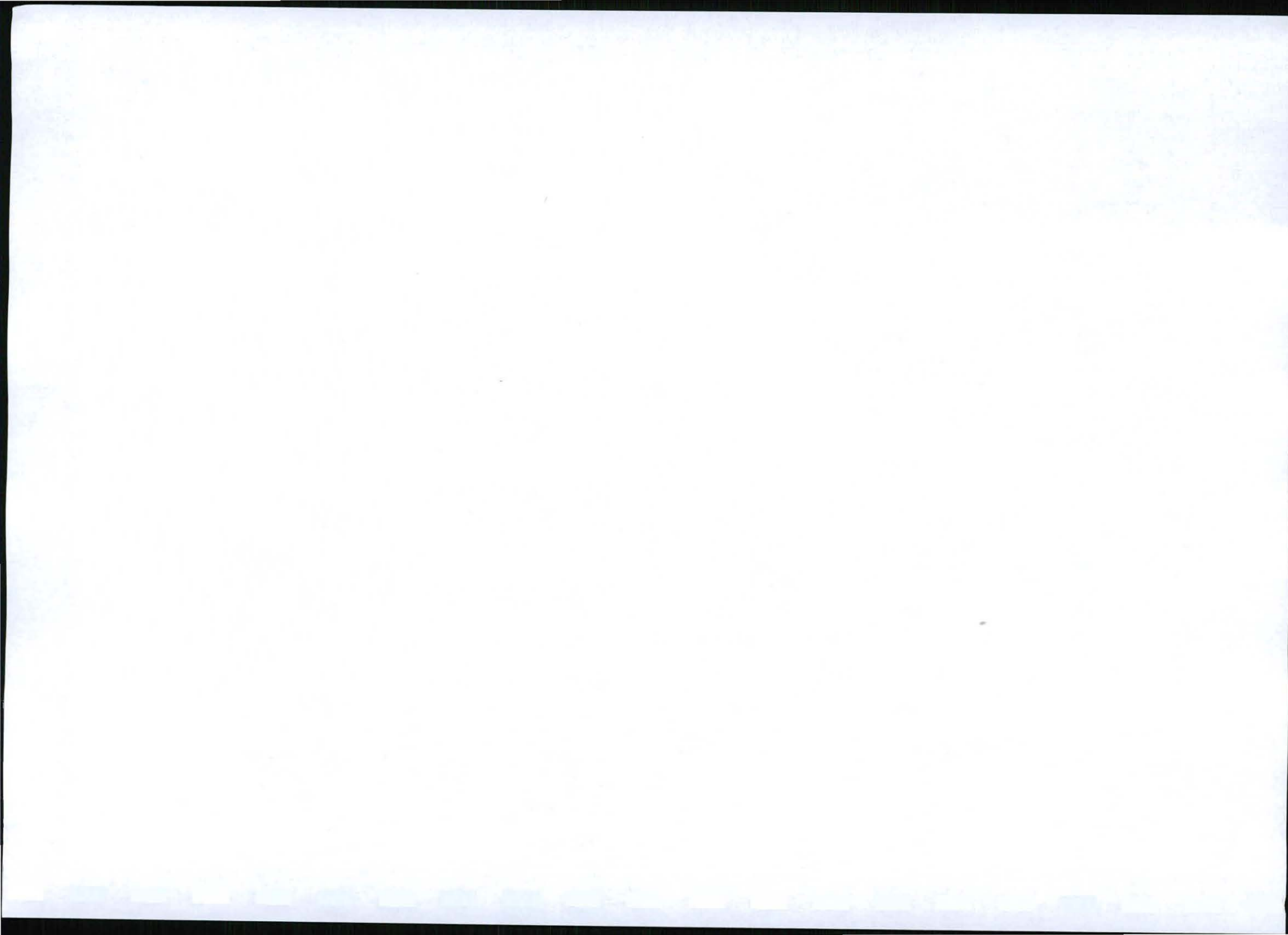
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Fax: (033) 343 6788

