

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 Liqhobong 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, Sebatapala 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

	Reading	Writing	Speaking
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

Company	Contact Person	Telephone nr.
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 L CORBETT

Name : **CORBETT, LOUISE**
 Date of Birth : 31 July 1981
 Profession/Specialisation : Environmental Practitioner
 Years with Firm : 5
 Nationality : South African
 Years experience : 7

Key qualifications

Ms Corbett, an Associate in the Cape Town office, has a Bachelors of Science (Hons) Degree in Environmental and Geographical Science, specialising in Environmental Management, from the University of Cape Town. She has 7 years' experience in the environmental field and has compiled and managed numerous environmental investigations including Environmental Impact Assessments (EIAs), Environmental Management Plans (EMPs) and Environmental Management Programmes (EMPs). Ms Corbett has a particular interest in the energy sector and has undertaken numerous environmental projects in this field. Ms Corbett was the Treasurer of the South African affiliate of the International Association for Impact Assessment (Western Cape Branch) from 2009 to 2011 and remains a Member. Ms Corbett is also a Registered Professional Natural Scientist with the South African Council for Natural Scientific Professions.

Employment record

03/2009 - Date	Aurecon (previously Africon, Ninham Shand and Connell Wagner), Associate
2006 - 02/2009	Ninham Shand Consulting Engineers, Cape Town, South Africa, Environmental Practitioner
2006 - 2007	CCA Environmental (Pty) Ltd, Cape Town, South Africa, Environmental Consultant
2005	Morrison's Plc, London, United Kingdom, Systems Administrator
2004 - 2005	Barclays Bank Plc, London, United Kingdom, Customer Services Advisor
2003 - 2004	Fairmont Chateau Whistler, Whistler, Canada, Fairmont Gold Attendant
2003	University of Cape Town, Cape Town, South Africa, Practical Demonstrator to Undergraduate Environmental and Geographical Science students

Experience record

Port Elizabeth Manganese Ramp-up (Eastern Cape, South Africa) 2012. *Project Leader.* The project entailed consulting services for providing a second berth for manganese bulk vessels in the Port of Port Elizabeth to ramp up export volumes, by extending the existing berth 14. Responsible for review of environmental input required to determine if the project required authorisation in terms of the National Environmental Management Act. (Transnet National Port Authority).

Wind and solar energy facility on Kangnas Farm near Springbok (Northern Cape, South Africa) 2012-date. *Project Leader.* The project entailed an Environmental Impact Assessment for a wind and solar energy facility, comprising 750 and 250 MW respectively, located approximately 40 km from Springbok, Northern Cape. Responsible for the management and review of the EIA Process and finances. (Mainstream Renewable Power South Africa).

Fatal Flaw Study for Four Potential Wind Energy Sites, South Africa (Northern and Western Cape, South Africa) 2012. *Project Leader.* The study entailed a fatal flaw analysis of four potential wind energy facility sites across the Northern and Western Cape. Responsible for the management and review of the fatal flaw analysis. (Mainstream Renewable Power South Africa).

Richtersveld wind energy facility (Northern Cape, South Africa) 2012. *Project Leader (Environmental).* The project entailed a due diligence of the proposed wind energy facility to review compliance with the requirements of the Department of Energy's Independent Power Producer process. Responsible for the management and review of the environmental input to the due diligence report. (Tozzi Renewable Energy S.P.A. and Guma Group).

Wind energy facility on the Eastern Plateau near De Aar (Northern Cape, South Africa) 2011- date. *Project Leader.* The project entailed an Environmental Impact Assessment for a wind energy facility, comprising 300 - 520 MW, located on the Eastern Plateau approximately 20 km east of De Aar, Northern

Cape. Responsible for the management and review of the EIA Process and finances. (Mulilo Renewable Energy).

Three photovoltaic (PV) energy facilities near De Aar (Northern Cape, South Africa) 2011- date. *Technical Reviewer.* The project entailed two Environmental Impact Assessments and a Basic Assessment for three PV energy facilities, comprising between 20 - 150 MW, located near De Aar, Northern Cape. Responsible for the review of the EIA Process. (Mulilo Renewable Energy).

Three PV energy facilities near Copperton (Northern Cape, South Africa) 2011- date. *Project Leader.* The project entailed three Environmental Impact Assessments for three PV energy facilities, comprising 75 - 150 MW, located near Copperton, Northern Cape. Responsible for the management and review of the EIA Process and finances. (Mulilo Renewable Energy).

Wind energy facility on near Gouda (Western Cape, South Africa) 2011- date. *Project Leader.* The project entailed an EIA for a wind energy facility, comprising 30 MW, located near Gouda, Western Cape. Responsible for the undertaking, management and review of the EIA Process and finances. (iNca Energy).

Wind energy facility near Koekenaap (Western Cape, South Africa) 2011- date. *Project Leader.* The project entailed undertaking the basic assessment for the construction of eight proposed wind turbines to generate approximately 19.2MW on the Oliphant's River Settlement near Koekenaap. Responsible for the management and review of the Basic Assessment Process and finances. (Plan 8).

