

In the event of a crisis and/or emergency the following people will be notified:

Table 10: External Response Team

Emergency Participant	Contact No	Role and Responsibility
Queenstown Fire Station	045 807 2749	To act should a fire occur at the quarry
Cofimvaba Police Station	047 874 0868	To close roads and inform people downstream of the quarry should an incident requires such measures
Lady Frere Police Station	047 876 8008	
Emergency Services	10111	
Netcare 911 EMS	082 911	To transport those injured in an incident to a medical treatment centre
Queenstown Ambulance Services	045 838 3467	
Cofimvaba District Hospital	047 874 0111	To stabilise and treat the injured
Tsolwana Community Service	048 881 5115	
Mhlophekazi Health Facility	047 548 1254	
Department of Water Affairs and Forestry – Regional Office	043 604 5402 043 604 5407	To assist in water pollution incidents
Knight Piésold Consulting	011 806 7111	To assist in case of any emergency at the quarry site

9.4 Potential Environmental Emergency Situations

Incidents/accidents will happen, as this is part of the quarrying environment. In order to prevent incidents/accidents, the possible emergencies that could result in an incident/accident must be identified. The following emergencies are identified at the proposed quarry that could result in an impact on the receiving environment including the water, air, soil, fauna and flora.

Spillages of chemicals/substances such as fuel, oils and diesel and other chemicals in the pit area during operations are the most common incidents that are likely to occur on a quarry site. The nature of the chemical spilled and the place where it occurred will determine the criteria of the incident and the subsequent response. The area where these chemicals and other substances are used and stored will be designed in such a way that all contaminated water or spillages will be contained in that area, therefore a spillage will be localised and will be contained within the immediate area experiencing a minor incident.

Fires are other activities that can result in significant damages or result in emergency and crisis situations at the mine. Bush fires could occur during dry periods for various reasons. These incidents could potentially result in an emergency or crisis due to the lack of fire fighting infrastructure in the area.

Potential explosions at the pit area have also been taken into consideration. The risk of this happening can be low due to the measures that are implemented, including storing the detonators and primers separately and constructing the magazine in such a way that it will withstand an explosion and thus prevent damage to the surrounding environment. The explosives storage unit will be located a minimum of 400 m from any other structure to reduce the possibility of damage to other structures in the event of an explosion. Should an explosion occur, the damage and impact that could result should be contained to the quarry site area and will not impact on outside of the boundaries of the quarry site.

9.5 Emergency Response Actions

In the following section the actions will be detailed for each of the emergency events listed below. These response procedures will be revised and updated on a regular basis to ensure their effectiveness.

- Spillages of fuel and chemical substances
- Failure of the hazardous substance store
- Fires (bush, explosives)

9.5.1 Criteria for Triggering the Plan and Alarm Signals

Workmen will be trained to identify any potential environmental emergency situation. They will report any situation directly to their immediate supervisor, the Engineer who will raise the alarm. This procedure would be applicable for chemical substance spillages and failure of the hazardous substance store, etc.

If the situation threatens both equipment and human lives (as in the case of a fire) and immediate evacuation is required, then the fire alarm will be sounded immediately. All employees should evacuate to pre-determined assembling points in an orderly manner.

Each situation will necessitate unique actions to be taken that will be set out in the Emergency Response Actions to be discussed below.

9.5.2 Spillages of Fuel and Chemical Substances

Such spills are usually much smaller incidents, however, the incident must be reported to the responsible Engineer. Specific actions to be taken are provided below:

- If possible, stop the spillage at the source
- Switch off all sources of ignition
- Contain the spillage to the smallest possible area
- Prevent the substance from entering any surface water

- If soil is contaminated, remove the polluted soil and replace with a clean soil or rehabilitate the soil in situ to a situation that is the same, or better than prior to the incident
- Dispose of all contaminated clean up materials and waste to a hazardous waste container for removal by an approved contractor to an appropriate landfill site
- Notify DWAF if surface or groundwater is polluted
- Initiate an investigation to determine the root cause of the incident
- Implement the necessary actions required to prevent a recurrence of the incident
- Follow up with a report to DWAF within 14 days depicting the actions that were taken to remediate the impacts

9.5.3 Failure of the Flammable Hazardous Substances Store

The person observing the incident must notify the responsible Engineer. The responsible Engineer must decide whether it is necessary to notify the fire brigade. Specific actions to be taken are provided below:

- If possible, stop the spillage at the source and switch off all sources of ignition
- Evacuate the area and demarcate the area with red and white barrier tape
- Display “no smoking” and “no open flame” signs
- Prevent spilt substance from entering surface water and water courses
- Contain incident to smallest area possible
- Notify the fire brigade of the incident
- All waste and contaminated materials must be disposed of to a hazardous container for disposal by an approved contractor to an appropriate permitted site
- Rehabilitate contained area
- Notify DWAF if surface or groundwater is polluted
- Initiate an investigation to determine the root cause of the incident
- Implement the necessary actions required to prevent a recurrence of the incident
- Follow up with a report to DWAF within 14 days depicting the actions that were taken to remediate the impacts

9.5.4 Fires

All fires (veld, chemical fires and explosive) on the quarry area must be reported to the Engineer. Specific actions to be taken by the Engineer are provided below:

- When alerted he, must record the following:
 - The exact position of the fire
 - Any injuries
 - Establish what is burning (veld, chemicals, equipment)
- Notify the local farmers
- Take the necessary actions
- Evacuate people in the immediate vicinity

- Remove equipment in danger of being destroyed
- Investigate the root cause of the incident
- Take the necessary steps to prevent the incident from happening again.

9.6 Reporting and Emergency Response Plan Revision

All environmental incidents reported at the quarry will be investigated and documented. The outcome of the investigations will be used to update the current system to prevent a recurrence of the incident.

The Emergency Response Plan will be revised, as necessary, should an incident or audit highlight a shortcoming in the plan.

9.7 Training

The Engineer will be responsible for training all the workmen to such a standard as to ensure that they will deal with an environmental incident or accident in the most efficient way.

All employees will undergo induction training. During the induction training they will be informed and trained on what to do if they observe an environmental incident or accident.

10. ENVIRONMENTAL MONITORING

10.1 Visual Quarry Record

The Engineer will keep a visual record of the proposed quarry site by taking photographs before, during and after operation has commenced. These will be kept in a monitoring file and copies sent to DWAF for their records.

10.2 Fauna and Flora

The regular removal of alien plant species is vital to the creation of a resilient ecological system. Attention to detail is required to remove invasive plants, and this should be done once they are easily identifiable and when indigenous plant species have begun establishing themselves.

The quarry should be surveyed every four to six months after closure to remove alien species and re-vegetate seeds of local indigenous species (Table 3). A flora and fauna checklist with cover abundance data should be completed on every visit allowing for comparisons over time. An analysis of the initial rehabilitation progress should be produced within two years of closure. A biodiversity assessment should be undertaken yearly. If this is not possible then the site should be monitored every four to six months to remove alien vegetation.

10.3 Water Monitoring

The Contractor must establish the monitoring programme as set out in the General Authorisation (GN no. 399, 2004 (S. 21(f), (h) and (g))) to monitor the quantity and quality of wastewater prior to storage or disposal, as follows:

- The location of the storage dam or wastewater disposal site must be specified
- The quantity of wastewater stored must be recorded monthly
- The quantity of wastewater discharged must be metered and the total recorded weekly
- The quality of wastewater discharged must be monitored weekly by grab sampling.

The Contractor must submit the above information, as well as details of the monitoring programme/s, failures and malfunctions in the storage and discharge system and corrective measures taken, on a monthly basis to DWAF. The methods for the measurement of specific substances and parameters in any wastewater must be carried out by a laboratory that has been accredited under the South African National Accreditation System (SANAS) in terms of SABS Code 0259 for that method.

11. EMPROGRAMME PERFORMANCE ASSESSMENT

The DWAF is committed to implementing the EMProgramme set out in this document and acknowledges the fact that a performance assessment of the environmental management programme must be conducted:

- To ensure compliance with the EMProgramme
- To assess the continued appropriateness and adequacy of the EMProgramme

The DWAF undertakes to submit a performance report to the minister of the DME upon closure of the quarry. The objective of this report would be to ascertain:

- Compliance with the EMProgramme throughout the project
- Appropriateness and effectiveness of the EMProgramme
- Ongoing identification and assessment of environmental impacts that were not properly addressed, or which were unknown, when the EMProgramme was compiled
- Proactive actions were being taken which result in the establishment of appropriate performance indicators and timeous corrective actions or amendment to the EMProgramme

The performance assessment report shall be compiled in a format that is acceptable to the DME. The report shall be submitted within 30 days of the assessment and shall contain the following:

- Information regarding the period applicable to the performance assessment
- The scope of the audit
- Interpreted information gained from monitoring the approved EMP
- Evaluation criteria used during the assessment
- Results of the assessment

12. FINANCIAL PROVISION FOR REHABILITATION

Financial provision for environmental rehabilitation and closure requirements of a quarry operation forms an integral part of the MPRDA.

The DWAF realises the importance of the financial provision for the closure phase to ensure that there will be sufficient funds available to address all negative impacts adequately. This is not only a legal requirement, but in terms of strategic management, it will prevent excessive costs to the DWAF during the closure phase.

A Memorandum of Understanding (MoU) exists between the DWAF and DME dated 2 May 2007 in which "It is therefore agreed between both parties....DWAF shall be deemed to comply with the requirements of financial provision: Provided that the estimated costs for the management, rehabilitation and closure of such quarries and borrowed areas or works are provided within the approved budget for such Government water works." Refer to Appendix F for the MoU as mentioned above.

The objectives of this financial provision are to:

- Ensure that sufficient funds are available to mitigate and rehabilitate negative impacts once the quarry enters into the closure phase
- Evaluate and review the quantum for financial provision annually to ensure that sufficient funds are available for the rehabilitation of the existing disturbed area.

The DWAF will initially provide a financial guarantee for the quantum required and no updates will be provided as the project is expected to run for only 4 months.

12.1 Quantum of Financial Provision

The DWAF will have to provide a quantum of R 186 825.50 at the end of the quarry's life based on the initial approved budget plan. This quantum was determined using the Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine. Refer to Table 11 for the DME Quarry Closure Provision Model.

Table 11: DME Quarry Closure Provision Model

Component	Description	Unit	Master Rate	Multiplication factor	Weighting Factor 1	Quantity	Total	Comments
3	Access Road	m ²	R 17.00	1	1.1	2418.93	R 45 233.99	Based on 30m from main access road to quarry
6	Opencast Rehabilitation	ha	R 99 600.00	0.04	1.1	1.25	R 5 478.00	Area covered by surface quarry
8(A)	Overburden and Spoils	ha	R 66 400.00	1	1.1	0.0875	R 6 391.00	Area covered by topsoil stockpiles
10	General Surface Rehabilitation	ha	R 52 600.00	1	1.1	0.53	R 30 665.80	Process (crusher, screening) & general area
12	Fencing	m	R 60.00	1	1.1	605	R 39 930.00	Perimeter
13	Water management	ha	R 20 000.00	0.17	1.1	1.305	R 4 880.70	Surface Mine and settling pond
14	Maintenance and after care	ha	R 700.00	1	1.1	1.66	R 1 278.20	Open pit, process area, settling pond, topsoil stockpile area
						Sub total	R 133 857.70	
Multiply sum of above by Weithging Factor 2 - peri-urban therefore factor of 1.05					1.05		R 140 550.60	
Preliminary and General - Add 6% of subtotal if < R 100,000,000.00							R8433.00	
						Sub total	R 148 983.60	
Contingencies - add 10% of subtotal							R 14 898.40	
						Sub total	R 163 882.00	
Add VAT @ 14%							R 22 943.50	
						GRAND TOTAL	R 186 825.50	

Where:

Mine type : Dolerite (Small - Class C mine)
 Risk Ranking : Low Risk
 Environmental Sensitivity : Low
 Level of Information : Limited

Closure Components:

Weighting Factor 1 : Undulating = 1.1
 Weighting Factor 2 : Peri-urban = 1.05

Assumptions

- Rehabilitation for the processing area (crusher, screening and conveyors) have been considered and included in Component 10: General Surface Rehabilitation
- Rehabilitation of the settling pond have not been included in the calculation for financial provision as the engineering aspects of the settling pond is very limited. However, it has been considered and included in Component 13: Water Management and Component 14: Maintenance and After Care. An area of 2500 m² has been estimated for the settling pond.

13. CONCLUSION

The Tsojana Quarry's Environmental Management Programme (EMProgramme) has been completed as an application document for approval and will be submitted to the DME in compliance with the requirements of the Mineral and Petroleum Resources Development Act (MPRDA). The potential impacts have been identified, characterised and quantified.

The EMP contains the objectives to prevent and minimise in a responsible manner the impacts of the quarry operations on the receiving environment. A conservative approach has been adopted when setting out mitigation measures. Environmental actions are described in detail in order to manage the impacts.

Site clearing, creation of an access road, topsoil stripping and stockpiling, and employment of local labour will be conducted during the pre-operational phase. The most significantly negative impacts during this phase will be on the soils compacted along the access road, destruction of habitats and plants during site clearance and social problems for farmers. These include security risks, stock theft due to poaching and potential drug and alcohol abuse among the Contractor's workforce. The areas to be cleared during the pre-operational phase will be kept to a minimum, and potential impacts will be sufficiently mitigated.

