

# **Tony Barbour**

## **ENVIRONMENTAL CONSULTING AND RESEARCH**

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Tony Barbour's experience as an environmental consultant includes working for ten years as a consultant in the private sector followed by four years at the University of Cape Town's Environmental Evaluation Unit. He has worked as an independent consultant since 2004, with a key focus on Social Impact Assessment. His other areas of interest include Strategic Environmental Assessment and review work.

### **EDUCATION**

- BSc (Geology and Economics) Rhodes (1984);
- B Economics (Honours) Rhodes (1985);
- MSc (Environmental Science), University of Cape Town (1992)

### **EMPLOYMENT RECORD**

- Independent Consultant: November 2004 – current;
- University of Cape Town: August 1996-October 2004: Environmental Evaluation Unit (EEU), University of Cape Town. Senior Environmental Consultant and Researcher;
- Private sector: 1991-August 2000: 1991-1996: Ninham Shand Consulting (Now Aurecon, Cape Town). Senior Environmental Scientist; 1996-August 2000: Steffen, Robertson and Kirsten (SRK Consulting) – Associate Director, Manager Environmental Section, SRK Cape Town.

### **LECTURING**

- University of Cape Town: Resource Economics; SEA and EIA (1991-2004);
- University of Cape Town: Social Impact Assessment (2004-current);
- Cape Technikon: Resource Economics and Waste Management (1994-1998);
- Peninsula Technikon: Resource Economics and Waste Management (1996-1998).

### **RELEVANT EXPERIENCE AND EXPERTISE**

Tony Barbour has undertaken in the region of 200 SIA's, including SIA's for infrastructure projects, dams, pipelines, and roads. All of the SIAs include interacting with and liaising with affected communities. In addition he is the author of the Guidelines for undertaking SIA's as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa.

Tony was also the project manager for a study commissioned in 2005 by the then South African Department of Water Affairs and Forestry for the development of a Social Assessment and Development Framework. The aim of the framework was to enable the Department of Water Affairs and Forestry to identify, assess and manage social impacts associated with large infrastructure projects, such as dams. The study also included the development of guidelines for Social Impact Assessment, Conflict Management, Relocation and Resettlement and Monitoring and Evaluation.

Countries with work experience include South Africa, Namibia, Angola, Botswana, Zambia, Lesotho, Swaziland, Ghana, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan and Sudan.



## Curriculum Vitae

### Allan Bailey

Civil Engineer

Rivers, Deltas and Coasts

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Allan is a Principal Specialist in Water Resources. Allan's experience encompasses more than 30 years in water resources, hydrology and system analysis, water quality and computer modelling and programming. Closely linked with hydrology, he also has experience with climate change and Environmental Water Requirements. He is a specialist and project manager for the Water Resources 2005 and 2012 projects for the Water Research Commission (respectively 2005-2009 and 2012-2016). These projects are the country-wide assessments on water resources and involve substantial analysis of available data.

Another major undertaking is being the custodian of the WRSM2000 / Pitman rainfall-runoff model in which Allan manages all aspects including continuous development, training courses and client liaison.

#### Nationality

South African

#### Years of Experience

35 year(s)

#### Years with Royal HaskoningDHV

27 year(s)

#### Professional memberships

South African Institution of Civil Engineering, Member  
Engineering Council of South Africa, Pr Eng 870125  
Engineering Council of South Africa, Mentor, Civil

#### Qualifications

- 1997** MDP Project Management, University of South Africa, South Africa
- 1989** BSc Computer Science, University of South Africa, South Africa
- 1981** BSc Civil Engineering, University of the Witwatersrand, South Africa

## Professional experience

### **Amajuba/Umzinyathi District Municipality Water Resources Analysis, South Africa**

> Start Date: 2016  
> Client Name: Amajuba/Umzinyathi District Municipality  
> Project Value (water resources): R 80 000  
Position: Hydrologist  
Assigned Tasks: Water resources  
W01.NEW.000117

### **Technical and Market Due Diligence Kainji and Jebba Dams, Nigeria**

> Start Date: 2016  
> Client Name: African Development Bank  
> Project Value: R 1 500 000  
Position: Hydrologist  
Assigned Tasks: Review, reservoir modelling and hydropower  
W01.JNB.000833

### **Bryanston Country Club, South Africa**

> Start Date: 2015  
> Client Name: The Bryanston Country Club  
> Project Value: R100 000  
Position: Project Manager and Hydrologist  
Assigned Tasks: Hydrological analysis  
W01.JNB.000807

### **Eastern Cape Small Hydro Feasibility Study, South Africa**

> Start Date: 2014  
> Client Name: Gibb (Pty) Ltd  
> Project Value: R2,279,000.00  
Water Resource studies pertaining to hydropower at Collywobbles/Mbashe Dam, First Falls Dam and Second Falls Dam.  
Position: Water Resources and Project Manager  
Assigned Tasks: Water Resources and project management  
Hydrological and Water Resource Analysis.  
W01.RDC.000018

### **Decommissioning of Sokhulu Reservoir, South Africa**

> Start Date: 2014  
> Client Name: Richards Bay Minerals  
> Project Value: R0.00  
Position: Hydrologist  
Assigned Tasks: Water Resources  
W01.JNB.000711

### **Mangaung Airport Development Floodline Study, South Africa**

> Start Date: 2014  
> Client Name: Pro-Plan Consulting Engineers (Pty) Ltd  
> Project Value: R78,271.00  
Floodline Delineation Study for Mangaung Airport Development Node Phase 2.  
Position: Hydrologist  
Assigned Tasks: Water Resources  
W01.RDC.000008

### **Detailed Planning Study for the Southern Ndwedwe Bulk Water Supply Scheme, South Africa**

> Start Date: 2013  
> Client Name: Umgeni Water  
> Project Value: R2,362,730.00  
Detailed planning study for the investigation and assessment of a Bulk Water Supply Scheme for the Southern Ndwedwe area. The scheme is planned to supply 25Ml/day to a population of 112 020 and the scheme's estimated cost is R615,4 million.  
Position: Civil Engineer  
Assigned Tasks: Water Resources  
W01.DUR.000188

### **WRSM2000 Sales and Courses, South Africa**

> Start Date: 2013  
> Client Name: B&M Environmental Services (Pty) Ltd  
> Project Value: R4,921.00  
WRSM2000 analysis of the Kafue Flats catchment and report.  
Position: Project Manager, Project Manager  
Assigned Tasks: Hydrological and Water Resource Analysis - Course Leader and coordinator of the WRSM2000 model.

W00.JNB.000029

**Pre- Feasibility of Monantsa Pumped Storage Scheme, Lesotho**

- > Start Date: 2013
- > Client Name: Lesotho Electricity Company (Pty) Ltd
- > Project Value: R157,000.00

Pre-feasibility study for a pump storage scheme in Lesotho, including sub-studies on hydrology, siltation, environmental, social, geotechnical, financial, dam design, hydropower, economical, stakeholder engagement, topographical surveys, transmission analysis, and cost estimates.

Position: Civil Engineer  
Assigned Tasks: Hydrology.

W01.JNB.000505

**Liquid Gold Feasibility Study, South Africa**

- > Start Date: 2013
- > Client Name: Watercare Mining (Pty) Ltd
- > Project Value: R10,500,000.00

Gold Fields and Sibanye Gold wish to put in place a long term water management strategy which will cater for the life of the operations at three mines, as well as for eventual mine closure and post closure. This study will lead to the formulation and implementation of a medium and long term water management strategy and the implementation of solutions in the short term.

Position: Hydrologist  
Assigned Tasks: Water Resources

W01.JNB.000559

**Development of an Operating Rule for the Mhlathuze Weir (MW/PR 11 / 2011), South Africa**

- > Start Date: 2012
- > Client Name: Mhlathuze Water
- > Project Value: R683,189.80

The Mhlathuze Weir is located on the Mhlathuze River, which currently supplies the Nsezi Water Treatment Plant in addition to Hillendale Mine, and emergency supply point for eSikhaleni. Future mining activities are also planned. The aims of the study are to optimize the overall management system, abstract costs management,

leverage on Nsezi Storage and defining optimal abstraction points during the year.

Position: Water Resources Engineer

Assigned Tasks: Water resources specialist and task leader for hydrological modelling, WRSM2000. Allan was responsible for the hydrological analysis using the rainfall-runoff model WRSM2000 including calibration and determination of naturalised flows required for the WRYM yield analysis.

W01.JNB.000526

**Thrust 1: Water Resources Assessment and planning, Program 3: Water Resources Planning, South Africa**

- > Start Date: 2012
- > Client Name: Water Research Commission
- > Project Value: R4,000,000.00

This project was to enhance and provide new research and analysis for the Water Resources of South Africa. Known as WR2012, this study built on previous Royal HaskoningDHV and University of the Witwatersrand appraisals which date back to 1952. The study covered most aspects of water resources including catchment modelling of the whole of South Africa, Lesotho and Swaziland, groundwater and water quality. Streamflow was analysed for historical (simulated), observed, naturalised and present day. The website [www.waterresourceswr2012.co.za](http://www.waterresourceswr2012.co.za) contains all data and information generated from this study.

Position: Project Manager and water resources specialist  
Assigned Tasks: Project management and water resources analysis. Allan was responsible for all aspects of the study including the website, further development of the WRSM/Pitman model (software development), liaison with the Client and Reference Group meetings, program and quality system management, all technical work, presentations at symposiums, courses, training and final deliverables which were 10 reports and a book of GIS maps.