Anaerobic biodigester in Elgin (Western Cape, South Africa) 2011- date. *Project Leader.* The project entailed a Basic Assessment for an anaerobic digester and associated infrastructure for the processing of organic waste to generate heat and electricity on erven 291 and 292, Grabouw. Responsible for the management and review of the Basic Assessment Process and finances. (Elgin Fruit Juices).

Rehabilitation of the stormwater system at Zevenwacht Residential Estate, Zevenwacht (Western Cape, South Africa) 2011 to date. *Project Leader.* The project entailed a basic assessment for the rehabilitation of the stormwater management system on Zevenwacht Residential Estate in order to avoid seasonal flooding of an adjacent residential estate. Responsible for the management and review of the Basic Assessment Process. (City of Cape Town).

Upgrading the PPC Riebeeck Plant near Riebeeck West (Western Cape, South Africa) 2010 – 2012. *Technical advisor.* This project entailed the undertaking of an Environmental Impact Assessment (EIA) for the upgrade of the existing Pretoria Portland Cement Riebeeck Plant. Aurecon undertook the environmental authorisation processes required for the proposed upgrade to the existing cement manufacturing plant in Riebeeck West. The upgrade of PPC Riebeeck would align the plant's functioning and operations with the emission requirements now and in the foreseeable future. Responsible for *ad hoc* review and technical input. (PPC Cement).

Wind energy facility on Struisbult Farm near Copperton (Northern Cape, South Africa) 2011- 2012. *Project Leader.* The project entailed an Environmental Impact Assessment for a wind energy facility, comprising 140 MW, located near Copperton, Northern Cape. Responsible for the undertaking, management and review of the EIA Process and finances. (Plan 8).

Hydropower station on the Orange River near Kakamas (Northern Cape, South Africa) 2011- 2012. *Project Leader.* The project entailed a Basic Assessment for a hydropower station, comprising 12 MW, located on the Orange River near Kakamas in the Northern Cape. Responsible for the management, finances, undertaking the Basic Assessment Process, specialist co-ordination and public participation process. (Mulilo).

Wind energy facility in Saldanha (Western Cape, South Africa) 2011- 2012. *Project Leader.* The project entailed a Basic Assessment for a wind energy facility, comprising 6 turbines, located within the industrial area of Saldanha, Western Cape. Responsible for the management and review of the Basic Assessment Process and finances. (Arcellor Mittal).

Solar energy facility on Onder Rietvlei Farm (Portion 3 of Farm 18, Aurora) near Aurora (Western Cape, South Africa) 2011 – 2012. *Technical Advisor.* The project entailed a Basic Assessment for the proposed construction of a 10 MW solar energy facility. Responsible for review of documentation. (Solaire Direct Southern Africa).

Reverse osmosis plant at Hendrina Power Station near Pullenshope (Mpumalanga, South Africa)

2011-2012. Project Leader. The current water management system at Hendrina Power Station is at risk of non-compliance with Eskom Holdings (Pty) Ltd's (Eskom) Zero Liquid Effluent Discharge policy due to excess wastewater. In order to reduce the risk of non-compliance, Eskom proposed to construct a reverse osmosis (RO) plant to treat concentrated cooling water, which was being disposed of at the ash dam as wastewater. The treated water from this plant would be re-used in the power station's processes. The project entailed a Basic Assessment and Waste Management Licence for the RO plant. Responsible for the undertaking, management and review of the Basic Assessment process and finances. (Eskom Holdings).

Extension of the Ash Dam Facility at Kriel Power Station (Mpumalanga, South Africa) 2010 – Date. Technical advisor. The project entails an EIA and a Waste Management Licence for the proposed construction of a fourth ash dam facility at the Kriel power station. Responsible for *ad hoc* review of various documents and providing technical input, as required. (Eskom Holdings)

Reverse osmosis plant at Tutuka Power Station (Mpumalanga, South Africa) 2010-2011. Project Leader. The brine from the existing RO plant was being disposed of on the ash dump through irrigation and this was resulting in leachate from the ash dump. Eskom proposed the construction of an additional RO plant to concentrate the brine from the existing plant in order to limit brine being sent to the ash dump and to recover water that would be used within the power station. The project entailed a Basic Assessment and Waste Management Licence for the RO plant. Responsible for the undertaking, management and review of the Basic Assessment process and finances. (Eskom Holdings).

Moatize Coal Mine expansion in Tete (Mozambique) 2010. Senior Environmental Practitioner. The project entailed an EIA for the expansion of the existing Moatize Coal Mine in the Tête province in Mozambique. Responsible for report writing. (Vale Moçambique).

Abstraction of groundwater to augment Sedgefield's water supply (Western Cape, South Africa) 2009. Senior Environmental Practitioner. The project entailed a basic assessment for the abstraction of groundwater in order to augment Sedgefield's water supply. Responsible for the compilation of the Basic Assessment Report (BAR) and ran the public participation process. (Knysna Municipality).