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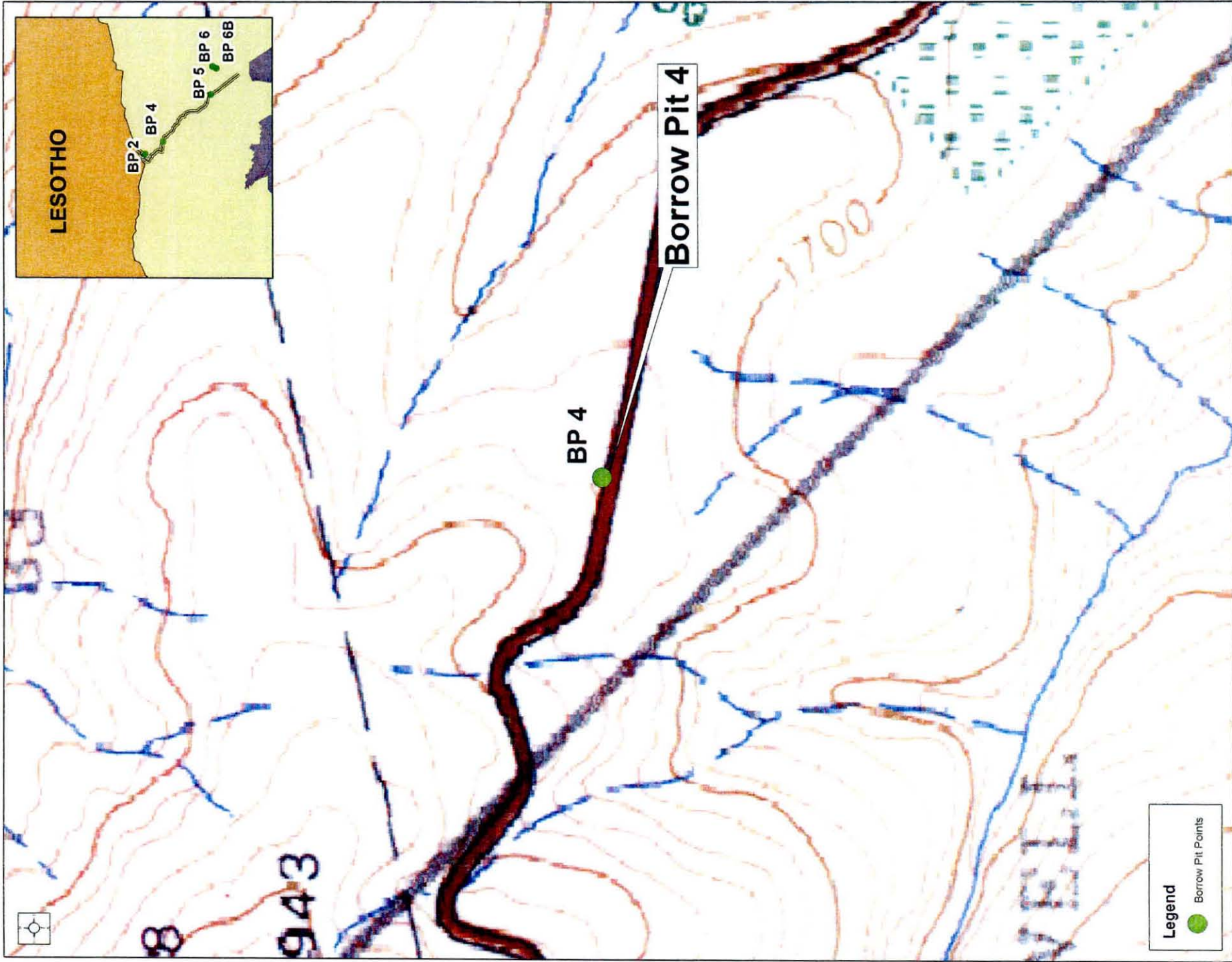
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FIGURE 3- LOCALITY OF BORROW PIT 2





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FIGURE 4- LOCALITY OF BORROW PIT 4