The operational phase will include drilling and blasting of rock, crushing and screening of excavated rock on site, loading and haulage of excavated material and maintenance of the access road. The most significantly negative impacts during this phase will be the disturbance of the geology of the site by surface quarrying excavations as the excavation of the materials and the need for soils will impact on the topsoils and subsoils in the quarry area, continued potential social problems for farmers as mentioned in the pre-operational phase and visual impacts due to the excavation of material during quarry operations. Most of the significantly negative impacts of this phase can be sufficiently mitigated with the implementation of specific management and mitigation measures.

Closure and rehabilitation activities will include the removal of surface infrastructure, earthmoving operations for rehabilitation and topsoil and re-vegetation operations. The most significant impacts during this phase will be the end of employment of local labour, the disturbed geology, rehabilitation of the land as far as practicably and economically possible to the pre-quarrying land use (a positive impact), and the replacement and grading of soils on the site will result in the enhancement of the ecological succession process which will also be positive.

The EMP programme also addresses emergency preparedness and response planning and identifies possible incidents that could result in an environmental emergency and proposes the necessary actions to be taken to clean up and rehabilitate the results of an incident.

In order to determine whether the quarry complies with the commitments made in the EMP programme, a performance assessment is set out in this document which will determine the actions that the DWAF needs to take for the performance assessment report. This report will be submitted to the minister of the DME on closure of the quarry.

Finally, the MPRDA emphasises the importance of providing sufficient financial funds to address the ongoing and, more important, the closure and post closure impacts. The quantum for financial provision for rehabilitation was calculated using DME's: Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine. This quantum will be reserved for site rehabilitation in accordance with the requirements of the MPRDA.

This EMP strives to address the possible impacts that could result from quarry operations through the setting out of detailed action plans to address impacts and emergency situations should they occur, as well as the steps taken towards the provision of sufficient funds for closure.

14. REFERENCES

- Centre for Scientific and Industrial Research (2002) *Guidelines for Standardised Environmental Management Plans for Department of Water Affairs and Forestry*
- Department of Environmental Affairs and Tourism (2000) *Shape of the Provinces* (www.environment.gov.za/Enviro-Info/prov/shape.htm)
- Department of Water Affairs and Forestry (2004) *Amatole-Kei Area Internal Strategic Perspective*
- Department of Water Affairs and Forestry (2007) *Dam Safety Rehabilitation Programme for Government Water Works 2007/2008*
- Department of Minerals and Energy (2005) *Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine*
- Department of Minerals and Energy (2004) *Standardised EMP for Prospecting Right and Mining Permit*
- Knight Piésold Consulting & Lukhozi Consulting Engineers (2008) *Tsojana Dam Design Report*
- Knight Piésold Consulting (2007) *Environmental Screening Report Tsojana Dam*
- Knight Piésold Consulting (2007) *Flood Hydrology Report*
- Knight Piésold Consulting (2007) *Tsojana Dam Inception Report*
- Resources Management Services (2008) *Fauna and Flora Survey for the Tsojana Dam Quarry in the Eastern Cape*
- Terreco Consulting Engineers (2007) *Geotechnical Report for Tsojana Dam*
- Van Schalkwyk, J. (2008) *Heritage Impact Assessment Report for the Tsojana Dam Rehabilitation Project, Cofimvaba Magisterial Districts, Eastern Cape Province*
- World Climate: www.worldclimate.com

15. **UNDERTAKING**

The Department of Water Affairs and Forestry hereby undertakes to implement the measures to reach the objectives set in this Environmental Management Programme to ensure that the impacts on the receiving environment are prevented, minimised and or mitigated.



Signature

Name: WG vd Westhuizen
D: Strategic Asset Management
On behalf of the Department of Water Affairs and Forestry