Wind monitoring masts in Cookhouse (Eastern Cape, South Africa) 2009. Senior Environmental Practitioner. The project entailed a basic assessment for two wind monitoring masts for the collection of wind data. Responsible for the compilation of the Basic Assessment Report (BAR) and ran the public participation process. (African Infrastructure Investment Managers (AIIM)).

Wind monitoring masts in Middelburg (Eastern Cape, South Africa) 2009. Senior Environmental Practitioner. The project entailed a basic assessment for two wind monitoring masts for the collection of wind data. Responsible for the compilation of the Basic Assessment Report (BAR) and ran the public participation process. (African Infrastructure Investment Managers (AIIM)).

Wind monitoring masts in De Aar (Northern Cape, South Africa) 2009. Senior Environmental Practitioner. The project entailed a basic assessment for two proposed wind monitoring masts for the collection of wind data. Responsible for the compilation of the Basic Assessment Report (BAR) and ran the public participation process. (African Infrastructure Investment Managers (AIIM)).

Sedgefield off-channel dam (Western Cape, South Africa) 2008. Environmental Practitioner. The project involved an EIA for an off-channel dam in Sedgefield. Responsible for compiling the EIA report and for the public participation process. (Knysna Municipality).

Garden City New Town development near Kraaifontein (Western Cape, South Africa) 2008 - 2012. Project Leader and Senior Environmental Practitioner. This project included an Environmental Impact Assessment (EIA) for a proposed low income integrated housing development covering 782 ha on behalf of Garden Cities and Basil Read. Responsible for the EIA, all related administrative and management tasks and the compilation of a framework Environmental Management Plan (EMP). (Garden Cities/Basil Read).

Two coal-fired power stations in the Waterberg (Limpopo, South Africa) 2008 - Date. Project Leader and Senior Environmental Practitioner. The project involved site selection and an Environmental Impact Assessment (EIA) for two proposed coal-fired power stations in Limpopo. The EIA and the framework compilation of an Environmental Management Plan (EMP) were undertaken with the involvement of 17 specialists. Responsible for the site selection process, undertaken by the EIA team, identifying sites based on technical, environmental and economical constraints. Later in the project cycle took over the management of the project, including compilation of the Environmental Impact Reporting and project finances.

Review work (Eastern Cape, South Africa) 2008. *Environmental Practitioner.* Appointed by the Eastern Cape's Department of Economic Development and Environmental Affairs (DEDEA) to review and process the backlog of Environmental Impact Assessment applications under the Environmental Conservation Act (ECA). Reviewed and processed a number of applications under the Environmental Conservation Act according to sound EIA practices and legal requirements. Drafted correspondence to applicants, as well as Records of Decision on behalf of DEDEA. (Eastern Cape Department of Economic Development and Environmental Affairs (DEDEA).

Subdivision of Farm Palmiet River Number 319, Elgin (Western Cape, South Africa) 2008. *Environmental Practitioner.* The project included a basic assessment for the proposed subdivision of Farm Palmiet River for residential purposes. Responsible for finalising the basic assessment report and compiling the comments and response report. (Molteno Brothers).

Siting exercise for a Coal-to-Liquids facility (South Africa) 2008. *Environmental Practitioner.* The project entailed the identification of sites for an 80 barrel a day Coal-to-Liquids facility as well as selection of a preferred site based on a multi-criteria decision analysis tool. Responsible for compilation of reports. (PetroSA)

Plant extraction facility in the Paarl Industrial Area (Western Cape, South Africa) 2007 - 2008. *Environmental Practitioner.* The project comprised a basic assessment for the construction of a plant extraction facility in Paarl. Responsible for compiling the basic assessment report and running the public participation process. (Cognis).

Upgrade of fuel pipelines at Cape Town International Airport (Western Cape, South Africa) 2007. *Environmental Practitioner.* The project comprised of an exemption application to upgrade fuel pipelines at Cape Town International Airport. Responsible for working on compiling the exemption application. (Kantey & Templer for Airports Company of South Africa (ACSA)).

Deepwater geophysical survey of the South African Continental Margin (South Africa) 2007. *Environmental Practitioner.* The project comprised a deepwater geophysical survey of the South African Continental Margin. Responsible for the compilation of the EIA and EMP, undertaking the public participation process and specialist co-ordination. (PetroSA)

2D seismic survey in the Northern Block, offshore Namibia (Namibia) 2007. *Environmental Practitioner.* The project comprised a 2D seismic survey in the Northern Block, offshore Namibia. Responsible for compiling the EIA and EMP, undertaking the public participation process and specialist co-ordination. (BHP Billiton Petroleum).

Development of the Ibhubesi Gas Field and associated infrastructure (Western Cape, South Africa) 2006 - 2007. *Environmental Practitioner.* This project included an Environmental Impact Assessment (EIA) for the development of Ibhubesi Gas Field. Responsible for writing sections of the Scoping Report and EIA, as well as compiling comments reports and maintaining the I&AP database. (Forest Oil).