W01.JNB.000478

**Luapula Hydro Electric Power Project, Zambia**

- > Start Date: 2012
- > Client Name: Gibb (Pty) Ltd
- > Project Value: R1,000,000.00

The Amazini Consultants JV, of which Royal HaskoningDHV is a partner, has been appointed by Copperbelt Energy Corporation to develop a Master plan for Hydropower development along the Luapula River.

Position: Water Resources Engineer

Assigned Tasks: Water Resource Modelling. Hydrological and Water Resources Analysis

W01.JNB.000573

#### **Shell Exploration in south Western Karoo, South Africa**

> Start Date: 2012

> Client Name: Shell South Africa Marketing (Pty) Ltd

> Project Value: R400,921.00

Position: Water Resources Engineer

Assigned Tasks: Water Resources

W01.JNB.000436

#### **Planning study for dam on Weza River at Weza Water Treatment Works, South Africa**

> Start Date: 2011

> Client Name: Ugu District Municipality

> Project Value: R114,000,000.00

Undertake detailed feasibility study and planning for dam on the Weza River to provide storage for a 10Ml/day Waterworks.

Position: Hydrologist

Assigned Tasks: Investigation and Planning

W01.PZB.000099

#### **Surface and Groundwater Resources, South Africa**

> Start Date: 2011

> Client Name: United Nations Office for Project Services

> Project Value: R872,720.00

ORASECOM - Development and Adaption of Strategic Action Programme for Balancing Water Uses and Sustainable Natural Resource Management in the Orange-Senqu River Transboundary Basin (Lesotho, Namibia and Botswana).

Surface and Groundwater Resources - Contribution to final Transboundary Diagnostic Analysis; and 'Built Structures' Database

Major Activities:

! Study initiation

! Surface and groundwater chapter in TDA

! Built structures database

! Surface and groundwater chapter in Coffee Table Book

! Finalization of all deliverables, including client comments.

Position: Project Manager

Assigned Tasks: Water Resources

Hydrological and Water Resource Analysis responsible for the following:

! Study initiation

! Project management of the study

! Surface and groundwater chapter in TDA

! Built structures catalogue

! Finalization of all deliverables, including Client comments.

W01.JNB.000509

#### **Mpukunyoni Upgrade, South Africa**

> Start Date: 2011

> Client Name: Umkhanyakude District Municipality

> Project Value: R80,000,000.00

System optimisation of wide-area bulk water supply network involving river abstraction and off-channel storage, water treatment works, 8 No. pump stations and more than 20 reservoirs and storage tanks supplying rural population of 67 000 people west of Mtubatuba and N2. Design and implementation of additional bulk pipelines and pump station upgrading. Remedial works and upgrade of existing bulk water supply system infrastructure.

Position: Hydrologist

Assigned Tasks: Water Resources

W01.PZB.000257

#### **BP Preparation for Umzimvubu Ward 6, South Africa**

> Start Date: 2011

> Client Name: Alfred Nzo District Municipality

> Project Value: R3,440,000.00

Carrying out detailed feasibility study to supply bulk potable water to Umzimvubu Ward 6 of the Alfred Nzo District Municipality.

Position: Hydrologist

Assigned Tasks: Water Resources

W01.PZB.000232

**Mpumalanga: Technical Assistance DARDLA, South Africa**

> Start Date: 2011

> Client Name: Mpumalanga Provincial Government

> Project Value: R40,000,000.00

Appointment for professional engineers to assist the DARDLA, Mpumalanga Province in planning, designing, implementation, monitoring and evaluation of various infrastructure projects for a period of 36 months.

Position: Hydrologist

Assigned Tasks: Water Resources

W01.JNB.000421

**Impendle Bulk Water Supply Investigation, South Africa**

> Start Date: 2011

> Client Name: uMgungundlovu District Municipality

> Project Value: R185,000,000.00

Bulk water Supply to Stepmore, Lotheni, Nzinga, Makhuseeni, eNguga, Kwanovuka and Gomane areas of Impendle Local Municipality. Includes 2 Abstractions and Water Treatment Works, pumpstations, reservoirs pumping and gravity main pipelines.

Position: Hydrologist

Assigned Tasks: Water Resources

W01.PZB.000247

**Zulti South: Pre-feasibility to review Water Supply, South Africa**

> Start Date: 2011

> Client Name: Richards Bay Minerals

> Project Value: R200,000,000.00

Richards Bay Minerals want to expand their mining operations. One aspect of the new infrastructure would be to allow for water supply to accommodate all the processes involved.

Position: Water Resources Specialist

Assigned Tasks: Hydrology and water supply.

W01.JNB.000443

**Water Systems Review for Richards Bay Minerals, South Africa**

> Start Date: 2010

> Client Name: Richards Bay Minerals

> Project Value: R20,000,000.00

The project included a review of Richards Bay Minerals raw water supply systems. Items reviewed were the 60 MI/day Monzi pumpstation capacity and pipeline condition, and the overall operation of the system. The project also includes a cost optimisation of the water supply system including system hydrology, development of options and life cycle costings for each of the options. As a result of the study Monzi pumpstation was upgraded from 60 MI/day to 95 MI/day.

Position: Water Resources Engineer

Assigned Tasks: Hydrological modelling for Richards Bay Minerals water supply system.

W01.JNB.000414

**Investigation of the condition of the Caledon River, South Africa**

> Start Date: 2010

> Client Name: Bloemwater

> Project Value: R1,500,000.00

Investigation of the Condition of the Caledon River.

Position: Project Leader

Assigned Tasks: Project leader: Water resources

W01.BFN.000081

**Enhancements to WR2005 study (Completed for the WRC in December 2008), South Africa**

> Start Date: 2010

> Client Name: Water Research Commission

> Project Value: R450,000.00

Enhancements to WR2005 study (the WR2005 Study was completed for the WRC in December 2008).

Position: Project Principal, Project Manager

Assigned Tasks: Allan was responsible for all aspects of the study including liaison with the Client and Reference Group meetings, program and quality system management, all technical work, presentations at symposiums and final deliverables.

Water resources analysis

W01.JNB.000374

**Revision of National Water Resources Strategy, South Africa**

> Start Date: 2010

> Client Name: Department of Water Affairs and Forestry  
> Project Value: R11,202,278.00

Member of core team that contributes to the revision of the National Water Resources Strategy. The second version of the National Water Resources Strategy requires the input of many experts, stakeholder participation and connection to different Ministries and coordination with Department of Water Affairs (DWA) projects. The consultant team is assisting DWA in developing the revised strategy by coordination of all different inputs and drafting of the chapters.

Position: Specialist

Assigned Tasks: Water Resources Specialist, responsible for setting up a document clarifying what the current situation is regarding water resources data and information systems and what steps could be taken to improve it.

W01.JNB.000366

#### **Dam Synchronisation and Flood Releases in the Zambezi River Basin, Zambia**

> Start Date: 2010

> Client Name: Deutsche Gesellschaft Fur Technische Zusammenarbeit GmbH

> Project Value: R7,200,000.00

To diminish the damage of floods and to improve environmental conditions, technical advice is given to the interim Zambezi Committee and SADC for improvement of operational procedures of the large reservoirs in the Zambezi. A design of an improved flow forecasting system for the basin and the evaluation of options is part of the project. Large investments in the river basin are investigated for their impact on environmental flows and flood protection.

Position: Hydrologist

Assigned Tasks: Hydrological analyses of the Zambezi catchment.

W01.JNB.000331

#### **Glen Alpine Dam - Annual Operating Rules Glen Alpine Dam, South Africa**

> Start Date: 2009

> Client Name: Department of Water Affairs and Forestry

> Project Value: R2,483,332.00

Determine operating rules for Glen Alpine Dam using WRSM2000, WRYM and WRPM models.

Position: Project Principal, Project Manager

Assigned Tasks: Project Management, Hydrology using WRSM2000. Allan was responsible for the hydrological analysis using the rainfall-runoff model WRSM2000 including calibration and determination of naturalised flows required for the WRYM yield analysis. Allan was also responsible for managing the project which had a major contribution from a sub-consultant (the WRYM and WRPM modelling).

W01.JNB.000299

#### **Kafue - Integrated Water Resources Management, Zambia**

> Start Date: 2009

> Client Name: World Wide Fund

> Project Value: R180,000.00

This project was concerned with the preservation with the wetlands environment of the area liable to flooding between Itezhi-Itezhi and the Kafue Gorge known as the Kafue Flats.

Position: Project Manager, Project Manager, Project Principal

Assigned Tasks: Allan was responsible for all aspects of the study including liaison with the Client and progress meetings, program and quality system management, all technical work and final report.

W01.JNB.000307

#### **Chatten Farm Golf Course, South Africa**

> Start Date: 2009

> Client Name: Engineering Advice and Services (Pty) Ltd

> Project Value: R64,000.00

Water Resources Modelling to determine if there is an adequate supply of water

Position: Project Manager

Assigned Tasks: Water resource modelling

W01.JNB.000296

#### **Water Resources System Analysis for the Umfolozi River and Sokhulu Dam System, South Africa**

> Start Date: 2009

> Client Name: Richards Bay Minerals

> Project Value: R326,314.00

The Water Resources Stimulation Model (WRSM2000) rainfall-run off model is used to analyse the hydrology of the Umfolozi and the Water Resources Yield model (WRYM) is then used to analyse the yield of the Umfolozi and Sokhulu River System with various pumping rates at the Umfolozi pump station so as to establish to what extent the system yield may be increased.

