

Bathusi
Environmental
Consulting

gateway to ecological specialist services

Riaan A. J. Robbeson (Pr.Sci.Nat.)

Name of Firm: Bathusi Environmental Consulting cc
 Position: Member, Specialist Investigator
 Profession: Environmental Scientist, Ecologist, Botanist
 Date of Birth: 13th April 1969
 Consulting experience: 15 years
 Nationality: South African
 Cellular Contact: 0027 82 3765 933
 email: riaan@bathusi.org

Membership in Professional Societies:

CLASS	PROFESSIONAL SOCIETY	YEAR OF REGISTRATION
Pr.Sci.Nat.	South African Council of Natural Scientific Professions (SACNASP) (Ecological Scientist & Botanical Scientist, Reg no: 400005/03) (weblink:www.infoveld.com/sarnap/EXEC/4/04c7jg21y2fpby11qc2dh1ikyr8m)	2003
Professional Member	Grassland Society of Southern Africa	2008

Fair and Reasonable Opinions:

YEAR	CLIENT	RESPONSIBILITY	DESCRIPTION
2002	Deneys Reitz Attorneys	Environmental Due Diligence	Determining the fire damage to the structural layers of the vegetation in Sabi Sand Private Game Reserve
2007	Cameron Cross Inc	Environmental Due Diligence	Investigating findings of GDACE in negative ROD for the proposed Greengate Residential Establishment

Abbreviated list of Current Tasks & Completed Projects:

YEAR	CLIENT	COMMODITY	PROJECT DESCRIPTION
2009	PBA International	Power Utility	Masa Selomo 765kV Lines Ecological EIA
	Mills & Otten	Infrastructure	Bakgatla Ecological EIA
	GCS	Power Utility	Kangra PS Ecological EIA
	Savanna Environmental	Power Utility	Kyalami Strengthening
	NuCoal Mining	Biological Monitoring	Environmental monitoring of ecological environment
	SSI	Power Utility	Watershed Sephaku Biodiversity EIA
	PB Power	Power Utility	Environmental Monitoring Committee
	PBA International	Power Utility	Epsilon Substation Biodiversity Scoping Assessment
2008	Bohlweki	Power Utility	Biodiversity EIA – Boulders – Marathon 132kV
	Bombela CJV	Infrastructure	Biodiversity Monitoring of construction activities
	Marsh Vikela	Mining	GOPE Biodiversity EIA
	PB Power	Power Utility	Medupi Power Station Environmental Monitoring
	Kwezi V3 Engineers	Mining	Greenfield Expansion Biodiversity EIA
	Savannah Env	Power Utility	Mokopane Integration Biodiversity EIA
	Bohlweki	Power Utility	Vygeboom EMP Upgrade
	Bohlweki	Power Utility	Majuba CCGT EIA
	Iliso Consulting	Infrastructure	Kaalplaasspruit Remedial EMP
2007	PBA International	Power Utility	Biodiversity Impact Assessment of the Matimba – Marang Power lines
	PBA International	Power Utility	Biodiversity Impact Assessment of the Matimba – Dinaledi Power lines
	PBA International	Power Utility	Biodiversity Impact Assessment of the Mmamabula – Delta Power lines
	Marsh Vikela	Development	Biodiversity Impact Assessment of the farm Leeuwpoort
	Bohlweki	Power Utility	Biodiversity Impact Assessment of the proposed Steelpoort Pumped Storage Scheme
	SIVEST	Development	Biodiversity Assessment of the Bultfontein Development
	SIVEST	Development	Biodiversity Assessment of the Newmarket Development
	PBA International	Power Utility	Biodiversity Scoping Assessment of the proposed Epsilom Sub station
	AgriDev International	Development	Biodiversity Impact Assessment of Golwe
	Bombela JV	Transport	Red Data species location and relocation for the Gautrain Development
	Woestalleen Colliery	Mining	Development and implementation of bio-monitoring programme
	Eko-Info cc	Mining	Floristic Surveys of the proposed Nu-Largo coal mine
	Eko-Info	Mining	Floristic Surveys of the proposed Mmamabula coal mine
	Bohlweki	Mining	Floristic Impact Assessment of the proposed Underground Gasification Concept mining
Bohlweki	Power utility	Biodiversity Impact Assessment of the Matimba B	

			Power Station
2006	PBA International	Power utility	Biodiversity Scoping assessment of the proposed Matimba Integration
	Digby Wells	Mining	Biodiversity Assessment of the proposed Mareesburg mine
	Bohlweki	Power utility	Floristic Assessments of the Kabokweni and Kiepersol power lines
	African EPA	Development	Bryntirion, Paardeplaats, Willows, Simon Vermooten Floristic Assessments
	Eko-Info	Development	Floristic sampling of Lula, Mozambique
	Mills & Otten	Development	Olievenhoutbosch, Brakfontein, Kosmosdal, Blue Hills, Garstfontein Biodiversity Assessments
Pre 2006	Agricultural Research Council	Research	Management Guidelines and Impact Assessment of Quelea control activities in wetlands
	SEF	Research	Floristic sampling of the Tshwane Municipal area
	University of Pretoria	Research	Floristic sampling of the Kglalagadi Transfrontier Park, Botswana
	Confidential	Development	Biodiversity assessment of selected sites in the Okavango Delta for limited lodge development and hunting concessions
	African EPA	Development	Red Data investigation for development purposes
	Groundwater Consulting	Mining	Ecological investigation of Wildebeestpan
	Groundwater Consulting	Mining	Ecological investigation of Teutfontein
	Groundwater Consulting	Mining	Ecological investigation of Aasvoelkrans
	Groundwater Consulting	Mining	Ecological investigation of Klipspruit
	Deneys Reitz Attorneys	Research	Quantification of fire damage to the vegetation structure in Sabi Sand Private Game Reserve
	Northam Platinum Limited	Mining	Development of an alien control programme for the mining area.
	SEF	Development	Removal and relocation of medicinal plants from Calswald development site.
	Woestalleen Collier	Mining	Development and installation of a natural wind and visual break between mining and provincial roads
	Confidential	Research	Vegetation structure analysis of waterpans in the Chobe National Park, Botswana
	Institute for Soil, Climate and Water	Research	Floristic sampling and development of a GIS remote sensing tool for the assessment of natural degradation of vegetation in the Gauteng Province
	Institute for Soil, Climate and Water	Research	Floristic sampling and development of a GIS remote sensing tool for the assessment of natural degradation of vegetation in the Mpumalanga Province

Key Qualifications & Attributes

Riaan A.J. Robbeson is an experienced ecologist and botanist, having obtained his Masters degree in Plant Ecology at the University of Pretoria while working as a research assistant on the National Grassland Biome Project. His involvement in specialist environmental studies followed naturally after graduation and he has since 1998 been involved in numerous projects that related to his field of expertise, ranging in size from a few hectares to provincial scale. Extensive experience has subsequently been obtained on the status and reaction of the natural environment to development and the assessment thereof. In addition to pure scientific investigations, he has also developed and successfully implemented several biodiversity monitoring programmes on mining areas. International projects include areas such as Botswana and Mozambique. Project management include the management of other specialist investigators and the ecological integration of biodiversity data and reports.

On a personal level, Riaan is an amateur wildlife photographer and is compiling a personal database of photographs of South African wild flowers. He also is a social ultra distance runner and has completed 4 Comrades marathons.