Date: 2009/8/31

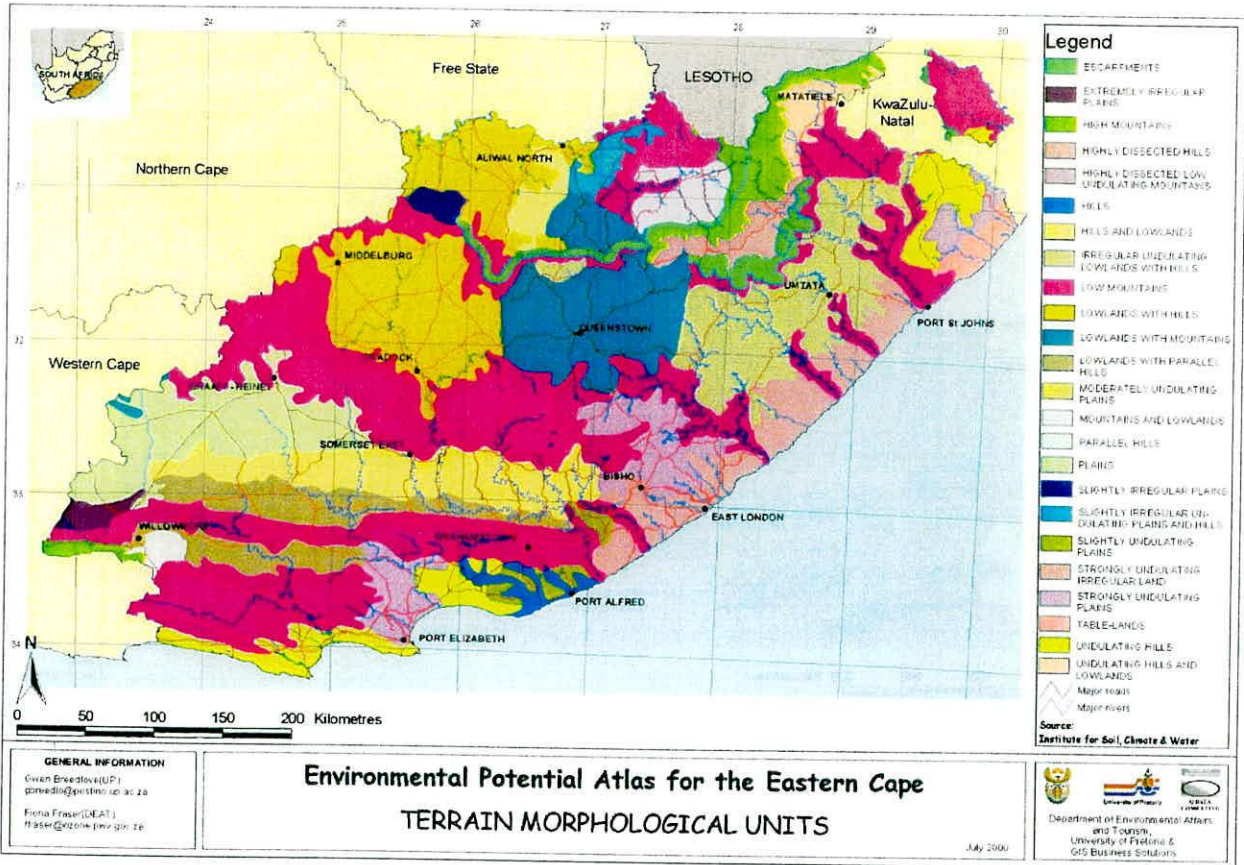
APPENDIX A

DWAF and DEAT Agreement on Environmental Procedures

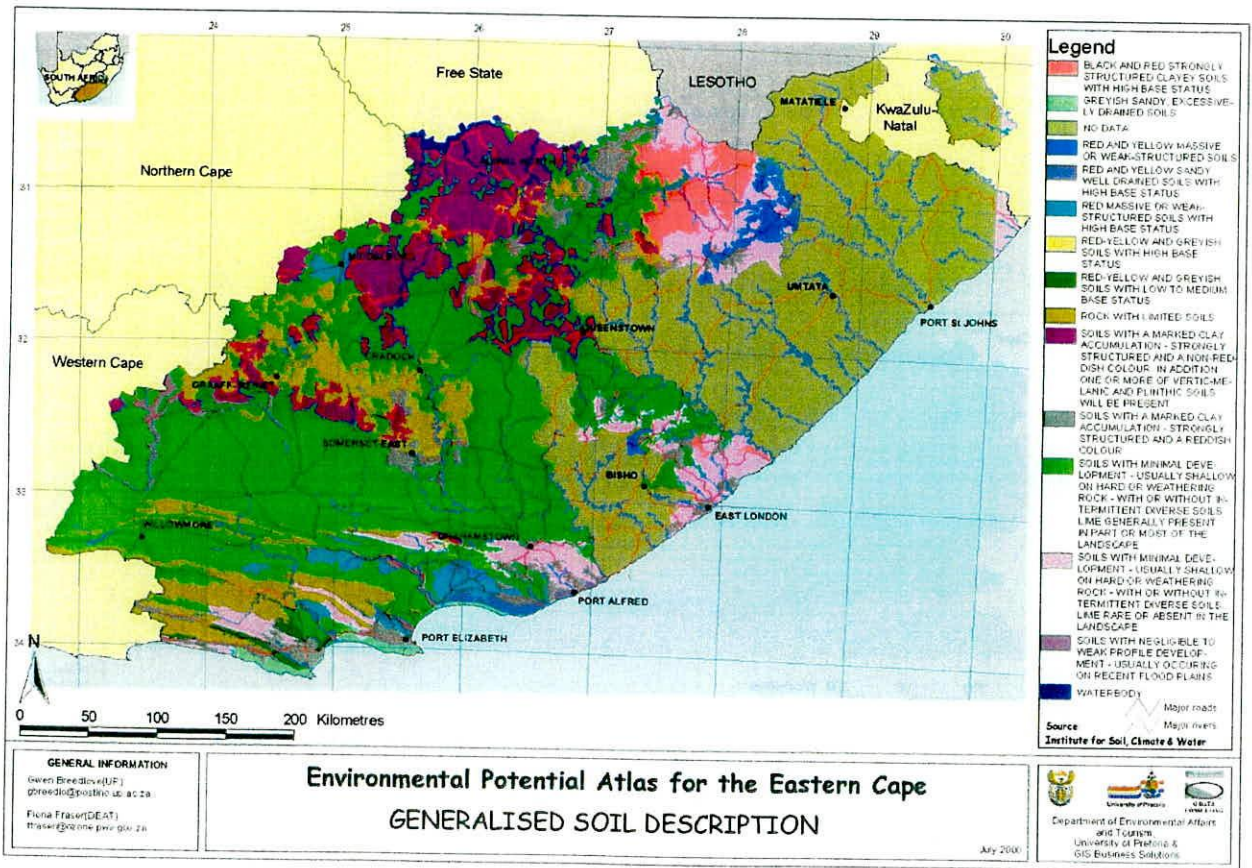


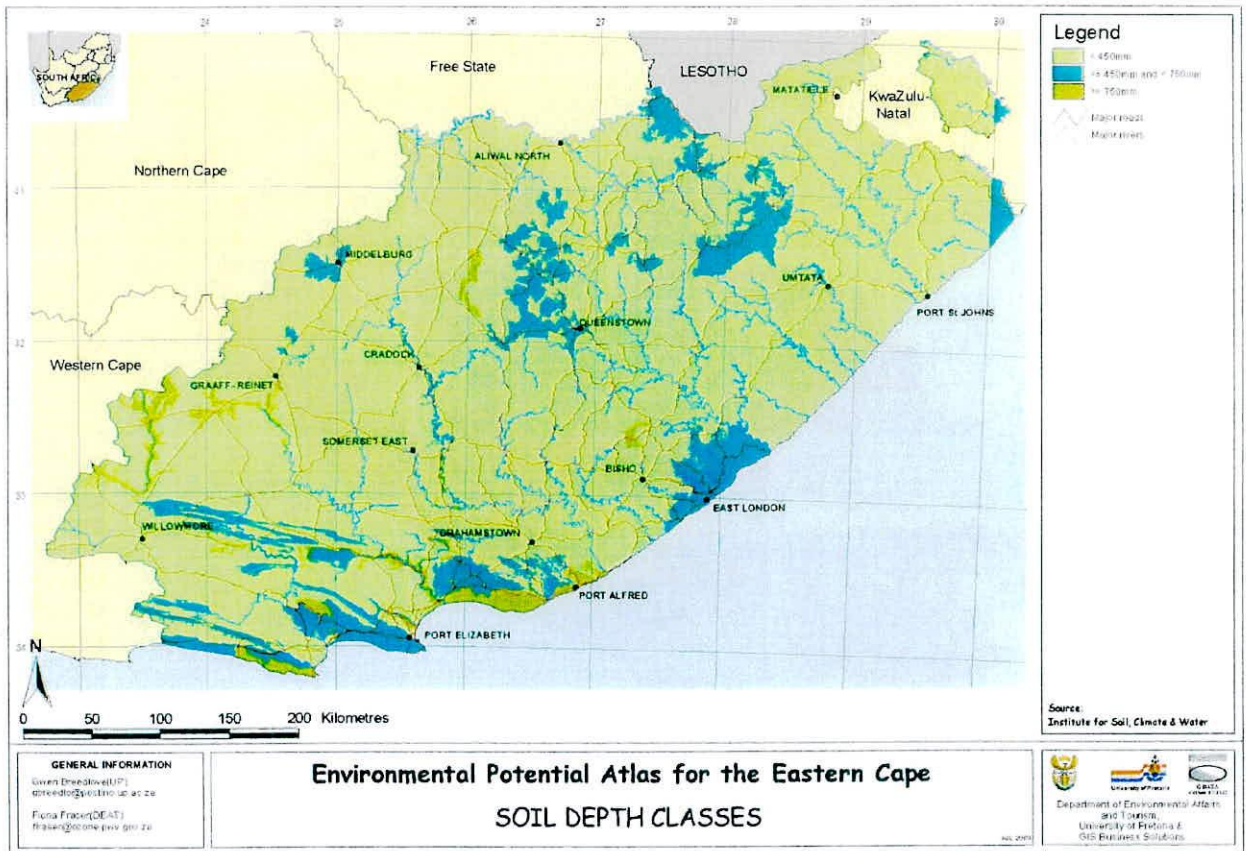
APPENDIX B
Environmental Parameter Maps

Topography

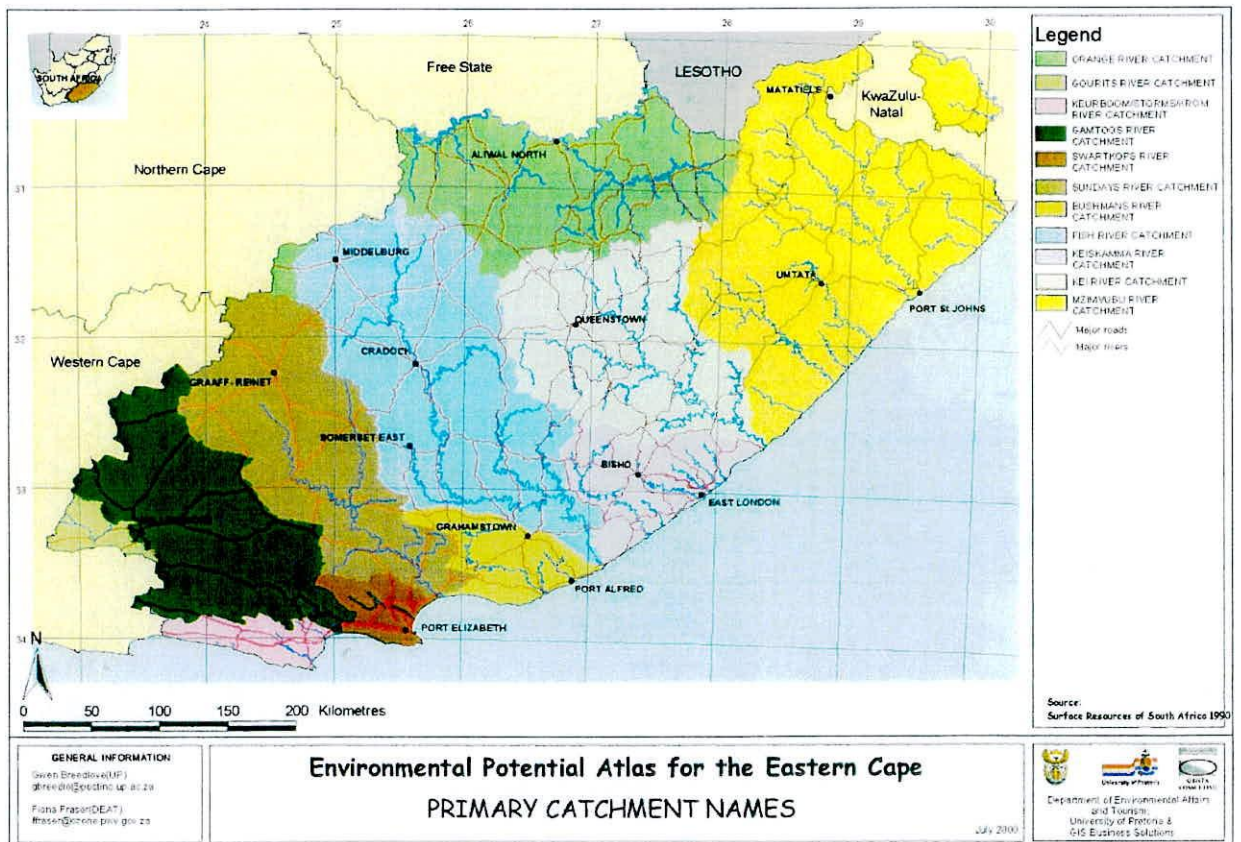


Soils

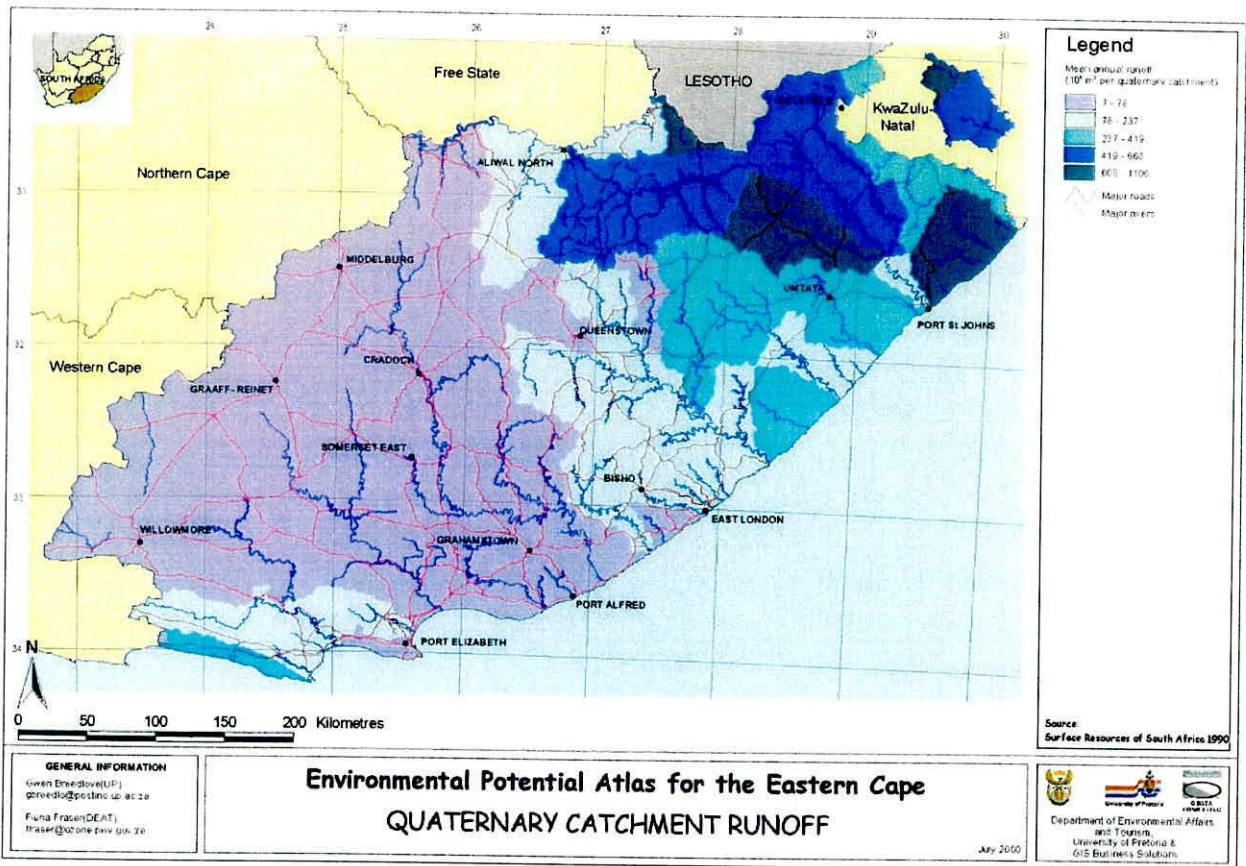




Surface Water River Catchment



Catchment Runoff



APPENDIX C

List of Birds from the Roberts Multimedia Package Recorded in the Quarter Degree Square
(2125CB)

QDS 3125CD

Name: _____ Date: _____ Place: Grassridge Quarry Site QDS: 3125CD Species 267

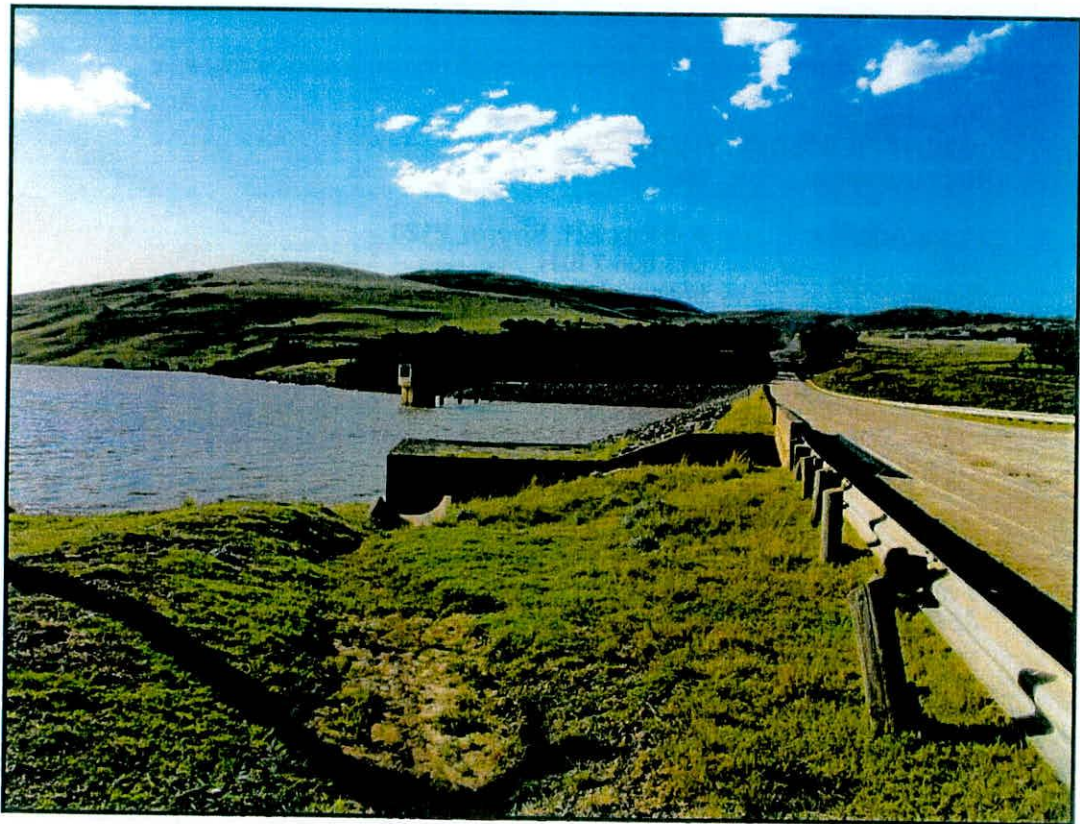
Rob	English Name	Map Status	Rob	English Name	Map Status	Rob	English Name	Map Status
105	African Black Duck	R-C	701	Chinstrap Batis	R-C	94	Hadeda Ibis	R-VC
148	African Fish Eagle	R-U	666	Cloud Cisticola	R-U	81	Hammerkop	R-VC
160	African Goshawk	R-C	226	Common Moorhen	R-C	203	Helmeted Guineafowl	R-VC
451	African Hoopoe	R-VC	200	Common Quail	R-U	416	Horus Swift	BM-U
240	African Jacana	R-U	264	Common Sandpiper	NBM-C	530	House Martin	NBM-U
165	African Marsh Harrier	R-U	846	Common Waxbill	R-VC	801	House Sparrow	R-VC
631	African Marsh Warbler	BM-C	255	Crowned Plover	R-U	152	Jackal Buzzard	E-VC
210	African Rail	R-U	272	Curlew Sandpiper	NBM-U	382	Jacobin Cuckoo	BM-C
638	African Sedge Warbler	R-U	8	Dabchick	R-U	592	Karoo Chat	E-C
95	African Spoonbill	R-C	60	Daric	R-U	654	Karoo Eremomela	E-C
418	Alpine Swift	BM-C	665	Desert Cisticola	R-C	686	Karoo Prinia	E-A
595	Antenting Chat	E-VC	386	Diederik Cuckoo	BM-U	614	Karoo Robin	E-VC
552	Ashy Tit	E-C	301	Doublebanded Courser	R-U	577.1	Karoo Thrush	E-VC
392	Barn Owl	R-C	788	Dusky Sunbird	E-VC	248	Kittlitz's Plover	R-C
645	Barthroated Apalis	R-U	495.2	Eastern Clapper Lark	E-C	230	Kori Bustard	R-VC
213	Black Crane	R-U	500.2	Eastern Longbilled Lark	E-U	172	Lanner Falcon	R-C
547	Black Crow	R-VC	102	Egyptian Goose	R-VC	887	Larklike Bunting	E-VC
131	Black Eagle	R-C	286	Ethiopian Snipe	R-C	355	Laughing Dove	R-A
168	Black Harrier	E-C	438	Eurasian Bee-eater	NBM-VC	622	Layard's Titbabbler	E-C
84	Black Stork	R-C	374	Eurasian Cuckoo	NBM-U	783	Lesser Doublecollared Sunbird	E-VC
792	Black Sunbird	R-U/VC	543	Eurasian Golden Oriole	NBM-U	97	Lesser Flamingo	R-U/C
412	Black Swift	BM-U	633	Eurasian Marsh Warbler	NBM-U	731	Lesser Grey Shrike	NBM-U
864	Black Widowfinch	R-U	404	Eurasian Nightjar	NBM-U	476	Lesser Honeyguide	R-U
143	Blackbreasted Snake Eagle	R-C	446	Eurasian Roller	NBM-U	183	Lesser Kestrel	NBM-C
76	Blackcrowned Night Heron	R-U	757	Eurasian Starling	R-U	527	Lesser Striped Swallow	BM-VC
568	Blackeyed Bulbul	R-VC	518	Eurasian Swallow	NBM-VC	677	Levaillant's Cisticola	R-VC
876	Blackheaded Canary	E-C	411	Eurasian Swift	NBM-U	67	Little Egret	R-U
65	Blackheaded Heron	R-VC	706	Fairy Flycatcher	E-C	274	Little Stint	NBM-C
7	Blacknecked Grebe	R-U	589	Familiar Chat	R-VC	417	Little Swift	R-VC
127	Blackshouldered Kite	R-VC	664	Fantailed Cisticola	R-C	651	Longbilled Crombec	R-VC
258	Blacksmith Plover	R-VC	348	Feral Pigeon	R-C	717	Longbilled Pipit	R-U
870	Blackthroated Canary	R-VC	405	Fierynecked Nightjar	R-U/C	232	Ludwig's Bustard	E-C
295	Blackwinged Still	R-C	698	Fiscal Flycatcher	E-VC	117	Maccoa Duck	R-U
208	Blue Crane	E-C	732	Fiscal Shrike	R-A	431	Malachite Kingfisher	R-U
234	Blue Korhaan	E-VC	541	Forkmiled Drongo	R-VC	775	Malachite Sunbird	R-VC
746	Bokmakierie	E-VC	161	Gaber Goshawk	R-U	269	Marsh Sandpiper	NBM-C
136	Booted Eagle	R-C	619	Garden Warbler	NBM-U	140	Martial Eagle	R-C
498.1	Bradfield's Lark	R-U	429	Giant Kingfisher	R-U	814	Masked Weaver	R-VC
435	Brownhooded Kingfisher	R-C/VC	93	Glossy Ibis	R-U	492	Melodious Lark	E-U
533	Brownthroated Martin	R-C	764	Glossy Starling	E-C/VC	586	Mountain Chat	E-VC
719	Buffy Pipit	R-U	826	Golden Bishop	R-U	356	Namaqua Dove	R-C
391	Burchell's Coucal	R-U	884	Goldenbreasted Bunting	R-U	344	Namaqua Sandgrouse	E-U
885	Cape Bunting	R-VC	64	Goliath Heron	R-U	687	Namaqua Warbler	E-C
872	Cape Canary	R-U/VC	661	Grassbird	E-U	681	Neddicky	R-C
400	Cape Eagle Owl	R-U	716	Grassveld Pipit	R-VC	727	Orangethroated Longclaw	E-VC
557	Cape Penduline Tit	E-C	6	Great Crested Grebe	R-U	170	Osprey	NBM-U
635	Cape Reed Warbler	R-C	389	Great Spotted Cuckoo	BM-U	1	Ostrich	R-C
601	Cape Robin	R-VC	66	Great White Egret	R-U	162	Pale Chanting Goshawk	E-VC
581	Cape Rockthrush	E-C	785	Greater Doublecollared Sunbird	E-C	770	Palewinged Starling	E-VC
112	Cape Shoveller	E-VC	96	Greater Flamingo	R-U/C	147	Palmnut Vulture	V #
803	Cape Sparrow	E-A	474	Greater Honeyguide	R-C	710	Paradise Flycatcher	BM-VC
106	Cape Teal	R-U	182	Greater Kestrel	R-U	523	Pearlbreasted Swallow	BM-U
354	Cape Turtle Dove	R-A	526	Greater Striped Swallow	BM-VC	171	Peregrine Falcon	NBM-U
122	Cape Vulture	E-U	270	Greenshank	NBM-C	294	Pied Avocet	R-C
713	Cape Wagtail	R-VC	62	Grey Heron	R-C	465	Pied Barbet	E-VC
813	Cape Weaver	E-VC	669	Greybacked Cisticola	E-VC	548	Pied Crow	R-A
796	Cape White-eye	E-VC	516	Greybacked Finchlark	E-C	428	Pied Kingfisher	R-U
587	Capped Wheatear	R-U	315	Greybacked Gull	R-U	759	Pied Starling	E-A
486	Cardinal Woodpecker	R-U	190	Greywing Francolin	E-C	508	Pinkbilled Lark	E-C
71	Cattle Egret	R-VC	480	Ground Woodpecker	E-C	860	Pintailed Whydah	R-VC
697	Chat Flycatcher	E-C	169	Gymnogene	R-C	718	Plainbacked Pipit	R-U