Position: Project Manager, Water Resources Specialist

Assigned Tasks: WRSM2000 and WRYM modelling. Allan was responsible for the hydrological analysis using the rainfall-runoff model WRSM2000 including calibration and determination of naturalised flows required for the WRYM yield analysis. Further to this was the WRYM modelling and report.

W01.JNB.000309

#### **Jozini Hydro Electric Project, South Africa**

> Start Date: 2008

> Client Name: Umhloingana Development Agency

> Project Value: R1,600,000.00

Feasibility study for the Jozini Hydro Electric Project. The project aims to generate electricity using water discharging from the Jozini Dam.

Position: Civil Engineer

Assigned Tasks: Water resources modelling.

W01.JNB.000230

#### **KwaSani Water Services Backlog Eradication, South Africa**

> Start Date: 2007

> Client Name: Harry Gwala District Municipality

> Project Value: R70,000,000.00

Feasibility study and business plan preparation.

Position: Hydrologist

Assigned Tasks: Water Resources

W01.PZB.000072

#### **Lesotho Lowlands Bulk Water Supply Scheme, Lesotho**

> Start Date: 2007

> Client Name: Ministry of Finance and Development Planning

> Project Value: R66,931,190.00

Lead consultant for consultancy services for detailed design of Lesotho Lowlands Bulk Water Supply Scheme and implementation of a National Water Sector Information Management System. The scheme consists of over 800km small to large diameter mains, 5 river abstraction works, water treatment works, 30 pump stations, over 80 reservoirs and associated structures.

Position: Hydrologist

Assigned Tasks: Hydrology and Water Resources Modelling.

W01.IBU.000123

#### **Wedgewood Golf Course and Country Estate, South Africa**

> Start Date: 2006

> Client Name: Property Promotions & Management (Pty) Ltd

> Project Value: R91,200,000.00

Preliminary design of bulk and internal services, including irrigation dams.

Position: Hydrologist

Assigned Tasks: Water Resources

W03.PLZ.000006

#### **MCC Mozambique - Nacala Dam, Mozambique**

> Start Date: 2006

> Client Name: PD Naidoo and Associates

> Project Value: R70,000,000.00

Pre-feasibility study into rehabilitation and augmentation of the capacity of Nacala Dam in the Nampula Province of Mozambique. The project includes investigations of two potential dam sites on the Sanhute River as well as comparison of various transfer options to get water from the Sanhute River to Nacala Dam.

Position: Hydrologist

Assigned Tasks: Water Resources

W00.IBU.000036

#### **Memel/Zamani Flood Study, South Africa**

> Start Date: 2006

> Client Name: BT Mongwe & Associates

> Project Value: R12,000.00

Contract agreement.

Position: Hydrologist



Assigned Tasks: Water Resources  
W00.JNB.155290

#### **Corridor Sands Review, Mozambique**

> Start Date: 2005  
> Client Name: SNC Lavalin Murray and Roberts (Pty) Ltd  
> Project Value: R211,000.00  
Consulting Seminars Agreement No. 53001  
Position: Hydrologist  
Assigned Tasks: Reviewed water resources.  
W01.IBU.000021

#### **Assessment of Water Availability in Olifants Catchments, South Africa**

> Start Date: 2005  
> Client Name: Department of Water Affairs and Forestry  
> Project Value: R8,200,000.00  
Assessment of the water resources in the Olifants Catchment Water Management Area.  
Position: Water Resources Engineer  
Assigned Tasks: Water resources specialist and project management  
W00.JNB.000103

#### **Mokolo River Study, South Africa**

> Start Date: 2005  
> Client Name: WRP  
> Project Value: R85,426.00  
Hydrology  
Position: Project Manager  
Assigned Tasks: Water resources engineer. Rainfall analysis, streamflow analysis and WRSM2000 analysis.  
W00.JNB.000095

#### **Development of a Reconciliation Strategy for the Amatole Bulk Water Supply Systems, South Africa**

> Start Date: 2005  
> Client Name: Department of Water Affairs and Forestry  
> Project Value: R4,100,000.00  
Continual growth in the Amatole catchment of the Eastern Cape Province is placing stress upon the water resources. In addition, consumers are served through several bulk water supply schemes, which for various reasons are not operated as a system. The assignment is to identify and

develop reconciliation scenarios, to develop the scenarios into a strategy which will reconcile the conflicting demands on the water resources, to propose the manner in the schemes can be operated as a system, to identify potential water augmentation schemes to meet the expected demands over 25 years, to propose the most promising options and to develop a simple monitoring method to track changes in water requirements against the proposed reconciliation strategy with a view to taking corrective action where necessary.

Position: Project Manager

Assigned Tasks: Water resources specialist and project management. Allan was responsible for the hydrological analysis of which WRSM2000 modelling played a major part as well as assisting the Project Leader with Client meetings and the report.

W00.JNB.000039

#### **Assessment of Water Availability in the Olifants WMA by means of Water Resource Related Models, South Africa**

> Start Date: 2005  
> Client Name: Department of Water Affairs and Forestry  
> Project Value: R8,200,000.00  
Model Olifants River system to quantify allocatable water, a decision support for licensing and integrated water resource planning.

Position: Water Resources Specialist

Assigned Tasks: Water resources specialist and technical project management. Allan was responsible for the WRSM2000, WQT and WRPM modelling and reporting. He also liaised and advised the WRYM specialist and played the role of the technical project manager.

W00.JNB.000011

#### **Water Resources of South Africa, 2005 Study (WR2005), South Africa**

> Start Date: 2004  
> Client Name: Water Research Commission  
> Project Value: R8,000,000.00  
Updating the water resources data of South Africa  
Position: Project Manager

Assigned Tasks: Water resources specialist. Project management, enhancement of WRSM model and water resources issues.

W00.JNB.000009

#### **Development of Water Services Planning and Management Reference Frameworks for Gauteng, South Africa**

> Start Date: 2004

> Client Name: Department of Water Affairs and Forestry

> Project Value: R3,000,000.00

Development of a reference framework document through the population of an already existing structure with knowledge drawn from existing information from the Department of Water Affairs as well as Local Government and the private sector.

Position: Water Resources Engineer

Assigned Tasks: Water Resources Review.

W00.JNB.000021

#### **Olifants River Water Resources Development Project, South Africa**

> Start Date: 2004

> Client Name: Department of Water Affairs and Forestry

> Project Value: R1,300,000.00

Determination of yields for proposed dams.

Position: Project Manager

Assigned Tasks: Water resources specialist and WRYM modelling and associated work.

W00.JNB.169268

### **Employment history (if applicable)**

#### **Royal HaskoningDHV formerly SSI Engineers and Environmental Consultants (Pty) Ltd, Johannesburg, South Africa (2012 to present)**

Principal Specialist

■ Assigned Tasks:

#### **SSI Engineers and Environmental Consultants (Pty) Ltd, Johannesburg, South Africa (2005 to 2012)**

Principal Specialist

■ Assigned Tasks:

#### **Stewart Scott International, South Africa (1996 to 2004)**

Associate

■ Assigned Tasks:

#### **SSI Engineers and Environmental Consultants (Pty) Ltd (formerly Stewart Sviridov and Oliver) (1989 to 1996)**

Mathematical Modelling, Senior Engineer

■ Assigned Tasks:

#### **Chamber of Mines Research Organisation (1989 to 1989)**

Computer Analyst

■ Assigned Tasks:

#### **Watermeyer, Legge, Piesold and Uhlmann (1988 to 1989)**

Senior Engineer

■ Assigned Tasks:

#### **Watermeyer, Legge, Piesold and Uhlmann (1984 to 1988)**

Civil Engineer

■ Assigned Tasks:

#### **Grinaker Computing Services (1982 to 1984)**

Computer Analyst

■ Assigned Tasks:



# Curriculum Vitae: Michiel Jonker

<b>Name:</b>	Michiel Jonker	<b>Marital status:</b>	Single
<b>Date of birth:</b>	25/05/1984	<b>Driver's license:</b>	Code 8
<b>ID No.:</b>	840525 5110 085	<b>Contact No:</b>	084 585 7479
<b>Place of birth:</b>	Johannesburg, South Africa	<b>Email:</b>	michiel@ecotone-sa.co.za
<b>Postal address:</b>	PO Box 84 Florida, Johannesburg, South Africa, 1710		
<b>Experience:</b>	10 Years		

## Education

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### University of Johannesburg

#### 2011 M. Sc (Environmental Management)

This is a lectured Masters degree focussing on the concepts and principles of environmental management. The MSc. includes three modules: (1) Environmental management, biosphere and the environment. (2) Environmental management skills and (3) A mini dissertation in related field works.

#### 2009 M.Sc (Aquatic Health) *cum laude*

This Masters study has an ecotoxicological basis. It deals with the effects of androgenic and estrogenic growth-promoting hormones, used in cattle feeding lots, on aquatic freshwater ecosystems. It aims to incorporate biomarkers in fish (metabolomics and cellular energy allocation) as well as studies of general water quality, sediment composition and invertebrate community structures

#### 2006 B.Sc Honours (Zoology) *cum laude*

**Related course work:** Laboratory and field skills, Philosophy and research methodology, population genetics, project management, mammal diversity, eco-physiology, parasite ecology, ichthyology, research project, biological systems integrity, terrestrial ecology, nature conservation.