Education

DEGREE / DIPLOMA	FIELD	INSTITUTION
B.Sc.	Botany and Zoology (main subjects)	University of Pretoria (1987 – 1991)
B.Sc. (Hons)	Botany	University of Pretoria (1992)
M.Sc.	Plant Ecology	University of Pretoria (1994 – 1998)
Visual Basic Programming	Programming	Unischool (University of Pretoria), 1999

Employment Record

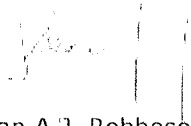
POSITION	COMPANY	JOB DESCRIPTION	DURATION
Research Assistant	University of Pretoria	Botanical surveys, plant identifications, data capturing, data analysis, report compilation, phytosociological descriptions, Post graduate Masters Publications	1994 - 1998
Member	EkoInfo cc	Project acquisition, site investigations, data analysis, report compilation, GIS mapping, selected peer review for publications and specialist reports	1995-1999
Member	Bathusi Environmental Consulting	Project acquisition, project management, site investigations, data analysis, report compilation, GIS mapping, selected peer review for publications and specialist reports, financial administration	1999 - present

Languages

English: RWS - Excellent
Afrikaans: RWS - Excellent

Certification

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications and experience.



Riaan A.J. Robbeson (Pr.Sci.Nat.)
2009 - 06 - 22

**The South African Council
for Natural Scientific Professions**
certifies in terms of Section 20(3)(a) of the
Natural Scientific Professions Act, 2003, that

Mr R A J Robbeson
is registered as a Professional Natural Scientist, Reg. no.
in the following field(s) of practice **400005/03**
**Botanical Science Ecologi-
cal Science**

Expiry Date 31 May 2010

2617

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in the following field(s) of practice **400005/03**
Botanical Science
Ecological Science

Expiry Date : 31 May 2009

2416

Curriculum Vitae ~ Dewald Kamffer

PRECIS

Personal Details:

- Born in and current resident of South Africa
- 33 year old white male in good health
- Married without children
- Interests include wildlife photography and sports
- Proficient in English writing, reading and speaking

Academic History:

- B.Sc.(Zoology & Entomology); University of Pretoria (1995)
- B.Sc.(Hons)(Entomology); University of Pretoria (1996)
- M.Sc.(Grassland Conservation Ecology); University of Pretoria (2004)

Career History:

- 2001: Game Ranger at Mala-Mala Private Game Reserve
- 2002-2009: Director and Senior Environmental Specialist of Ecocheck (faunal specialist EIA company)

Professional Affiliation:

- Ecological and Zoological Scientist with the South African Council for Natural Scientific Professions (400204/05)

Contact Details:

- E-mail: ecocheck@ee-sa.com
- Fax: 0027 12 365 3217
- Cell: 0027 82 940 8708

Post Graduate Study: M.Sc.

Community-level effects of fragmentation of the afromontane grassland in the escarpment region of Mpumalanga, South Africa

Supervisor: Prof. J.W.H. Ferguson

Co-Supervisor: Prof. A.S. Van Jaarsveld

ABSTRACT

Large scale afforestation, resulting in habitat destruction and fragmentation of the afromontane grassland in the Drakensberg escarpment of Mpumalanga, South Africa, has led to the necessity of describing the flora and fauna aspects of the remaining grassland fragments, allowing forestry companies to mitigate the effects of afforestation on the biodiversity of these fragments and for initiating a management program for the remaining grassland. This study aims, firstly, to determine if any marked human-induced disturbance to the plant communities in the grassland fragments has occurred. I do this by comparing the plant communities of eighteen fragments with those of six control plots outside of the plantations with no marked disturbance to the grassland, by determining whether the plant assemblages in the fragments can be assigned to any of the natural and intact plant communities that Matthews (1993) described from a large-scale survey of undisturbed mountain areas and by ascertaining the presence of any known intruder plant species within the fragments. I also compare the faunal biodiversity in grassland fragments within afforested areas to that of control plots in undisturbed grassland and determine to which degree the Coleoptera, Orthoptera, Lepidoptera and bird communities reflect recognized plant communities, and are restricted to specific plant communities. Secondly, the study aims to compare the habitat specificity (degree of stenotopy) of the different taxonomic groups and trophic levels of animals and to make recommendations for the conservation of the

Afromontane grassland fauna in the remaining grassland fragments in afforested areas. Thirdly, I aim to quantify the effect of several environmental characteristics (slope, rainfall, geology, etc) on the faunal community structure of the grassland fragments, to quantify the effects of degree of isolation on species richness, species diversity and assemblage structure of plants, insects and birds in grassland remnants and to test for the effects of edges on the extant insect biodiversity in the grassland fragments inside plantations. Lastly, the study aims to quantify the effects of fragment size on species richness, species diversity and assemblage structure of plants, insects and birds and to rank the grassland fragments in an order of conservation importance using factors such as biodiversity and uniqueness of the floral community. The results indicate that afforestation and habitat fragmentation have not significantly impacted on the flora of the grassland fragments. Fragments are still identifiable as natural communities, described by previous workers during provincial-scale surveys. Also, no obvious invader – or disturbed plant communities are discernible even though some of the fragments have been isolated for as long as 40 years and the plant communities of conservation importance described by previous workers coincide with the important communities recognized in this study. Rare and endangered plant species, as well as species endemic to the region, are more frequently found on the scarce Black Reef quartzite of the region, which is more evident to the Northern part of the study area. Two plant communities are of particular conservation importance, not only as a result of their geological base, but also because of the high risk associated with the few grassland examples left of these communities. The high levels of habitat specificity of many of the taxonomic and trophic faunal groups indicate that many of the invertebrate taxa are probably endemic to the region, and that the plant endemism encountered in the Afromontane grasslands is reflected by a similar degree of animal endemism. The similarity in faunal assemblages and

diversity between isolated fragments and large areas of grassland emphasizes the conservation importance of the fragments, even when smaller than 5 Ha in extent. Fragments therefore have a high conservation importance, since they represent natural grassland areas and are sometimes the only representative of a particular plant community remaining in the area. I detected no significant edge effects on the faunal communities 10, 20 and 50 meters from the edge of the plantation. Birds (and probably other vertebrates in these grasslands) are affected by fragment size, while invertebrates are much less affected and plants do not show any measurable effect of fragment size. Fragments in the wetter northern part of the study area, characterized by high levels of plant endemism, have a higher conservation importance as judged by faunal biodiversity. Experimental management involving grazing, mechanical cutting, grazing and burning is needed to derive an efficient management plan, so that the grassland biodiversity can be conserved in a planned way. Such work will also allow empirical testing of the efficiency of the indicator species suggested in this study.

Work experience as faunal Environmental Impact Assessment specialist for

ECO-CHECK

Summary: 153 projects in eleven provinces and three countries. Projects include linear structures such as roads, pipelines and power lines; as well as residential developments and various mines.

