

## Curriculum vitae: Mr A VAN DER MERWE

Name : VAN DER MERWE, ANDRIES  
 Date of Birth : 23 September 1973  
 Profession/Specialisation : Environmental Engineering and Environmental Auditing  
 Years with Firm : 16  
 Nationality : South African  
 Years experience : 16

### Key qualifications

Andries van der Merwe is an environmental engineer who has been involved in a wide spectrum of infrastructure development projects throughout Africa. He is a trained SABS/ISO 14001 environmental management systems (EMS) auditor and his specific expertise allows him to assume a leading role in the compilation of environmental management systems (EMSs) and environmental management plans (EMPs) for all life-cycle phases of typical infrastructure development projects as well as the monitoring and auditing of the implementation of EMSs and EMPs on site. Recent projects of this nature include the operational EMP for the Sunderland Ridge Wastewater Treatment Works, the design and construction EMP for the Gautrain project and the EMP implementation monitoring on the 60km Polokwane Effluent Transfer Project.

He regularly acts as project team leader and provides technical assistance and input with regard to environmental impact assessments (EIAs) and environmental management frameworks (EMFs). Recent projects include the EIA, visual assessment and public participation process for the proposed 132kV overhead powerlines from Ha Lejone to the Lqhobong and Kao diamond mines in Lesotho and the EIA for the Mavoco Hazardous Waste Disposal Facility outside Maputo in Mozambique. EMFs were recently completed for Alexandra in Johannesburg as part of the Presidential Alexandra Renewal Project, for the Mussulo Peninsula outside Luanda in Angola, as part of the master plan for the development of the peninsula, as well as for the City of Windhoek in Namibia. He has completed a number of environmental risk assessments, a recent example being that completed for the operational activities of the Nelspruit Airport in Mpumalanga.

He has been involved in a number of training and capacity building projects in the field of environmental management. Recent examples include the second phase of the Integrated Industrial Pollution Prevention programme in Mozambique that focused on capacity building in the Environmental Ministry in Mozambique, with specific emphasis on hazardous waste, pollution control and related strategies as well as the environmental management module of the European Union funded infrastructure asset management training programme run by the National Department of Provincial and Local Government in South Africa for officials of various local and district authorities. He has drafted a Technical Information Document summarising the requirements for environmental impact assessments (EIAs) for engineering work in terms of the South African environmental legislation to assist engineers and developers in understanding these requirements and contributed to the training material on environmental management issues for a SAICE project management course.

### Employment record

03/2009 - date	Aurecon (previously Africon, Ninham Shand and Connell Wagner), Environmental Engineer and Auditor/Associate
2004 - 02/2009	Ninham Shand, Associate
08/1999 - 2004	Africon, Environmental Engineer and Auditor
08/1998 - 07/1999	Africon, Resident Engineer
01/1996 - 07/1998	Africon, Design Engineer

### Experience record

**Emergency Desalination Plant (Mossel Bay, South Africa) 05/2010 - Date.** *Project Leader.* Compilation of a Section 24G application in terms of the National Environmental Management Act for an emergency 15Ml/d seawater reverse osmosis plant as a result of more than 1:150 year drought situation in the Southern Cape, inclusive of a construction phase environmental Management Plan. (Mossel Bay Municipality).

### **Application of a Multi-criteria Decision Making Model to rank development sites within Etosha**

**national Park (Namibia) 04/2010 - 04/2011.** *Environmental Engineer.* The project entailed the application of a Multi-criteria Decision Making Model (MCDM) to rank identified potential development sites in two zones within the Etosha National Park as part of staff housing and related infrastructure. Involved for 0.8 person-months. (Millennium Challenge Account Namibia).

**Environmental impact assessment for the Moatize Coal Mine expansion project (Tete, Mozambique) 03/2010 - 04/2011.** *Project Leader.* The additional infrastructure required for the Moatize Coal Mine expansion included a second primary crusher and second coal processing plant, increased raw water supply and storage capacity, an upgraded water treatment plant and power substation, a new coal conveyor system, enlarged storage yard to accommodate two lines of coal, optimised materials handling between the existing operations and proposed expansion, upgraded leachate cut-off drains, upgraded tailings dam effluent filtration system, and solid waste landfill and hazardous waste disposal facilities. The environmental impact assessment coincided with a pre-feasibility study (FEL2 Level) undertaken to determine the infrastructure required to accommodate the expansion of the mine. The aim of the assessment was to seek a decision regarding the project acceptability from the Mozambican environmental authorities (MICOA) through an update of the assessment completed for the first Moatize Mine complex and to describe, include and assess the proposed additional infrastructure. Involved for 1.3 person-months. (Vale).

**Environmental impact assessments for the Nacala Rail Corridor (Mozambique and Malawi) 03/2010 - Date.** *Project Leader.* A series of four environmental impact assessment packages for the proposed 860km Nacala Rail Corridor for the export of coal from the Vale Moatize Mine involving the construction and rehabilitation of the railway line between the loading terminal at the mine and the offloading terminal at the proposed deep-water port at Nacala-a-Velha, passing through southern Malawi. The project assessed the following components: the expansion of the existing mine loading terminal to accommodate the additional train traffic, transport of coal in trains (each comprising 4 diesel electric locomotives and 115 wagons with a capacity of 60t), management of train movement in the yards with priority given to loaded trains, signalling and control of movement of trains along the route based on GPS technology to allow for monitoring the movement of each and depots along the route to allow for provision of supplies and exchange of teams. It also included the deep-water port at Nacala-a-Velha with new coal terminal off-loading facilities using rail car tippler dumpers, workshops to house rolling stock and to allow for maintenance of trains following discharge and infrastructure for fuel provision. Construction is proposed to start mid-2011, with export capacity ramping up to 26Mtpa in 2016. The focus of the assessments was to review the relevant scoping reports, EPDA reports and available baseline data and acquiring updated information where necessary to describe and assess the predicted social and environmental impacts of the proposed additional infrastructure. Each package included a common assessment of the strategic impacts related to the project as a whole within the region, to allow for an understanding of each component within the bigger picture. (Vale).

**Social and environmental management plan for new sulphuric acid storage tank at the Rössing Uranium Mine (Arandis, Namibia) 02/2010 - 06/2010.** *Project Leader.* Compilation of a social and environmental management plan for the proposed new 15Kt sulphuric acid storage tank located within the mine precinct adjacent to similar tanks to increase acid storage capacity. Involved for 0.1 person-months. (Rössing Uranium/Rio Tinto).

**Garden route environmental management framework (South Africa) 06/2008 - 05/2009.** *Environmental Engineer.* Supporting role contributing to the hydrology and infrastructure information layers and provision of local liaison support for the development of the Garden Route Environmental Management Framework, focusing on the Kaaimans River to Noetzie study area on the Garden Route in the Southern Cape. Involved for 0.2 person-months. (earthINC / Department of Environmental Affairs and Tourism).

**Emergency Desalination Plant (Plettenberg Bay, South Africa) 12/2009 - Date.** *Project Leader.* compilation of a Section 24G application in terms of the National Environmental Management Act for an emergency 2Ml/d seawater reverse osmosis plant as a result of more than 1:150 year drought situation in the Southern Cape, inclusive of a construction phase Environmental Management Plan. (Bitou Municipality).

**HSE Brochure for Rössing Uranium's Expansion project (Arandis, Namibia) 09/2009 - Date.** *Project Leader.* The project entailed the compilation of a succinct and easily accessible brochure describing Rössing Uranium's Health, Safety and Environmental Management system components such as management policies, programs and procedures already in use at the mine for wider public understanding. (Rössing Uranium/Rio Tinto).

**Decommissioning of the Sonae Novobord Fibreboard Factory (George, South Africa) 07/2009 - Date.** *Project Leader.* The project consisted of an environmental management plan for the decommissioning of the Sonae Novobord factory in George Industria, with a focus on the recovery and handling of salvageable

materials and the lawful recovery and safe disposal of hazardous wastes and contaminated soil. Later also appointed to act as the Environmental Control Officer during the decommissioning phase to oversee the implementation of the Environmental Management Plan. (Sonae Novobord).

**Emergency upgrading of Keurbooms rising main and pumps and later application for authorisation for a further length of rising main rehabilitation (Plettenberg Bay, South Africa) 06/2009 - Date.** *Project Leader.* Project consisted of the urgent environmental application for the upgrading of the Keurbooms pumpstation, abstraction works and an initial length of steel rising raw water main to allow for an increase in river abstraction and later the application for environmental management plan. Subsequently also appointed as the environmental control officer for the construction phases. (Bitou Municipality).