Rob	English Name	Map Status	Rob	English Name	Map Status
703	Pririt Batis	E-VC	266	Wood Sandpiper	NBM-U
65	Purple Heron	R-U	878	Yellow Canary	E-VC
852	Quail Finch	R-U	714	Yellow Wagtail	NBM-U
350	Ramcron Pigeon	R-U	653	Yellowbellied Firemornela	R-C
824	Red Bishop	R-VC	104	Yellowbilled Duck	R-VC
733	Redbacked Shrike	NBM-VC	68	Yellowbilled Egret	R-U
842	Redbilled Firefinch	R-U	126	Yellowbilled Kite	BM-U
821	Redbilled Quelea	R-U	90	Yellowbilled Stork	NBM-U
108	Redbilled Teal	R-C	869	Yellowweyed Canary	R-U
452	Redbilled Woodhoopoe	R-VC	805	Yellowthroated Sparrow	R-C
155	Redbreasted Sparrowhawk	R-U			
507	Redcapped Lark	R-C			
377	Redchested Cuckoo	BM-U			
567	Redeyed Bulbul	E-A			
352	Redeyed Dove	R-VC			
426	Redfaced Mousebird	R-VC			
469	Redfronted Tinker Barbet	R-VC			
856	Redheaded Finch	E-VC			
228	Redknobbed Coot	R-C			
769	Redwinged Starling	R-VC			
58	Reed Cormorant	R-VC			
245	Ringed Plover	NBM-U			
886	Rock Bunting	R-VC			
181	Rock Kestrel	R-VC			
529	Rock Martin	R-VC			
349	Rock Pigeon	R-VC			
721	Rock Pipit	E-C			
284	Ruff	NBM-U			
406	Rufouscheeked Nightjar	BM-C			
688	Rufouseared Warbler	E-VC			
91	Sacred Ibis	R-VC			
532	Sand Martin	NBM-U			
281	Sanderling	NBM-U			
806	Scalyfeathered Finch	E-C			
118	Secretarybird	R-C			
582	Sentinel Rockthrush	E-U			
583	Shorttoed Rockthrush	E-U			
591	Sicklewinged Chat	J-U			
572	Sombre Bulbul	R-VC			
528	South African Cliff Swallow	BM-C			
103	South African Shelduck	E-VC			
736	Southern Boubou	E-VC			
551	Southern Grey Tit	E-VC			
804	Southern Greyheaded Sparrow	E-VC			
113	Southern Pochard	R-C			
742	Southern Tchagra	E-C			
424	Speckled Mousebird	R-VC			
506	Spikeheeled Lark	E-VC			
297	Spotted Dickkop	R-C			
401	Spotted Eagle Owl	R-C			
689	Spotted Flycatcher	NBM-U			
116	Spurwinged Goose	R-C			
231	Stanley's Bustard	R-C			
867	Steelblue Widowfinch	R-U			
149	Steppe Buzzard	NBM-C			
596	Stonechat	R-VC			
881	Streakyheaded Canary	R-U/C			
132	Tawny Eagle	R-U			
512	Thickbilled Lark	E-VC			
249	Threebanded Plover	R-VC			
621	Titbabbler	E-C/VC			
760	Wattled Starling	R-VC			
290	Whimbrel	NBM-U			
83	White Stork	NBM-VC			
425	Whitebacked Mouschird	E-VC			
55	Whitebreasted Cormorant	R-VC			
799	Whitebrowed Sparrowweaver	R-U			
550	Whitenecked Raven	R-VC			
415	Whiterumped Swift	BM-C			
879	Whitethroated Canary	E-VC			
520	Whitethroated Swallow	BM-C			
239	Whitewinged Korihaan	E-VC			
339	Whitewinged Tern	NBM-U			
643	Willow Warbler	NBM-C			

APPENDIX D

Heritage Impact Assessment for Tsojana Dam its Surroundings

**Heritage impact assessment report for the
TSOJANA DAM REHABILITATION PROJECT, COFIMVABA
MAGISTERIAL DISTRICT, EASTERN CAPE PROVINCE**



THE PROJECT:

Rehabilitation of certain aspects of the Tsojana Dam.

THIS REPORT:

HERITAGE IMPACT ASSESSMENT REPORT FOR THE TSOJANA DAM
REHABILITATION PROJECT, COFIMVABA MAGISTERIAL DISTRICT, EASTERN
CAPE PROVINCE

Report No: 2008/JvS/041
Status: Final
Revision No: 0
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EXECUTIVE SUMMARY

HERITAGE IMPACT ASSESSMENT REPORT FOR THE TSOJANA DAM REHABILITATION PROJECT, COFIMVABA MAGISTERIAL DISTRICT, EASTERN CAPE PROVINCE

The aim of the survey was to locate, identify and evaluate sites, objects and structures of cultural significance found within close proximity of the Tsojana Dam, for which the Department of Water Affairs and Forestry (DWAF) has recommended some rehabilitation measures to ensure the safety of the resource and the people living in its vicinity.

Very little research has been done in the region of the dam, resulting in a near absence of information. From available information (Derricourt 1977), it is deduced that a number of sites containing rock art occur some distance to the north of the study area.

As no sites of cultural heritage significance were identified, there would be no impact due to the planned rehabilitation actions. A borrow pit for obtaining of material to rehabilitate Tsojana Dam is located on the slope to the east of the dam wall. No sites, features or objects of cultural heritage significance were identified in the vicinity of the borrow pit.

Therefore, in line with Section 38 of the National Heritage Resources Act, No. 25 of 1999, it is recommended that the proposed development can continue. However, we recommend the following:

- If archaeological sites or graves are exposed during construction work, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.

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GLOSSARY OF TERMS AND ABBREVIATIONS**STONE AGE**

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

IRON AGE

Early Iron Age	AD 200 - AD 1000
Late Iron Age	AD 1000 - AD 1830

HISTORIC PERIOD

Since the arrival of the white settlers - c. AD 1800 in this part of the country

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
EIA	Early Iron Age
EIA	Environmental Impact Assessment
ESA	Early Stone Age
CSG	Chief Surveyor General
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

HERITAGE IMPACT ASSESSMENT REPORT FOR THE TSOJANA DAM REHABILITATION PROJECT, COFIMVABA MAGISTERIAL DISTRICT, EASTERN CAPE PROVINCE

1. INTRODUCTION

The Department of Water Affairs and Forestry (DWAF) as owner of Government Water Works (GWW) is responsible for approximately 350 dams across the country. About 160 of these have been found to be below the current acceptable safety standard for registered dams. The dam safety rehabilitation programme (DSRP) is a multiyear project aimed at accelerating the rehabilitation of those dams which need to be brought in line with current safety standards (DWAF 2007).

All the dams in the DSRP are existing dams having a safety risk and the control measures defined in the National Water Act, Section 118 (3) (C), state that the Minister, in consultation with the Minister of Environmental Affairs and Tourism, may specify by the Minister, any specific repairs or alterations to that dam which are necessary to protect the public, property or the environment. The DSRP is a multi-year project aimed at accelerating the rehabilitation of those dams which need to be brought in line with current safety standards (DWAF 2007).

When a particular dam within the DSRP is to be addressed, a screening exercise is undertaken, preferably by a certified Environmental Assessment Practitioner (EAP) with the identified dam safety problems and probable rehabilitation measures in mind. This screening report informs the statutory Approved Professional Person (APP) of features to be considered in detail design of the dam safety measures (DWAF 2007).

Within this framework, the following activities are planned for Tsojana Dam:

- The construction of a temporary bridge during construction
- Stabilizing the embankment with rockfill material
- Increasing the length of the spillway and widening the chute
- Concrete repairs carried out on the spillway and chute
- Surfacing of the district road running over crest
- Existing quarry to be excavated 400m downstream to obtain rock material for dam construction

2. TERMS OF REFERENCE

The scope of work consisted of conducting a Phase 1 archaeological survey of the area surrounding the dam basin in accordance with the requirements of Section 38(3) of the National Heritage Resources Act (Act 25 of 1999).

This included:

- Conducting a desk-top investigation of the area;
- A visit to the dam site.

The objectives were to:

- Identify possible archaeological, cultural and historic sites within the vicinity of the dam basin;
- Evaluate the potential impacts of the rehabilitation activities set out in Section 1 above on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

3. DEFINITIONS AND ASSUMPTIONS

The following aspects have a direct bearing on the survey and the resulting report:

- *Cultural resources* are all non-physical and physical human-made occurrences, as well as natural occurrences that are associated with human activity. These include all sites, structures and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development.
- The *significance* of the sites and artefacts are determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.
- Sites regarded as having low significance have already been recorded in full and require no further mitigation. Sites with medium to high significance require further mitigation.
- The latitude and longitude of archaeological sites are to be treated as sensitive information by the developer and should not be disclosed to members of the public.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figures 1 - 3. As the dam wall is not to be raised, the full-supply level would not increase. Therefore it was necessary only to survey a limited area surrounding the dam, the dam wall and spillway.