<u>YEAR</u>	<u>LOCATION</u>	<u>PROJECT</u>	<u>CLIENT</u>
2002	Gauteng, South Africa	Giel v/d Berg residential development	Die Giel v/d Berg Trust
2002	Mpumalanga, South Africa	Carlswald opencast coal mine	Tribal Consultants
2002	Mpumalanga, South Africa	CBM opencast coal mine	Tribal Consultants
2002	NW Province, South Africa	Brakspruit granite mine	Helio Alliance
2002	Gauteng, South Africa	Supplier Park industrial development	Tribal Consultants
2002	Mpumalanga, South Africa	Hartbeesfontein mine	Eco-Afrika Consulting
2002	Gauteng, South Africa	Willows residential development	EkoInfo
2003	Kwazulu-Natal, South Africa	Utrecth mine	GCS
2003	Mpumalanga, South Africa	Roosenekal opencast mine	Eco-Afrika Consulting
2003	Gauteng, South Africa	Cradle-of-humankind development	Eco Assessments
2003	Gauteng, South Africa	Summerset residential development	Tribal Consultants
2003	Gauteng, South Africa	Amandasig residential development	EkoInfo

2003	Gauteng, South Africa	Olienhoutbosch residential development	Tribal Consultants
2003	Gauteng, South Africa	Kromdraai development	Eco Assessments
2003	Gauteng, South Africa	Feather Wood residential development	Eco Assessments
2003	Gauteng, South Africa	Supplier Park 2 industrial development	Tribal Consultants
2003	Mpumalanga, South Africa	Highlands Gate Golf Estate development	Eco Assessments
2003	Gauteng, South Africa	Irene Township development	Tribal Consultants
2003	NW Province, South Africa	Frontier granite mine	Helio Alliance
2003	Gauteng, South Africa	Sterrewag residential development	EkoInfo
2003	Gauteng, South Africa	Brakfontein development	Tribal Consultants
2003	Gauteng, South Africa	Valley View residential development	Tribal Consultants
2003	Gauteng, South Africa	Bordeaux residential development	EkoInfo
2003	Gauteng, South Africa	Randjiesfontein equestrian development	EkoInfo
2004	Gauteng, South Africa	Olienhoutbosch road	KV3 Engineers
2004	NW Province, South Africa	Sun City vacation club development	Sun International
2004	Free State, South Africa	Reitz Quelea research project	Agri Research Council
2004	Gauteng, South Africa	Louwardia residential development	Tribal Consultants
2004	Gauteng, South Africa	Maruladal development	Tribal Consultants
2004	Gauteng, South Africa	Craigavon residential development	Tribal Consultants
2004	Northern Cape, South Africa	Frances Baard municipality SEA	EkoInfo

2004	Mpumalanga, South Africa	Schoonoord coal mine	African EPA
2004	Gauteng, South Africa	Witkoppen residential development	Tribal Consultants
2004	Gauteng, South Africa	Valley Farm development	Plan Practice
2004	Gauteng, South Africa	Heaven-on-earth residential development	EkolInfo
2004	Limpopo Province, South Africa	BJF Game Range Environ. Audit	EkolInfo
2004	Gauteng, South Africa	Broadacres residential development	EIMS (Pty) Ltd
2005	Gauteng, South Africa	Silverton residential development	BEC
2005	Mpumalanga, South Africa	Lakenvlei development	African EPA
2005	Limpopo Province, South Africa	Leopard's Bend Lodge development	EkolInfo
2005	Gauteng, South Africa	Honingklip residential development	EkolInfo
2005	Gauteng, South Africa	Modderfontein development	EkolInfo
2005	Gauteng, South Africa	North Riding residential development	Tswelopele Environ.
2005	NW Province, South Africa	Amarosa development	BEC
2005	NW Province, South Africa	Waterval residential development	BEC
2005	Gauteng, South Africa	Lion Park development	EkolInfo
2005	Vilanculos, Mozambique	Lula Lodge Environmental Audit	EkolInfo
2005	Mpumalanga, South Africa	Impomelelo development	EkolInfo
2005	Limpopo Province, South Africa	Kololo Lodge development	EkolInfo
2005	Gauteng, South Africa	Paardeplaats development	Landev (Pty) Ltd

2005	Gauteng, South Africa	Cashan residential development	BEC
2005	Limpopo Province, South Africa	Matimba B Power Station	ESKOM
2005	NW Province, South Africa	Elandsfontein residential development	EkolInfo
2005	Gauteng, South Africa	Rietvallei development	EkolInfo
2005	Mpumalanga, South Africa	Middelkraal opencast coal mine	African EPA
2005	Gauteng, South Africa	Simon Vermooten Road extensions	BEC
2005	Gauteng, South Africa	Klapperkop SEA	EkolInfo
2005	Gauteng, South Africa	The Hills residential development	EkolInfo
2005	Gauteng, South Africa	Wallmansthal development	BEC
2005	Gauteng, South Africa	Waterkloof Heights residential development	BEC
2005	NW Province, South Africa	Beau Rivage residential development	BEC
2005	NW Province, South Africa	Le Chateau residential development	BEC
2005	Gauteng, South Africa	Zuickerboschfontein residential development	Zuicker. Property Trust
2005	Gauteng, South Africa	Garsfontein residential development	BEC
2005	Gauteng, South Africa	Rooihuiskraal residential development	EkolInfo
2006	Limpopo Province, South Africa	Kapama Game Lodge development	EkolInfo
2006	Free State, Northern Cape - SA	Perseus-Hydra high voltage power line	ESKOM
2006	NW Province, South Africa	Schurveberg residential development	Viking Properties 330
2006	NW Province, South Africa	De Rust development	BEC

2006	Gauteng, South Africa	Zesfontein landfill site	Ekurhuleni Municipality
2006	Mpumalanga, South Africa	Zone-of-Integration development	BEC
2006	Gauteng, South Africa	Doornkraal development	BEC
2006	Gauteng, South Africa	Zwartkoppies residential development	BEC
2006	Gauteng, South Africa	Rigel South Risk Assessment	EkolInfo
2006	Gauteng, South Africa	SWM development	Germiston Uitgewers
2006	Gauteng, South Africa	Boschkop residential development	Viking Properties 330
2006	Gauteng, South Africa	Donkerhoek residential development	BEC
2006	Gauteng, South Africa	Willowbrae residential development	Vexma Properties
2006	Gauteng, South Africa	Equestria residential development	ASG Rental Solutions
2006	Mpumalanga, South Africa	Mareesburg mine extension	BEC
2006	Gauteng, South Africa	Sedibeng township development	EkolInfo
2006	Gauteng, South Africa	Cullinan residential development	EkolInfo
2006	Gauteng, South Africa	Bronberg South residential development	EkolInfo
2006	Limpopo Province, South Africa	Koedoesfontein Lodge development	EkolInfo
2006	Gauteng, South Africa	Voortrekker Monument development	EkolInfo
2006	Gauteng, South Africa	Zambezi residential development	EkolInfo
2006	Gauteng, South Africa	Midrand residential development	EkolInfo
2006	Central District, Botswana	Mmamabula opencast coal mine	EkolInfo

2006	Gauteng, South Africa	Jameson Field residential development	BEC
2006	Gauteng, South Africa	Olympus Agric Holdings development	BEC
2006	Gauteng, South Africa	Willows 281 residential development	BEC
2006	Gauteng, South Africa	Fountains Valley development	EkolInfo
2006	Mpumalanga, South Africa	Xstrata opencast coal mine	Xstrata Coal
2006	Limpopo Province, South Africa	Soutpansberg mining operation	ERM
2006	Free State, South Africa	Vredefort Dome SEA	African EPA
2006	Mpumalanga, South Africa	Trichardt residential development	Prohibio
2006	Limpopo Province, South Africa	Musina Weigh Bridge	BEC
2007	Gauteng, South Africa	Ashlea Gardens residential development	BEC
2007	Gauteng, South Africa	Gautrain	BEC
2007	Limpopo Province, South Africa	Thornclyff mine	AGES SA
2007	Gauteng, South Africa	Shoshanguve residential development	EkolInfo
2007	Gauteng, South Africa	Rabie Ridge residential development	BEC
2007	Mpumalanga, South Africa	R40 (Nelspruit-Baberton) road extensions	BEC
2007	Gauteng, South Africa	Dainfern residential development	Golden Creek Investments
2007	Limpopo Province, South Africa	Vhurivhuri tribal area development	BEC
2007	Gauteng, South Africa	Kliprivier development	Kenric Investments
2007	Gauteng, South Africa	Kievietskroon residential development	EkolInfo