**Social and environmental screening of potential railway route alternatives (Southern Malawi) 05/2009 - 12/2009.** *Project Leader.* The project consisted of the screening of 4 potential railway alternatives through southern Malawi, as part of a wider study to determine the feasibility of establishing an export corridor from Tete in Mozambique, through Malawi, to the port of Nacala-a-Velha in Nampula. The environmental screening coincided with a FEL2 level engineering study evaluating the technical and financial feasibility of the routes. The environmental and social screening was done using a simplified Multi-criteria Decision Making Model and comprised a review of background information, authority liaison and meetings, compilation of a list of suitable social and environmental screening criteria and rating methodology for each specified criteria, a detailed legal framework review, fieldwork to confirm sensitivity of the receiving environment, a fatal flaw analysis, GIS mapping of findings, preparation of cost estimates of social and environmental mitigation measures including resettlement (split into capital and operational costs) and presentation of the findings and recommendations in a summary report. Involved for 0.8 person-months. (Vale).

**Social and environmental management plan for mineral exploration drilling (Arandis, Namibia) 01/2009 - 01/2011.** *Project Leader.* The project entailed the compilation of a social and environmental management plan for exploration drilling activities within the overlap of the sensitive Namib-Naukluft Park and Rössing Uranium mine license area. Later also appointed for a phase 2 exploration drilling social and environmental management plan to address more detailed infill drilling, inclusive of rehabilitation plans for drill sites and access routes. Involved for 0.5 person-months. (Rössing Uranium/Rio Tinto).

**Phase 2: Social and environmental impact assessment for Rössing Uranium's expansion project (Namibia) 08/2008 - Date.** *Project Leader.* Social and environmental impact assessment for the second phase of Rössing Uranium's expansion project including increased production in the current SJ open pit and the establishment of associated process facilities including additional crushers and ore stockpiles, the establishment of an acid heap leaching facility that would be a first in uranium processing, increased waste rock dump capacity and increased tailings capacity. Involved for 12.5 person-months. (Rössing Uranium / Rio Tinto).

**Environmental and socio-economic impact assessment for proposed NamPower coal-fired power station at Walvis Bay (Namibia) 05/2008 - 08/2009.** *Environmental Engineer.* Environmental and socio-economic impact assessment for proposed NamPower coal-fired power station at Walvis Bay that included a site screening and selection process through the application of a multiple criteria decision-making model, a scoping study and the development of an Environmental Management Plan (EMP). Involved for 2 person-months. (Namibian Power Corporation).

**Social and environmental management plan for Rössing Uranium Expansion SEIA Phase 1 (Namibia) 02/2008 - 08/2008.** *Environmental Engineer.* The social and environmental management plan for the first phase of Rössing Uranium's expansion project including an acid plant, ore sorter and SK4 pit. Involved for 1.5 person-months. (Rössing Uranium / Rio Tinto).

**Environmental impact assessment for the feasibility update and the development of studies to evaluate the transport of coal from Moatize to Nacala and its shipment (Mozambique) 11/2008 - 06/2009.** *Environmental Project Leader.* Updating the 2006 Bankable Feasibility Study (BFS) to 14Mtpa and to create a rail capacity simulation and trade-offs model for the ramp-up period. Alternative heavy haul routes had to be investigated on Sections 2 and 3 before it was assumed that the base case route was the best route for the new tonnages. Included in the study was a phased upgrade of railway line from 4-26Mtpa. Responsible for the high level environmental screening. Involved for 3 person-months. (Vale).

**Application of a multiple criteria decision-making model to optimise future land use planning at Rössing Uranium (Namibia) 04/2008 - 03/2009.** *Project Leader.* Development and application of a multiple criteria decision-making (MCDM) model to optimise future land use planning focusing on the new

waste dump areas, heap leach and ripios sites and mine tailings areas. Involved for 1 person-month. (Rössing Uranium / Rio Tinto).

**Social and environmental impact assessment for a bulk sulphur handling facility (Walvis Bay, Namibia) 07/2008 - 12/2009.** *Project Leader.* The project entailed the compilation of a social and environmental impact assessment, inclusive of a social and environmental management plan for the proposed bulk sulphur importation, stockpiling and handling facility in the Port of Walvis Bay. Involved for 0.5 person-months. (Rössing Uranium/Rio Tinto).

**Paratus emergency generation facility (Walvis Bay, Namibia) 05/2008 - 08/2008.** *Environmental Engineer.* The project entailed the environmental authorisation process in relation to a proposed 50MW heavy fuel oil emergency electricity generation facility located within Walvis Bay. Involved for 0.5 person-months. (Namibian Power Corporation).

**Environmental impact assessment for the upgrade to the Knysna wastewater treatment works (Knysna, South Africa) 10/2007 - 05/2008.** *Internal Reviewer.* Environmental Impact Assessment and Environmental Management Plan for the upgrade to the existing Knysna Wastewater Treatment Works in the sensitive Knysna Lakes area in the Southern Cape. Involved for 0.1 person-months. (Knysna Municipality).

**Environmental screening of infrastructure alternatives, Sishen Iron Ore, Sishen (South Africa) 09/2007 - 12/2007.** *Project Leader.* Environmental screening of proposed infrastructure route alternatives, as input into the design processes for the relocation of infrastructure required as part of the Sishen Expansion Project, to increase production at the Sishen opencast iron ore mine. Involved for 0.5 person-months. (Kumba Iron Ore).

**Automotive supplier park (Rosslyn, South Africa) 02/2007 - 12/2007.** *Project Manager and Environmental Control Officer.* Providing environmental management support to the Supplier Park Development Company in the second phase of the establishment of the Automotive Supplier Park in Rosslyn, north of Pretoria. Fulfilling the role of Environmental Control Officer during the construction phase of new projects within the park in this Gauteng Province Blue IQ initiative. Involved for 1.7 person-months. (Project Management Solutions Africa / Supplier Park Development Company).

**Upgrading of Khutala pumpstation (Kriel, South Africa) 03/2007 - 08/2007.** *Project Leader.* Basic Assessment for the construction of a bypass pipeline at the Khutala Pumpstation to ensure increased capacity and reduced operating cost of the facility. Involved for 0.45 person-months. (Department of Water Affairs and Forestry).

**Basic assessment for the VRESAP access road (Vaal Marina, South Africa) 05/2007 - 09/2007.** *Project Leader.* Basic Assessment for the 2,2km access road to the Boschkop pumpstation of the Vaal River Eastern Sub-system Augmentation Project (VRESAP) through the Vaal Marina and traversing Gauteng and Mpumalanga Provinces. Involved for 0.4 person-months. (Vaal Pipeline Consultants / Trans Caledon Tunnel Authority).

**Polokwane effluent transfer project (Polokwane, South Africa) 02/2007 - 12/2007.** *Environmental Control Officer.* Acting as the part-time Environmental Control Officer on this project to transfer treated sewage effluent from the Polokwane wastewater treatment works to the AngloPlatinum mine outside Mokopane, including two pumpstations, approximately 60km pipeline and several reservoirs along the alignment. Involved for 2 person-months. (AngloPlatinum).

**Upgrading of the Rietfontein nature reserve (Paulshof, South Africa) 06/2007 - 09/2007.** *Project Leader.* Acting as Environmental Control Officer on the construction phase of the upgrading of facilities within the Rietfontein Nature Reserve in Paulshof, northern Johannesburg. The first phase of upgrading focused on the establishment of an environmental educational centre within the reserve. Involved for 0.2 person-months. (Johannesburg City Parks).

**Overhead 132kV powerlines to Liqhobong and Kao Diamond Mines (Lesotho) 09/2006 - 02/2008.** *Project Leader.* Environmental impact assessment, social impact assessment and public participation for the 38km of 132kV overhead powerlines from the Ha Lejone substation to the new Liqhobong and Kao Diamond Mines in northern Lesotho in difficult and inaccessible mountainous terrain. Involved for 4 person-months. (Liqhobong Mining Development Company and Kao Diamond Mine / Plantech Associates).

**Rietfontein Weir dredging and landfilling (Trichardt, South Africa) 04/2006 - 12/2007.** *Project Leader.* The EIA for the dredging and landfilling of contaminated silt from the Rietfontein Weir in the Trichardspruit



north of the SASOL Syferfontein Mine outside Trichardt, inclusive of the public participation process and permitting of the proposed hazardous waste landfill. Involved for 1.5 person-months. (Department of Water Affairs and Forestry).

**Lesotho highlands further phases studies (Lesotho) 04/2006 - 01/2007.** *Environmental Engineer.* Application of the Ideal Mode Analytical Hydrarchy Process Multiple Criteria Decision Making (MCDM) Model in the initial technical planning workshop to optimise potential further phases alternatives in the Lesotho Highlands Water Project, with specific focus on MCDM Model setup, configuration and application. Involved for 0.8 person-months. (Lesotho Highlands Water Commission).

**Joint Maputo river basin water resources study (Mozambique, Swaziland and South Africa) 09/2006 - 03/2007.** *Environmental Engineer.* Compilation of an Environmental Impact Assessment (EIA) Best Practice Guideline, based on a comparative review of EIA triggers and process requirements in the Tripartite Permanent Technical Committee member countries and international best practice, that contributed to an integrated comprehensive study of the water resources of the Maputo River Basin, covering Mozambique, Swaziland and South Africa. Involved for 1 person-month. (Tripartite Permanent Technical Committee / European Union).