#### 2005 B.Sc (Natural and Environmental Sciences)

Majors: Geography and Zoology

Minors: Environmental management, botany, chemistry, environmental chemistry, biogeochemistry, statistics, information science

**Related course work:** Cartography, biogeography, soil science, climatology and geomorphology, economic and urban geography, GIS, Geography of Africa and South Africa, invertebrate and vertebrate diversity, parasitology, ecotoxicology, terrestrial ecology and limnology, animal physiology, economic and ethno-botany, plant diversity, plant-water relations, organic and physical chemistry.

## Employment and Work Experience

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Feb '08 – Pres

**Ecotone Freshwater Consultants CC**  
**Member and Freshwater Ecologist**

Recent projects:

- **ESKOM / EIMS – Arnot Power Station**, Wetland Specialist report - Integrated Environmental Impact Assessment Process(Waste Management License Application, Environmental Authorisation Application And Associated Environmental Management Programme) and Water Use License Application For The New Ash Disposal Facility at Arnot Power Station In Mpumalanga (August 2016).
- **ERM** Environmental Flow assessment, Yiben Dam Project, Sierra Leone (July 2016).
- **SMD / EIMS** aquatic ecology and impact assessment - Scoping and EIA/EMP Report for the proposed expansion of the Kao Diamond Mine, Lesotho (May 2016).
- **Vaalbult Colliery** aquatic specialist assessment, proposed road crossing, Carolina, Mpumalanga (February 2016 – Present).
- **EkolInfo** aquatic biomonitoring plan and implementation for the Elands River associated with the Maseve mining operations near Sun City, in the North West Province, (January 2016- present).
- **Exxaro**, Zonderwater Coal Proposal, Wetland Specialist Assessment (November 2013 – April 2016).
- **Dyambyini / ESKOM – Hendrina Power Station**, wetland and aquatic ecology assessment, management and biomonitoring plan for Water Use Licence Authorisation for the Proposed expansion of the Hendrina Ash Disposal Facility and related Power Line infrastructure (March 2016).
- **Delta Mining** wetland assessment and watercourse management plan for mining operations associated with the Proposed Rietkuil operations. Rietkuil, Delmas, Mpumalanga (February 2016).
- **SLR Consulting-** Biodiversity assessment, management and biomonitoring plan for the proposed expansion of the Holfontein Toxic Waste Disposal Facility, Gauteng (January 2016).
- **Enviroolutions (Eskom)** Pre-, during- and post construction biomonitoring for pylon constructions crossing smaller tributaries of the Vaal River, Vereeniging, Gauteng (January 2015- present).
- **WPC** Ngonye Falls- 52 MW Hydroelectric Power Plant. Baseline biodiversity study and Environmental Flow Assessment, Zambia (October 2015 to present).
- **Ara-sul** Aquatic baseline assessment of the Sabie River, up- and downstream of Corumana Dam, Kruger National Park and Mozambique (November 2015 to January 2016).
- **EcoGain** Wetland and Impact assessment associated with the proposed Opencast Mining Operation, Delmas (October 2015 to present).
- **Enviroolutions** Water quality Assessment, Broadacres Retirement Village, Broadacres Gauteng Province (November 2015).
- **ERM, Ncondezi Coal Mine**, Freshwater Ecology baseline study and Desktop Environmental Flow Assessment, Tete, Mozambique (November 2014 – May 2015).
- Hydrological Alteration-Aquatic Ecology Assessment-**New Largo** (July 2010 - Present).
- **Goliath Gold** Aquatic and impact assessment associated with the proposed de-water of a mine shaft, Heidelberg, Gauteng (January – May 2015).
- **Zambezi River Authority**, Kariba Dam wall upgrade, Freshwater Ecology baseline, impact assessment and Environmental Flow Assessment, Zambia/Zimbabwe (October 2014 - March 2015)
- **Dyambyini / ESKOM - Majuba Power Station**, Wetland Specialist Assessment (December - January 2015).

- **Doogvallei Rail Siding Company (Pty) Ltd**, Aquatic Biomonitoring Assessment of associated drainage lines, Carolina Mpumalanga (September 2012 – January 2015).
- **Pembani Coal**: Aquatic Biomonitoring Assessment, Carolina (March 2012 –January 2015).
- **Kumba Iron Ore**, Wetland and River study for WULa, Thabazimbi, Limpopo (December 2014).
- **FFMES, Cominco Phosphate Mine**, Hinda Project Freshwater Baseline Study and critical habitat assessment, Republic of Congo (March to August 2014).
- **Lidwala**, Majuba Wetland Rehabilitation Proposal, Wetland Specialist Assessment (March-July 2014).
- **Imperata**, NKP Terminal 2, Wetland Monitoring Assessment (June – July 2014).
- **Jeffars and Green**, Thabong Interchange, Wetland Rehabilitation Plan (June 2014).
- **Envirobility**, Sand Quarry, Diepsloot, Wetland Specialist Assessment (March 2014 – May 2014).
- **Lidwala / ESKOM - Majuba Power Station**, Wetland Assessment Augmentation, Wetland Specialist Assessment (April 2014).
- **WSP, Kathu CSP Project**, Northern Cape, Wetland Specialist Assessment (January 2014 – April 2014).
- **ERM, Mulungushi Hydropower Project**, Aquatic Specialist (February, 2013).
- **ERM, Muchinga Hydropower Stations**, Aquatic Specialist, Zambia (April, 2013).
- **FFMES, Exxaro DMC Iron Congo Project**, Aquatic specialist study, Mayoko, Republic of Congo (September 2012).
- **ERM, Sasol Twistdraai Export Plant**, Wetland Specialist Assessment (November 2013 – May 2014).
- **GladAfrica, Centurion Lake Sediment Trap**, Aquatic Specialist Study, Gauteng, South Africa (November, 2012).
- **MSA, Meyerton Waste Water Treatment Works Upgrade**, Aquatic Specialist Study, Gauteng, South Africa (November 2012).
- **ESKOM, Majuba Ash Disposal Facility**, Wetland Specialist Study for the Scoping/EIA, Mpumalanga, South Africa (September, 2012).
- **ESKOM, Tutuka Ash Disposal Facility**, Wetland Specialist Study for the EIA, Mpumalanga, South Africa (September, 2012).
- **FFMES, Sintoukola Project**, Aquatic specialist study, Republic of Congo (May 2012; July 2012).
- **Coffey Environments, Tete Iron Project**, Aquatic specialist study of the Revuboe River, Chiúta and Moatize districts, Tete, Mozambique (March 2012).
- **Shanduka Coal**, wetland and impact assessment for a proposed 400kV line relocation, Middleburg, Mpumalanga (April, 2012).
- **Worldwide Coal Carolina**, aquatic biomonitoring assessment, Carolina, Mpumalanga (March, 2012).
- **Homeland Mining and Energy SA**, proposed Eloff Opencast Mine, specialist wetland assessment ( $\pm$  1400 ha) just outside the town of Delmas, Mpumalanga (February, 2012).
- **Exxaro MagVanTi Project** -Aquatic Ecology Baseline Study, Limpopo (January, 2012).
- **Shanduka Coal**, wetland and impact assessment of a pan located in the Graspan Colliery, Middleburg, Mpumalanga (January, 2012).
- **African Barrick Gold North Mata Mine** - Aquatic Consultant: Ecotoxicological risk assessment for discharge of treated waste water into the Mara River, North Mara, Tanzania (August, 2011).
- **Moamba Dam Project, Moamba, Mozambique**, Aquatic Consultant- Impacto: Aquatic ecology assessment for proposed (July, 2011).
- Fresh water Ecology **scoping study-Hendrina-Mpumalanga**( May 2011)
- Aquatic Biomonitoring Assessment-Blesbokspruit- **Hydro Testing** (May 2011)

- Aquatic Consultant- Lidwala environmental and engineering consultants: Sanral N14 river/stream crossing aquatic assessment (May 2011).
- Aquatic Consultant- Randwater: Proposed water and treated water residue pipeline near **Lethabo power station** in Vereeniging (May 2011).
- Aquatic Consultant- Anglo Coal: Assessment on non-perennial drainage lines associated with proposed coal mining development near All days in Limpopo (May, 2011).
- Hydro Testing Biomonitoring(KP290+100) **KwaZulu-Natal- Aquatic Ecology Assessment** (February 2011)
- Aquatic Consultant- Riversdale: Aquatic specialists on the **Benga Coal Project**, Tete, Mozambique (January, 2011).
- Aquatic Consultant- Transnet: Aquatic biomonitoring - **Ladysmith pump station oil spill**, Ladysmith, Natal (January, 2011).
- Aquatic Consultant – Imperata – Aquatic assessment for a proposed **Rand Water pipeline** crossing over the Pienaars River near Pretoria (May, 2010).
- Aquatic Consultant – Ekoinfo – Aquatic assessment for a **NuCoal mine** (Vuna colliery) near Middelburg Mpumalanga (March 2010- Current)
- Aquatic Consultant – EcoAgent – A MSA project – Detailed Aquatic assessment for the propped **Veremo Magnetite mine** in the Eastern Bushveld near Stofberg Mpumalanga (May 2010)
- Aquatic Consultant – New Multi Purpose Pipeline (NMPP) a combined Transnet, **Group Five and Spiecapag project** –Aquatic assessment and monitoring of associated river crossings in the Upper Vaal, Thukela and Mvoti Water Management Areas (Ocktober 2009- Current).
- Aquatic Consultant – **Intergraded Landscape Architects** – Raslouw Riparian delineation and aquatic assessment, Johannesburg (November 2009).
- Aquatic Consultant – Ekoinfo – **Klipriviersberg** Full Aquatic assessment (January. 2009)
- Aquatic Consultant – Ekoinfo – **Lonmin** Aquatic biodiversity assessment (January 2009).
- Aquatic Consultant – NSS– Optimum **Coal Fish** diversity assessment (March 2009)
- Aquatic Consultant –NSS – **Rio Tinto Chapudi** proposed coal mine diversity assessment (March 2009).
- Aquatic Consultant – **Lonmin platinum-** aquatic biodiversity assessment and action plan (January, 2009).
- Aquatic Consultant – **SASOL** – aquatic ecosystem impact assessment for proposed pipeline development (January 2009).
- Aquatic Consultant – Arcus Gibb - Aquatic biodiversity assessment for proposed coal **Eskom Mulilo coal mining development** (December 2008).
- Aquatic Consultant – **ESKOM** - Biomonitoring for proposed **Majuba railroad construction** for Eskom (October 2008- current).