4.2 Methodology

4.2.1 Preliminary investigation

4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources, as well as survey reports, were consulted - see the list of references below.

4.2.1.2 Data bases

The *Heritage Sites Database* and the *Environmental Potential Atlas* was consulted. In addition, the SAHRA and the NASA databases were also accessed.

4.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

All of the above information was used to inform the field survey. By having this information available, it assisted in evaluating the possible impact of the development on heritage sites on a regional basis.

4.2.2 Field survey

The field survey was done according to generally accepted archaeological practices, and was aimed at locating all possible sites, objects and structures. The area that had to be investigated was identified by **Knight Piesold (Pty) Ltd** by means of maps and relevant coordinates. The dam was visited and a route was followed, by driving and by walking, around the dam. Special attention was given to hills, outcrops, clusters of trees and streams.

4.3 Documentation

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are determined by means of the *Global Positioning System* (GPS)¹ and plotted on a map. This information is added to the description in order to facilitate the identification of each locality.

Map datum used: Hartebeeshoek 94 (WGS84).

4.4 Limitations

None at present.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 Site location

The Tsojana Dam is located in the Cofimvaba magisterial district of Eastern Cape Province (see Fig. 1 below). It centres around the following coordinates on topo-cadastral map 3127DC: S 31.88481, E 27.62567. The dam wall is located on the farm Lower Ncuncuzo 23.

¹ According to the manufacturer a certain deviation may be expected for each reading. Care was, however, taken to obtain as accurate a reading as possible, and then to correlate it with reference to the physical environment before plotting it on the map.



Fig. 1. Map showing the location Tsojana Dam in regional context.

5.2 Site description

The geology of the area made up of mudstone in the valleys, with dolorite forming the hills surrounding the dam. The topography of the area can be described as consisting of lowlands with mountains. Over most of the area the original vegetation is described as Moist Upland Grassland, but in some areas it have been replaced by plantations of exotic trees. The dam wall is located in the Ncuncuzo River.

5.3 Regional overview

Very little archaeological research has been done in the region. The information presented below is mostly derived from the work of Derricourt (1977), but is supplemented where possible with other sources.

The region has been inhabited by humans at least since at Later Stone Age (LSA) times. This is based on the occurrence of a number of sites containing rock art located to the north of the dam: these sites are named Elucwecwe, Qumanco and Tsakana.

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Silver Leaves south of Tzaneen dating to AD 270. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area.

The occupation of the Eastern Cape region did not start much before the 1500s, although recent research (e.g. Binneman 1996, Nogwaza 1994, Prins & Granger 1993) indicates that it started during the 1st millennium. Derricourt (1977) investigated a number of sites in the Middeldrift area that he attributed to the Iron Age. Of course, the Late Iron Age also continues into modern times with the occupation of the area by the Nguni-speakers currently occupying the region.

White settlers moved into the area during the second half of the 18th century. They were largely self-sufficient, basing their survival on cattle/sheep farming and hunting. Few towns

were established and it remained an undeveloped area. This was also the area where white colonial expansion came into contact with the African populations, resulting in conflict, as well as the transfer of new ideas.

5.4 Survey results

5.4.1 Stone Age

No sites, features or objects of cultural significance dating to the Stone Age were identified in the study area.

5.4.2 Iron Age

No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.

5.4.3 Historic period

No sites, features or object of cultural significance dating to the historic period were identified in the study area.

5.5 Borrow pit

A borrow pit for obtaining material to rehabilitate Tsojana Dam is located on the slope to the east of the dam wall. It centres around the following coordinates: S 31.88325, E 27.64214. In essence it would be the extension of an existing borrow pit.

No sites, features or objects of cultural heritage significance were identified in the vicinity of the borrow pit.

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 Statement of significance

Impact analysis of cultural resources under threat of the proposed development, are based on the present understanding of the development.

The **significance** of a heritage site and artefacts is determined by its historical, social, aesthetic, technological and scientific value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Sites regarded as having low significance are viewed as being recorded in full after identification and would require no further mitigation. Impact from the development would therefore be judged to be low. Sites with a medium to high significance would therefore require mitigation. Mitigation, in most cases the excavation of a site, is in essence destructive and therefore the impact can be viewed as high and as permanent.

No sites, features or objects of cultural heritage significance were identified in proximity of the Tsojana Dam basin or in the vicinity of the planned borrow pit.

6.2 Impact assessment

As no sites were identified, there would not be any impact.

7. RECOMMENDED MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on, can be written into the management plan, whence they can be avoided or cared for in the future.

7.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the National Heritage Resources Act (Act No. 25 of 1999), should these be discovered during construction.

7.2.1 Construction phase

General management objectives and commitments:

- To avoid disturbing sites of heritage importance; and
- To avoid disturbing burial sites.

The following shall apply:

- The contractors and workers should be notified that archaeological sites might be exposed during the construction work.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

7.2.2 Operation phase

General management objectives and commitments:

- To avoid disturbing sites of heritage importance.

The following shall apply:

- Continued care should be taken to observe discovery of any sites of heritage significance during operation. Should any archaeological artifacts and palaeontological remains be exposed during operations, work on the area where the artefacts were found, shall cease immediately and the appropriate person shall be notified as soon as possible;
- Upon receipt of such notification, an Archaeologist or Palaeontologist shall investigate the site as soon as practicable. Acting upon advice from these specialists, the necessary actions shall be taken;
- Under no circumstances shall archaeological or palaeontological artefacts be removed, destroyed or interfered with by anyone on the site during operations; and
- The dam operator shall advise its workers of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51(1).

8. RECOMMENDATIONS

The aim of the survey was to locate, identify and evaluate sites, objects and structures of cultural significance found within close proximity of the Tsojana Dam, for which the Department of Water Affairs and Forestry (DWAF) has recommended some rehabilitation measures to ensure the safety of the resource and the people living in its vicinity.

Very little research has been done in the region of the dam, resulting in a near absence of information. From available information (Derricourt 1977), it is deduced that a number of sites containing rock art occur some distance to the north of the study area.

As no sites of cultural heritage significance were identified, there would be no impact due to the planned rehabilitation actions. A borrow pit for obtaining of material to rehabilitate Tsojana Dam is located on the slope to the east of the dam wall. No sites, features or objects of cultural heritage significance were identified in the vicinity of the borrow pit.

Therefore, in line with Section 38 of the National Heritage Resources Act, No. 25 of 1999, it is recommended that the proposed development can continue. However, we recommend the following:

- If archaeological sites or graves are exposed during construction work, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.

9. REFERENCES

9.1 Data bases

Environmental Potential Atlas, Department of Environmental Affairs and Tourism.

Heritage Sites Database, Pretoria.

National Archives of South Africa

SAHRA site list

9.2 Literature

Acocks, J.P.H. 1975. *Veld Types of South Africa*. Memoirs of the Botanical Survey of South Africa, No. 40. Pretoria: Botanical Research Institute.

Binneman, J. 1996. Preliminary results from investigations at Kulubele, an Early Iron Age farming settlement in the Great Kei River valley, Eastern Cape. *Southern African Field Archaeology* 5(1)28-35.

Department of Water Affairs and Forestry, 2007. Dam safety rehabilitation programme for Government Water Works 2007/2008.

Derricourt, R.M. 1977. Prehistoric man in the Ciskei and Transkei. Cape Town: Struik.

Holm, S.E. 1966. *Bibliography of South African Pre- and Protohistoric archaeology*. Pretoria: J.L. van Schaik.

Nogwaza, T. 1994. Early Iron Age pottery from Canasta Place, East London District. *Southern African Field Archaeology* 3:103-106.

Prins, F.E. & Granger, J.E. 1993. Early farming communities in the northern Transkei: the evidence from Ntsitsana and adjacent areas. *Natal Museum Journal of Humanities* 5:153-174.

Raper, P.E. 2004. *South African place names*. Johannesburg: Jonathan Ball Publishers.

Richardson, D. 2001. *Historic sites of South Africa*. Cape Town: Struik Publishers.

9.3 Maps and aerial photographs

1: 50 000 7RSRFDGWDOP DSV- 3127D&

Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

Significance

The *significance* of the sites and artefacts are determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value				
Is it important in the community, or pattern of history				
Does it have strong or special association with the life or work of a person, group or organisation of importance in history				
Does it have significance relating to the history of slavery				
2. Aesthetic value				
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group				
3. Scientific value				
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage				
Is it important in demonstrating a high degree of creative or technical achievement at a particular period				
4. Social value				
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons				
5. Rarity				
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage				
6. Representivity				
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects				
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class				
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.				
7. Sphere of Significance		High	Medium	Low
International				
National				
Provincial				
Regional				
Local				
Specific community				
8. Significance rating of feature				
1.	Low			
2.	Medium			
3.	High			

Significance of impact:

- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- KJK where the impact will require mitigation on the project regardless of any mitigation

Certainty of prediction:

- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

- 1 = no further investigation/action necessary
- 2 = controlled sampling and/or mapping of the site necessary
- 3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
- 4 = preserve site at all costs
- 5 = preserve site if possible, or relocate graves after excavation and documentation

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority-

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

The National Heritage Resources Act (Act no 25 of 1999) stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I:** Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III:** Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, consistent with the criteria set out in section 3(3), which must be used by a heritage resources authority or a local authority to assess the intrinsic, comparative and contextual significance of a heritage resource and the relative benefits and costs of its protection, so that the appropriate level of grading of the resource and the consequent responsibility for its management may be allocated in terms of section 8.

APPENDIX 3: SURVEY RESULTS

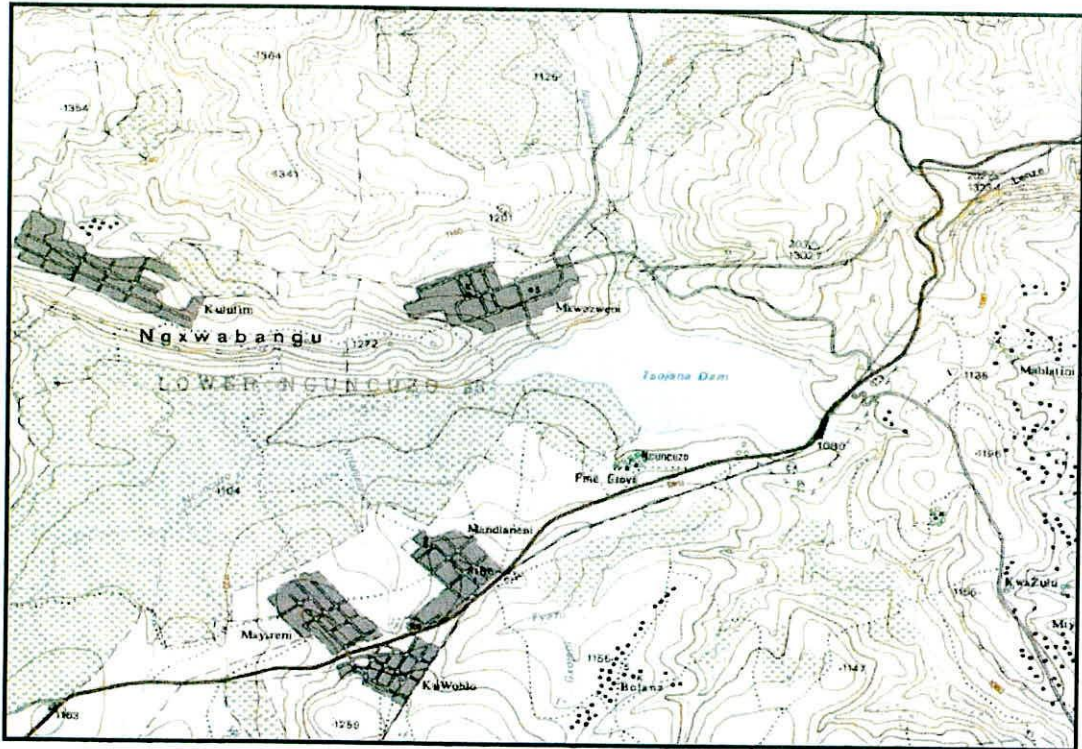


Fig. 2. The study area.

Map 3127DC: Chief Directorate Survey and Mapping.

Map datum used: Hartebeeshoek 94 (WGS84).