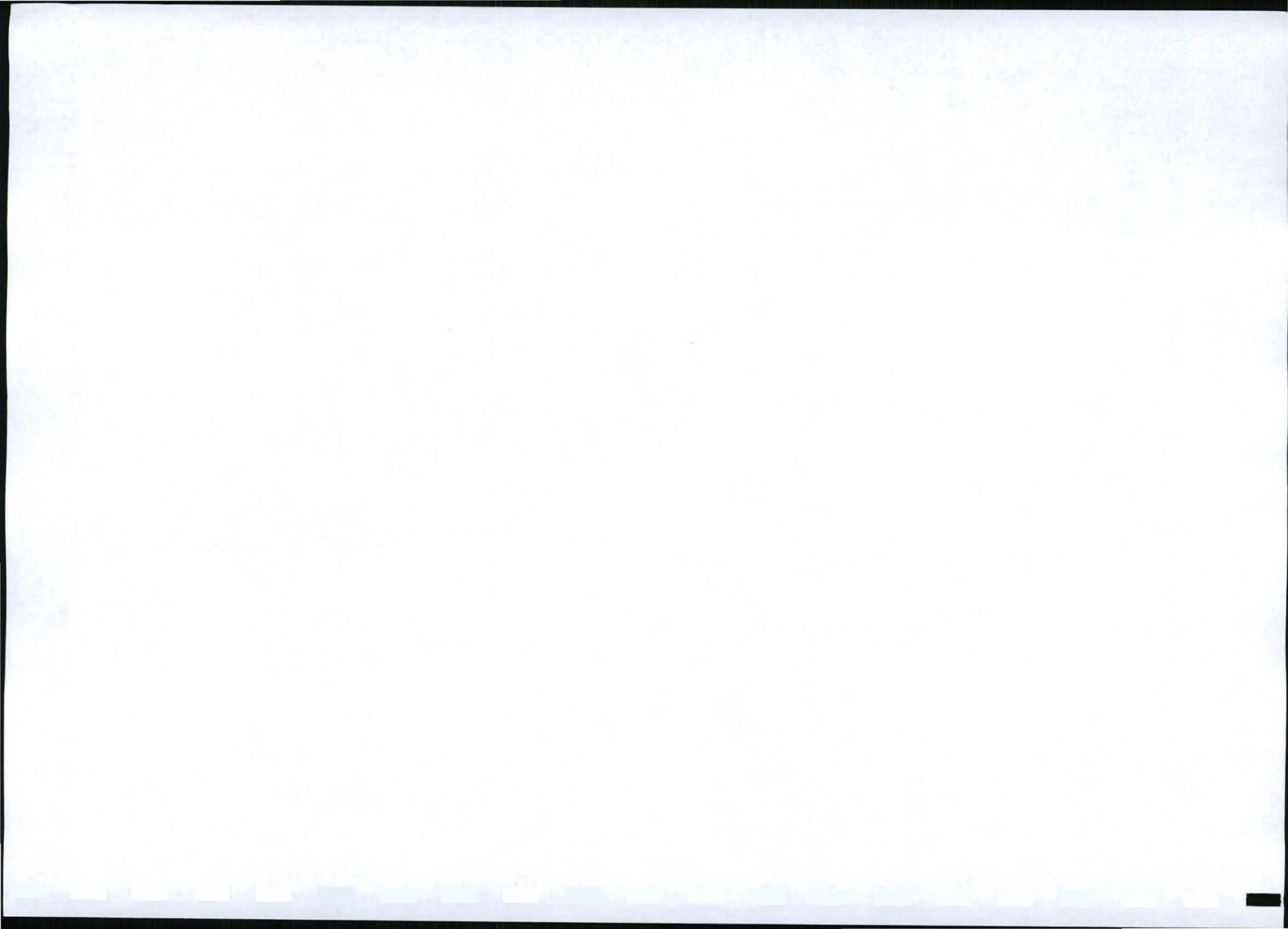


COORDINATE SYSTEM
Transverse Mercator
Spheroid: Everest
Datum: Everest
Units: Meter