Feb 07 – Jan 08

**EnviRoss Environmental Scientific Consultants Cc  
Consultant**

- Junior Scientist – Enviross cc - Aquatic macro-invertebrate biodiversity study for proposed feedlot **Mpumalanga** 2007. (November 2007)
- Junior Scientist – Enviross cc - **Tshwane** sewerage works bio-monitoring. (September 2007).
- Junior Scientist – Econ@uj - Ecological state of five estuaries in the **Wild coast** for proposed heavy mineral mining (October 2007).
- Aquatic Consultant – Ekoinfo - Aquatic ecological assessment for proposed golf course development in **North West province for Sun City** (August 2007).
- Junior Scientist – Enviross cc - Firgrove industrial development in **Somerset West** 2007 (July 2007) 2007.

- Junior Scientist – Enviross cc - Aquatic health determination and eco-classification for **ANGLO coal** (Mpumalanga) in 2007 (2007).
- Junior Scientist – Econ@uj - Aquatic health determination and eco-classification for **TOTAL coal** in 2006 (May 2006).
- Junior Scientist – Econ@uj - Aquatic health and fish diversity assessment at **Klipplaat nature reserve**, 2006 (September 2006).
- Technical Assistant - **University of Johannesburg Zoology department** - Aquatic health and biodiversity of the **Crocodile West Marico and Magaliesburg system**, 2007 (February 2007).
- Technical Assistant – Enviross cc - **Owl surveys** (March 2007).
- Project Manager - University of Johannesburg Zoology department - Aquatic health and biodiversity of **lake Chrissie in Mpumalanga**, 2007 (April 2007)
- Technical Assistant - University of Johannesburg Zoology department - PhD study regarding effects of pesticides on the freshwater aquatic health in the **Levubu River in Venda (Limpopo Province)** (February 2008)
- Researcher - University of Johannesburg Zoology department - Presented poster at Zoological society South Africa (ZSSA) in July 2007: Abiotic factors influencing invertebrate community structures in pan and dams in the **Mpumalanga highveld area** (June 2007)

## Workshops and Courses

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<b>2011</b>	<b>Tools for Wetland Assessment Short Course</b> Department of Environmental Science Rhodes University; Grahamstown Port Elizabeth
<b>2009</b>	<b>Environmental Management Systems –WTH Management and Training</b> ISO 14001, OHSAS 18001 and development of Environmental Management Systems, University of Johannesburg, Auckland Park, Johannesburg
<b>2008</b>	<b>Wetland and Riparian Delineation Course</b> Accredited wetland delineator Wetland Consulting Services and Department of Water Affairs and Forestry (DWAF) Pretoria, South Africa.
<b>2008</b>	<b>Skippers Course</b> License Holder of a Category “R” skippers license
<b>2007</b>	<b>SASS5 Accredited Practitioner</b> Auditors: Christa Thirion (DWAF, RQS), Colleen Todd (DWAF, RQS) and Hermien Roux (North West Nature Conservation).
<b>2007</b>	<b>Multivariate Statistics Training</b> Collaboration between Wageningen University (Holland) and University of Johannesburg, UJ Eiland, Vaal Dam
<b>2006</b>	<b>Advanced 4x4 driving course</b>

## Societies and Accreditations

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<b>2009</b>	<b>The South African Council for Natural Scientific Professions (SACNASP)</b> Professional Natural Scientist
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*Pr. Sci. Nat.* (Aquatic Health, Zoological & Ecological Sciences)  
Registration number: 400275/12

- 2009**      **Member of the International Association of Impact Assessment-SA (IAIA SA).**
- 2006**      **Member of the Zoological Society of Southern Africa (ZSSA)**
- 2006**      **Member of the Southern African Society of Aquatic Scientists (SASAqS)**

## Presentations

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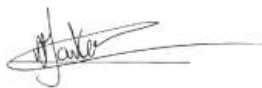
- Jun 2010**      **South African Society of Aquatic Scientists (SASAqS) Congress**  
MN Jonker, G. Walsh & JHJ van Vuren  
*Creating Management Thresholds for Fish Communities Exposed to the Effects of Coal Mining in the Mpumalanga Highveld.*
- Oct 2009**      **Department of Geography and Energy studies, University of Johannesburg**  
MN Jonker, M Sherwood and R Rowles. 2009.  
*Historical overview of water quality associated with the Blesbokspruit RAMSAR site.* Syndicate project completed in partial fulfillment of M.Sc (Environmental Management).
- Jul 2007**      **Zoological Society of Southern Africa Conference, Potchefstroom.**  
MN Jonker  
*Differences in invertebrate community structures associated with pans and dams in the Mpumalanga Highveld, South Africa.*

## Publications

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1. Van der Zee, J., Walsh, G., Sonnenberg, R., Alexandre, M. & Jonker, M.N. (*in press*). A description of three new co-occurring *Aphyosemion* species (Cyprinodontiformes: Nothobranchiidae) from Lower Guinea, with notes on habitat partitioning and allopatric speciation. *Zootaxa*.
2. Walsh, G., Jonker, M. & Mamonekene, V. (2014). A collection of fishes from tributaries of the lower Kouilou, Noubi and smaller coastal basin systems, Republic of the Congo, Lower Guinea, west-central Africa.  
*Checklist Journal* **10 (4)**: 900 - 912.
3. Jonker, M.N., Van Vuren, J.H.J & Wepener, V. (2009). The impact of feedlot effluent on water quality and aquatic macroinvertebrate community structure in streams of the upper Vaal River catchment, South Africa. *African Journal of Aquatic Science* **34 (3)**.
4. De Jager, C., Swemmer, A., Aneck-Hahn, N.H., van Zijl, C., van Wyk, S., Bornman, M.S., Barnhoorn, I.E.J., Jonker M., van Vuren, J.H.J. & Burger, A.E.C. (2010). Endocrine Disrupting Chemical (EDC) Activity and Health Affects of Identified Veterinary Growth Stimulants in Surface and Ground Water. WRC report no. K5-1686. Pretoria, South Africa.

I, Michiel Jonker, do hereby declare that all the information furnished above is true to the best of my knowledge.



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## **CURRICULUM VITAE: D G Paterson**

**SURNAME:** PATERSON  
**FIRST NAME(S):** David Garry  
**KNOWN AS:** Garry  
**DATE OF BIRTH:** 25-08-1959 in Bellshill, Scotland  
**NATIONALITY:** South African  
**I.D. No.:** 5908255258088  
**LANGUAGE PROFICIENCY:** English, Afrikaans (both fluent), French (poor)  
**MARITAL STATUS:** Married, one son

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**E-MAIL ADDRESS:** garry@arc.agric.za

### **ACADEMIC QUALIFICATIONS:**

- Matriculated: 1976, Dalziel High School, Motherwell, Scotland
- BSc (Hons) Geography, 1980, University of Strathclyde, Glasgow, Scotland
- MSc (Soil Science) *cum laude*, 1998, University of Pretoria
- PhD (Soil Science), 2014, University of Pretoria

### **PROFESSIONAL CAREER:**

- 1981-1987: Soil Scientist: Soil and Irrigation Research Institute, Pretoria
- 1987-1992: Senior Soil Scientist: Soil and Irrigation Research Institute, Pretoria
- 1992-present: Senior Soil Researcher: ARC-Institute for Soil, Climate & Water

### **FIELDS OF SPECIALITY AND COMPETENCE:**

- Soil classification and mapping
- Soil interpretations
- Soil conservation, including biotextiles
- Soil rehabilitation
- Soil survey project management
- Environmental assessment
- Soil survey and land capability course presentation
- Ground penetrating radar

### **PUBLICATIONS (see attached list):**

- Three refereed articles (S.A. Journal of Plant and Soil)
- Nine Congress papers/posters
- One book chapter
- S.A. Soil Classification (1991) (Member of working group)
- Seven 1:250 000 Land Type Maps
- Three Land Type Memoirs
- More than 200 soil survey reports and/or maps

**COURSES COMPLETED:**

- Course in Project Management (University of Stellenbosch)
- Course in Junior Personnel Management (Dept of Agriculture)
- Course in Handling of Grievances and Complaints (Dept of Agriculture)
- Course in Marketing (ARC-ISCW)
- Course in National Qualifications Framework Assessment, ARC-CO
- Training Course in Ground Penetrating Radar (GSSI, USA)
- Introduction to ArcGIS 8, GIMS, 2004