Rocklands Eco Estate, Cape Town (Western Cape, South Africa) 2006 - 2007. *Environmental Practitioner.* The project involved basic assessment for the development of a proposed eco estate with approximately 80 houses and public open space. Responsible for being involved in specialist coordination and running the public participation process.

Rezoning of public open space (portion of Erf 10565, Boston, Bellville) (Western Cape, South Africa) 2006 - 2007. *Environmental Practitioner.* The project entailed a basic assessment for the proposed construction of an off-ramp and parking area in Boston, Bellville. Responsible for helping to compile the basic assessment report and running the public participation process. (Bright's Hardware).

Forty borrow pits in the Beaufort West and Murraysburg area, Karoo (Western Cape, South Africa) 2006 - 2007. *Environmental Practitioner.* The project entailed Environmental Management Programmes (EMPs) in terms of the Minerals and Petroleum Resources Development Act for forty strategic borrow pits, required for the resurfacing of gravel roads, in and around the Beaufort West and Murraysburg areas (Central Karoo District) in the Karoo. Responsible for compiling the EMPs, managing two specialists and running the public participation process. (Kwezi V3 for Provincial Government Western Cape).

Borrow pits for the upgrade of road sections in the Overberg District (Western Cape, South

Africa) 2006 - 2007. *Environmental Practitioner.* The project entailed Environmental Management Programmes (EMPs) in terms of the Minerals and Petroleum Resources Development Act for nine borrow pits, required for the resurfacing of gravel roads in the Overberg District. Responsible for compiling the EMPs, managing two specialists and running the public participation process. (PD Naidoo & Associates for Provincial Government Western Cape).

Upgrade of the N1 intersections near De Doorns (Western Cape, South Africa) 2006 - 2007. *Environmental Practitioner.* The project consisted of a basic assessment for the proposed upgrading of intersections on the N1 near De Doorns. Responsible for being involved in compiling the basic assessment report and running the public participation process. (Argus Gibb for the South African National Roads Agency Ltd).

New regional landfill to service the City of Cape Town (Cape Town) 2006 - 2007. *Environmental Practitioner.* The project involved an Environmental Impact Assessment (EIA) for a landfill near Atlantis. Responsible for being involved in organising the public participation process, compiling a comments report and managing the I&AP database. (City of Cape Town).

Subdivision and rezoning of Erf 3410, Simon's Town (Simon's Town, Cape Town) 2006 - 2007. *Environmental Practitioner.* The project consisted of a basic assessment for the proposed development of 10 luxury houses in Glencairn. Responsible for compiling the basic assessment report, specialist coordination and running the public participation process. (Cape Town Coastal Properties).

Upgrading of facilities at the River Club in Observatory (South Africa) 2006 - 2007. *Environmental Practitioner.* The project included basic assessment for the proposed upgrading of facilities at the River Club (including a conference centre and additional buildings). Responsible for being involved in specialist coordination and running the public participation process.

Subdivision and rezoning of Erf 23300, Maitland (Royal Maitland Phase 3) (Cape Town) 2006 - 2007. *Environmental Practitioner.* The project entailed a basic assessment for the subdivision and rezoning of Erf 23300, Maitland, for the proposed development of middle-income housing (Royal Maitland Phase 3). Responsible for being involved in compiling the basic assessment report, specialist coordination and running the public participation process. (Cape Town Community Housing Company).

Subdivision and rezoning of Erf 1366, Eerste River (Western Cape) 2006 - 2007. *Environmental Practitioner.* The project comprised basic assessment for rezoning Erf 1366, Eerste River, for a residential development of 47 houses. Responsible for compiling the basic assessment report, specialist coordination, running the public participation process, and compiling a construction environmental management plan. (Tech-Sure Fin).

Geotechnical survey in the Southern and Northern Blocks offshore Namibia (Namibia) 2006. *Environmental Practitioner.* The project comprised a geotechnical survey of the Southern and Northern Blocks offshore Namibia. Responsible for compilation of an Addendum Report for the surveys and managing the public participation process, specialist co-ordination and compiling the EIA and EMP. (BHP Billiton Petroleum).

Reseal of Trunk road 44/1, Main roads 401, 404, 368 and the upgrade of Divisional road 1834 and the development of an associated borrow pit near Uniondale (Western Cape) 2006. *Environmental Practitioner.* The project entailed the resealing of Trunk road 44/1, Main roads 401, 404, 368 and the upgrade of Divisional road 1834 from gravel to sealed road. An associated borrow pit was also developed. Responsible for the compilation of the EMP and Checklist in terms of the Environmental Conservation Act as well as undertaking the public participation and specialist co-ordination. (SNA for Provincial Government Western Cape).

Construction Environmental Management Plan for Sitari Fields Golf Estate, Firgrove/ Macassar (Western Cape) 2006. *Environmental Practitioner.* The project comprised a golf estate consisting of mixed uses, including a golf course, housing and clubhouse. Responsible for the compilation of a Construction EMP. (Olympian Developing Company).

