

Tony Barbour

ENVIRONMENTAL CONSULTING AND RESEARCH

10 Firs Avenue, Claremont, 7708, South Africa
(Tel) 27-21-761 2355 - (Fax) 27-21-761 2355 - (Cell) 082 600 8266
(E-Mail) tbarbour@telkomsa.net

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: Michiel Jonker

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

Education

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

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

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

Societies and Accreditations

| | |
|-------------|---|
| 2009 | The South African Council for Natural Scientific Professions (SACNASP) Professional Natural Scientist |
|-------------|---|

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)**

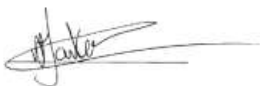
Presentations

- 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

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.



Michiel Jonker

MSc (Aquatic Health) UJ
MSc (Environmental Management) UJ
Pr. Sci. Nat.
Freshwater Ecologist
M +27 84 585 7479
T +27 11 672 1375
F 088 011 672 1375
michiel@ecotone-sa.co.za
www.ecotone-sa.co.za

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

ADDRESS: ARC-Institute for Soil, Climate and Water
Private Bag X79
Pretoria 0001
Republic of South Africa

TEL.: 012 310 2601(w)
012 333 0829 (h)
083 556 2458 (cell)
FAX: 012 323 1157

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 (2nd 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. 14th 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. 16th 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. 17th 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. 21st 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. 24th 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)
2. Prof M.C. Laker (082 785 5295; 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

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

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 m² GLA of retail

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 m² GLA of retail and a high school.

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.

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 m² GLA of retail.

CURRICULUM VITAE

ANDREW BULMAN

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.

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 m² retail and other public amenities.

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.

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.

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.

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.

CURRICULUM VITAE

ANDREW BULMAN

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.

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.

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

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.

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

PROJECT NAME: **TWO RIVERS URBAN PARK**

PERIOD: From: 2012 to 2013

CURRICULUM VITAE

ANDREW BULMAN

CLIENT: Provincial Government Western Cape
SUMMARY: Transport planning for the development of 1,000,000 m² sustainable development adjacent to the Black River in Cape Town. Included innovative ways of reducing traffic congestion and improving sustainable use of transport infrastructure

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

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

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 m² 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

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

CURRICULUM VITAE

ANDREW BULMAN

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

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.

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

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.

**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: 021 850 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.*

RECTOR AND VICE-CHANCELLOR

DEAN



REGISTRAR

7 December 2001

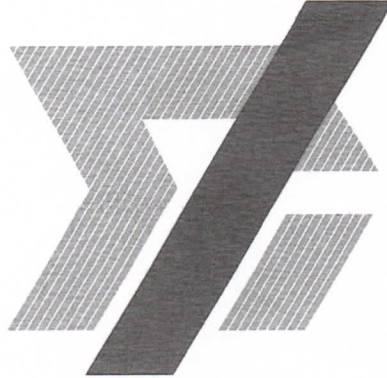
This certificate was issued in both Afrikaans and English.
In the unlikely event of an inconsistency in the wording,
the Afrikaans text shall have precedence.

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