**PROFESSIONAL STATUS:**

- Registered Natural Scientist: Soil Science (SA National Council for Natural Scientific Professions) – registration number 400463/04
- Member of South African Soil Classification Working Group, 1990-present
- Convenor of South African Soil Classification Working Group, 2013-2015
- Member of Soil Science Society of South Africa (1982-present)
- President of Soil Science Society of South Africa (2005-2007)
- Member of South African Soil Survey Organisation (2000-present)
- Council Member of South African Soil Survey Organisation (2002-2003)
- Member of International Erosion Control Association
- Scientific Referee, S.A. Journal for Plant and Soil
- External Examiner, University of Pretoria, University of Witwatersrand, University of Venda

**AWARDS:**

Best article on Soil Science, South African Journal for Plant and Soil, 2011

**MISCELLANEOUS:**

- Editor, Soil Science Society newsletter, 1993-present
- Member, Clapham High School (Pretoria) Governing Body, 1998-2002
- Member, Northern Gauteng Football Referee's Association, 2000-2002
- Committee Member, Rosslyn Golf Club (Club Champion 2002 and 2007)

**INTERESTS:**

Sport, especially golf and soccer; wildlife; reading; music

## PUBLICATIONS LIST:

### *Refereed Articles:*

**BÜHMANN, C., KIRSTEN, W.F.A., PATERSON, D.G. & SOBCZYK, M.E.**, 1993. Pedogenic differences between two adjacent basalt-derived profiles. 1. Textural and chemical characteristics. *S. Afr. J. Plant & Soil*, 10: 155-161

**BÜHMANN, C., KIRSTEN, W.F.A., PATERSON, D.G. & SOBCZYK, M.E.**, 1994. Pedogenic differences between two adjacent basalt-derived profiles. 2. Mineralogical characteristics. *S. Afr. J. Plant & Soil*, 11: 5-11

**PATERSON, D.G. & LAKER, M.C.**, 1999. Using ground penetrating radar to investigate spoil layers in rehabilitated mine soils. *S. Afr. J. Plant & Soil*, 16:131-134.

**PATERSON, D.G., BÜHMANN, C., PIENAAR, G.M.E. & BARNARD, R.O.**, 2011. Beneficial effects of palm geotextiles on inter-rill erosion in South African soils and mine dam tailings: a rainfall simulator study. *S. Afr. J. Plant & Soil*, 28: 181-189.

**PATERSON, D.G. & BARNARD, R.O.**, 2011. Beneficial effect of palm geotextiles on inter-rill erosion in South African soils. *S. Afr. J. Plant & Soil*, 28: 190-197.

**BHATTACHARRYA, R., FULLEN, M.A., BOOTH, C.A., KERTESZ, A., TOTH, A., SZALAI, Z., JAKAB, G., KOZMA, K., JANKAUSKAS, B., JANKAUSKIENE, G., BÜHMANN, C., PATERSON, D.G., MULIBANA, N.E., NELL, J.P., VAN DER MERWE, G.M.E., GUERRA, A.J.T., MENDONCA, J.K.S., GUERRA, T.T., SATHLER, R., BEZERRA, J.F.R., PERES, S.M., ZHENG YI, LI YONGMEI, TANG LI, PANOMTARANICHAGUL, M., PEUKRAI, S., THU, D.C., CUONG, T.H., TOAN, T.T.**, 2011. Effectiveness of biological geotextiles for soil and water conservation in different agro-environments. *Land Degradation and Development*, 22: 495-504.

**FULLEN, M.A., SUBEDI, M., BOOTH, C.A., SARSBY, R.W., DAVIES, K., BHATTACHARRYA, R., KUGAN, R., LUCKHURST, D.A., CHAN, K., BLACK, A.W., TOWNROW, D., JAMES, T., POESEN, J., SMETS, T., KERTESZ, A., TOTH, A., SZALAI, Z., JAKAB, G., JANKAUSKAS, B., JANKAUSKIENE, G., BÜHMANN, C., PATERSON, D.G., MULIBANA, N.E., NELL, J.P., VAN DER MERWE, G.M.E., GUERRA, A.J.T., MENDONCA, J.K.S., GUERRA, T.T., SATHLER, R., BEZERRA, J.F.R., PERES, S.M., ZHENG YI, LI YONGMEI, TANG LI, PANOMTARANICHAGUL, M., PEUKRAI, S., THU, D.C., CUONG, T.H., TOAN, T.T., JONSYN-ELLIS, F., SYLVA, J.T., COLE, A., MULHOLLAND, B., DERALOVE, M., CORKILL, C. & TOMLINSON, P.**, 2011. Utilising biological geotextiles: introduction to the Borassus Project and global perspectives. *Land Degradation and Development*, 22: 453-462.

**SMETS, T., POESEN, J., BHATTACHARRYA, R., FULLEN, M.A., SUBEDI, M., BOOTH, C.A., KERTESZ, A., SZALAI, Z., TOTH, A., JANKAUSKAS, B., JANKAUSKIENE, G., GUERRA, A.J.T., BEZERRA, J.F.R., ZHENG YI, PANOMTARANICHAGUL, M., BÜHMANN, C. & PATERSON, D.G.**, 2011. Evaluation of biological geotextiles for reducing runoff and soil loss under various environmental conditions using laboratory and field data. *Land Degradation and Development*, 22: 480-494.

**NETHONONDA, L.O., ODHIAMBO, J.J.O. & PATERSON, D.G.**, 2012. Indigenous knowledge of climatic conditions for sustainable crop production under resource-poor farming conditions using participatory techniques. *Sustainable Agriculture Research*, 2 (1), 26-31.

**NETHONONDA, L.O., ODHIAMBO, J.J.O. & PATERSON, D.G.**, 2012. Assessment of spatial variability of selected soil chemical properties in a communal irrigation scheme under resource-poor farming conditions in Vhembe District of Limpopo Province, South Africa. *African J. Agric. Res.* 7 (39), 5445-5492.

**PATERSON, D.G., SMITH, H.J. & VAN GREUNEN, A.**, 2013. Evaluation of soil conservation measures on a highly erodible soil in the Free State province, South Africa. *S. Afr. J. Plant & Soil*, 30: 213-217.

**PATERSON, D.G., TURNER, D.P., WIESE, L.D., VAN ZIJL, G.M., CLARKE, C.E. & VAN TOL, J.**, 2015. Spatial soil information in South Africa – situational analysis, limitations and challenges. *S. Afr. J. Science* 111 (5/6). Art. #2014-0178, 7 pages. <http://dx.doi.org/10.17159/sajs.2015/20140178>

#### ***Books:***

**PATERSON, D.G. & MUSHIA, N.M.**, 2012. Chapter 32. Soil databases in Africa. *In: Handbook of Soil Science: Resource Management and Environmental Impacts (2<sup>nd</sup> Edn)*. Eds. P.M. Huang, Y Li & M.E. Sumner. CRC Press, Boca Raton FL.

**SOIL CLASSIFICATION WORKING GROUP\***, 1991. Soil classification. A taxonomic system for South Africa. Institute for Soil, Climate & Water, Pretoria.

\* Co-author as member of Working Group

#### ***Theses:***

**PATERSON, D.G.**, 1998. The use of ground penetrating radar to investigate subsurface features in selected South African soils. Unpublished MSc Thesis, University of Pretoria.

**PATERSON, D.G.**, 2014. The use of palm leaf mats in soil erosion control. Unpublished PhD Thesis, University of Pretoria.

#### ***Congress Papers:***

**PATERSON, D.G.**, 1987. The relationship between geology and soil type in the northern Kruger National Park. 14<sup>th</sup> Congress of the Soil Science Society of S.A. Nelspruit, 14-17 July 1987.

**PATERSON, D.G.**, 1990. A study of black and red clay soils on basalt in the northern Kruger National Park. 16<sup>th</sup> Congress of the Soil Science Society of S.A. Pretoria, 9-12 July 1990.

**PATERSON, D.G.**, 1992. The potential of ground penetrating radar as an aid to soil investigation. 17<sup>th</sup> Congress of the Soil Science Society of S.A. Stellenbosch, 28-30 January 1992.

**PATERSON, D.G.**, 1995. The complex soil mantle of South Africa. ARC Wise Land Use Symposium, Pretoria, 26-27 October 1995

**PATERSON, D.G. & LAKER, M.C.**, 1998. Locating subsoil features with ground penetrating radar. 21<sup>st</sup> Congress of the Soil Science Society of S.A. Alpine Heath, 20-22 January 1998.

**PATERSON, D.G.**, 2000. Mapping rehabilitated coal mine soils in South Africa using ground penetrating radar. Eighth International Conference on Ground Penetrating Radar, Gold Coast, Australia, 23-26 May 2000.

**PATERSON, D.G. & VAN DER WALT, M.**, 2003. The soils of South Africa from the Land Type Survey. 24<sup>th</sup> Congress of the Soil Science Society of S.A., Stellenbosch, 20-24 January 2003.

**PATERSON, D.G.**, 2015. Geotextiles – applications for soil conservation. Congress of the Soil Science Society of S.A., George, 19-22 January 2015.

#### ***Land Type Maps:***

**PATERSON, D.G.**, 1990. 1:250 000 scale land type map 2230 Messina. Dept. Agriculture, Pretoria.

**PATERSON, D.G. & HAARHOFF, D.**, 1989. 1:250 000 scale land type map 2326 Ellisras. Dept. Agriculture, Pretoria.

**PATERSON, D.G., PLATH, B.L. & SMITH, H.W.**, 1987. 1:250 000 scale land type map 2428 Nylstroom. Dept. Agriculture, Pretoria.