Exemption application for tow surfing in the Table Mountain Marine Protected Area (Western Cape) 2006. *Environmental Practitioner.* The project entailed an exemption application to allow for tow surfing, a prohibited activity, within the Table Mountain Marine Protected Area. Responsible for compiling the exemption application, which included research into the environmental impacts of tow surfing, in terms of noise and emissions. (Tow Surf South Africa).

Education

2004 : BSc (Hons) Environmental Management, University of Cape Town, South Africa
 2003 : BSc Environmental and Geographical Science, University of Cape Town, South Africa

Career enhancing courses

2010 : Conflict Management Course, Centre for Conflict Management, South Africa
 2010 : Project Management Course, Aurecon (Internal), South Africa
 2009 : Certificate in Project Management: Principles and methods for use in business, University of Cape Town, South Africa
 2008 : Using Natural Resources for Community Development, GTZ, South Africa

Professional affiliations

Member, International Association for Impact Assessment South Africa (IAIASa)
 Professional Natural Scientist, SA Council for Natural Scientific Professions (SACNASP)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Good	Good	Good

Publications

Corbett L & Mangnall M. 2009. "The value of pre-EIA screening exercises". Presented at the 2009 IAIA Conference.

Van Wyk S. 2012. "The challenges of Environmental Governance: The case of Proclaimed Fishing harbours, Western Cape". Presented on behalf of S van Wyk at the 2012 IAIA Conference.

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 K VERSFELD

Name : **VERSFELD, KAREN**
 Date of Birth : 26 March 1980
 Profession/Specialisation : Senior Environmental Scientist
 Years with Firm : 6
 Nationality : South African
 Years experience : 10

Key qualifications

Ms Versfeld is a Senior Environmental Scientist with a MSc in Water Resource Management from the University of Pretoria. She has over eight years' experience in the Environmental and Water Resource Management fields.

In the environmental management field, Karen has experience in undertaking environmental processes for both small and medium to large-scale developments ranging from renewable energy projects to industrial and mining projects. As a Project Leader, Karen is responsible for managing the specialist team and reviewing specialist reports, coordinating the EIA process, integration of the impact assessments conducted by specialists to provide a holistic understanding of the potential impacts resulting from the project, and compilation of the EIA reports in accordance with applicable legislation. In the water resources field, Karen has experience as a surface water quality specialist and in applying for Water Use Authorisations in terms of the National Water Act (Act 36 of 1998).

Employment record

03/2009 - Date	Aurecon (previously Africon, Ninham Shand and Connell Wagner), Senior Environmental Scientist
11/2008 - 02/2009	Ninham Shand, Water Resource Scientist
02/2008 - 11/2008	Arcus GIBB (Pty) Ltd, Environmental Scientist
11/2005 - 01/2008	ILISO Consulting (Pty) Ltd, Environmental Scientist
03/2005 - 10/2005	Hartbeespoort Water Action Group (HWAG), Project Coordinator
09/2004 - 02/2005	CPH2O, Geographic Information System (GIS) Consultant

Management experience

07/2011 - Date	Project Leader
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Experience record

Basic Assessment (BA) for the proposed transmission lines from the South and North WEFs on the Eastern Plateau (De Aar 2), near De Aar, Northern Cape (Northern Cape, South Africa) 11/2012 - Date. *Project Leader.* Undertaking a Basic Assessment and EMP process for two 132kV overhead transmission lines connecting two WEFs, to be developed to the east of De Aar, to the national transmission grid. The proposed transmission lines would consist of a single servitude approximately 21km in length which would feed into Eskom's proposed Bushbuck substation. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multidisciplinary specialist team, review of specialist reports, and compilation of the BA Report and EMP. Involved for 2 person-months. (Mulilo Renewable Energy).

Social and Environmental Impact Assessment (SEIA) for the proposed mining of the Z20 uranium deposit (Erongo Region, Namibia) 10/2012 - Date. *Project Manager.* Aurecon was appointed to manage the SEIA process for the proposed mining of the Z20 uranium deposit and the infrastructure corridor linking the proposed mine to the Rössing plant. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multidisciplinary specialist team, review of specialist reports, compilation of the SEIA Report and EMP, and presentation at stakeholder forums. Involved for 4 person-months. (Rössing Uranium Limited).

Basic Assessment (BA) for the proposed transmission lines from the Maanhaarberg and Damfontein Wind Energy Facilities (WEF) (De Aar 1), near De Aar, Northern Cape (Northern Cape, South Africa) 07/2012 - Date. Undertaking a Basic Assessment process for two 132kV overhead transmission lines

connecting a two-phased WEF, to be developed to the west of De Aar, to the national transmission grid. The proposed transmission lines would consist of a single servitude approximately 25.6km in length which would feed into Eskom's proposed Eskom/PV3 substation. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multidisciplinary specialist team, review of specialist reports, and compilation of the BA Report and EMP. Involved for 2 person-months. (Mulilo Renewable Energy).