PRODUCTION DATE
November 2009

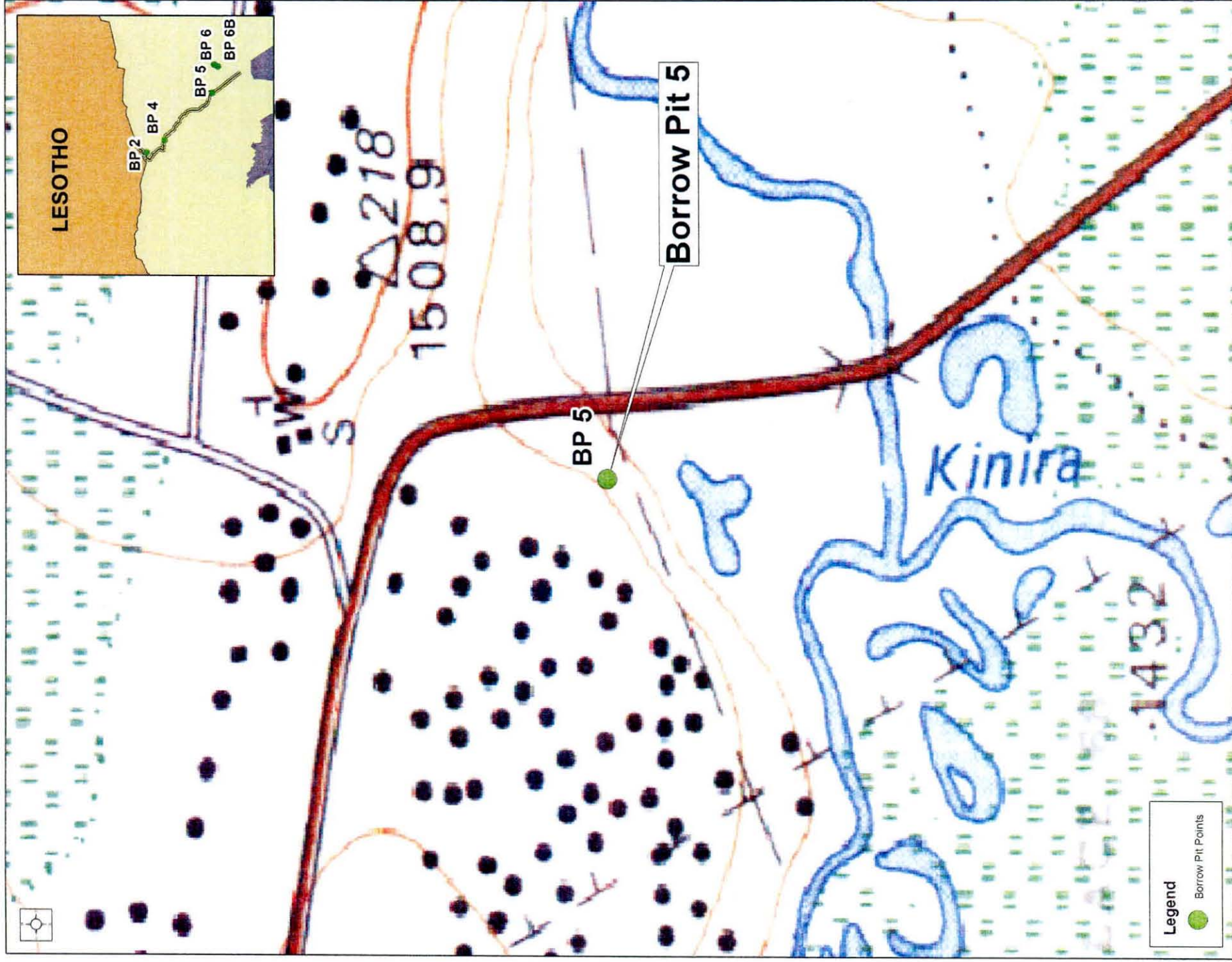
Scale
1:6 000

REFERENCE
Original plan prepared by the Department of Water Affairs, Lesotho
Scale: 1:25 000 (as per Environmental Services Unit)
Date: 1998



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FIGURE 5- LOCALITY OF BORROW PIT 5