**McHardy stream diversion basic assessment (Cullinan, South Africa) 07/2006 - 09/2007.** *Project Leader.* The Basic Assessment in terms of the National Environmental Management Act EIA Regulations for the diversion of the McHardy Stream through the Cullinan Diamond Mine grounds to establish separation of polluted runoff from mining activities and unpolluted natural stormwater flow. Involved for 0.63 person-months. (De Beers Group Cullinan Diamond Mine).

**Upgrading of the K46 bridge over the Jukskei River (Dainfern, South Africa) 08/2006 - 09/2007.** *Environmental Engineer.* An application for exemption from the requirements for environmental authorisation for the proposed upgrading of the K46 route over a total distance of 8km, inclusive of alignment improvements and the construction of new dual carriageway bridges to accommodate the 1:100 year flood where the alignment crosses the Jukskei River at Dainfern north of Johannesburg. Involved for 0.33 person-months. (Gautrans).

**Laudium bulk supply upgrade (Laudium, South Africa) 12/2006 - 12/2007.** *Project Leader.* Basic Assessment for the upgrading of an existing bulk supply line of 1.5km to an internal diameter of 700mm, linking a Rand Water Supply to the City of Tshwane reservoir in Laudium. Involved for 0.6 person-months. (City of Tshwane).

**Doornkraal reservoir (Polokwane, South Africa) 11/2006 - 12/2007.** *Environmental Control Officer.* Acting as part-time Environmental Control Officer on the 30MI Doorkraal Reservoir construction, west of Polokwane. Involved for 0.8 person-months. (AngloPlatinum).

**Sunderland ridge WWTW EMP implementation monitoring and operational EMP (Centurion, South Africa) 06/2006 - 12/2006.** *Environmental Engineer.* The monitoring of construction EMP implementation on site for the upgrading of the Sunderland Ridge Wastewater Treatment Works in Centurion to increase operational capacity with 20MI day and reporting on EMP implementation status, including preparation of monthly summary reports for submission to the provincial environmental authority. Completion of an Operational EMP for the upgraded facility. Involved for 0.81 person-months. (City of Tshwane Metropolitan Municipality).

**BKM Mine Infrastructure (South Africa) 02/2006 - 03/2006.** *Project Leader.* Environmental technical assistance to the engineering design team involved with the design of mine access and services infrastructure for the BKM iron ore mine. The assistance focused on the review of all available baseline information and mine environmental authorisation applications to establish a list of criteria that would ensure compliance to environmental best practice and authorisation permit conditions applicable to design of services infrastructure. The proposed mine will be an opencast mine with a washing, screening and beneficiation plant, ore stockpiles, crushing plant, conveyors and a rapid rail loading facility. Involved for 0.2 person-months. (BKM Iron Ore Mine).

**Technical and project management assistance to the Komati Basin Water Authority (Swaziland) 06/2006 - 08/2006.** *Environmental Engineer.* Environmental management assistance to the Komati Basin Water Authority (KOBWA), with a specific focus on compilation of a tender document used in a call for tenders for the second round of ecological and aquatic monitoring, tender evaluation and adjudication. Monitoring requirements based on the treaty between South Africa and Swaziland, as input into the study to determine the environmental water requirements. Involved for 0.25 person-months. (Komati Basin Water

Authority).

**Bizana solid waste disposal site (Bizana, South Africa) 10/2005 - 02/2006.** *Environmental Engineer.* The development of proposals for the formalisation of the existing Bizana solid waste dump and the operational and decommissioning EMP to guide operations up to the final closure of the site. Involved for 0.3 person-months. (Mbizana Local Municipality).

**Kokstad solid waste management section 78 assessment (Kokstad, South Africa) 05/2005 - 03/2006.** *Environmental Engineer.* A Section 78 assessment in terms of the Municipal Systems Act to assess existing solid waste management processes in Kokstad and evaluate the merits of both internal and external service providers based on financial modelling of both scenarios. Provided technical solid waste management input to the assessment. Involved for 0.25 person-months. (PriceWaterHouseCoopers Inc / Greater Kokstad Municipality).

**Braamhoek pumped storage access roads (South Africa) 08/2005 - 02/2006.** *Project Leader.* An EIA for the access roads to the Braamhoek pumped storage scheme, spanning the KwaZulu-Natal and Free State border and includes both the upgrading of sections of existing roads and the construction of new sections of road in mountainous areas. Involved for 0.2 person-months. (ESKOM Generation Division).

**Senqu and Senqunyane bridges (Lesotho) 06/2005 - 02/2006.** *Project Leader.* An EIA for two bridges spanning the Senqu and Senqunyane Rivers in Lesotho, as part of the proposed Roma-Semongkong-Sekake Road that will reduce travel time to and from the south of Lesotho and increase accessibility to the remote villages to the north of the Senqu and Senqunyane Rivers. Involved for 0.5 person-months. (Lesotho Ministry of Public Works Roads Branch).

**Mafikeng industrial development zone (Mafikeng, South Africa) 01/2005 - 01/2006.** *Project Leader.* A due diligence assessment and EIA for the proposed Mafikeng Industrial Development Zone that is planned around the existing Mafikeng Airport. The development caters for export and high-tech industries and includes a variety of industrial and technology land uses. Initial development is focused on providing for minerals export, livestock export and quarantine facilities and a cluster of light industrial stands. Involved for 0.5 person-months. (Mafikeng Industrial Development Zone (Pty) Ltd).

**KwaDukuza solid waste management section 78 assessment (KwaDukuza, South Africa) 07/2005 - 03/2006.** *Environmental Engineer.* A Section 78 assessment in terms of the Municipal Systems Act to assess existing solid waste management processes in KwaDukuza and evaluate the merits of both internal and external service providers based on financial modelling of both scenarios. Provided technical solid waste management input to the assessment. Involved for 0.2 person-months. (PriceWaterHouseCoopers Inc / Greater KwaDukuza Municipality).

**City of Tshwane city development strategy (Tshwane, South Africa) 07/2005 - 07/2005.** *Environmental Engineer.* Technical and engineering input into the review and updating of the City of Tshwane City Development Strategy, with specific inputs provided focusing on general environmental management strategic issues and solid waste management opportunities and constraints. The strategy aims to unlock the potential of the north of Tshwane through providing suitable infrastructure to stimulate growth. Involved for 0.2 person-months. (City of Tshwane Metropolitan Municipality).

**Groenpunt Prison wastewater treatment works (Sasolburg, South Africa) 08/2005 - 11/2005.** *Environmental Engineer and Project Leader.* A scoping assessment and EMP for the upgrading of the wastewater treatment works at the Groenpunt Prison on the banks of the Vaal River at Sasolburg. The upgraded works will reduce the pollution risk that the existing system poses and will mainly treat effluent from the large piggery on site. Involved for 0.25 person-months. (Stewart Scott International / Department of Public Works).

**Integrated industrial pollution prevention - Phase 2 national hazardous waste management strategy (Mozambique) 01/2004 - 03/2006.** *Environmental Engineer and Project Leader of Subconsultancy Team.* Technical assistance to the Environmental Ministry of Mozambique, in association with Ramboll, as part of the Integrated Industrial Pollution Prevention Programme (Phase 2) funded by DANIDA. This programme is aimed at hazardous waste management in Mozambique and capacity building within the Ministry regarding issues relating to the identification, handling, disposing, monitoring and regulating of hazardous waste. It also involves monitoring operations at the newly established hazardous waste disposal facility at Mavoco, Beluluane. Involved for 2.5 person-months. (Ministerio para a Coordenacao a Accao Impacto Ambiental (Micoa) / DANIDA).

**Coega IDZ Zone 1 infrastructure (Port Elizabeth, Eastern Cape, South Africa) 05/2004 - 03/2006.** *Environmental Control Officer.* Environmental technical assistance to the project implementation team involved with the design and construction supervision of the infrastructure developed for Zone 1 of the Coega Industrial Development Zone outside Port Elizabeth in the Eastern Cape Province, and acting as the Environmental Control Officer on site for the duration of construction. Involved for 1.1 person-months. (Coega Development Corporation).

**Maluti landfill EIA, (Eastern Cape, South Africa) 05/2004 - 07/2005.** *Environmental Engineer and Project Leader.* Compilation of an EIA for the development of a new general communal landfill for the town of Maluti in the Eastern Cape Province. Involved for 1 person-month. (Alfred Nzo District Municipality).

**North-West Agrivillage project (Mafikeng, South Africa) 09/2004 - 01/2005.** *Project Leader.* An EIA for a new rural agricultural project, inclusive of an access road, outside Mafikeng, as part of a poverty relief initiative under the Expanded Public Works Programme. Involved for 0.2 person-months. (North West Provincial Department of Public Works).

**Facim commercial development (Mozambique) 10/2004 - 01/2005.** *Project Leader.* Environmental opinion and detailed EMP for the Facim Commercial Development that includes an exhibition area, conference facilities, shopping centre and office space in downtown Maputo and potentially presents the single largest private real estate investment in Mozambique. Involved for 0.5 person-months. (HLM Financial Enterprises CC).