Environmental Impact Assessment (EIA) for the construction of the bulk water supply scheme at Aussenkehr (Aussenkehr, Namibia) 03/2012 - Date. *Project Leader.* Aurecon was appointed to manage a comprehensive and multi-disciplinary Environmental Impact Assessment (EIA) process for the proposed construction of the bulk water supply scheme for the town of Aussenkehr. Responsible for coordinating the multidisciplinary specialist team, review of specialist reports, compilation of the EIA Reports and EMP, and presenting at the stakeholder forums. Involved for 1 person-month. (Namibia Water Corporation (NamWater)).

Strandfontein School Integrated Waste Management Plan (IWMP) (Western Cape Province, South Africa) 01/2012 - Date. *Project Leader.* The project entailed the compilation of an Integrated Waste Management Plan (IWMP) for the rehabilitation of Erf 14927 and undertaking a Section 24G process to rectify the commencement of the unlawful activities. Responsible for financial management, contract negotiations with sub-consultants, coordinating the specialist team, review of specialist reports, and compilation of the reports. Involved for 0.5 person-months. (Western Cape Education Department (WCED)).

Environmental Impact Assessment (EIA) process for the proposed photovoltaic (solar) energy plan on Badenhorst Dam Farm, Paarde Valley Farm, and Annex du Plessis Dam Farm near De Aar (Northern Cape Province, South Africa) 11/2011 - 09/2012. *Project Leader.* Aurecon was appointed to manage two Environmental Impact Assessment (EIA) processes and one basic assessment for the proposed construction of three photovoltaic energy facilities and associated infrastructure. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multidisciplinary specialist team, review of specialist reports, and compilation of the EIA and BA Reports and EMP, and presenting at the stakeholder meetings. Involved for 2 person-months. (Mulilo Renewable Energy (Pty) Ltd).

Upgrades to the existing cement manufacturing plant and associated operations in Riebeeck West (Western Cape Province, South Africa) 07/2011 - Date. *Project Leader.* Aurecon was appointed to manage a comprehensive and multi-disciplinary Environmental Impact Assessment (EIA) process for the upgrading of an existing cement manufacturing plant and associated infrastructure. Responsible for coordinating the multidisciplinary specialist team, review of specialist reports, and compilation of the EIA Report and EMP, and presenting at the stakeholder meetings. Involved for 5 person-months. (Pretoria Portland Cement (PPC)).

Construction of the Newton pipeline (South Africa) 02/2011 - Date. *Task Leader.* This project entailed the construction of a potable water pipeline to supply water to the residents of Newton, Wellington, and Paarl. Responsible for the preparation of documentation in support of the water use authorisation and liaison with the Department of Water Affairs (DWA). Involved for 0.25 person-months. (Drakenstein Municipality).

Khanyisa Power Station (South Africa) 09/2010 - 01/2012. *Task Leader.* This project entailed an application for environmental authorisation for the proposed Khanyisa Power Station. Responsible for the surface Water Quality Impacts Assessments (WQIAs) associated with the proposed development. Involved for 0.5 person-months. (Ministry of Irrigation and Water Development).

Development of reconciliation strategies for large bulk water supply systems for the Greater Bloemfontein Area (Free State Province, South Africa) 11/2008 - Date. *Project Scientist.* The objective of this project was to develop a strategy that sets out a course of action to ensure adequate and sustainable reconciliation of future water requirements in the Greater Bloemfontein Area for a horizon of at least 25 years. Responsible for managing the sub-consultants, compilation of the reports, and project administration. Involved for 2 person-months. (Department of Water Affairs (DWA)).

Establishment of water monitoring systems (Malawi) 11/2008 - 08/2011. *Project Coordinator.* The project involved establishing a network and Management Information System (MIS) for groundwater, surface water, and water quality monitoring systems. Responsible for coordinating the various sub-consultants, the compilation of project documentation, and the review of all reports before submission to the client. Involved for 2 person-months. (Ministry of Irrigation and Water Development).

Development of the Catchment Management Strategy (CMS) for the Breede-Overberg Water Management Area (WMA) (South Africa) 11/2008 - 07/2011. *Project Scientist.* The project entailed developing a Catchment Management Strategy (CMS) for the Breede-Overberg Water Management Area (WMA). Aurecon was appointed as a technical sub-consultant to provide input to the water resource component of the CMS. Assisted with the compilation of the report on the status of water resources and water resource management strategies. Involved for 0.8 person-months. (Pegasys).

Compilation of the Integrated Waste and Water Management Plan (IWWMP) for Elitheni Coal in support of a Water Use Licence (South Africa) 11/2008 - 06/2011. *Project Scientist.* The project involved undertaking specialist studies and preparing the technical reports in support of the Integrated Water Use Licence Application (IWULA). Responsible for the preparation of documentation in support of the water use authorisation and liaison with the Department of Water Affairs (DWA). Involved for 0.6 person-months. (Elitheni Coal (Pty) Ltd).