2007	Gauteng, South Africa	The Hills Road	Ekoinfo
2007	Gauteng, South Africa	Raslouw residential development	Ekoinfo
2007	Gauteng, Mpumalanga - SA	Petronet multipurpose pipeline	BEC
2007	Central District, Botswana	TATI Nickel mine	Marsh Vikela
2007	Gauteng, South Africa	Newmarket residential development	BEC
2007	Gauteng, South Africa	Leeupoort residential development	BEC
2007	Gauteng, South Africa	Bultfontein residential development	BEC
2007	Mpumalanga, South Africa	Steelpoort mining	BEC
2007	Gauteng, Limpopo - South Africa	Marang high voltage power line	ESKOM
2007	NW, Limpopo - South Africa	Dinaledi high voltage power line	ESKOM
2007	Gauteng, South Africa	Klipdrift residential development	BEC
2007	Gauteng, South Africa	Selcourt residential development	BEC
2007	Gauteng, South Africa	Pienaarspoort residential development	Krysanthe Properties
2007	Eastern Cape, South Africa	Xolobeni mine	Pachnoda Consulting
2007	Limpopo Province, South Africa	Rockdale Ferrochrome mine	BEC
2007	NW Province, South Africa	PTM platinum mine	Oryx Environmental
2007	Limpopo Province, South Africa	Mmamabula-delta high voltage power line	ESKOM
2007	Gauteng, South Africa	Mooiplaats residential development	Pachnoda Consulting
2007	Mpumalanga, South Africa	Schoemanskloof residential development	GO EnviroScience

2008	Limpopo Province, South Africa	Cooyong residential development	Polygon Environ. Planners
2008	Central District, Botswana	Selkirk Lionore mine	AGES SA
2008	Gauteng, South Africa	SANRAL KVV3 road	Jeffares and Green
2008	Ghanzi District, Botswana	GOPE diamond mine (Central Kalahari)	Marsh Vikela
2008	Gauteng, South Africa	Ingwenya Lodge development	EkoInfo
2008	Mpumalanga, South Africa	Boulders-Malelane high voltage power line	ESKOM
2008	Gauteng, South Africa	Crystal Park residential development	BEC
2008	Gauteng, South Africa	Klipdrift Weir	Magalies Water
2008	Mpumalanga, South Africa	Majuba power generation plant	ESKOM
2008	NW Province, South Africa	Sun City golf course development	Sun International
2008	Mpumalanga, South Africa	Dorstfontein Coal Mine	GCS
2008	NW Province, South Africa	Lonmin Mine: Biodiversity Assessment	EkoInfo
2008	Gauteng, South Africa	Houtkop Development	BEC
2008	Gauteng, South Africa	Willow Park Development	Zotec Developments
2008	Gauteng, South Africa	Fairland Road Development	Arcus Gibb
2008	Gauteng, South Africa	Klipdrift Water Works, Pienaars River	Enviro-Namic
2008	NW Province, South Africa	Waste Management Services Assessment	GCS
2008	OFS & Northern Cape, SA	Perseus-Hydra Power Line Walk Down	EkoInfo
2008	KZN & Mpumalanga, SA	Majuba-Venus Power Line EIA	EkoInfo

2008	NW Province, South Africa	Watershed – Mmabatho Power Line	BEC
2008	Mpumalanga, South Africa	Kusipongo Red data assessment	BEC
2008	Gauteng, South Africa	Greenfield Expansion Development	BEC
2008	Limpopo Province, South Africa	Medupi Borrow Pits	BEC
2009	Mpumalanga, South Africa	Kangra Site Selection	BEC
2009	Mpumalanga, South Africa	Maquasa West	BEC
2009	Gauteng, South Africa	Elandsfontein Development	BEC
2009	Gauteng, South Africa	Crystal Park Development	BEC
2009	Gauteng, South Africa	Doornpoort Development Wetland Mammals	First Land Developments
2009	Gauteng, South Africa	NECSA pipelines assessment	EIMS
2009	OFS & Mpumalanga, SA	GNP SASOL Pipeline	SPEC
2009	Limpopo Province, South Africa	Leopard's Bend Lodge development	EkolInfo
2009	Gauteng, South Africa	Springvalley Development	BEC
2009	Gauteng, South Africa	Glockner – Kookfontein Power Lines	Baagi
2009	NW & Limpopo Provinces, SA	Delta-Epsilom Power Lines	BEC
2009	Gauteng, South Africa	Klipfontein Development	BEC
2009	Mpumalanga, South Africa	Boulders-Malelane Power Lines	BEC
2009	NW Province, South Africa	Watershed-Sephaku Power Lines	BEC

**The South African Council
for Natural Scientific Professions**

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Natural Scientific Professions Act, 2003, that**

Mr D Kamffer

**is registered as a Professional Natural Scientist, Reg. no.
in the following field(s) of practice**

400204/05

Ecological Science

Zoological Science

Expiry Date 2010-05-31

CURRICULUM VITAE (CV) FOR PROFESSIONAL STAFF OF WATER GEOSCIENCES CONSULTING

1. **Position:** HYDROGEOLOGIST
2. **Name of Firm:** Water Geosciences Consulting
3. **Name of Expert:** Jude Cobbing
4. **Date of Birth:** 29 October 1971
5. **Nationality:** South African
6. **Expertise:**
 - o Aquifer testing and groundwater sampling, quality assessment and evaluation
 - o Groundwater input to Environmental Impact Assessment and compliance
 - o Groundwater resource evaluation, including vulnerability assessments
 - o Down-hole borehole geophysical logging and log data interpretation
 - o Water borehole drilling and construction supervision
 - o Training of groundwater professionals
 - o Mine water assessment and remediation of mine-related water pollution

7. Education:

Name of institution	Degree(s) or Diploma(s) obtained:	Date of obtainment
University of London (University College)	MSc (Hydrogeology) Dissertation: The spatial variability of arsenic in groundwater at Magura, western Bangladesh	2000
University of South Africa (UNISA)	Post-Graduate Certificate in Education (PGCE) specialising in science and English teaching	1999
University of Cape Town	BSc (Geology)	1994

8. Membership of Professional Associations:

Professional Natural Scientist registered with the SA Council for Natural Scientific Professions (SACNASP Registration Number 400156/06)
 Member of the Geological Society of South Africa
 Fellow of the Geological Society of London and Chartered Geologist
 Member of the International Association of Hydrogeologists (IAH)
 Member of the Burdon Commission of the IAH, an African hydrogeology specialist group
 Member of the European Federation of Geologists

9. Other Training:

2006	One week course on Reactive Transport Groundwater Modelling, University of the Western Cape (co-organiser)
2006	One day course on the Department of Water Affairs and Forestry South African Groundwater Decision Tool (SAGDT)
2004	Three day course on ARCGIS 8 Geographical Information System software
2003	One week course in PRINCE2 Project Management Skills
2003	One week course on Quaternary geology and geomorphology
2003	Two day course in advanced WORD
2002	Two day course on geological core logging
2002	One day course on the use of portable down-hole geophysical logging equipment
2001 and 2002	Health and Safety courses including advanced driving, off-road driving and fire safety awareness

10. Countries of Work Experience: *[List countries where expert has worked in the last ten years]*

South Africa, Great Britain, N. Ireland, Malawi, Ghana, Nigeria, Bangladesh

11. Languages: *[For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing.]*

Language	Reading	Speaking	Writing
English	Good	Good	Good
Afrikaans	Fair	Fair	Fair
Xhosa	Poor	Poor	Poor
French	Poor	Poor	Poor

12. Employment Record:

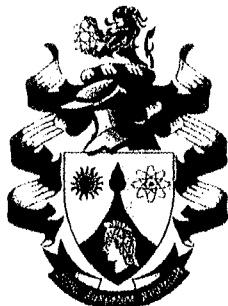
From [Year]: July 2007		TO [Year]: Present	
Employer:	Water Geosciences Consulting		
Positions held:	Hydrogeologist		
Purpose of position:	Manage contracts and deliverables for various areas of interest to the company, including mining, environmental and state sectors.		