**Ekurhuleni Northern Region Environmental Management Framework (EMF) (South Africa) 03/2004 - 01/2005.** *Environmental Engineer.* Development of an integrated environmental management framework (EMF) to facilitate the current conflict between development, conservation and high potential agricultural land in Ekurhuleni. Involved for 0.8 person-months. (Ekurhuleni Metropolitan and Gauteng Department of Agriculture, Conservation and Environment (GDACE)).

**DPLG / EU capacity building phase 2 (South Africa) 07/2004 - 02/2005.** *Environmental Training Facilitator.* Follow-up to the pilot project to establish environmental capacity on local and district authority level for the operation and maintenance of municipal infrastructure services - environmental management module presented to officials from various authorities in Mpumalanga and Limpopo Provinces. Involved for 1 person-month. (Department of Provincial and Local Government).

**Ibisi sanitation project (uMzimkulu, South Africa) 05/2004 - 06/2005.** *Project Leader.* Development of a scoping assessment for the construction and upgrading of the sanitation network in Ibisi village between uMzimkulu and Kokstad in the Eastern Cape Province. Involved for 0.2 person-months. (uMzimkulu Local Municipality).

**Lagos toll roads feasibility (Nigeria) 08/2004 - 11/2005.** *Environmental Engineer.* EIA and social impact assessment as part of the feasibility study for the development of approximately 150km of new toll roads through Lagos and along the Lekki Peninsula outside Lagos. Involved for 1 person-month. (Asset and Resource Management Company).

**Vector Logistics Technical Assistance (Gauteng, South Africa) 06/2004 - 08/2004.** *Environmental Engineer.* Technical assistance and conflict resolution of an external potential activity impacting on the Vector logistics food distribution centre in Florida, Johannesburg. Involved for 0.2 person-months. (Vector Logistic Solutions).

**Mehloding adventure trail access roads (Eastern Cape, South Africa) 06/2004 - 12/2004.** *Environmental Auditor.* Monitoring of the implementation of the construction EMP for the construction of vehicular access roads in mountainous terrain to the chalets of the Mehloding Adventure Trail near Maluti in the Eastern Cape Province. Involved for 1 person-month. (Alfred Nzo District Municipality).

**Gautrain Rapid Rail Link EMP (South Africa) 03/2003 - 02/2007.** *Environmental Engineer and Project Leader.* Review of the environmental Record of Decision for the project, drafting of a construction EMP framework for the client to use in their bid for the project and assistance with specialist environmental management aspects throughout the bidding process. Subsequent further EMP development and refinement following the announcement of Bombela Consortium as the preferred bidder, leading to development of both design criteria and a construction phase EMP for the project. Involved for 7.2 person-months. (Bombela Consortium).

**Limpopo National Park first phase infrastructure (Mozambique) 10/2003 - 03/2006.** *Environmental*

*Engineer.* EIA for the first phase infrastructure development for the Limpopo National Park comprising a camp, workshop, administrative complex, staff housing, ranger posts and new entrance gate. Involved for 2 person-months. (Limpopo National Park / Peace Parks Foundation).

**Moses Kotane environmental policy (North West Province, South Africa) 10/2003 - 05/2004.** *Project Leader.* Developing an environmental policy for the Moses Kotane Local Municipality in the North West Province of South Africa. Involved for 0.2 person-months. (Moses Kotane Local Municipality).

**Mbombela State of the Environmental Report (SoER) (Mpumalanga, South Africa) 01/2003 - 03/2004.** *Environmental Engineer.* A SoER for the Mbombela Local Municipality in Mpumalanga Province in South Africa that entailed the establishment and development of a base for environmental reporting based on the United Nations DPSIR model. Involved for 1.5 person-months. (Mbombela Local Municipality).

**Freedom Park legacy project EIA (Lesotho) 08/2003 - 08/2004.** *Environmental Engineer and Auditor.* An EIA for phase 1 of the development of the Freedom Park Legacy Project on Salvokop in Pretoria Gauteng inclusive of a detailed visual assessment and construction EMP, with EMP implementation monitoring on site during construction. Involved for 0.5 person-months. (Freedom Park Trust).

**Three bridges Lesotho EIA (Lesotho) 07/2003 - 07/2004.** *Environmental Engineer and Project Leader.* Drafting of a project brief document inclusive of a construction EMP for the construction of bridges across the Qhoali, Sebapala and Phutiatsana Rivers in Lesotho. Involved for 1 person-month. (Ministry of Public Works: Roads Branch).

**Windhoek Environmental Structure Plan (ESP) and policy (Windhoek, Namibia) 01/2003 - 05/2004.** *Environmental Engineer.* The ESP is a GIS-based product that provides essential information for land use planning for development programmes and classify the area into environmental zones for various types of development and is supported by a database of physio-ecological information. The project also involved the drafting of an Environmental Policy for the city of Windhoek after completion of the ESP. Involved for 1.5 person-months. (City of Windhoek).

**Limpopo Province State of the Environmental Report (SoER) (Limpopo Province, South Africa) 08/2003 - 01/2004.** *Environmental Engineer.* Establishment and development of a base for environmental reporting based on the United Nations DPSIR Model for the Limpopo Province in South Africa. Involved for 1 person-month. (Limpopo Department of Agriculture, Land and Environmental Affairs).

**Rehabilitation EMP for road TR1/11 (Namibia) 11/2003 - 12/2003.** *Environmental Engineer and Project Leader.* Drafting of an EMP for the construction and rehabilitation phases of Road TR1/11 from Ondangwa to Oshikango in Namibia. Involved for 0.5 person-months. (Roads Authority of Namibia).

**Water services development plan (WSDP) for Tshwane (Gauteng, South Africa) 04/2003 - 12/2003.** *Environmental Engineer and Project Leader.* Drafting of the environmental policy and strategic environmental management plan and for the City of Tshwane Division: Water and Sanitation, and completion of the environmental chapter for the WSDP. Involved for 2 person-months. (City of Tshwane Metropolitan Municipality).

**New Lesotho parliament building and staff housing (Lesotho) 03/2003 - 10/2003.** *Project Leader.* Environmental Impact Statement (EIS) for the proposed new Lesotho Parliament and staff housing complex in Maseru, inclusive of a social impact assessment and specialist vegetation study, as well as an EMP containing mitigatory measures for potential impacts. Involved for 0.5 person-months. (Ministry of Public Works: Building Design Services).

**Environmental management system for Yum! Restaurants International (South Africa) 07/2003 - 10/2003.** *Environmental Auditor and Project Leader.* First phase of Environmental Management System development for Yum! Restaurants International that represents KFC in South Africa, including a gap analysis, a legal review and review of existing operational policies and procedures with recommendations for further EMS development. Involved for 0.5 person-months. (Yum! Restaurants International).

**Master plan for the development of Mussulo Peninsula (Luanda, Angola) 01/2002 - 12/2003.** *Environmental Engineer.* The project entailed the development of a master plan for the development of the Mussulo Peninsula, incorporating an Environmental Management Framework (EMF) to focus development on the least sensitive areas, as well as proposals for applicable design standards and norms based on the carrying capacity of the Peninsula to ensure sustainable development. Involved for 3 person-months. (Ministério dos Transportes de Angola).



**Spatial representation of industrial areas in Gauteng Province and recommendations on Buffer Zones Phase 2 (Gauteng, South Africa) 12/2002 - 02/2003.** *Environmental Engineer.* Phase 2 of this project entailed the refining and spatial representation of different categories of industrial land use in Gauteng Province in a Geographic Information System (GIS) based decision support tool with recommendations on buffer zones for each. Involved for 1 person-month. (Gauteng Department of Agriculture, Conservation, Environment and Land Affairs).

**Nestlé Isando EIA (South Africa) 11/2002 - 12/2003.** *Environmental Engineer and Project Leader.* An EIA for the new dry pet food plant for Nestlé Purina Petcare in Isando including specialist air pollution dispersion modelling and noise assessment. The aim of the study was to establish status quo conditions on site prior to operation, predict impacts and propose suitable mitigation where applicable. Involved for 0.5 person-months. (Nestlé Purina Petcare - Friskies).

**Combolcha - Gundewein major link road EIA (Ethiopia) 11/2002 - 12/2003.** *Environmental Engineer.* An EIA inclusive of a social impact assessment for the proposed major link road from Combolcha to Gundewein in Ethiopia. Involved for 1 person-month. (Ethiopian Roads Authority).

**Environmental Impact Assessment (EIA) for the Telemetry masts for Kanyamazane Water Treatment Works (WTW) and reticulation system (Kanyamazane Mbombela, South Africa) 03/2002 - 08/2002.** *Environmental Engineer and Project Leader.* Responsible for Environmental Impact Assessments (EIAs) for four telemetry masts of the treatment and reticulation system of the Southern Nsikazi Regional Water Scheme, also including construction Environmental Management Plans (EMPs). Involved for 1 person-month. (Mbombela Local Authority).