Development of reconciliation strategies for the Algoa Water Supply Area (Eastern Cape Province, South Africa) 11/2008 - 06/2011. *Project Scientist.* The project entailed developing strategies to reconcile the water supply available from the Algoa Water Supply System (AWSS) with the water requirements up to 2035. Responsible for the compilation of reports and project administration. Involved for 2 person-months. (Department of Water Affairs (DWA)).

Drakenstein River Management Plan: assessment of the urban reaches of rivers within the Drakenstein Municipality (Western Cape Province, South Africa) 11/2008 - 02/2011. *Project Scientist.* The project involved the assessment of the urban reaches of selected rivers from an environmental and engineering perspective to guide the development of a practical river management plan. Responsible for the river assessment. Assisted with the field investigation of the selected rivers. Involved for 0.1 person-months. (Drakenstein Municipality).

Water use authorisation process for identified water uses at the Pretoria Portland Cement's (PPC's) Jupiter cement plant in terms of the National Water Act (NWA) (South Africa) 02/2008 - 11/2008. *Project Scientist.* The project involved an application for a water use authorisation for the Jupiter Cement Plant. Responsible for the compilation of the technical reports in support of the Water Use Licence Application (WULA). Responsible for the preparation of documentation in support of the water use authorisation and liaison with the Department of Water Affairs (DWA). Involved for 0.25 person-months. (Pretoria Portland Cement (PPC)).

Compilation of the Volunteer Water Quality Training Manual, the Communication Structures Manual, and the Training Needs Manual for the Adopt-a-River Programme, Phase 2: development of an implementation plan (South Africa) 11/2008 - 02/2011. *Project Scientist.* The aim of the Adopt-a-River Programme was to create awareness and an understanding amongst all South Africans of the need to care for our scarce water resources and to facilitate their participation in the protection and management of these resources in an integrated manner. Responsible for developing the training manual for setting up a Water Quality Monitoring Programme (WQMP). Involved for 0.4 person-months. (Department of Water Affairs (DWA)).

Surface Water Quality Impact Assessment for the proposed ferrochrome smelter located outside of the Brits industrial area (North West Province, South Africa) 11/2008 - 02/2011. *Project Scientist.* The project comprised the assessment of the surface water impacts associated with establishing a ferrochrome smelter, and the development of baseline and operational Water Quality Monitoring Programme. Responsible for the surface Water Quality Impact Assessment and developing the Water Quality Monitoring Programme. Involved for 0.5 person-months. (Quanto Environmental Solutions cc).

Environmental compliance audits of Eskom's Gourikwa and Atlantis gas turbine power stations (Western Cape Province, South Africa) 02/2008 - 11/2008. *Project Scientist.* The project entailed auditing the construction sites in terms of the Environmental Management Plan (EMP). Responsible for compliance auditing on a quarterly interval. Involved for 1 person-month. (Eskom).

Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the transmission lines for a conventional nuclear power station and associated infrastructure at the Bantamsklip site (Nuclear 1) (Western Cape Province, South Africa) 02/2008 - 11/2008. *Project Scientist.* The project involved undertaking the Environmental Impact Assessment (EIA) for the proposed transmission line from the Bantamsklip site. Assisted with the Specialist site visit for identifying possible routes and associated impacts for the transmission line. Involved for 0.2 person-months. (Eskom).

Environmental auditing of the construction of erosion control structures along the Jukskei River (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Auditor.* The project entailed undertaking bi-weekly audits during the construction phase and submitting environmental compliance reports to the client. Responsible for environmental auditing and the compilation of audit reports. Involved for 0.1 person-months. (Johannesburg Roads Agency (JRA)).

Evaluation of the Water Use Licence Application (WULA) for Palabora Mining Company (PMC), Twickenham Platinum Mine, Sasol Nitro, and Xstrata Alloys in terms of the National Water Act (NWA) (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed the assessment of Water Use Licence Applications (WULA) on behalf of the Department of Water Affairs (DWA). Assisted with the drafting of the water use licences in accordance with the National Water Act (Act 36 of 1998) and record of decision. Involved for 4 person-months. (Department of Water Affairs (DWA)).

Gautrain Rapid Rail Link (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved a Water Use Licence Application (WULA) for the water use activities triggered by the Gautrain Rapid Rail Link. Assisted with the preparation of the technical report in support of the Water Use Licence Application. Involved for 1 person-month. (Gauteng Department of Public Transport, Roads and Works (GDPTRW)).

Gautrain Rapid Rail Link: diversion of a tributary of the Hennops River (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed applying for an amendment of the Gautrain Water Use Licence to include the proposed diversion of a tributary of the Hennops River. Assisted with the preparation of the technical report in support of Section 21 (i) and (c) water uses. Involved for 0.6 person-months. (Gauteng Department of Public Transport, Roads and Works (GDPTRW)).

Evaluation of the various Water Use Licence Applications (WULAs) in terms of the National Water Act (NWA) (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed the evaluation of Water Use Licence Applications (WULA) on behalf of the Department of Water Affairs (DWA). Assisted with the preparation of the water use licences in accordance with the National Water Act (Act 36 of 1998) and record of decision. Involved for 1 person-month. (Department of Water Affairs (DWA)).