COORDINATE SYSTEM
The UTM Zone 32S
Datum: WGS 84
Units: Meter

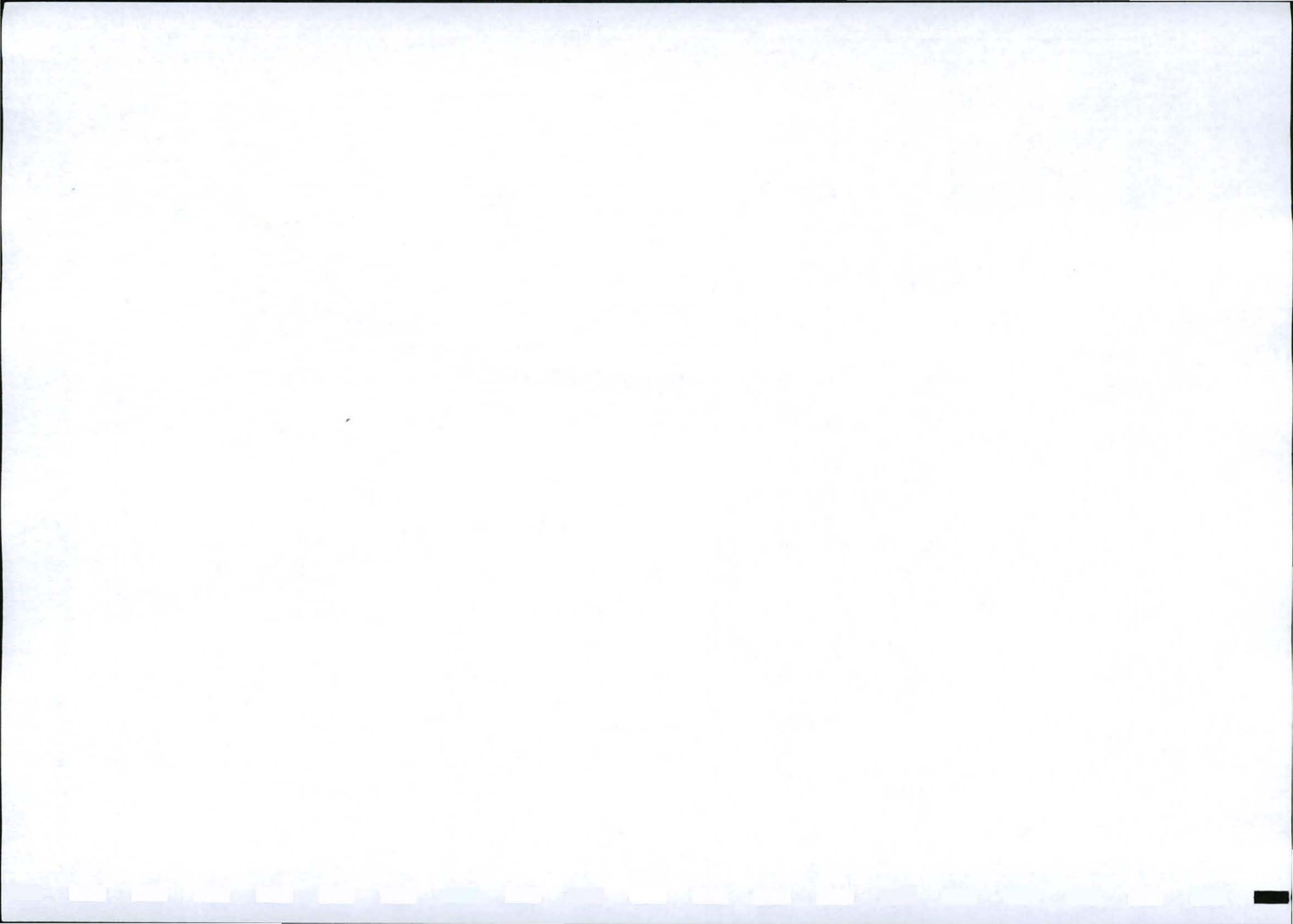
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PRODUCTION DATE
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Stage of Quality Assurance
15/11/09