**Operational Environmental Management Plan (EMP) for the Kruger Mpumalanga International Airport (Primkop, White River, South Africa) 04/2002 - 06/2002.** *Environmental Auditor.* The project involved an operational Environmental Management Plan (EMP) covering all operational aspects of the international airport for inclusion in the airport operations manual series. Involved for 1 person-month. (Primkop Airport Management).

**Instream Flow Requirements (IFR) for rivers in the King Sabata Dalindyebo study area (King Sabata, South Africa) 06/2002 - 07/2002.** *Environmental Engineer.* The project included the ecological classification of rivers and estimates of Instream Flow Requirements (IFR) with recommendations on integrated environmental management procedures and ecological management categories for planning purposes. Involved for 1 person-month. (Department of Water Affairs and Forestry (DWAF)).

**Environmental Management Plan (EMP) for Kruger Mpumalanga International Airport (Primkop, White River, South Africa) 07/2002 - 12/2002.** *Environmental Auditor.* Responsible for the Environmental Management Plan (EMP) for the construction phase of the new Kruger Mpumalanga International Airport (KMIA) and implementation monitoring and auditing during construction. Involved for 3 person-months. (Primkop Airport Management).

**Spatial representation of industrial areas in Gauteng and recommendations on buffer zones (Gauteng, South Africa) 01/2002 - 03/2002.** *Environmental Engineer.* The development of a Geographic Information System (GIS) based decision support tool to ensure that housing projects in Gauteng are not allowed in areas posing environmental and health risks, by mapping and classifying all industrial areas in the province and establishing worst and best case buffer zones based on legal requirements and expert consultation. Involved for 1 person-month. (Gauteng Department of Agriculture, Conservation, Environment and Land Affairs).

**Technical information document on the environmental legislation impacting on engineering work (South Africa) 03/2002 - 07/2002.** *Environmental Engineer.* Responsible for drafting of a technical information document providing a summary of the requirements for Environmental Impact Assessments (EIAs) in terms of South African Legislation with particular reference to engineering work. Involved for 1 person-month. (Aurecon).

**Survey of tourism potential and Socio-economic Impact Assessment (SIA) in four focus areas, namely: Madikwe, Barberton, Valley of the Olifants and Khayelitsha (South Africa) 01/2002 - 05/2002.** *Environmental Engineer.* The project involved a tourism promotion and development potential survey and a Socio-economic Impact Assessment (SIA) to review socio-economic conditions, estimate tourism demands and determine socio-economic impacts of tourism development in each of the focus areas. Involved for 1 person-month. (Japanese International Cooperation Agency (JICA)).

**Environmental Impact Assessment (EIA) and review of engineering design of the Mavoco hazardous waste disposal facility (Beluluane, Mozambique) 01/2002 - 02/2003.** *Environmental Engineer.* Responsible for Environmental Impact Assessment (EIA), Social Impact Assessment, (SIA) and Environmental Management Plans (EMPs) for construction, operation and rehabilitation phases and review of engineering design of the Mavoco Hazardous Waste Landfill site and access road near Mozal. Involved for 2 person-months. (Ministério para a Coordenação da Acção Ambiental (Micoa)).

**Environmental Management Plan (EMP) implementation monitoring on the Mohale feeder roads bridge sites (Mohale, Lesotho) 11/2001 - 02/2003.** *Environmental Auditor.* Responsible for monitoring of the implementation of the construction Environmental Management Plan (EMP) and recommendations on mitigation on the three Mohale Feeder Roads bridge sites. Involved for 2 person-months. (Lesotho Highlands Development Authority (LHDA)).

**Environmental Management Framework (EMF) for Alexandra Township (Alexandra, South Africa) 06/2001 - 10/2001.** *Environmental Engineer.* The Alexandra Environmental Management Framework (EMF) was developed on a GIS platform integrating impact management policy with spatial environmental priorities to seek sustainable development as part of the Presidential Alexandra Renewal Project. The EMF was developed at a scale of 1:5000 to indicate the required level of detail to fast-track environmental approvals and permitting procedures in areas with low sensitivity and included a generic environmental management plan (EMP) for construction in these areas. Involved for 1 person-month. (Gauteng Department of Agriculture, Conservation, Environment and Land Affairs).

**Kamiesberg Electrification Project Environmental Impact Assessment (EIA) (Northern Cape, South Africa) 01/2001 - 03/2001.** *Environmental Engineer and Project Leader.* The project included an Environmental Impact Assessment (EIA) for the provision of 3 phase electricity to 8 rural settlements in the Kamiesberg District in Namaqualand, including the assessment of the alignment of approximately 160km of new overhead electricity supply lines. Involved for 1 person-month. (Kamiesberg Municipal Authority).

**Bronberg Reservoir Environmental Management Plan (EMP) (Pretoria, South Africa) 04/2000 - 10/2005.** *Environmental Auditor.* The project comprised an Environmental Management Plan (EMP) for the construction of the new 100ML Bronberg Reservoir, also including site implementation monitoring and auditing. Involved for 1.5 person-months. (Greater Pretoria Metropolitan Council (GPMC)).

**Nelspruit Airport Environmental Risk Assessment (ERA) (Nelspruit, South Africa) 11/2000 - 01/2001.** *Environmental Auditor.* Responsible for the assessment of the environmental performance of activities within the property boundaries of the Nelspruit Airport. Involved for 1 person-month. (ABB).

**Environmental Risk Assessment (ERA) for the proposed Kruger Mpumalanga International Airport (Primkop, White River, South Africa) 11/2000 - 01/2001.** *Environmental Auditor.* The project involved an assessment of the environmental performance of current activities on the proposed site and an assessment of inherent environmental risk with the development of the proposed international airport. Involved for 1 person-month. (Primkop Airport Management).

**Mohale Dam feeder roads Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) (Mohale, Lesotho) 11/2000 - 08/2001.** *Environmental Engineer.* The project included and Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), review of the route alignments and an Environmental Management Plan (EMP) for the construction phase of the feeder roads around the Mohale Dam, as part of Phase 1B of the Lesotho Highlands Water Transfer Scheme. Involved for 3 person-months. Involved for 3 person-months. (Lesotho Highlands Development Authority (LHDA)).

**Centurion Environmental Management Framework (EMF) Phase 2 (Centurion, South Africa) 07/2000 - 06/2001.** *Environmental Engineer.* The project involved Centurion's overarching Environmental Management Framework (EMF) covering the whole of Centurion at a scale of 1:15000 on a Geographical Information System (GIS) platform integrating impact management policy with spatial environmental priorities to seek sustainable development within Centurion. Involved for 2 person-months. (Centurion Town Council).

**Qumbo and Gqunu Bulk Water Supply Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) (Eastern Cape Province, South Africa) 02/2000 - 03/2000.** *Environmental Engineer.* The project included an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) to mitigate negative impacts associated with the construction of infrastructure required to supply the villages of Qumbo and Gqunu with piped water. Involved for 1 person-month. (Eastern Cape

Department of Public Works).

**Tsomo Sewage Treatment Works (Eastern Cape, South Africa) 02/2000 - 03/2000.** *Environmental Engineer.* Responsible for an Environmental Impact Assessment (EIA) and Management Plan (EMP) for sewage treatment works for Tsomo Village. Involved for 1 person-month. (Eastern Cape Department of Public Works).

**North West Road upgrade Environmental Management Plan (EMP) (North West Province, South Africa) 10/2000 - 11/2000.** *Project Leader and Environmental Auditor.* The project involved the establishment of a generic Environmental Management Plan (EMP) for an extensive road rehabilitation project including borrow pits for the upgrading of 42 roads in the North West Province. Involved for 0.5 person-months. (North West Provincial Department of Public Works).

**Nelspruit Airport operational Environmental Management Plan (EMP) (Nelspruit, South Africa) 07/2000 - 09/2000.** *Environmental Auditor.* Responsible for an Environmental Management Plan (EMP) for the operational phase of the airport, based on the outcome of the previously completed risk assessment. Involved for 2 person-months. (ABB).

**Centurion major roads planning (Centurion, South Africa) 08/1999.** *Design Engineer and Project Leader.* Responsible for network planning for Irene as part of the Centurion major roads planning. Involved for 1 person-month. (Centurion Town Council).

**Centurion Environmental Management Framework (EMF) Phase1 (Centurion, South Africa) 08/1999 - 10/1999.** *Environmental Engineer.* The project consisted of Phase 1 of the Centurion EMF covering the planning of one forum of Centurion at a scale of 1:15000 on a Geographical Information Systems (GIS) platform integrating an impact management policy with spatial environmental priorities to seek sustainable development within Centurion. Involved for 1 person-month. (Centurion Town Council).