From [Year]: July 2005		TO [Year]: June 2007	
Employer:	Council for Scientific and Industrial Research (CSIR)		
Positions held:	Hydrogeologist		
Purpose of position:	To conduct research into groundwater and groundwater-related issues in South Africa, as part of the Water Resources Competence Area at the CSIR. The CSIR stressed high-quality research outputs in a multi-disciplinary environment, targeted in innovative ways at some of the most pressing water problems facing both South Africa and the greater SADC region.		

From [Year]: November 2000		TO [Year]: May 2005	
Employer:	British Geological Survey		
Positions held:	Hydrogeologist (Higher Scientific Officer)		
Purpose of position:	To conduct research into various aspects of hydrogeology and groundwater, both in the United Kingdom and elsewhere in the world, as part of the overall BGS research strategy. Projects ranged from two or three days to more than three years, and funding was sourced from both the public and the private (commercial) sectors. Part of my job was also to answer queries from members of the public regarding all matters related to groundwater.		

From [Year]: May 1996		TO [Year]: August 1999	
Employer:	Various		
Positions held:	Construction worker, map-shop manager, school teacher		
Purpose of position:	I worked in various positions in the United Kingdom whilst studying towards my PGCE qualification, and saving for the MSc qualification.		

From [Year]: March 1995		TO [Year]: April 1996	
Employer:	Lima Community Development Organisation		
Positions held:	Water resources project manager		
Purpose of position:	To manage the provision of community water supplies, including spring protection systems and boreholes, within the budget of this small non-governmental organisation (NGO). The work took place in the rural Eastern Cape Province, near the town of Mqanduli and the village of Zithulele.		



Die Suid-Afrikaanse Raad vir Natuurwetenskaplike Professies
The South African Council for Natural Scientific Professions

Verw.
Ref. 156/06

11 July 2006

Privaatsak/
Private Bag X540
SILVERTON
0127

Mr J.E. Cobbing Pr.Sci.Nat.
Suite 240
Private Bag X1
MENLO PARK
0102

GAUTENG PROV.
Republiek van Suid-Afrika
Republic of South Africa

Dear Mr Cobbing

Suite B313
Geowetenskap Gebou/
Geoscience Buildings
Pretoriaweg 280, Pretoria Rd
SILVERTON, PRETORIA

PROFESSIONAL REGISTRATION IN TERMS OF SECTION 20(3)(a) OF THE
NATURAL SCIENTIFIC PROFESSIONS ACT, 2003 (ACT 27 OF 2003)

It is our pleasure to confirm your registration as a *Professional Natural Scientist* in the field of practice *Earth Science* on 11 July 2006. *Your registration number is 400156/06.*

Tel: +27 (12) 841 1075

Fax: +27 (12) 841 1057

In terms of section 22(1)(a) and (b) of the Act you may use the title "Professional Natural Scientist" and affix the prescribed abbreviation "Pr.Sci.Nat." after your name.

epos/email:
sarnap@geoscience.org.za

<http://www.sacnasp.org.za>

A *registration card*, which lapses every year on 31 May, is issued to all registered persons in the category Professional Natural Scientist. Your card for the period ending 31 May 2007 is included.

The Council also issues a certificate of registration to each registered person for the category and field of practice in which he or she is registered. *Your certificate will follow shortly.*

In terms of section 24 of the Act the certificate remains the property of the Council and

- (a) must be returned to the Registrar when a registered person voluntarily cancels his or her registration; or*
- (b) within 30 days after directed to do so in writing, if a person's registration has lapsed after failing to pay the prescribed annual fee or portion thereof, within 60 days from it becoming due. [Section 21(1)(a)(iii).]*

With kind regards

Yours sincerely


A.J. DE KLERK
REGISTRAR

CURRICULUM VITAE

Name: Michiel-Nell Jonker
Physical Address: 82 Gordon Oval, 5th street, Bergbron, Gauteng, South Africa
Contact Numbers: 084 585 7479 (C) 011 753 2974 (H)
E-mail: ecotone-sa@mweb.co.za

Education

MSc. Environmental Management (2009-current)
University of Johannesburg

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.

MSc. Aquatic Health (cum laude) (2007-2008)
University of Johannesburg

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.

BSc. Honours (cum laude) (Zoology) (2006)
University of Johannesburg

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.

Honours Project: Aquatic invertebrate differences in dams and pans (a preliminary study to create a sensitivity index for lentic systems).

BSc. Natural and Environmental Sciences (2003-2005)
University of Johannesburg

- 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.

Work Experience

- 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 – Chapudi proposed coal mine diversity assessment (March 2009).
- Aquatic Consultant – MSA – Aquatic scoping assessment for proposed mining development (March 2009).
- Aquatic Consultant – Lonmin- 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 mining development (December 2008).
- Aquatic Consultant – ESKOM - Biomonitoring for proposed railroad construction for Eskom (October 2008- current).
- 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, 2007 (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)

Workshop and courses

- Accredited practitioner of the SASS5 Macro-invertebrate Assessment Protocol (2007)
- License Holder of a Category “R” skippers licence (2008)
- Computer-literate (Microsoft Office, CANOCO, Primer, SPSS)
- Certificate Holder of an Advanced Driving Course in 4X4 training (2006).
- Attended the Department of Water Affairs and Forestry's Wetland Delineation course (2008)

Societies

- Member of the Southern African Society of Aquatic Scientists (SASAqS) (Jan 2006).
- Member of the Zoological Society of Southern Africa (ZSSA) (Jan 2009).

Presentations

- July 2007: Zoological Society of Southern Africa Conference, Potchefstroom.
Presented at the 33rd Bi-annual Conference of the ZSSA .

Computer skills

- MS Project, MS Word, MS Excel, MS Power Point.
- Ecostatus Response (FRAI)
- PRIMER statistical suite
- Conoco statistical suite

Curriculum Vitae: **Gina Walsh**

Name:	Gina Walsh	Marital status:	Single
Date of birth:	10/07/1981	Driver's license:	Code 8
ID No.:	810710 0037 089	Contact No:	082 422 2793
Place of birth:	Johannesburg, South Africa	Email:	gina@ecotone-sa.co.za
Postal address:	P.O Box 84, Florida, Rodepoort, 1710		

Education

2006- 2009 University of Johannesburg

- **MSc (Zoology) cum laude**

Dissertation title: *Diatom, Macroinvertebrate and Riparian Vegetation Community Structure Responses in Agriculturally Impacted Rivers.*

2005 Rand Afrikaans University

- **BSc Honours (Zoology) cum laude**

Completed modules include Environmental Impact Assessment, Aquatic Reserve Management, Indices for Biotic Integrity and Aquatic Ecosystems.

Research project: *A Morphometric and Electrophoretic Analysis of Characters used in the Identification Keys for three Yellowfish species Endemic to southern Africa.*

2001-2004 ▪ **BSc (Zoology and Biochemistry)**

Completed courses in Zoology, Biochemistry, Botany, Microbiology, Chemistry and Physics.