Sites identified that could be impacted on by the rehabilitation project:

- None



Fig. 4. Aerial photograph of the dam.
(Photo: Google Earth)

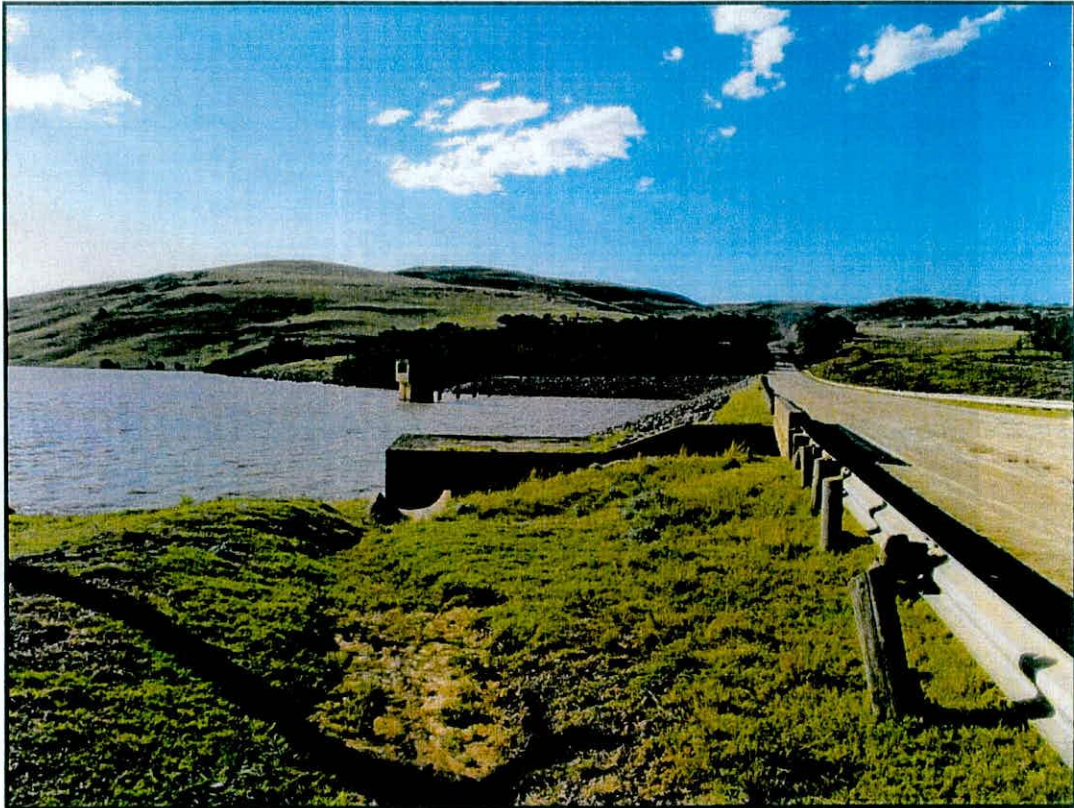


Fig. 5. Looking north along the dam wall.



Fig. 6. Looking west, upstream of the dam wall.



Fig. 7. Looking east towards the dam wall.

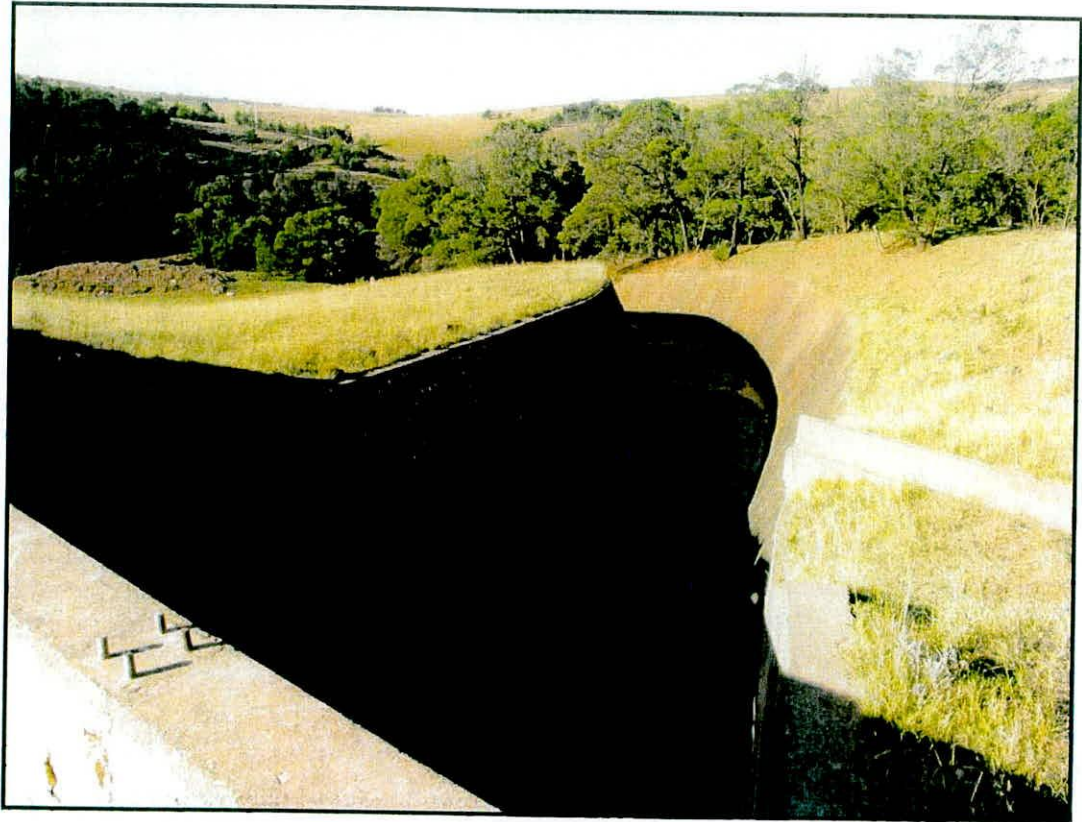
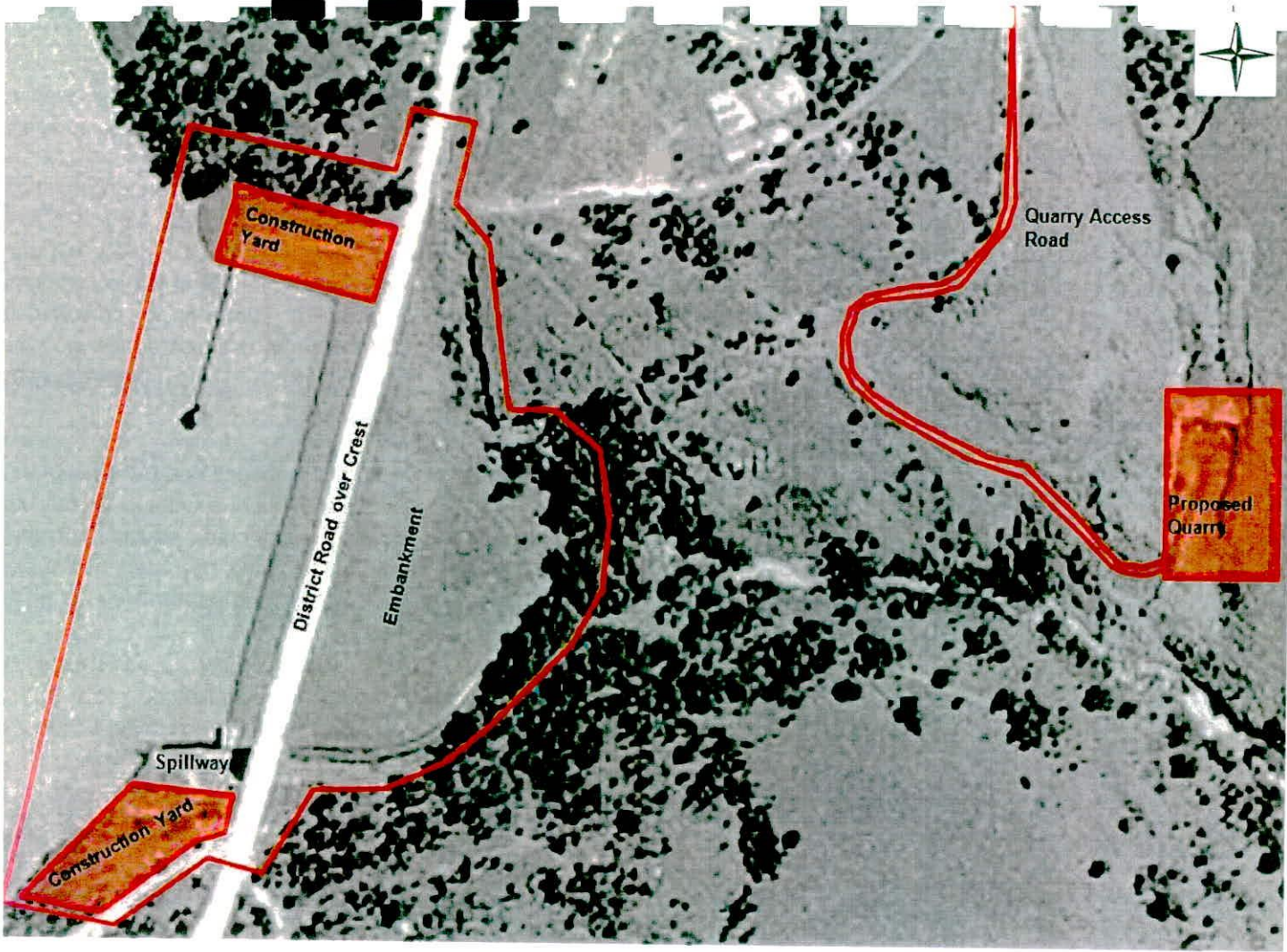


Fig. 8. The spillway at the dam wall.

APPENDIX E
Public Participation Documents



water & forestry

Department:
Water Affairs and Forestry
REPUBLIC OF SOUTH AFRICA



Rehabilitation of Tsojana dam

Uphuhliso Lwedamu
Tsojana

TSOJANA DAM CONSTRUCTION DOMAIN

Knight Piésold
CONSULTING



Introduction

The Department of Water Affairs and Forestry (DWAF) has embarked on a Dam Safety Rehabilitation Programme which aims to upgrade 7 existing dams within the Eastern Cape so as to comply with current safety standards.

Tsojana Dam situated within the Chris Hani District Municipality, is one such dam where rehabilitation has been prioritised.

Why dam rehabilitation work is required?

Tsojana Dam was constructed in 1978 and has not undergone significant maintenance since then. The primary objective is to ensure the safety of the dam wall and hence the safety of the public during extreme floods. The planned rehabilitation thus includes:

- The construction of a temporary bridge during construction
- Stabilizing the embankment with rockfill material
- Increasing the length of the spillway
- Concrete repairs carried out on the spillway and chute
- Surfacing of the district road running over the crest

Community Communication

Ward councillor Mr Mnyathaza and Mr Khoyo (Technical Manager, Intsika Yethu Local Municipality) who represents the local community and the local municipality in the vicinity of the dam have been informed of the project and the scope of work.

Public Safety

All work will be confined to the construction site that is to be demarcated by beacons (refer to construction domain). Members of the public and livestock will not be allowed entry into the area for safety. Recreational use of the dam, water and the shore line in the vicinity of the dam wall during the construction period will not be permitted.

Construction will commence in February 2009 and is expected to be completed by June 2009.

Important:

The dam storage capacity will not be changed and the full supply level will not be raised.

For further information, please contact:

Kavita Kalicharran

TC Watermeyer Centre, Cnr 10th Avenue and Rivonia Boulevard, Rivonia, 2128, Gauteng

Tel no: (011) 806 7101

Fax no: (011) 806 7100

Email: kkalicharran@knightpiesold.com



Isingeniso

Isebe lezamanzi nezamahlathi (DWAF) likwizame zohlelo lokuphuhlisa ukhuseleko lwamadamu ngezinjongo zokuhlengahlengisa ukhuseleko lwamadamu ayisixhenxe kwiphondo aseMpuma Koloni.

Lamadamu anjenge Tsojana Dam afunyanwa kwisixeko sikamasipala waseTsolwane District. Lingelinye lamadamu azophuhlisa ukuze libe semgangathweni nasemazingeni avumelekile ngokokhuseleko.

Kungani na kufuneka kuphuhliswe lamadamu?

Idamu iTsojana selokhu lakhiwa ngonyaka ka 1978 alikaze lithole uphuhliso. Injongo ke yalolu phuhliso ukuqinisekisa ukhuseleko lodonga lwedamu ngamaxhesha

ezikhukhula. Uhlelo lolu okuthethwa ngalo ludibanisa:

- Ukwakhiwa kwebhuloho lexheshana
- Ukuhlengahlengiswa konqenqema noma izindonga zedamu ngamatshe
- Ukunwethswa komlomo wedamu
- Imisenzi kakhonkolo ngenzame zokuhlengahlengisa umlomo wedamu
- Ukuphuhlisa umgaqo ohambela ngaphezulu kwedamu

Uthethwano nabahlali

U ward councillor Mr Mnyathaza kanye no Mr Khoyo abamele abahlali kanye nomasipala Intsika Yethu endaweni eyakhele idamu sebazisiwe ngaloluhlelo nangobungako bomsebenzi.

Iziphumo zaloluhlelo kubahlali

Umsebenzi uzokwenzeka kude buduze nedamu kuphela njengalokhu kubonisa izinkomba ndawo (beacons). Abahlali kanye nemfuyo angeke bavumeleke ukuba bangene kulendawo ngenxa yokhuseleko.

Phofu ezokhenketho kanye nokusetshenziswa kwamanzi ngexheshana lokwakhiwa angeke kuvumeleke.

Ukwakhiwa kuyoqaliswa ngenyanga ka February onyakeni ka 2009 kuze kugqitshezwe ngonyanga ka 2009 enyangeni ka June.

Ukubaluleka

Idamu kanye nobumgama balo angeke kushintshe ngenxa yokuthi ubungako bamanzi angenayo angeke andiswe.