**Ethiopian roads Environmental Impact Assessment (EIA) review (Ethiopia) 09/1999 - 11/1999.** *Research Member of Environmental Impact Assessment Team.* The project comprised an environmental and social impact assessment of the proposed construction and upgrading of 2 200km of major routes including a construction Environmental Management Plan (EMP) and detailed mitigation plans. Involved for 1 person-month. (Ethiopian Roads Authority).

**Scoping report and Environmental Management Plan (EMP) for remedial work at Leopard Creek Golf Estate (Malelane, South Africa) 09/1999 - 11/1999.** *Environmental Engineer.* The project involved an extended scoping study for the construction of a 140m gabion structure on the southern embankment of the Crocodile River in Mpumalanga. Involved for 1 person-month. (Leopard Creek Golf Estate).

**Access road and parking area for Technikon North West (Ga-Rankuwa, South Africa) 08/1998 - 09/1999.** *Resident Engineer.* Responsible for construction supervision on the construction of an access road and parking area for Technikon North West. Involved for 3 person-months. (Technikon North West).

**Environmental Impact Assessment (EIA) and visual assessment for Siemens Cellular Telecommunications Masts (South Africa) 09/1999 - 06/2002.** *National Project Manager.* The project involved an Environmental Impact Assessment (EIA) and visual assessments and public participation processes, for the construction of cellular telecommunication masts (and permitting) involving both exemption and scoping with mitigation measures for 1600 potential cellular masts for the 3rd cellular licence in South Africa in Cape Town, Pretoria, Johannesburg and Durban. Involved for 8 person-months. (Siemens Telecommunications).

**Centurion Environmental Impact Assessment (EIA) Review Panel (Centurion, South Africa) 09/1999 - 12/2001.** *Review Consultant.* Served as a member of the Centurion Council Environmental Review Panel, attending bi-weekly meetings and workshops to review all EIA applications after site visits to sensitive sites. Involved for 2 person-months. (Centurion Town Council).

**Rehabilitation of 14.2km of P158-1 (Ben Schoeman Highway) (Pretoria and Centurion, South Africa) 08/1998 - 08/1999.** *Assistant Resident Engineer.* Responsible for full time site supervision on the R40 million rehabilitation of approximately 14.2km of road P158-1 (Ben Schoeman Highway) between Potgieter Street and the Brakfontein Interchange. Involved for 11 person-months. (Gautrans).

**Kumasi, Tamale and Secondi Landfill Sites (Kumasi, Tamale, and Secondi in Ghana) 06/1998 - 07/1998.** *Design Engineer and Project Leader.* Responsible for the design, modelling and volume

calculations for Kumasi, Tamale and Secondi landfill sites. Involved for 1 person-month. (Ghana Department of Local Government).

**Upgrading of streets and stormwater in Mbabane (Mbabane, Swaziland) 02/1998 - 08/1998.** *Design Engineer and Project Leader.* Responsible for the design and documentation for the upgrading of streets and stormwater. Involved for 4 person-months. (Mbabane Local Authority).

**Roads and volume calculations for Mbabane Landfill Site (Mbabane, Swaziland) 12/1997 - 02/1998.** *Design Engineer.* Responsible for the design of roads and volume calculations for the Mbabane Landfill Site. Involved for 2 person-months. (Mbabane Local Authority).

**Stormwater drainage design for Taung Hospital (Taung, South Africa) 08/1997 - 03/1998.** *Design Engineer.* Responsible for the stormwater drainage design for the hospital grounds. Involved for 2 person-months. (Department of Public Works).

**Samrand Avenue (Centurion, South Africa) 10/1997 - 03/1998.** *Design Engineer.* Responsible for the design of Samrand Avenue West of P66-1 in Centurion. Involved for 3 person-months. (Centurion Town Council).

**Stormwater drainage and pavement design at the South African Bank Note Printers (Pretoria, South Africa) 02/1997 - 03/1997.** *Design Engineer.* Responsible for stormwater drainage and pavement design for the revised main entrance to the South African Bank Note Printers. Involved for 1 person-month. (SA Bank Note Printers).

**Sunnyside Campus of the University of South Africa (UNISA) (Pretoria, South Africa) 02/1997 - 05/1997.** *Design Engineer.* Responsible for the civil design of alternations to roads and parking areas for UNISA's Sunnyside Campus. Involved for 2 person-months. (UNISA).

**Design services for Gabonewe School (Gabonewe, South Africa) 06/1997 - 07/1997.** *Design Engineer and Project Leader.* Responsible for the design of access roads and parking areas for Gabonewe School. Involved for 1 person-month. (Department of Education).

**Design of New Park Shopping (Kimberley, South Africa) 02/1997 - 10/1997.** *Design Engineer and Project Leader.* Responsible for the design of civil works for New Park Shopping Centre including stormwater, access roads, intersections and parking areas. Involved for 3 person-months. (Moolman Brothers).

**Stormwater infrastructure design proposal (Johor Bahru, Malaysia) 05/1997 - 11/1997.** *Design Engineer.* Responsible for the design proposal for stormwater infrastructure for the Johor Bahru Development. Involved for 2 person-months. (Johor Bahru Development).

**Design of stormwater drainage at Technikon North West (Ga-Rankuwa, South Africa) 03/1997 - 05/1997.** *Design Engineer.* Responsible for the design of stormwater drainage at Technikon North West residences. Involved for 1 person-month. (Technikon North West).

**Design of new sports fields at Technikon North West (Ga-Rankuwa, South Africa) 01/1997 - 02/1997.** *Design Engineer and Project Leader.* Responsible for the design and documentation for new sports fields, including drainage culverts. Involved for 2 person-months. (Technikon North West).

**Civil design for Latter Day Saints' Meeting House (Atteridgeville, South Africa) 07/1997 - 10/1997.** *Design Engineer and Project Leader.* Responsible for the civil design for the LDS meeting house. Involved for 1 person-month. (Latter Days Saints' Church).

**Phatsima Township Phases 1 and 2 (Rustenburg, South Africa) 01/1996 - 04/1998.** *Design Engineer.* Responsible for the design of an access road to Phatsima Township Phases 1 and 2. Involved for 2 person-months. (Rustenburg Town Council).

**Tlhabane Township Phases 1 and 2 (Rustenburg, South Africa) 01/1996 - 04/1998.** *Design Engineer.* Responsible for the design of streets and stormwater in Tlhabane Township Phases 1 and 2. Involved for 2 person-months. (Rustenburg Town Council).

**Stormwater and pavement designs at Berea City Complex (Pretoria, South Africa) 01/1996 - 08/1997.** *Design Engineer.* Responsible for stormwater drainage and pavement designs at Berea City Complex.



Involved for 3 person-months. (EG Chapman Properties).

**Design of access road and parking areas at Technikon North West (Ga-Rankuwa, South Africa) 02/1996 - 05/1997.** *Design Engineer and Project Leader.* Responsible for the design of an access road and parking areas at Technikon North West. Involved for 3 person-months. (Technikon North West).

**Stormwater master plan for Tlhabane Township (Rustenburg, South Africa) 07/1996 - 10/1996.** *Design Engineer.* Responsible for a stormwater master plan for Tlhabane Township, including stormwater drainage development phasing with expenditure estimates for 5 years. Involved for 3 person-months. (Rustenburg Town Council).

**Earthworks design for Samrand Flagship building (Centurion, South Africa) 10/1996 - 12/1996.** *Design Engineer.* Responsible for earthworks design and volume calculations for the Samrand Flagship Building. Involved for 1 person-month. (Samrand).

**Residential units at Hans Merensky Golf Course (Phalaborwa, South Africa) 09/1996 - 11/1996.** *Design Engineer.* Responsible for the design of streets and stormwater for the proposed development of residential units at Hans Merensky golf course. Involved for 1 person-month. (Hans Merensky Golf Club).

**Stormwater master plan for Phatsima (Rustenburg, South Africa) 07/1996 - 10/1996.** *Design Engineer.* Responsible for a stormwater master plan for Phatsima Township, including stormwater drainage development phasing with expenditure estimates for 5 years. Involved for 3 person-months. (Rustenburg Town Council).