**PATERSON, D.G. & ROSS, P.G.**, 1989. 1:250 000 scale land type map 2330 Tzaneen. Dept. Agriculture, Pretoria.

**PLATH, B.L. & PATERSON, D.G.**, 1987. 1:250 000 scale land type map 2426 Thabazimbi. Dept. Agriculture, Pretoria.

#### ***Land Type Memoirs:***

**PATERSON, D.G., PLATH, B.L. & SMITH, H.W.**, 1988. Field Investigation. In: *Land types of the maps 2426 Thabazimbi & 2428 Nylstroom. Mem. Agric. Nat. Res. S. Afr.* No. 10. Dept. Agriculture, Pretoria.

**PATERSON, D.G., SCHOEMAN, J.L., TURNER, D.P., GEERS, B.C. & ROSS, P.G.**, 1989. Field Investigation. In: *Land types of the maps 2330 Tzaneen & 2430 Pilgrim's Rest. Mem. Agric. Nat. Res. S. Afr.* No. 12. Dept. Agriculture, Pretoria.

**PATERSON, D.G.**, 1999. 1:250 000 land type survey of the former Ciskei (Unpublished). ISCW Report GW/A/99/24.

#### ***Also:***

**PATERSON, D.G.**, 1992. Ground penetrating radar applications in USA and South Africa. Report on an official study tour to USA, 13-29 July, 1991. ISCW Report GW/A/92/8.

**PATERSON, D.G.**, 2000. Report on official overseas visit to GPR2000 Conference, Broadbeach, Australia, 23-26 May, 2000. ISCW Report GW/A/2000/40.

**Plus:** numerous ARC-ISCW Reports on soil surveys, soil interpretations, environmental impact assessments, soil suitability studies.

## **REFEREES**

1. Dr D.P. Turner (082 441 1676; [dturner@arc.agric.za](mailto:dturner@arc.agric.za))
2. Prof M.C. Laker (082 785 5295; [mlaker@telkomsa.net](mailto:mlaker@telkomsa.net))
3. Prof R.O. Barnard (078 291 7155)



# CURRICULUM VITAE

**ANDREW BULMAN**



POSITION : Director  
NAME OF FIRM : UrbanEQ Consulting Engineers (Pty) Ltd  
SPECIALISATION : Transportation Engineer  
DATE OF BIRTH : 23 October 1971  
NATIONALITY : South African  
YEARS EXPERIENCE : 21

## SUMMARY:

Andrew Bulman is a professional transportation engineer with 21 years of experience, specialising in the fields of traffic and transportation engineering and planning.

Key experience includes:

- Traffic engineering
- Transportation planning and feasibility studies
- Public transport system analysis and design
- Public transport operations
- Public transport financial, technical and efficiency analysis
- Public transport facilities design
- Planning, design and operation of event transport systems
- Transport impact assessments
- Road access management plans
- Traffic calming and signal design
- Conceptual design of transport infrastructure
- General contract administration and project management

## EDUCATION:

Qualification:	Institution:	Year Obtained:
MEng (Transportation)	University of Stellenbosch	2001
BSc (Eng) Civil	University of Cape Town	1994

## MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Registration as a Professional Engineer: Engineering Council of South Africa, 1999  
PrEng Registration No: 990261
- Member of the South African Institute of Civil Engineering  
Membership No: 091428

# CURRICULUM VITAE

**ANDREW BULMAN**

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## EMPLOYMENT RECORD:

**From:** 2016 to Date  
**Employer:** UrbanEQ Consulting Engineers (Pty) Ltd  
**Position held:** Director

**From:** 2002 to 2016  
**Employer:** GIBB (Pty) Ltd  
**Position held:** Technical Executive and Sector Unit Manager  
Traffic and Transportation

**From:** 2000 to 2001  
**Employer:** City of Cape Town  
**Position held:** Transportation Planning Professional

**From:** 1995 to 1999  
**Employer:** GIBB (Pty) Ltd  
**Position held:** Project Engineer, Traffic and Transportation

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## PROJECT HISTORY (Low Cost Housing Projects Applicable to this Tender):

**PROJECT NAME:** **STANFORD LOW COST HOUSING AND RETAIL DEVELOPMENT TIA**  
**PERIOD:** From: Mar 2016 to June 2016 - 3 months  
**CLIENT:** Overstrand Municipality  
**SUMMARY:** Preparation of a full Transport Impact Assessment (TIA) for the development of 822 low income housing units and 3 100 m<sup>2</sup> GLA of retail

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**PROJECT NAME:** **MASAKHANE LOW COST HOUSING DEVELOPMENT TIA**  
**PERIOD:** From: Mar 2016 to June 2016 - 3 months  
**CLIENT:** Overstrand Municipality  
**SUMMARY:** Preparation of a full TIA for the development of 1 567 low income housing units, 2 300 m<sup>2</sup> GLA of retail and a high school.

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**PROJECT NAME:** **ZWELIHLE LOW COST HOUSING DEVELOPMENT TIA**  
**PERIOD:** From: May 2015 to Sep 2015 - 4 months  
**CLIENT:** Overstrand Municipality  
**SUMMARY:** Preparation of a full TIA for the upgrading of 1 066 informal residential units to 944 low cost houses.

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**PROJECT NAME:** **MOUNT PLEASANT LOW COST HOUSING DEVELOPMENT PHASES 1 & 2 TIA**  
**PERIOD:** From: May 2015 to Sep 2015 - 4 months  
**CLIENT:** Overstrand Municipality  
**SUMMARY:** Preparation of a full TIA for the development of 300 (phase 1) and 104 (Phase 2) low income housing units and 19 270 m<sup>2</sup> GLA of retail.

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# CURRICULUM VITAE

**ANDREW BULMAN**

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**PROJECT NAME:** **HAWSTON LOW COST HOUSING DEVELOPMENT TIA**  
**PERIOD:** From: Nov 2015 to Jan 2015 - 2 months  
**CLIENT:** Overstrand Municipality  
**SUMMARY:** Preparation of a full TIA for the development of 563 low income housing units.

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**PROJECT NAME:** **GARDEN CITIES NEW TOWN: GREENVILLE PHASE 2 MASTER PLANNING & TIA**  
**PERIOD:** From: July 2010 to Mar 2015 – 5 years  
**CLIENT:** Garden Cities  
**SUMMARY:** Transport master plan and full TIA for the development of a new suburb that included 14 400 housing units, 334 100 m<sup>2</sup> retail and other public amenities.

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**PROJECT NAME:** **FREEDOM PARK AND VYGIESKRAAL LOW COST HOUSING DEVELOPMENTS TIA**  
**PERIOD:** From: July 2013 to Dec 2014 - 6 months  
**CLIENT:** City of Cape Town  
**SUMMARY:** Preparation of two full TIA's for the development of 275 and 172 low income housing units.

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## **PROJECT HISTORY (Other Major Projects):**

**PROJECT NAME:** **NATIONAL TREASURY CITY SUPPORT PROGRAMME: BUS RAPID TRANSIT**  
**PERIOD:** From: Oct 2015 to Date - 6 months  
**CLIENT:** Development Bank of South Africa and National Treasury  
**SUMMARY:** Assistance to the Cities of Johannesburg, Tshwane and Ethekwini to analyse and improve the operational efficiencies of their Bus Rapid Transit systems.

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**PROJECT NAME:** **PROVISION OF PROFESSIONAL SERVICES: BUSINESS DEVELOPMENT**  
**PERIOD:** From: Sep 2015 to Date - 7 months  
**CLIENT:** Transport for Cape Town, City of Cape Town (sub-con to Pegasys)  
**SUMMARY:** Assistance to the City of Cape Town's TCT Business Development section to develop business plans and undertake system analysis, cost modelling, business case investigations, design business parameters, develop business parameters, develop business strategies and other ad-hoc support.

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**PROJECT NAME:** **TECHNICAL SUPPORT TO THE CITY OF CAPE TOWN'S MYCITI BUSINESS DEVELOPMENT DEPARTMENT**  
**PERIOD:** From: Sep 2013 to Sep 2015 - 2 years  
**CLIENT:** Transport for Cape Town, City of Cape Town  
**SUMMARY:** Detailed analysis of the MyCiTi operations in order to maximise efficiencies and reduce expenditure. This included an assessment of profitability for each route based on patronage, revenue and operating costs for peak and off-peak periods, followed by recommended moderation interventions accompanied by quantified potential cost savings for each intervention and an assessment of feasibility.

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# CURRICULUM VITAE

**ANDREW BULMAN**

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**PROJECT NAME:** **TECHNICAL SUPPORT TO THE CITY OF CAPE TOWN'S MYCITI OPERATIONS DEPARTMENT**

**PERIOD:** From: Oct 2010 to Date - 5 years 6 months

**CLIENT:** Transport for Cape Town, City of Cape Town

**SUMMARY:** Provision of support to City of Cape Town officials managing the MyCiTi BRT system including vehicle fleet procurement and maintenance, electronic tracking, law enforcement, business KPIs, timetable development, invoice verification, contractual advice, system analysis, operational signage and management of operators.

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**PROJECT NAME:** **2010 FIFA WORLD CUP**

**PERIOD:** From: 2009 to 2010 – 1 year

**CLIENT:** FIFA 2010 Local Organising Committee

**SUMMARY:** Contracted to the 2010 FIFA Local Organising Committee for ten months as the Venue Transport Coordinator for Cape Town. Responsible for the operation of all transport services provided for the teams, staff, media and VIP guests including all parking facilities and access to the Cape Town Stadium precinct.