1995-1999 Florida Park High School

- Senior Certificate

Employment and Work Experience

**'08 Feb – Pres Ecotone Freshwater Consultants CC
Member and Consultant**

Recent aquatic ecology projects:

- **Transnet New Multi-Purpose Pipeline**, Environmental Officer, Heidelberg, Gauteng (2009 – Present)
- **Sasol GNP Pipeline**, river crossing and aquatic ecology base line survey for high and low flow seasons, Secunda, Mpumalanga (2008/2009).
- Proposed **Eskom Majuba Railway** line development: Base line surveys and monitoring over a 30 month period, Ermelo, Mpumalanga, South Africa (2008 – 2010).

- Proposed **Mulilo Coal Fired Power Station**: aquatic ecology specialists, Messina, Limpopo, South Africa (2008/2009).
- Proposed **Rio Tinto Chapudi Coal Mine**: ichthyological specialists, Soutpansberg, Limpopo, South Africa (2009).
- Proposed **VanMag Vanadium and Magenite Mine**: aquatic ecology specialists, Mokopane, Limpopo, South Africa.
- **Optimum Colliery biodiversity assessment**: ichthyological specialists, Mpumalanga, Limpopo, South Africa (2009).
- **Lonmin Platinum Mine Biodiversity Assessment (Aquatic Ecology)** - Karee mine area, North West, South Africa (2008 – 2009).
- **Lonmin Biodiversity Assessment (Aquatic Ecology)** - Boabab mine area, Limpopo, South Africa (2009).
- Proposed **Sun City Vacation Club**: aquatic ecology specialists, North West, South Africa (2008).

'07 Feb-Jan 08' **EnviRoss Environmental Scientific Consultants CC Consultant**

Recent aquatic ecology assessments:

- **ACSA: OR Tambo International Airport**: ecological assessment and rehabilitation plan for the Blaauwpan, Kempton Park, Johannesburg (2008).
- **Tshwane Waste Water Treatment Works**: aquatic biomonitoring assessments, Pretoria (2007/2008).
- Proposed **Ntaba Nyoni cattle feedlot** development: basic aquatic ecology assessment, Mpumalanga (2007).
- Proposed **Lanseria Business Park** development: basic aquatic assessment, Lanseria, Johannesburg (2007).
- Proposed **Firgrove Industrial Estate** development: basic aquatic assessment, Macassar, Western Cape (2007).
- Proposed **Sun City Vacation Club** development: aquatic ecology scoping report, Ledig, North West Province, (2007).
- **Gauteng Freeway Improvement Project**: basic terrestrial fauna and flora assessment, Pretoria (2007).
- **Mooi River Mall** development: specialist riparian vegetation assessments, Potchefstroom (2007).
- **Walter Sisulu National Botanical Gardens**: quarterly aquatic specialist ecological assessments, Johannesburg (2007).
- **Rand Water Fish Health Assessment**: Fish Health Survey, Vaal Dam (2007).
- Proposed **Braam Pretorius Street Upgrade**: Aquatic ecology assessment, Pretoria (2007).

2006 – 2007

**Econ@UJ
Junior Consultant/ Field Assistant**

- **AngloGold/FOSAF/NRF Yellowfish** Hybridisation Research Project, Vaal Dam (2005).
- **SAPPI Risk Management**: biomonitoring and ecotoxicology field work to develop guidelines for SAPPI paper mill effluent, Elands River Valley, Mpumalanga (2006).
- **Total Coal**, Springbok Siding: aquatic ecology assessments to assess open coal siding impacts on the general Olifants River ecosystem, Witbank, Mpumalanga (2006, 2007).

2006 – 2007

**University of Johannesburg
Lecturing**

- Lecture on the topics of riparian vegetation and diatoms in biomonitoring.
- Mentoring of BSc Hons and MSc students.

- Conduct field trips for honours course.

**2005- 2007 Zoology Department, University of Johannesburg
Graduate Research Assistant**

- Planning field excursions, editing of scientific documents, logistics of workshops and field trips, administrative work, technical support and laboratory work.
- Research support to associate Professor.

Workshops and Courses

- July 2009 South African Society of Aquatic Scientists (SASAqS) Congress**
Beyond rapid assessments - time for an aquatic research renaissance in South Africa.
21-24 June, Magliesberg.
- June 2008 Wetland and Riparian Delineation Course**
Wetland Consulting Services and Department of Water Affairs and Forestry (DWAF)
- Dec 2007 Multivariate Statistics Training**
Collaboration between Wageningen University (Holland) and University of Johannesburg, UJ Eiland, Vaal Dam.
- July 2007 Rivers Database Training**
Department of Water Affairs and Forestry (DWAF) – Resource Quality Services, Pretoria.
- Dec 2006 Environmental Management Systems –WTH Management and Training**
ISO 14001, OHSAS 18001 and development of Environmental Management Systems, University of Johannesburg, Auckland Park, Johannesburg.
- July 2006 EcoStatus Training Workshop**
Determination of the ecological states within the eco-classification process with specific emphasis on aquatic invertebrates and riparian vegetation. Department of Water Affairs and Forestry (DWAF) – Resource Quality Services, 11-13th July 2006, Pretoria.
- April 2006 Diatom Training Workshop**
Diatoms in Biomonitoring. Water Research Commission (WRC), 4th April 2006, Gezina, Pretoria, South Africa.
- Nov 2005 Monitoring Contaminant Levels in Freshwater fish**
Qualified as a Health Assessment Index practitioner through the University of Johannesburg, 7-11 November 2005, RAU Eiland, Vaal Dam.
- Jan 2005 Intermediary 4x4 Driving Skills Course & Boat Handling Course**
Intermediary 4x4 handling and driving skills course. RSG 4x4 Expeditions (2005).
Intermediary boat handling course. Rietvlei Dam, Pretoria (2005).

Societies and Accreditations

- May 2008 The South African Council for Natural Scientific Professions (SACNASP)**
Candidate Natural Scientist in ecological and zoological science, registration number: 100023/08.
- July 2007 SASS5 Accredited Practitioner**
Auditors: Christa Thirion (DWAF, RQS), Colleen Todd (DWAF, RQS) and Hermien Roux

(North West Nature Conservation).

Jan 2006 **Member of the Zoological Society of Southern Africa (ZSSA)**

Jan 2006 **Member of the Southern African Society of Aquatic Scientists (SASAqS)**

Presentations

July 2007 **Zoological Society of Southern Africa Conference, Potchefstroom.**
Presented at the 33rd Bi-annual Conference of the ZSSA
Title: *An Investigation of the Ecological Integrity of the Crocodile and Magalies rivers (Hartbeespoort Dam) with Reference to Agricultural Impacts.*

Sept 2005 **PARSA – Parasitological Society of Southern Africa**
Presented at the 34th Annual International PARSA conference
Title: *Utilisation of Host specificity of Monogeneans as a Taxonomic Indicator of Host Yellow Fish Species*