## Education

1995 : BEng (Civil), University of Pretoria, South Africa

## Career enhancing courses

2011 : Investment in African mining International Conference 2011 (Mining Indaba), Cape Town, International Investment Conferences

2010 : Basic MS Projects Course, Aurecon

2009 : International Association of Impact Assessment South African National Conference, International Association of Impact Assessment South Africa (IAIAsa)

2009 : BST Financial Management Course, Aurecon

2009 : Life-Long Learning Solutions CPD DVD Series 2009, South African Association of Consulting Engineers (SAACE)

2008 : WasteCon 2008, Institute of Waste Management of Southern Africa (IWMSA)

2008 : Life-Long Learning Solutions CPD DVD Series 2008, South African Association of Consulting Engineers (SAACE)

2008 : ProMan Financial Management Course, Ninham Shand, Cape Town

2007 : Life-Long Learning CPD DVD Series 2007, South African Association of Consulting Engineers (SAACE)

2007 : Handling projects in a Consulting Engineer's Practice, South African Institution of Civil Engineering (SAICE)

2006 : Business Finances for Built-Environment Professionals, South African Institution of Civil Engineering (SAICE)

2006 : Life-Long Learning Solutions CPD DVD Series, South African Association of Consulting Engineers (SAACE)

2006 : Environmental Law Update, North-West University, South Africa

2005 : Environmental Law Update, North-West University, South Africa

2004 : Internal Assessor / Moderator Course, Africon, South Africa

2002 : Protocol for Risk-Based Evaluation of the Performance of Waste Disposal Sites, South African Institution of Civil Engineering (SAICE)

2002 : Business Writing Skills, Pula Madibogo

2002 : Role of IT in Management of the RSA Environment, South African Institution of Civil Engineering (SAICE)

2000 : Environmental Auditing, University of Potchefstroom, South Africa

2000 : Environmental Law, University of Potchefstroom, South Africa

2000 : Environmental Management Systems (SABS/ISO 14001), University of Potchefstroom, South Africa

- 2000 : Introduction to Environmental Management, University of Potchefstroom, South Africa
- 2000 : Microsoft Access, Finlore Education
- 1999 : Environmental Governance, University of South Africa (UNISA)
- 1998 : Internet and Email, South African Institution of Civil Engineering (SAICE)
- 1997 : Basic Portuguese, Africon/University of South Africa
- 1997 : Microsoft Excel Advanced, Edu-Pro, South Africa
- 1997 : Microsoft Windows 95 Advanced, Edu-Pro, South Africa
- 1997 : Design of Streets and Stormwater, University of Pretoria, South Africa
- 1996 : Communication Skills 1, Africon, South Africa
- 1996 : Microsoft Windows 95, Edu-Pro, South Africa
- 1996 : Model Maker DTM, Model Maker Systems
- 1996 : Internal Project Management, Africon, South Africa
- 1996 : Communication Skills 2, Africon, South Africa

### Professional affiliations

Registered Professional Engineer, Engineering Council of South Africa (ECSA)  
 Member, South African Institution of Civil Engineers  
 Member, Institute of Waste Management of South Africa (IWMSA)  
 Member, International Association of Impact Assessment (IAIA)

### Languages

	<b>Reading</b>	<b>Writing</b>	<b>Speaking</b>
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

### Honours and awards

Merit award for excellence in Landscape Architecture in the category for ecological planning for the Centurion Environmental Management Framework (EMF) project completed in 2001 received from the Institute of Landscape Architects of South Africa (ILASA) in 2003.

### Publications

Schneeweiss, R, van der Merwe, A. 2009. "The application of Multi-criteria Decision Making in the early stages of Environmental Impact Assessment and Technical Project Development Planning for a large mine expansion project". Paper presented at the International Association of Impact Assessment South African National Conference held in Wilderness, South Africa.

Pillay, M, van der Merwe, A, West, A. 2009. "The Application of the Ideal Mode Analytical Hierarchy Process Multi-criteria Decision Making Model in Strategic Project Planning and Environmental Impact Assessments". Paper presented at the International Association of Impact Assessment South African National Conference held in Wilderness, South Africa.

### Referees

<b>Company</b>	<b>Contact Person</b>	<b>Telephone nr.</b>
ABB	Mr Walter Ringelmann	+27 11 236 7221
City of Tshwane Metro	Mr Hannes Scholtz	+27 12 308 8820
Lesotho Highlands Development Authority	Mr Ikarabele Sello	+266 311 280/314 324

By my signature below I certify the correctness of the information above and my availability to undertake this assignment.

\_\_\_\_\_  
Signature of Staff Member

\_\_\_\_\_  
Date

## Curriculum vitae: Ms FI GRESSE

Name : **GRESSE, FRANCIENA ISABELLA**  
 Date of Birth : 14 March 1985  
 Profession/Specialisation : Environmental Practitioner  
 Years with Firm : 3  
 Nationality : South African  
 Years experience : 3

### Key qualifications

Ms Gresse is an Environmental Practitioner in the Cape Town office. She completed a Bachelor of Science and an Honours Degree in Conservation Ecology at the University of Stellenbosch. She has been involved in various projects, including a 24G application, environmental impact assessments, renewable energy projects, environmental management plans, environmental control officer (ECO) work, pre-feasibility and feasibility studies for the Western Cape Water Supply System and a catchment management strategy for the Olifants-Doorn catchment, Western Cape.

### Employment record

03/2009 - Date Aurecon, (previously Africon, Ninham Shand and Connell Wagner), Environmental Practitioner  
 2008 - 02/2009 Ninham Shand, Candidate Environmental Consultant

### Experience record

***Proposed Rehabilitation of Wetlands as Part of the Working for Wetlands (Western and Northern Cape, South Africa) 2010 – Date. Project Staff.*** Appointed by the South African National Biodiversity Institute (SANBI) to conduct environmental impact assessments for the rehabilitation of specific wetlands in all provinces of South Africa over a five year period. She was responsible for the compilation of Basic Assessment Reports and Wetland Rehabilitation Plans for the Western Cape as well as the Northern Cape. Other responsibilities includes liaison with authorities, public participation process, management of specialists and general project management. (SANBI)

***Environmental Impact Assessment for the Proposed Extension of the Ash Dam Facility at Kriel Power Station (Mpumalanga, South Africa) 2010 – Date. Project Staff.*** Appointed by Eskom to conduct an environmental impact assessment for the proposed construction of a fourth ash dam facility at the Kriel power station. She was involved in the screening process, compiling the scoping and EIA reports and public participation. In conjunction, she was also involved in the compilation of a Waste Management Licence application required for the proposed ash dam. (Eskom)

***Environmental Impact Assessment for Proposed Solar Energy Facility, Onder Rietvlei Farm (Portion 3 of Farm 18, Aurora, West Coast, South Africa) 2010 – 2011. Project Staff.*** Appointed by Solaire Direct to undertake a basic environmental impact assessment process for the proposed construction of a 10 MW solar energy facility. Responsible for the compilation of the draft and final reports, public participation process, management of specialists and general project management. (Solaire Direct Southern Africa)

***Environmental Sensitivity Study for a Proposed Solar Energy Facility on a Farm Near Aurora (West Coast, South Africa) 2010. Project Staff.*** Appointed to provide an environmental sensitivity study (ESS) which inter alia highlights the potential constraints (“red flags”) and opportunities presented by the site from an environmental perspective. Responsible for the compilation of the ESS. (Solaire Direct Southern Africa)

***Proposed Remediation, Rehabilitation and Restoration of the Spruit, Krom, Leeu and Palmiet Rivers (Wellington and Paarl, South Africa) 2009 – 2010. Project Staff.*** Appointed by the Drakenstein Municipality to undertake the requisite EIA process for the rehabilitation, remediation and stabilisation of four rivers within Paarl and Wellington. Responsible for the EIA and public participation processes. (Drakenstein Municipality)

***Proposed Construction of a New Pipeline from Bovlei Winery to Withoogte Dam (Wellington, South Africa) 2009 – 2011. Project Staff.*** The Drakenstein Municipality propose to replace a section of the existing pipeline extending from the Withoogte Dam to the Welvanpas Reservoir near Wellington as part of



the municipality's water master plan in order to improve the overall water supply. Responsible for the compilation of the EIA report, management of specialists and the public participation process. (Drakenstein Municipality)

**Proposed Erection of Eskom Communication Sirens/PA Systems (Blaauwberg, South Africa) 2009 – 2010.** *Project Staff.* Appointed by Eskom to conduct three EIA processes for the (a) erection of 10 new sirens in the Parklands area, (2) relocation of one siren in Bloubergstrand and (3) upgrade of five sirens on farms near Melkbosstrand. Responsible for compilation of EIA reports and the public participation process. (Eskom)

**Overberg District Municipality: Integrated Transport Plan: Strategic environmental informants (South Africa) 2009.** *Project Staff.* Aurecon's Transportation Unit was appointed to revise the integrated transport plan. The Environmental Unit was sub-contracted to provide environmental input. Responsible for identifying and describing the relevant informants. (Overberg District Municipality).

**Annandale Commercial: Development of Petrol Filling Station on Portion of Erf 5561 (Kuils River, South Africa) 2009.** *Project Staff.* Appointed to compile a construction environmental management plan (CEMP) for the construction of a filling station on the corner of Gladioli Street and Amandel Drive, Kuils River. Responsible for the compilation of the project specification document as part of the CEMP. (Communicate)

**Pre-feasibility and Feasibility Studies for Augmentation of the Western Cape Water Supply System (South Africa) 2008 – Date.** *Project Staff.* The Department of Water Affairs commissioned the pre-feasibility and feasibility studies for the augmentation of the Western Cape Water Supply system through the further development of the surface water resources. Surface water schemes to be investigated, were identified by the Western Cape Water Supply system: Reconciliation strategy study. Responsible for the public participation process, management of environmental specialists and the compilation of a socio-economic overview of the study area.