Uma udinga ulwazi oluthe xaxa, sicela uthinte:

Kavita Kalicharran

TC Watermeyer Centre, Cnr 10th Avenue and Rivonia Boulevard, Rivonia, 2128, Gauteng

Itelefoni: (011) 806 7101

Fax no: (011) 806 7100

Email: kkalicharran@knightpiesold.com

NOTICE OF AN ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (PUBLIC PARTICIPATION)

Notice is hereby given in terms of Regulation 27 to 36 compiled in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act no. 107 of 1998), of the Department of Water Affairs and Forestry's intention to carry out the following activities:

DESCRIPTION OF THE PROPOSED ACTIVITY

Rehabilitation of Tsojana Dam in Intsika Yethu Municipality in the Eastern Cape Province. The proposed rehabilitation comprises:

- The construction of a temporary bridge during construction
- Stabilizing the embankment with rockfill material
- Increasing the length of the spillway
- Concrete repairs carried out on the spillway and chute
- Surfacing of the district road running over crest

All Interested and/or Affected Parties are hereby notified in terms of relevant legislation indicated above to obtain further project information. Stakeholders and interested and affected parties are invited to raise issues and concerns regarding the proposed upgrade and rehabilitation of the dam.

Should you have any queries or comments, please contact Knight Piésold Consulting.

Contact Details:

Ms Kavita Kalicharran or Mr Zama Dlamini

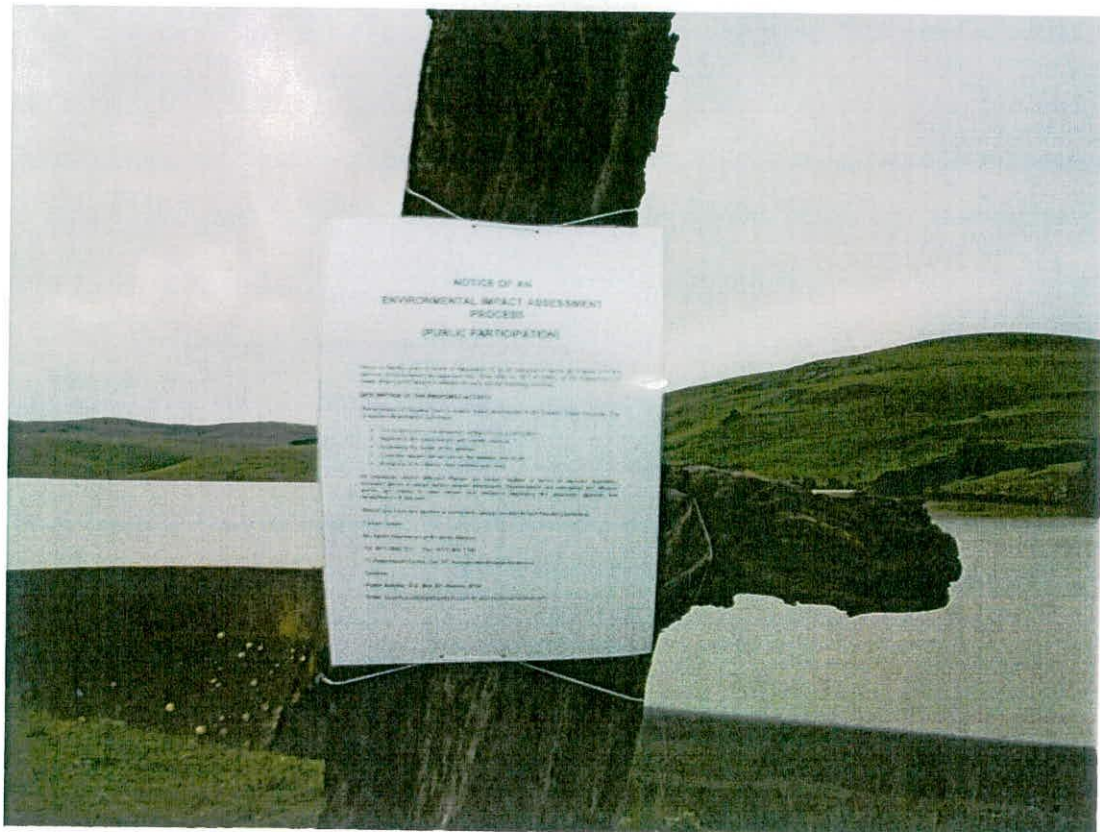
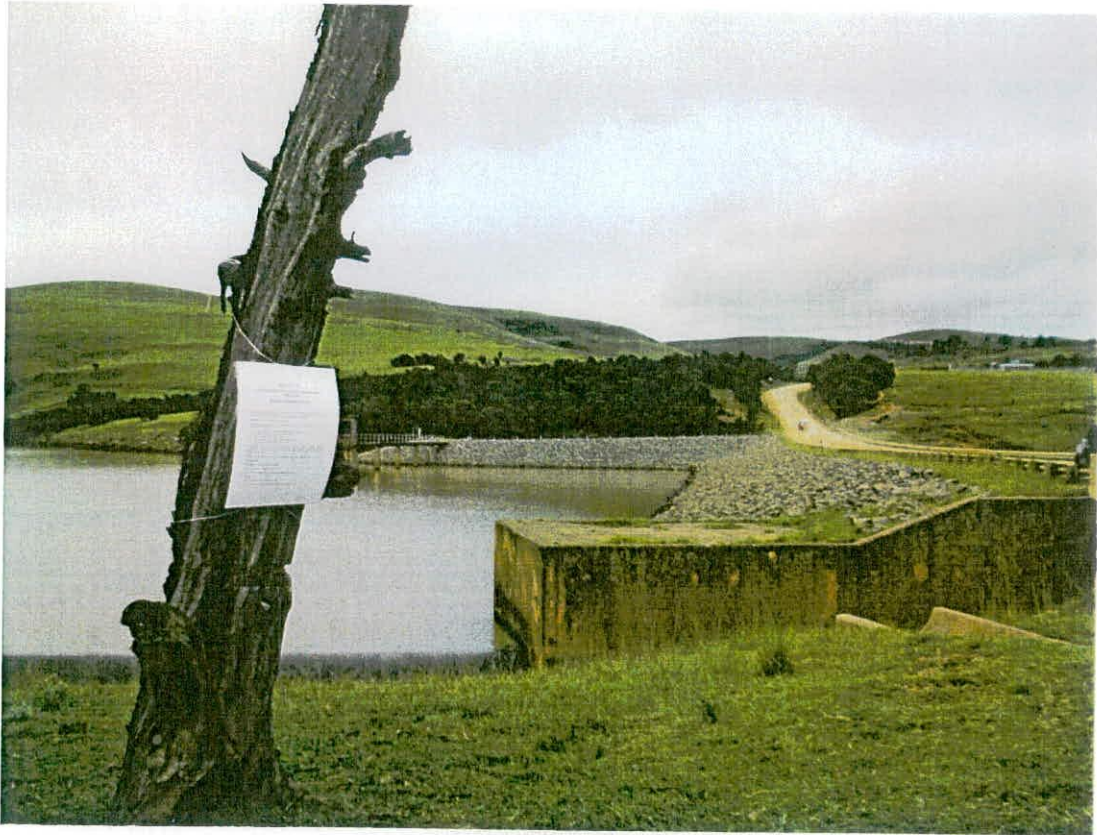
Tel: (011) 8067111 Fax: (011) 806 7100

TC Watermeyer Centre, Cnr 10th Avenue and Rivonia Boulevard,
Gauteng

Postal Address: P.O. Box 221 Rivonia, 2128

Email: kkalicharran@knightpiesold.com or zdlamini@knightpiesold.com

Tsojana On-site Notice Photos



DAM SAFETY REHABILITATION PROGRAMME



TSOJANA DAM



Knight Piésold
CONSULTING

TEAM INTRODUCTIONS

1. Department of Water Affairs and Forestry (DWAf)
2. Knight Piésold Consulting (present)
 - Tamryn Manzoni – Project leader (Environmental)
 - Nicholas Pilz – Engineer (Water Dept)
 - Kavita Kalicharran – Environmental consultant (PP)
 - Zama Dlamini - Environmental consultant (PP)



Knight Piésold
CONSULTING

PROJECT BACKGROUND

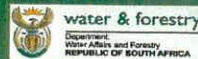
Tsojana Dam are unsafe
Rehabilitation required (safety standards)

Upgrade will involve:

- Increasing the length of the spillway
- Raising of the crest and stabilizing of the embankment with rockfill
- Concrete repairs carried out on the spillway and chute
- Raising of the bridge and surfacing of the district road along the crest
- Mechanical and Electrical Refurbishments



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ENVIRONMENTAL MANAGEMENT PLAN

Includes:

- Environmental baseline information
 - Specialist study (cultural/historical assessment)
 - Impact assessment and evaluation
 - Mitigation measures
- Commits the Contractor to manage impacts associated with the construction activities
Audited by the Engineer for compliance



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ENVIRONMENTAL AUTHORISATIONS REQUIRED

- Environmental Management Programme Report (EMPR) for quarry/borrow pit
- Same concept as EMP but more in depth approach
 - Regulated by Dept of Minerals and Energy
- Commits the Contractor to manage impacts associated with the quarry operations
Audited by the DME for compliance



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CONSULTING

PUBLIC PARTICIPATION PROCESS

Public participation is a process leading to a joint effort by stakeholders and technical specialists who work together to make informed decisions.

The public participation process (PPP) ensures that the public's view will be reflected and considered by the regulating authorities.



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PURPOSE OF THE PP PROCESS

Provide information on the Proposed Public Participation process (PPP)

Register Interested and Affected Parties (IAPs)

Provide project background information to IAPs

Identify IAP issues and concerns

Outline the way ahead



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WHAT IS YOUR ROLE ??

Register as an IAP

Keep track of this project

Find out how the proposed project could affect you

Have your say and raise issues and concerns

Provide input to the project team



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THE WAY AHEAD

Register all IAPs

Record IAP issues and concerns

Compile IAP Issues and Concerns Register



Knight Piésold
CONSULTING

CONTACT DETAILS

Please provide comments, issues or concerns to:

Miss Kavita Kalicharran

Knight Piésold Consulting

P.O. Box 221

Rivonia

2128

South Africa

Tel: (011) 806 7101

Fax: (011) 806 7100

kkalicharran@knightpiesold.com



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MINUTES OF FOCUS GROUP MEETING

PROJECT: Dam Safety Rehabilitation Project **JOB NO:** 5163/30
SUBJECT: Focus Group Meeting –Tsojana Dam **TIME:** 14H00
VENUE: Mgxobhozweni Community Hall, Cofimvaba **DATE:** 19 March 2008
FILE:

PRESENT: Refer to Attendance Register below

APPOLOGIES: None

1. OPENING AND WELCOME	ACTION
<p>Councillor Myathaza welcomed the project team and asked for everyone to stand up for an opening prayer.</p> <p>Mr Zama Dlamini opened the meeting and welcomed all present. He further introduced himself, the project team from Knight Piésold Consulting and asked everyone in the house to introduce themselves.</p>	
<p>1.1 Introductions</p> <p>Each person present introduced themselves to the meeting.</p> <ul style="list-style-type: none"> • Project team members: <ul style="list-style-type: none"> Nicholas Pilz (NP) – Dam Engineer Tamryn Manzoni (TM) – Environmental Consultant Zama Dlamini (ZD) - Environmental Consultant (Facilitator) Kavita Kalicharran (KK) - Environmental Consultant • Invited guests <ul style="list-style-type: none"> Refer to the attendance register 	
<p>1.2 Meeting Conduct</p> <ul style="list-style-type: none"> • Switch off cell phones or at least put on silence • Identify yourself • Work through the Facilitator • Language of choice • Do not interrupt the speakers – discussion time is allocated • Equal participation 	
<p>2. AGENDA</p> <p>The following agenda items were accepted by the participants:</p> <ol style="list-style-type: none"> 1) Purpose of the meeting 2) Introduction of the project team 3) Background of the project (project description) 4) Background information on the environmental process 5) Background information on the public participation process 6) Questions 	

7) Way forward	
<p>3. PRESENTATIONS</p> <p>Please refer to a copy of the presentations, attached as Appendix 1.</p> <p>Mr Pilz gave a presentation covering the following aspects:</p> <ul style="list-style-type: none"> • The purpose for the dam rehabilitation <p>The primary objective is to ensure the safety of the dam wall and hence the safety of the public during extreme floods.</p> <ul style="list-style-type: none"> • The project description (engineering design) <ul style="list-style-type: none"> • Increasing the length of the spillway • Raising of the crest and stabilizing of the embankment with rockfill • Concrete repairs carried out on the spillway and chute • Raising of the bridge and surfacing of the district road along the crest • Mechanical and Electrical Refurbishments <p>Miss Manzoni gave a presentation covering the following aspects:</p> <ul style="list-style-type: none"> • Purpose of the meeting <p>Is to provide background information about the proposed project to all interested and affected parties (IAP's).</p> <ul style="list-style-type: none"> • Environmental Management Programme Report (EMPR) for the proposed opening of the quarry required and an Environmental Management Plan (EMP) which includes: <ul style="list-style-type: none"> • Potential significant impacts associated with the construction activities during pre-construction, construction, operation and closure phases • Specialist studies that are to be undertaken- Two specialist studies will be undertaken such as the fauna and flora and cultural heritage assessment (identify archaeological artefacts, graves, memorials, etc). • Public Participation Process <p>Tamryn provided information about this process.</p> <ul style="list-style-type: none"> • The way forward <p>Distribute BIDs (spread the word, inform people in villages, communities, etc), identify other IAPs, put up PP notices at dam site, etc.</p>	<p>ACTION</p>