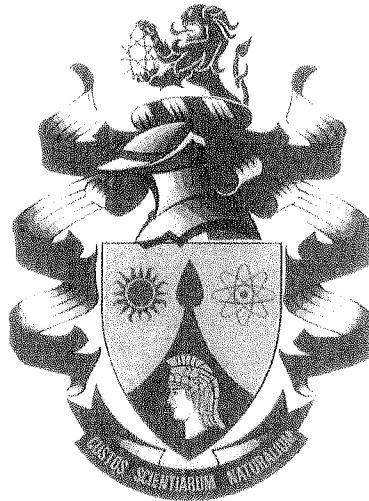
Publications

1. Walsh, G. and Wepener, V. (2009). The influence of land use on water quality and diatom community structures in agriculturally stressed rivers. *Water SA* **35(5)**.
2. Bloomer, P. and Bills, I.R. and van der Bank, F.H. and Villet, M.H. and Jones, N. and Walsh, G. (2007). *Report of the multidisciplinary investigation of differentiation and potential hybridisation between two Yellowfish species Labeobarbus Kimberleyensis and L. Aeneus from the Orange-Vaal system.* Yellowfish Working Group with funding support from AngloGold Ashanti, FOSAF and the National Research Foundation.
3. Ansara-Ross, T., Van den Brink, P.J., Wepener, V. & Walsh, G. (2007). *The use and validation of a probabilistic risk assessment model for estimating potential risks of deltamethrin to the Crocodile River, South Africa.* SETAC – The Society of Environmental Toxicology and Chemistry. Porto, Portugal.
4. Milne, S.J., Walsh, G., Avenant-Oldewage, A. & van der Bank, H.F. (2006). Utilisation of Host specificity of Monogeneans as a Taxonomic Indicator of Host Yellow Fish Species. *Journal of the South African Veterinary Association*, **77(2)**: 92–103

Computer Skills

Competent in the following programs:

- The EcoStatus response suite (FRAI, MIRAI, VEGRAI)
- Canoco and PRIMER v6. statistical suite
- River Database (Version 3)



THE SOUTH AFRICAN COUNCIL
FOR
NATURAL SCIENTIFIC PROFESSIONS

herewith certifies that

Gina Walsh

Registration number: 100023/08

has been registered as a

Candidate Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice
(Schedule I of the Act)

Ecological Science
Zoological Science

21 May 2008
21 May 2008

21 May 2008

Pretoria

President

Chief Executive Officer

PUBLICATIONS (see attached list):

- Three refereed articles (S.A. Journal of Plant and Soil)
- Nine Congress papers/posters
- 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 (SA National Council for Natural Scientific Professions)
- Member of South African Soil Classification Working Group
- Member of Soil Science Society of South Africa (1982-present)
- President of Soil Science Society of South Africa (2005-2007)
- Council Member of South African Soil Survey Organisation (2002-2003)
- Scientific Referee, S.A. Journal for Plant and Soil
- External Examiner, University of Pretoria and University of Witwatersrand

MISCELLANEOUS:

Editor, Soil Science Society newsletter, 1993-present

Member, Clapham High School (Pretoria) Governing Body 1998-2002

Member, Northern Gauteng Football Referee's Association

Committee Member, Rosslyn Golf Club (Club Champion 2002 and 2007)

INTERESTS:

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

REFEREES:

Mr T.E. Dohse, ARC-Institute for Soil, Climate and Water.
Tel: (012) 310-2504; 082 324 5389

Prof A.S. Claassens, Faculty of Plant Production and Soil Science, University of Pretoria
Tel: (012) 420-3213; 084 581 6488

Prof M.C. Laker (retired), (012) 361-2900; 082 785 5295

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.

Book:

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

Thesis:

PATERSON, D.G., 1998. The use of ground penetrating radar to investigate subsurface features in selected South African soils. Unpublished M Sc 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 Jan.1992.

PATERSON, D.G., 1995. The complex soil mantle of South Africa. ARC Wise Land Use Symposium, Pretoria, 26-27 Oct. 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 Jan. 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 Jan. 2003

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 ARC-ISCW Reports on:

- Ground penetrating radar investigations in: Kruger National Park; Enseleni, Natal; Weatherly, Maclear; Kleinkopje Mine
- Soil survey investigations at: Roodeplaat, Kathu, Steelpoort River, Palala River, Zeekoegat (Roodeplaat), Limpopo River, Lydenburg, Kendal, Clewer Sand (Witbank), Botha Sand (Witbank), Balmoral Colliery, Bafokeng (Rustenburg), Towoomba (Warmbaths), Hoefeld Stene (Middelburg), Quality Bricks (Witbank), Visagie Sand (Middelburg), Rosslyn, Coalbrook (Sasolburg), Stewart Coal (Delmas), Forzando Coal (Hendrina), Vaalgro (Vereeniging), Ratanda (Heidelberg), Elspark (Boksburg), Thornccliffe Mine (Steelpoort), Jan Smuts Quarry (Boksburg), Ennerdale (Phase I & II), Thokoza, North Riding, Natalspruit (Alberton), Arnot, Kroondal (Phase I & II), Ga-Rankuwa, Hartebeespoort Dam, Kosmos, Assen, Grasmere, Magalies Moot (Pretoria), Valpre (Paulpietersburg), Cargo Carriers (Sasolburg), Waterval (Rustenburg), Rayton,

Bronkhorstspuit, Zwavelpoort (Pretoria), Pietersburg, Trojan Mine (Steelpoort), Platinum Highway (Rustenburg), Moutse, Centurion, Salique (Klaserie), Northam, Greenside Colliery (Witbank), South Deep Mine (Westonaria), Bank Colliery, Steelpoort Platinum, Gautrain Route (Pta/Jbg), Rietspruit Mine (Ogies), Potgietersrus Platinum, Atok Mine (Lebowa), Blue Ridge Mine (Groblersdal), Ngodwana, Estancia (Breyton), Twickenham Mine (Steelpoort), Marikana



ARC-INSTITUTE FOR SOIL, CLIMATE AND WATER
LNR-INSTITUUT VIR GROND, KLIMAAT EN WATER

Private Bag/Privaatsak X79, Pretoria 0001, SOUTH AFRICA/SUID-AFRIKA
Tel: (012) 310 2500 Int: v 27-12 310 2500
Fax/Faks: (012) 323 1157 Int: v 27-12 323 1157
e-mail: isewinfo@arc.agric.za website: www.arc-iscw.agric.za

Enquiries/Navrae
D G Paterson

Ref. No/Verw. Nr.

14th March 2008

To whom it may concern:

According to the Natural Scientific Professions Act (Act 27 of 2003) **all soil science consulting work** (including soil classification and mapping) may only be carried out by a registered Natural Scientist **in the category Soil Science** under the auspices of the South African Council for Natural Scientific Professions (SACNASP).

Such a registered scientist commits himself to carrying out his consultations honestly, impartially and to the highest possible standards. If he fails to do this he may be sanctioned/suspended through SACNASP.

I confirm that I am a registered natural scientist (Soil Science), I have the necessary expertise and experience and I wholeheartedly commit myself to the principles outlined above.

Yours sincerely,

A handwritten signature in black ink, appearing to read "D G Paterson".

D G Paterson (Pr. Sci. Nat. No. 400463/04)

ARC-Institute for Soil, Climate & Water
Private Bag X79, Pretoria 0001, South Africa

Tel: 012-310-2601; 083 556 2458

Fax: (012) 323-1157

e-mail: garry@arc.agric.za

CURRICULUM VITAE
Johan Abraham van Schalkwyk

PERSONAL PARTICULARS

Date of birth: 14 April 1952
Identity number: 520414 5099 08 4
Marital status: Married; one daughter
Nationality: South African

CURRENT POSITION

Head of Research: National Cultural History Museum.