**C.A.P.E. Olifants-Doring Catchment Management Agency Project: Development of a catchment management strategy water resource protection sub-strategy for the Olifants-Doring Catchment (South Africa) 2008 – 2009.** *Project Staff.* Appointed by CapeNature to compile a catchment management strategy water resource protection sub-strategy for the Olifants-Doorn catchment. Responsible for the compilation of a database that lists all institutions and their respective mandates in terms of water resource protection and biodiversity conservation decision-making for the Olifants-Doring catchment, workshop arrangements and general project related work.

**Table Mountain Group Aquifer Feasibility Study and Pilot Project (Western Cape, South Africa) 2008 - 2010.** *Environmental Control Officer.* The City of Cape Town initiated a study into the Table Mountain Group Aquifer as a potential water source to augment the city's supply. The feasibility and pilot project phase Record of Decision (RoD) required completion for site-specific Environmental Management Plans (EMPs) for drilling sites that were assessed to be environmentally sensitive. Site-specific EMPs were designed for sensitive sites to ensure minimal environmental impact during the drilling phase. Responsible for monitoring compliance with the RoD and EMP during the drilling phase. (City of Cape Town).

**Water Reconciliation Strategy for the Algoa Water Supply Area (Eastern Cape, South Africa) 2008 - 2009.** *Project Staff.* This project provided an assessment of the environmental opportunities and constraints for a suite of water schemes in the Algoa water supply area. This was undertaken as part of a broader study in the area.

**Proposed Extension of Lock Road (Kalk Bay, South Africa) 2008 - 2009.** *Project Staff.* The project comprised an Environmental Impact Assessment (EIA) process for extending Lock Road to an existing erf. Responsible for being involved during the final stages of the application. (Mr Rick Bartlett).

**Proposed Development of Apple and Pear Orchards on Soetmelksvlei Farm (Riviersonderend, South Africa) 2008 - 2009.** *Project Staff.* This Agri-development project involved the development of 50ha of apple and pear orchards in the Riviersonderend region. Responsible for compiling the basic assessment report, Environmental Management Plan (EMP), and managing the specialists and public participation process. (BETCO).

**Application for Rectification in Terms of Section 24G of NEMA for the Unlawful Commencement of a Fruit Processing Factory on Farm Op De Tradouw, Number 69 (Barrydale) 2008 - 2009.** *Project Staff.* The project consisted of an application for rectification in terms of Section 24G of NEMA. Responsible for

compiling an environmental impact report and an Environmental Management Plan (EMP) for the application, as well as managing the public participation process. (Schoonies Family Trust).

**Proposed redevelopment of the Blaauwberg Conservation Area: Eersteste Node (South Africa) 2008 - 2010.** The project entailed an Environmental Impact Assessment (EIA) process for redeveloping the Eersteste Conservation Area on the West Coast. Responsible for compiling the EIA report, as well as managing specialists and the public participation process. (City of Cape Town).

**Environmental Sensitivity Study for the Proposed Dasdrif Poultry Farm (Moorreesburg, South Africa) 2008.** *Project Staff.* Appointed to provide an environmental sensitivity study (ESS) which inter alia highlights the potential constraints (“red flags”) and opportunities presented by the site from an environmental perspective. Responsible for the compilation of the ESS. (Eikenhoff Poultry Farms (Pty) Ltd).

**Department of Economic Affairs, Environment and Tourism (DEAET) decision-making support (South Africa) 2008.** *Project Staff.* Responsible for assisting DEAET with the review and processing of Environmental Impact Assessment (EIA) applications in terms of the Environment Conservation Act.

**Joint Maputo River Basin water resources study (Mozambique, Swaziland and South Africa) 2008.** *Project Staff.* The project provided an environmental opportunities and constraints assessment of a suite of potential dams in South Africa and Swaziland, within the Maputo River Catchment. This was undertaken as part of a broader study into the catchment.

### Education

2007 : BSc (Hons) Conservation Ecology, University of Stellenbosch, South Africa

### Professional affiliations

Member, International Association of Impact Assessment (IAIA)

### Languages

	<b>Reading</b>	<b>Writing</b>	<b>Speaking</b>
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

By my signature below I certify the correctness of the information above and my availability to undertake this assignment.

\_\_\_\_\_  
Signature of Staff Member

\_\_\_\_\_  
Date

## Curriculum vitae: Ms N SIWELA

Name : **SIWELA, NOMVELO**  
 Date of Birth : 07 April 1988  
 Profession/Specialisation : Environmental Consultant/ Environmental Management  
 Years with Firm : 2  
 Nationality : South African  
 Years experience : 3

### Key qualifications

Nomvelo Siwela is a qualified Environmental Consultant with Aurecon's Cape Town Environment and Advisory unit. She holds a Bachelors of Technology degree in Environmental Management from the Cape Peninsula University of Technology (CPUT) in South Africa. She has gained valuable experience over the past few years in landowner notification, National Environmental Management Act (NEMA) authorization and Public Participation Processes (PPP).

Nomvelo has also worked as an Environmental Officer at the Department of Environmental Affairs and Development Planning (DEA&DP) under the Directorate Pollution Management and Sub Directorate Remediation and Emergency Incidents. Her responsibilities involved reviewing of contamination reports pertaining to remediation and emergency incidents with respect to NEMA s28 and 30, analysing land and groundwater contamination results on pollution, writing technical comments based on the information presented on reports by the Environmental Protection Agency (EPA) and reviewing of emergency incident reports as required by NEMA s30. She also assisted and conducted site inspection for contaminated lands, attended meetings, evaluated basic assessments for Environmental Impact Assessment (EIA) applications and provided commentaries.

She is well versed in environmental compliance and enforcement, water quality management, understand the principles of integrated water resource management (IWRM) and catchment management and pollution mitigation measures, National Water Act 1998 (Act 36 of 1998), and the National Environmental Management Act 1998 (Act 107 of 1998) together with the related policies, regulations, principles, guidelines, tools and procedures, policy development, implementation and monitoring.

### Employment record

12/2012 - Date	Aurecon, Environmental Consultant
12/2011 - 11/2011	Department of Environmental Affairs and Development Planning (DEA&DP), Intern/ Environmental Officer

### Experience record

**Piketberg Stormwater upgrade (Western Cape Province, South Africa) 2012 - 2013.** *Environmental Consultant.* The Bergrivier Municipality proposes to upgrade the existing stormwater systems of the town of Piketberg to better cater for the current stormwater discharge flow rates during high flow rain events, which typically result in the flooding of residential properties and streets with sediment-laden stormwater. Responsible for assisting with drafting of landowner notification letters for the National Environmental Management Act (NEMA) authorization. Involved for 1 person-month. (Bergrivier Local Municipality).

**Riemvasmaak Hydropower Station (Northern Cape Province, South Africa) 2012.** *Environmental Consultant.* Hydro Electric Power (Pty) Ltd (RVM 1, 2 & 3) appointed Aurecon to assist with the construction of a 10 and a 9.9 Megawatt (MW) hydropower stations on the Orange River, on the farm Riemvasmaak (remainder of farm no 497 and portion 1 of farm no 498), north of the Augrabies Falls, approximately 40 km north west of Kakamas in the Northern Cape Province of South Africa. Responsible for assisting with landowner information and communication with local authorities for the Public Participation Process (PPP). Involved for 2 person-months. (Mulilo Renewable Energy).

**Road materials supply strategy (Western Cape Province, South Africa) 2008 - 2013.** *Environmental Consultant.* The project entailed the investigation of possible material sources for use in maintenance and re-gravelling work on provincial roads in the Western Cape. The scope of work included the facilitation of compliance with the applicable environmental legislation, namely the Minerals and Petroleum Resources Development Act, No. 28 of 2002 (MPRDA), the National Heritage Resources Act, No. 25 of 1999 (NHRA),

and the National Environmental Management Act, No. 107 of 1998 (NEMA). Responsible for the application of National Environmental Management Act (NEMA) authorizations from the provincial Department of Environmental Affairs and Development Planning (DEA&DP). Involved for 1 person-month. (Western Cape Government Department of Transport and Public Works).

### Education

- 2011 : BTech Environmental Management, Cape Peninsula University of Technology (CPUT), South Africa
- 2010 : NDip Environmental Management, Cape Peninsula University of Technology (CPUT), South Africa

### Career enhancing courses

- 2010 : Certificate in Health and Safety Management, -

### Languages

	<b>Reading</b>	<b>Writing</b>	<b>Speaking</b>
English	Good	Good	Good
Afrikaans	Fair	Fair	Fair
Xhosa	Good	Good	Excellent

### Referees

<b>Company</b>	<b>Contact Person</b>	<b>Telephone nr.</b>
DEA&DP	Celesté Lesch	+27 82 694 0860
DEA&DP	Moses Mukota	+27 21 483 3009/ Moses.Mukota@westerncape.gov.za

By my signature below I certify the correctness of the information above and my availability to undertake this assignment.

\_\_\_\_\_  
Signature of Staff Member

\_\_\_\_\_  
Date