4. DISCUSSION		
NAME	QUESTION / COMMENT	RESPONSE
Mr X Sidloyi	<ul style="list-style-type: none"> • Will local labour and local contractors be used? • Will disabled people be able to benefit in terms of jobs? • Is there a possibility of having a site meeting with DWAF, KP and the community members to explain the project? 	<p>NP: It will be stated in the tender document that a certain percentage of the labour will be sourced locally. However we do not know what the percentage is at this point in time since this will be decided during the preparation of the tender document. Local contractors will have an opportunity to tender for the job.</p> <p>For the disable people, we are not sure since this will not be stated in the tender document however the contractor will have to decide on this.</p> <p>NP: During the tender period, a site meeting will be held for the contractors. Once tender has been awarded, there will be a site handover meeting with DWAF and the successful contractor. It is only then that we can make a recommendation to DWAF to have such a meeting, but we cannot</p>

		commit to anything at this stage.
	<ul style="list-style-type: none"> Is it possible for Knight Piésold to provide some services like clinics and schools to the community as a way of ploughing back to the community of Intsika Yethu? 	ZD: Unfortunately we are a consulting company appointed by DWAF to design and assist in obtaining approval for the proposed work.
Mr S Sofika	<ul style="list-style-type: none"> How are you going to get the information about the current environment? 	TM: We have specialists who will be going to site soon to do an assessment of the area (example flora and fauna and cultural and historical specialist). They in turn will send us a report of the findings which we will include in our EMPR Report.
Mr M Pukwana	<ul style="list-style-type: none"> When does the work start? What are the mitigation measures to not pollute the water since the community uses the water for there daily activities? No chemical must be used. 	<p>NP: We need to submit an EMPR Report to DME and this report will include all the specialist studies undertaken, impacts, mitigation measures and the views and comments from the IAP's. This report will need to be approved by DME and then only the project can go ahead. Construction will probably start in February next year and will last for about 6-8 months.</p> <p>NP: With regards to the pollution of the water, construction will take place during the dry season so the water level will be low. There will be an EMP in place where the contractor will be monitored for compliance and an environmental control officer will be on site. If the contractor does not comply with the EMP they will be penalised. The section of the dam that provides water to the community will not be affected. However the rehabilitation involves the usage of rocks and concrete so no chemicals will be used.</p>
Mr M Hlobani	<ul style="list-style-type: none"> Where are they proposing to put the bridge? How are they going to guarantee safety of road users during construction? 	<p>NP: The temporary bridge will be built over the existing chute, east of the dam. DWAF is also looking at an alternative of using the old road above the dam for the duration of construction.</p> <p>The contractor will have people manning the road and have the stop and go signs for the entire duration of construction.</p>
Mr X Sidloyi	In closing, on behalf of the community of this ward, we would like to commend Knight Piésold for their approach and professionalism in ensuring that the public is well informed of the project.	

5. WAY FORWARD	ACTION
Zama Dlamini summed up the way forward as follows:	

<ul style="list-style-type: none"> • Register all IAPs • Record IAP issues and concerns and include these in the (EMP) report • Address IAP concerns in the EMP • Submit the final EMP to authorities for review and decision • Notice of the environmental authorisation will be provided to IAPs 	
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6. CLOSURE	
The Facilitator thanked the attendees for their meaningful participation and adjourned the meeting at 15H00.	

7. ATTENDANCE REGISTER

Title	Name	Surname	Organisation	Position	Contact details	Physical address
					Tel :	
					Cell :	
					Fax :	
					Email:	
Title	Name	Surname	Organisation	Position	Contact details	Physical address
					Tel :	
					Cell :	
					Fax :	
					Email:	
Title	Name	Surname	Organisation	Position	Contact details	Physical address
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					Tel :	
					Cell :	
					Fax :	
					Email:	
Title	Name	Surname	Organisation	Position	Contact details	Physical address
					Tel :	
					Cell :	
					Fax :	
					Email:	

ATTENDANCE REGISTER

DATE:	19 March 2008	TIME:	14H30
DETAILS OF MEETING:	Rehabilitation of Tsojana Dam Focus group meeting	VENUE:	Mgxobhoxweni Community Hall, Cofimvaba

Title	Name	Surname	Organisation	Position	Contact details	Physical address
	MPUMELELO	Sobuwa	ANC	Chairman	Tel : Cell : Fax : Email :	
	REJOICE	MRWEBI	CPF	Chairperson	Tel : Cell : Fax : Email :	
	Megsile	Kobani	WORD CM		Tel : Cell : Fax : Email :	
	Nkomo	Sofika	ANC	Word Commet	Tel : Cell : Fax : Email :	
	NOZIPHWO	Pheme	ANC	Word Commette	Tel : Cell : Fax : Email :	
MISS	Ncediwe	Yese	W/Commite	Word Commette	Tel : Cell : 083 373 0877 Fax : Email :	P.O. Box 125 Cofimvaba 5380
MR	Bison	Lafika	ANC	Sihale	Tel : Cell : Fax : Email :	
	Xolani	Sidloyi	ANC	M. Commette	Tel : Cell : Fax : Email :	
MR	SALISO	MYATHA ZA	INTSINGAYETHU W/Comm	W/Comm	Tel : Cell : 0834195497 Fax : 047-4880196 Email :	21st NGLEZA A/A TSONE

APPENDIX F

Memorandum of Understanding between DWAF and DME on Financial Provision for
Rehabilitation



MEMORANDUM OF UNDERSTANDING

BETWEEN

THE DEPARTMENT OF WATER AFFAIRS AND FORESTRY

**DULY REPRESENTED BY
MR JI SINDANE**

**IN HIS CAPACITY AS
DIRECTOR-GENERAL: WATER AFFAIRS AND FORESTRY**

AND

THE DEPARTMENT OF MINERALS AND ENERGY

**DULY REPRESENTED BY
ADV S NOGXINA**

**IN HIS CAPACITY AS
DIRECTOR-GENERAL: MINERALS AND ENERGY**

ON

**FINANCIAL PROVISION ASSOCIATED WITH THE REHABILITATION OF QUARRIES
AND BORROWED AREAS USED FOR THE CONSTRUCTION OR MAINTENANCE OF
DAMS OR ANY OTHER WATER RESOURCE INFRASTRUCTURE**

Jointly hereinafter referred to as the parties

PREAMBLE

WHEREAS in terms of the National Water Act, 1998 (Act No. 36 of 1998), the Minister of Water Affairs and Forestry may enquire, construct, alter, repair, operate or control Government water works in order to protect, use, develop, conserve, manage and control the nation's water resources in the public interest;

WHEREAS section 41(1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) requires an applicant for a prospecting right, mining right or mining permit, to make the prescribed financial provision for the rehabilitation and management of negative environmental impacts, before the Minister approves the environmental management plan or environmental management programme;

WHEREAS the Department of Water Affairs And Forestry (*hereinafter referred to as DWAF*) raised some concerns on the implementation on section 41(1) of the Mineral and Petroleum Resources Development Act, 2002 with respect to the methods of financial provision for the rehabilitation and management of negative environmental impacts prescribed in the Mineral and Petroleum Resources Regulation 53 as it relates to quarrying and burrowed activities undertaken during the development and maintenance of water resource infrastructure and recognising the requirements of the Public Finance Management Act, 1999 (Act No 1 of 1999) in particular for the efficient use of State funds;

AND PURSUANT to a meeting on, Friday 6 October 2006 between representatives of DWAF and the Department of Mineral and Energy (*hereinafter referred to as DME*) where a common understanding was reached on the implementation of sections 41(1) and 106 of the Mineral and Petroleum Resources Development Act, 2002 read with the Government Notice No. R.762 of 25 June 2004 as published in Government Gazette No. 26501;

NOW THEREFORE THE PARTIES' UNDERSTANDING IS HEREWITH RECORDED AS FOLLOWS:

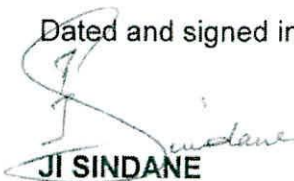
The purpose of this Memorandum of Understanding is to confirm consistent compliance of legislation by DWAF when undertaking construction or maintenance of Government water works infrastructure.

It is thus understood by both DWAF and DME that:

- 1.1 In terms of section 106(1) of the Mineral and Petroleum Resources Development Act, 2002 read with the Government Notice No. R.762 of 25 June 2004 published in Government Gazette No. 26501, an organ of state is only exempted from application procedures and the approval or granting of such right or permit in terms of sections 16, 20, 22 and 27 of the said Act,

- 1.2 Notwithstanding the exemption stated in clause 1.1 above, in terms of section 106(2) of the Mineral and Petroleum Resources Development Act, 2002, the provisions pertaining to environmental management, financial provision and mine closure in terms of the Mineral and Petroleum Resources Development Act, 2002 and its supporting Regulations, applies to quarrying and burrowing activities undertaken by DWAF during the development or maintenance of water resource infrastructure.
- 2.1 With regard to section 41 of the Mineral and Petroleum Resources Development Act, 2002 and its supporting Regulations 53 and 54, DWAF, its agents, or developer or any other person contracted by DWAF, is not exempted from these provisions that requires financial provision to be made.
- 2.2 It is therefore agreed between the parties that for the construction and maintenance of Government water works undertaken by the DWAF's own Construction Unit, DWAF shall be deemed to comply with the requirements of financial provision: Provided that the estimated costs for the management, rehabilitation and closure of such quarries and borrowed areas or works are provided for within the approved budget for such Government water works.
3. This Memorandum of Understanding shall be in force upon signature by both parties, and shall remain in force until terminated by written notice signed by both parties.

Dated and signed in Pretoria on this 02 day of APRIL 2007



JI SINDANE

DIRECTOR-GENERAL: WATER AFFAIRS AND FORESTRY

Dated and signed in Pretoria on this 20TH day of MARCH 2007



ADV S NOGXINA

DIRECTOR-GENERAL: MINERALS AND ENERGY

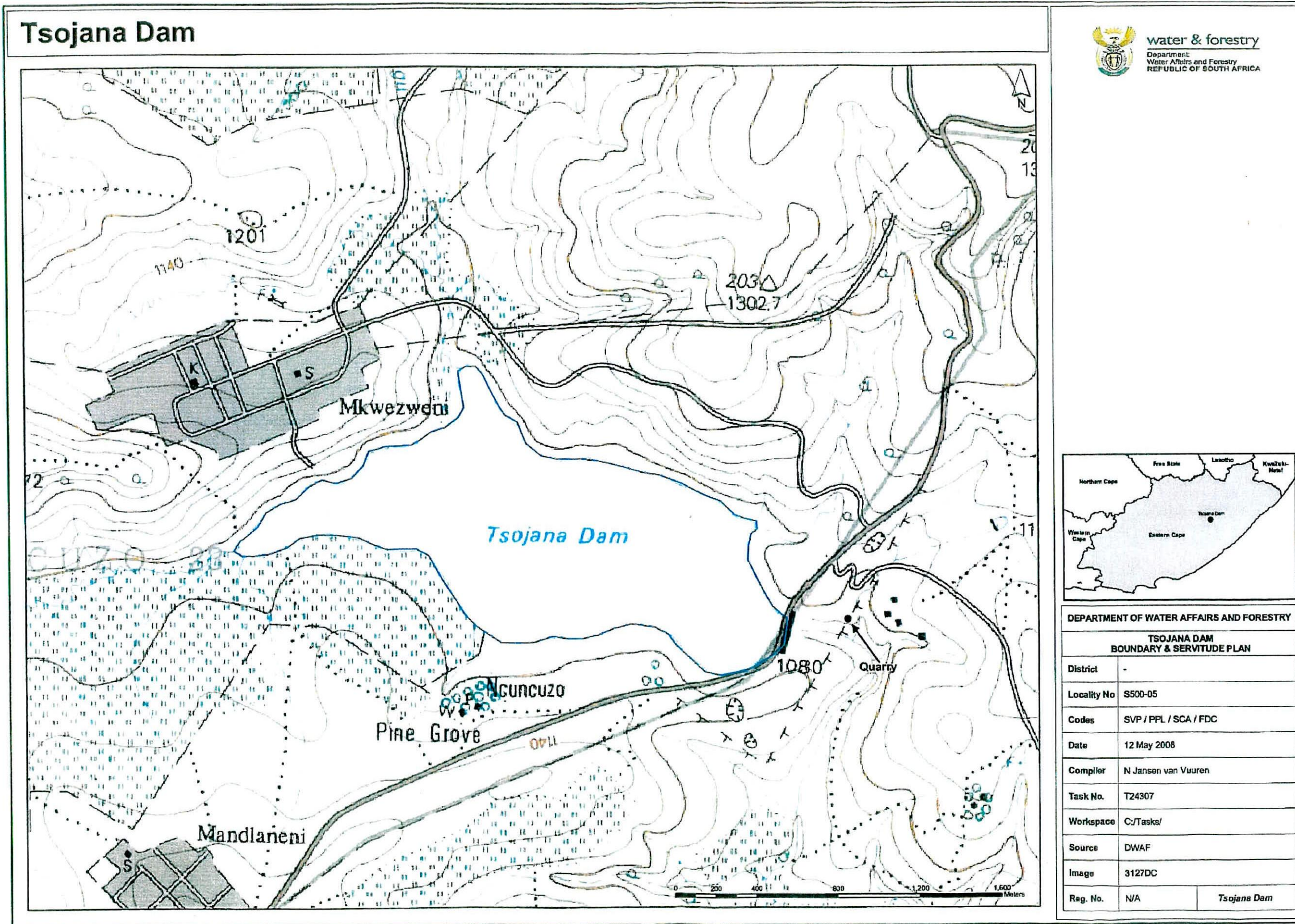


Figure 2: Map depicting the location of the existing Tsojana Quarry Site (DWAF, 2008)