CURRENT ADDRESS

Work:
P O Box 28088, Sunnyside, 0132
Tel: (012) 324 6082; Fax: (012) 328 5173; E-mail: johnny@nfi.org.za

Home:
62 Coetzer Ave, Monument Park, Pretoria, 0181
Tel/Fax: (012) 347 7270; 076 790 6777; E-mail: jvshalkwyk@mweb.co.za

ACADEMIC QUALIFICATIONS

BA. – 1976 (UP)
BA. (Hons.) Archaeology - 1978 - (with distinction) (UP)
Post Graduate Diploma in Museum Science – 1979 (UP)
BA. (Hons.) Anthropology - 1981 - (with distinction) (UP)
MA. Anthropology – 1985 (UP)
D. Litt et Phil (Anthropology) – 1996 (UNISA)

NON ACADEMIC QUALIFICATIONS

12th HSRC-School in Research Methodology - July 1990
Dept. of Education and Training Management Course - June 1992
Social Assessment Professional Development Course - 1994
Integrated Environmental Management Course, UCT - 1994

EMPLOYMENT RECORD

1978 - present: National Cultural History Museum, Pretoria
1976 - 1977: Archaeology Department, University of Pretoria

PROFESSIONAL EXPERIENCE

1992 - present: Senior researcher: Head of Department of Research. Manage an average of seven researchers in this department and supervise them in their various research projects. Did various projects relating to Anthropology and Archaeology in Limpopo Province, Mpumalanga, North West Province and Gauteng.
1978 - 1991: Curator of the Anthropological Department of the Museum. Carried out extensive fieldwork in both anthropology and archaeology
1976 - 1977: Assistant researcher responsible for excavations at various sites in Limpopo Province and Mpumalanga.

- Curated various exhibitions at different museums. Topics range from ceramics, beadwork and woodcraft to Iron Age archaeology.

- Have done extensive work in the field of heritage impact assessments in Limpopo Province, Gauteng, Mpumalanga, North West Province, KwaZulu-Natal, Western Province, Botswana, Lesotho and Swaziland.
- Did a number of projects regarding the development of arts and crafts and community tourism – Tlokwa, Hananwa, Swazi.

PROFESSIONAL ACCREDITATION

Association for Southern African Professional Archaeologist: Principal Investigator for Iron Age, Colonial Period and Industrial Heritage. Membership no.: 164.

MEMBERSHIPS

Member, Association for Southern African Professional Archaeologists

Member, Anthropology Southern Africa

Member, African Studies Association, Smithsonian Institute, Washington

PUBLICATIONS

Published more than fifty papers on topics relating to anthropology, archaeology, history and impact assessment in various scientific journals - a complete list can be supplied on request.

HERITAGE IMPACT ASSESSMENT

Did more than 800 impact assessments (archaeological, anthropological and social) for various departments and companies. Projects include roads, pipelines, powerlines, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.

Curriculum Vitae of
Andrew Pearson (Pr.Sci.Nat)

PERSONAL INFORMATION

First Names:	Andrew Jesse	Contact Number	0749461464
Surname:	Pearson	E-mail Address	andrewp@ewt.org.za
ID Number	8203245195088	Residential Address	96 Aloe Place 1, Greenstone Dr, Edenvale, Johannesburg
Age	29	Drivers Licence	Yes (Code B)
Gender	Male	Languages	English, Afrikaans
Affiliation	South African Council for Natural Scientific Professions		
Registration number	400423/11		
Field of Expertise	Ecological Science (Professional Member)		

WORK EXPERIENCE

March 2011- Present

Avifaunal Specialist: Endangered Wildlife Trust

- Specialist Bird Impact Assessment Studies for Electrical infrastructure
- Powerlines:
 - St Francis Bay Kouga WEF 66kV; Ncwane Okuku 88kV; Vulcan Ekangala 132kV; Merapi Everest 400kV; Mathibestad Majaneng 132kV; Majaneng Themba Main-Babelegi 132kV; Ngoma Pandamatenga 400kV (ZIZABONA Phase 2); Estancia Thuli 132kV; Estancia Zamokuhle 132kV; Gumeni Bosloop 132kV; Mbumbu Tsakani 132kV; Normandie Heyshope 132kV; Mookodi Integration Project; Wildebees Bethal 132kV.
- Wind Energy Facilities:
 - Kouga WEF; Aberdeen WEF; Hidden Valley WEF; Middleton WEF.
- Concentrated Solar Power (CSP) plants:
 - Humansrus CSP; Arriesfontein CSP.
- Other:
 - Expansion of Hendrina Power Station Ash Dam Facilities

Sept 2010- Mar 2011

Group Environmental Manager: Basil Read (Pty) Ltd.

Jan 2008- Aug 2010

Senior Environmental Officer: Basil Read (Pty) Ltd.

- Responsible for the successful implementation of an Environmental Management System for this major construction company, that was certified for ISO 14001:2004 in November 2009
- Group Internal Environmental Audits and Report writing
- Compilation of EMP's and Environmental site inspections
- Assistance in ENV authorisations and applications

Feb 2006 – Jan 2008

Game Ranger and Walking Guide: CC Africa (now &BEYOND): Phinda Private Game Reserve

- Game drives and walks in a Big 5 reserve
- Hosting guests and sharing environmental and wildlife knowledge
- Environmental management, waste management & Lodge “greening”

EDUCATIONAL BACKGROUND & QUALIFICATIONS

<u>August 2010</u>	Hazard Identification and Risk Assessment (HIRA) Course, IRCA Global, Randburg.
<u>April 2010</u>	SAMTRAC, NOSA, East Rand Office.
<u>April 2009</u>	Green Star Accredited Professional Exam, (GBCSA), PROMETRIC.
<u>May 2008</u>	Environmental Auditing: ISO 14001:2004, a Lead Auditors Course (SAACTA approved), Centre for Environmental Management at North West University (NWU), Potchestroom
<u>February 2008</u>	Environmental Law for Managers, Centre for Environmental Management at the North West University.
<u>February 2008</u>	Implementing Environmental Management Systems-ISO 14001:2004, Centre for Environmental Management at NWU
<u>2001-2005</u>	Bachelor of Science: Conservation Ecology, University of Stellenbosch This four year degree (honours equivalent) covered a range of subjects from maths, chemistry and physics in the first year to advanced conservation, and a write up of a Conservation Management Plan in the fourth year. Important subject matter included environmental management plans (EMP), ecosystem processes and functioning, Impact assessment (EIA), sustainable development, rehabilitation and restoration ecology, SASS5, environmental sampling as well as the writing up of scientific papers.

CONFERENCES & SEMINARS

<u>October 2011</u>	Wind Energy and Birds – Information Week. Hosted by the Endangered Wildlife Trust, Darling, Western Cape.
<u>September 2011</u>	The South African Wind Energy association (SAWEA), Inaugural Conference and Expo, “WINDABA”. CTICC, Cape Town.
<u>August 2011</u>	IAIA South Africa, 2011 Conference.
<u>March 2011</u>	2011 Wildlife and Energy Symposium, Hebron Haven, KZN Hosted by the Endangered Wildlife Trust (EWT) - WEP.

ADDITIONAL SKILLS

- Google GEO tools and Google Earth.
- Computer Skills: Office 2007 incl. Microsoft Word, Excel, Outlook and PowerPoint; Arc Map, Statistica.
- Field work skills involving various sampling methods, data capturing & analysis.
- Excellent knowledge of fauna (especially birds) and flora.
- Basic Fire Fighting course- *Action Training Academy*
- Rifle handling and 4x4 driving skills
- PADI Open Water Diver

REFERENCES

1) Megan Diamond

Program Manager, Wildlife and Energy Program (WEP), EWT. Tel: 011 372 3660

2) Jonathan Smallie

Independent Avifaunal Specialist and Professional Natural Scientist. Tel: 0824448919

3) Mr. Pieter Els

Group Quality and Environmental Manger (GQEM), Basil Read (Pty) Ltd. Tel: 011 418 6427

3) Prof. Allison Leslie

Lecturer and Head of Department: Conservation Ecology, University of Stellenbosch. Tel: (021) 808 3304