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**PROJECT NAME:** **2010 FIFA WORLD CUP - DETAILED TRANSPORT OPERATIONS PLANNING**

**PERIOD:** From: 2006 to 2009 – 3 years

**CLIENT:** City of Cape Town

**SUMMARY:** Responsible for the multi-disciplinary team that conceptualised and developed the transport operations plan for the 2010 WC for the City of Cape Town. Included bus shuttles, parking, VIP routes, rail park 'n rides, signage, marketing and transport information for visitors

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**PROJECT NAME:** **CLAREMONT PUBLIC TRANSPORT INTERCHANGE**

**PERIOD:** From: 2006 to 2008 - 2 years

**CLIENT:** City of Cape Town

**SUMMARY:** Design of a new Public transport interchange including taxi rank and bus terminus. Project leader of the multi-disciplinary team responsible for the planning, conceptual design, detailed design, tendering and construction of the new taxi rank and bus terminus. This included regular liaison with both the bus and taxi operators and design of the operational system.

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**PROJECT NAME:** **V&A WATERFRONT TRANSPORT MASTER PLAN**

**PERIOD:** From: 2012 to 2013

**CLIENT:** V&A Waterfront

**SUMMARY:** Five-year update to the transport master plan including road management, parking analysis, public transport service assessment and NMT facility design

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**PROJECT NAME:** **TWO RIVERS URBAN PARK**

**PERIOD:** From: 2012 to 2013

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# CURRICULUM VITAE

**ANDREW BULMAN**

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**CLIENT:** Provincial Government Western Cape  
**SUMMARY:** Transport planning for the development of 1,000,000 m<sup>2</sup> sustainable development adjacent to the Black River in Cape Town. Included innovative ways of reducing traffic congestion and improving sustainable use of transport infrastructure

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**PROJECT NAME:** **BAYSIDE SHOPPING CENTRE – TRANSPORT AND TRAFFIC ENGINEERING INPUT TO THE EXPANSION OF BAYSIDE SHOPPING CENTRE IN TABLE VIEW**  
**PERIOD:** From: 2008 to 2013  
**CLIENT:** Acucap Properties  
**SUMMARY:** A number of TIA's to support development applications, conceptual design of parking and road infrastructure

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**PROJECT NAME:** **NEWLANDS RUGBY STADIUM – TRANSPORT FEASIBILITY STUDY FOR THE REDEVELOPMENT OF NEWLANDS RUGBY STADIUM**  
**PERIOD:** From: 2012 to 2013  
**CLIENT:** WPRFU  
**SUMMARY:** Preliminary transport assessment of the feasibility of the development of the Newlands Rugby Stadium. Assessment of future traffic demand, assessment of possible entrance points and calculation of parking requirements

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**PROJECT NAME:** **CULEMBORG QUARTER – TRANSPORT PLANNING**  
**PERIOD:** From: 2007 to 2012  
**CLIENT:** Culemborg Investment Properties (Pty) Ltd  
**SUMMARY:** Detailed TIA for the development of a large 200 000 m<sup>2</sup> GLA inner-city multi-use facility including integration with the local road, NMT & public transport networks.

---

**PROJECT NAME:** **NO 1 SILO BUILDING, V&A WATERFRONT**  
**PERIOD:** From: 2008 to Date  
**CLIENT:** V&A Waterfront  
**SUMMARY:** Transportation engineering services for the development of the 5 Green Star office building including successfully preparing the Green Star application report for the transport component of the submission

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**PROJECT NAME:** **TRAFFIC ENGINEERING SUPPORT TO THE CITY OF CAPE TOWN**  
**PERIOD:** From: 2011 to Date  
**CLIENT:** City of Cape Town  
**SUMMARY:** General support to the functions performed by the City's Traffic Engineering department. Undertaking speed surveys, speed hump investigations, billboard application analysis, intersection conceptual designs and traffic signal designs

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# CURRICULUM VITAE

**ANDREW BULMAN**

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**PROJECT NAME:** **FESTIVAL MALL – TRANSPORT PLANNING FOR THE UPGRADE OF A REGIONAL SHOPPING CENTRE IN GAUTENG**  
**PERIOD:** From: 2009 to 2011  
**CLIENT:** Acucap Property Limited  
**SUMMARY:** TIA for the extension and upgrade of a regional shopping centre. Included trip generation, intersection analysis, conceptual design and parking analysis.

---

**PROJECT NAME:** **NUCLEAR ONE TRANSPORT STUDY**  
**PERIOD:** From: 2007 to 2012  
**CLIENT:** Eskom  
**SUMMARY:** Transport specialist study at three locations as part of EIA process for the proposed Nuclear One power plant

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**PROJECT NAME:** **GREATER KOMMETJIE/SUN VALLEY REGIONAL - TRANSPORT IMPACT ASSESSMENT AND BULK CONTRIBUTION STUDY**  
**PERIOD:** From: 2009 to 2011  
**CLIENT:** JBB Properties  
**SUMMARY:** Regional TIA for development in the area over a 10-year period including roads master planning, detailed TIA and calculation of future development contributions to fund the construction of infrastructure.

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**PROJECT NAME:** **GARDEN ROUTE MALL - TRANSPORT IMPACT ASSESSMENT**  
**PERIOD:** From: 2009 to 2011  
**CLIENT:** Torbell Holdings (Pty) Ltd  
**SUMMARY:** TIA for the development of a new regional shopping centre in George

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## PUBLICATIONS & PAPERS

- MyCiTi Integrated Rapid Transit System “*It is not just about the bus*”, SAICE Civil Engineering Magazine, September 2013
- Above paper presented at SATC, July 2014
- “*Can BRT be operated sustainably in South Africa?*” Paper presented to the National South African Transport Conference on 8 July 2015.



**UNIVERSITY OF CAPE TOWN**  
*with which is incorporated the South African College*

**Degree of  
Bachelor of Science in Engineering**

*We hereby certify that* ANDREW MARK BULMAN  
*was admitted to the Degree of Bachelor of Science in  
Engineering in Civil Engineering  
on* 7 DECEMBER 1994.

I CERTIFY THAT THIS DOCUMENT IS A TRUE  
COPY OF THE ORIGINAL WHICH WAS  
EXAMINED BY ME AND THAT, FROM MY  
OBSERVATION, THE ORIGINAL HAS NOT  
BEEN ALTERED IN ANY MANNER

.....  
SIGNATURE

OFFICE OF THE STATION COMMANDER  
SOUTH AFRICAN POLICE SERVICE

29 MAR 2016

P.O. BOX 22, DURBANVILLE, 7551

TEL: 021 976 3820 • FAX: 021 976 4472

.....

Vice-Chancellor

.....

Registrar



UNIVERSITY OF STELLENBOSCH

*This is to certify that whereas*

ANDREW MARK BULMAN

*had complied with all the conditions prescribed  
in the Act, Statute and Rules of the University,  
the degree*

I CERTIFY THAT THIS DOCUMENT IS A TRUE COPY OF THE ORIGINAL WHICH WAS EXAMINED BY ME AND THAT, FROM MY OBSERVATION, THE ORIGINAL HAS NOT BEEN ALTERED IN ANY MANNER.

*[Handwritten signature]*  
SIGNATURE

MASTER OF ENGINEERING  
(MEng)  
(Civil Engineering)

OFFICE OF THE STATION COMMANDER  
SOUTH AFRICAN POLICE SERVICE

29 MAR 2016

P.O. BOX 22, DURBANVILLE, 7551  
TEL: 021 520 3820 • FAX: 021 976 4472

*with all the rights and privileges pertaining thereto was conferred on  
him at a congregation of the University in December 2001.*

*[Handwritten signature]*

RECTOR AND VICE-CHANCELLOR

*[Handwritten signature]*  
DEAN



*[Handwritten signature]*  
REGISTRAR  
7 December 2001

This certificate was issued in both Afrikaans and English. In the unlikely event of an inconsistency in the wording, the Afrikaans text shall have precedence.

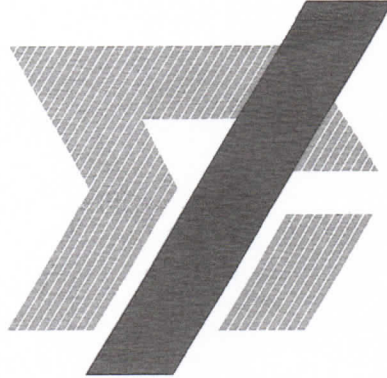


# Engineering Council of South Africa

OFFICE OF THE STATION COMMANDER  
SOUTH AFRICAN POLICE SERVICE

29 MAR 2016

P.O. BOX 22, DURBANVILLE, 7551  
TEL: 021 976 3826 • FAX: 021 976 4472



This is to  
certify  
that

**Andrew Mark Bulman**

is registered as

**Professional Engineer**

I CERTIFY THAT THIS DOCUMENT IS A TRUE  
COPY OF THE ORIGINAL WHICH WAS  
EXAMINED BY ME AND THAT, FROM MY  
OBSERVATION, THE ORIGINAL HAS NOT  
BEEN ALTERED IN ANY MANNER.

SIGNATURE

in terms of the Engineering Profession of South Africa Act  
1990 (Act 114 of 1990)

Date **8 November 1999**

Registration  
Number **990261**

President

Registrar