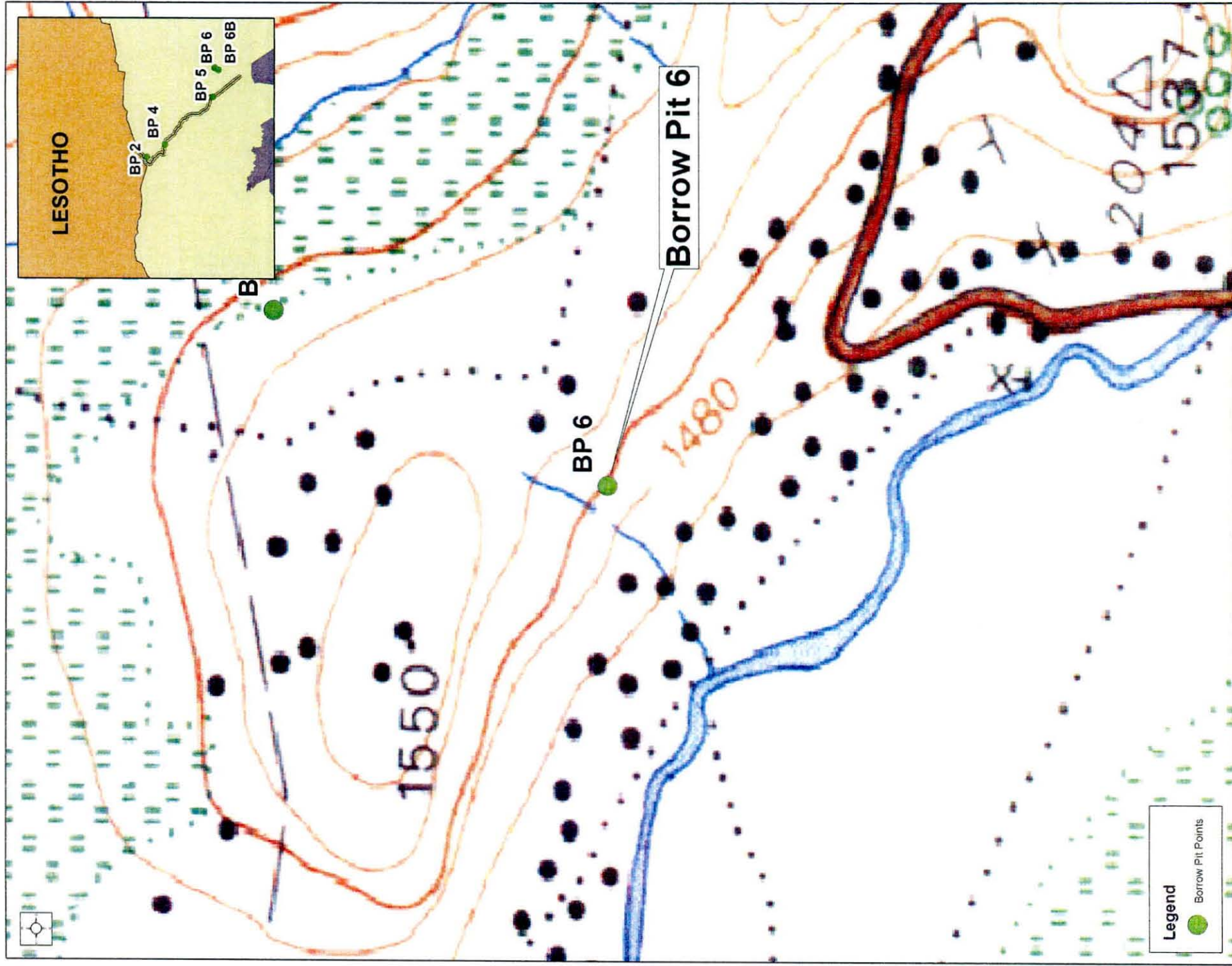
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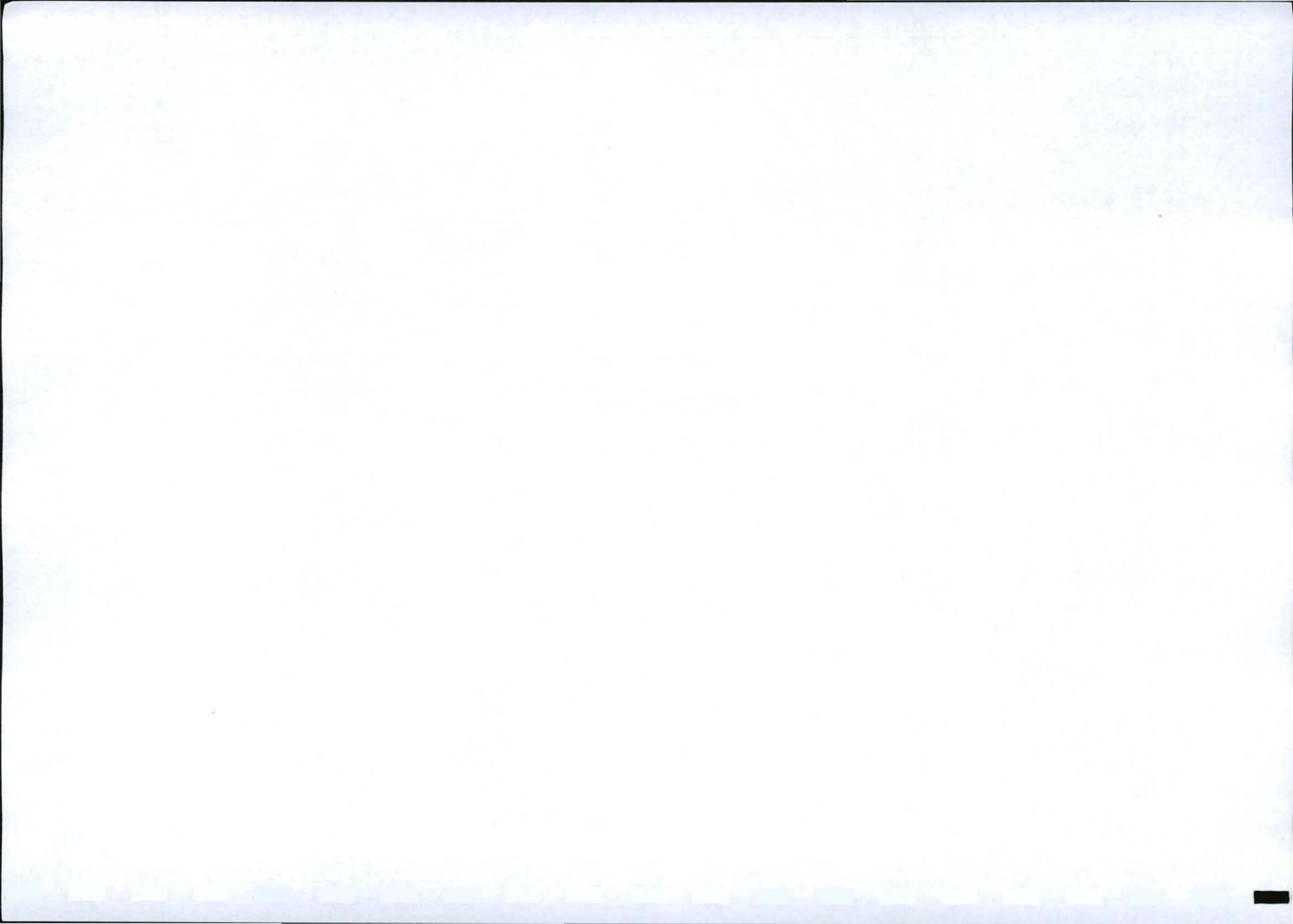
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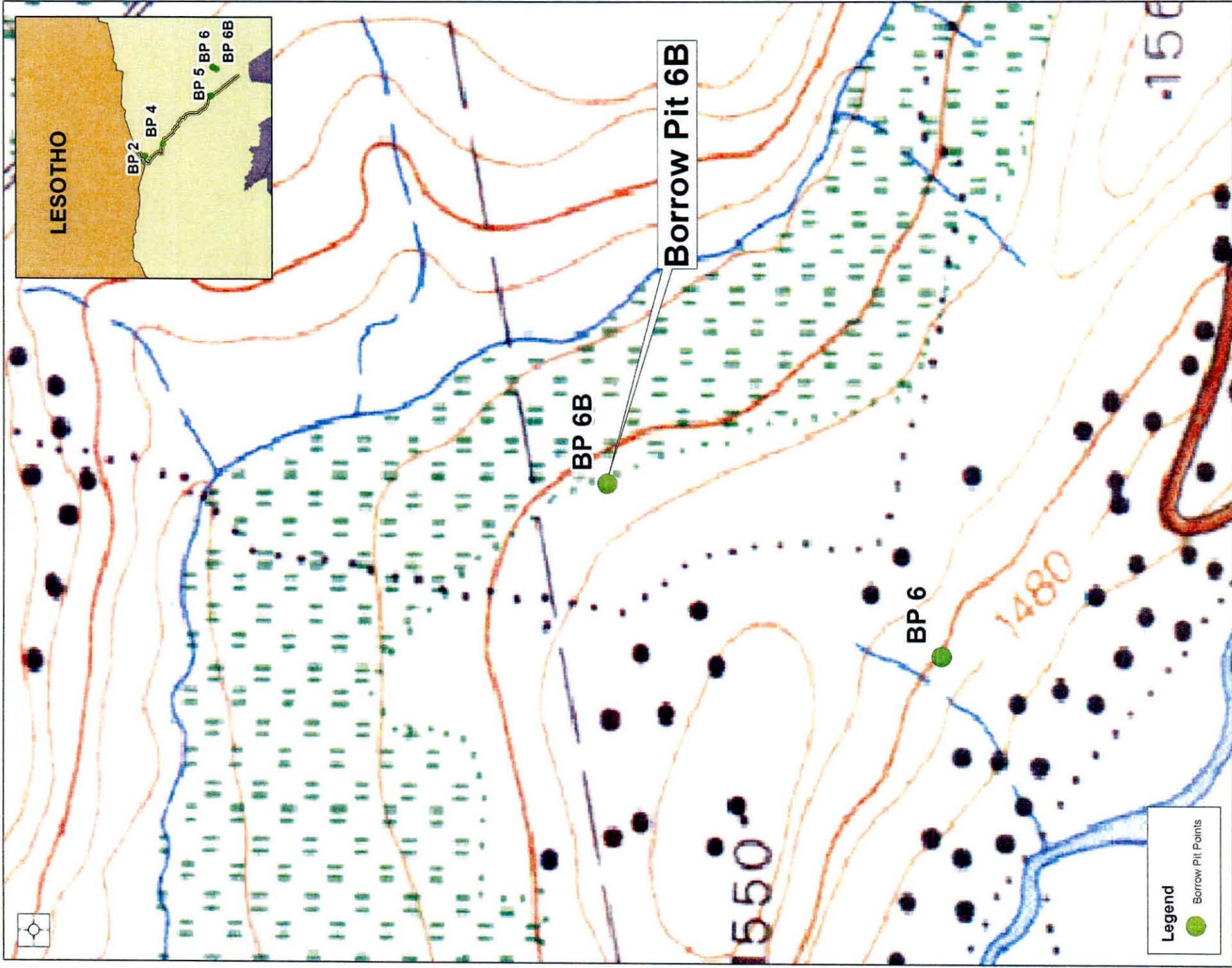
FIGURE 6- LOCALITY OF BORROW PIT 6





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FIGURE 7- LOCALITY OF BORROW PIT 6B



Legend

- Borrow Pit Points

COORDINATE SYSTEM
Transverse Mercator
Spheroid: Everest
Datum: Everest
Units: Meter

SCALE
1:6,000

PRODUCTION DATE
November 2009

REFERENCE
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Map of Quthing and Surrounding Areas, 1:6,000
Scale, Surveying Department, Lesotho & Botswana

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