Assessment of the Water Use Licence backlog and the evaluation of the various Water Use Licence Applications (WULAs) in terms of the National Water Act (NWA) (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed the assessment of Water Use Licence Applications (WULA) backlog to better understand the reasons for delays. Responsible for checking on the status of WULAs in Gauteng and in the Western Cape. Involved for 1 person-month. (Department of Water Affairs (DWA)).

The development of a reconciliation strategy for the Crocodile West Water Supply System: water quality assessment report (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* This project involved developing a reconciliation strategy for the Crocodile West Water Supply System. Responsible for data analysis and preparing the water quality assessment report. Involved for 2 person-months. (Department of Water Affairs (DWA)).

Upgrading of the Khutsong Wastewater Treatment Works (WWTW) (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved applying for environmental authorisation for the proposed upgrade of the Khutsong Wastewater Treatment Works (WWTW). Assisted with the compilation of the Environmental Impact Assessment (EIA) reports. Involved for 1 person-month. (Merafong City Local Municipality).

Construction of the Kokosi Wastewater Treatment Works (WWTW) (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved applying for environmental authorisation for the proposed upgrade of the Kokosi Wastewater Treatment Works (WWTW). Assisted with the compilation of the Environmental Impact Assessment (EIA) reports. Involved for 1 person-month. (Merafong City Local Municipality).

Upgrade of the expansion of the Zeekoegat Wastewater Treatment Works (WWTW) (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved applying for environmental authorisation for the proposed upgrade of the Zeekoegat Wastewater Treatment Works (WWTW) and applying for the Water Use Licence in terms of the National Water Act (NWA) (Act 36 of 1998). Assisted with the compilation of the Environmental Impact Assessment (EIA) reports. Involved for 1 person-month. (City of Tshwane).

Construction of the Wastewater Treatment Works (WWTW) for Nolukhanyo (South Africa) 11/2005 -

01/2008. Environmental Scientist. The project entailed applying for environmental authorisation for the proposed Nolutkhanyo Wastewater Treatment Works (WWTW). Responsible for the Environmental Impact Assessment (EIA). Assisted with the compilation of the Environmental Impact Assessment (EIA) reports. Involved for 1 person-month. (Ndlambe Municipality).

Construction of the poultry facility for Bontsi Poultry (Gauteng Province, South Africa) 11/2005 - 01/2008. Environmental Scientist. The project involved applying for environmental authorisation for the proposed development of a poultry farm. Assisted with the compilation of the Environmental Impact Assessment (EIA) reports. Involved for 0.6 person-months. (Bontsi Poultry (Pty) Ltd).

Environmental Management Plan (EMP) and environmental auditing of the new Durban Stadium construction site for the duration of the construction period (KwaZulu-Natal Province, South Africa) 11/2005 - 01/2008. Environmental Auditor. The project entailed compiling of an Environmental Management Plan (EMP) and undertaking monthly audits. Responsible for compiling the EMP and compliance auditing on a monthly. Involved for 2 person-months. (Ibholo Lethu Consortium).

Education

2004 : MSc Water Resource Management, University of Pretoria, South Africa
 2002 : Honours, University of Cape Town, South Africa
 2001 : BSc Microbiology and Plant Pathology, University of KwaZulu-Natal, South Africa

Career enhancing courses

2012 : Project Management: Principles and Methods for Use in Business, University of Cape Town, South Africa
 2012 : Project Management Course, Aurecon Project Support Office
 2010 : Legal Training Course, Aurecon Group Legal Services
 2010 : Climate Change and Integrated Water Resource Management (IWRM), University of the Western Cape, South Africa
 2009 : Catchment Management Strategy Development for the Breede Water Management Area (WMA), FET Water
 2007 : Environmental Law for Environmental Managers, North West University, Potchefstroom Campus
 2006 : Environmental Impact Assessment (EIA): The National Environmental Management Act (NEMA), North West University, Potchefstroom Campus

Professional affiliations

Candidate Member, South African Council for Natural Scientific Professions (SACNSP)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Fair	Fair	Fair

Referees

Company	Contact Person	Telephone nr.
Aurecon	Andries van der Merwe	+27 44 805 5427
Aurecon	Dr Chris von Holdt	+27 21 526 5793

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: Mrs K DE BRUYN

Name : **DE BRUYN, KAREN**
 Date of Birth : 12 December 1987
 Profession/Specialisation : Environmental studies/management
 Years with Firm : 3
 Nationality : South African
 Years experience : 4

Key qualifications

Karen de Bruyn is currently employed as an Environmental Assessment Practitioner at Aurecon, where she assists with compiling Basic Assessment Reports (BARs), Environmental Management Plans (EMPs), and Environmental Impact Assessments (EIAs).

She has experience in a wide range of projects; however her main focus has been waste management and renewable energy projects.

Karen holds BSc Conservation Ecology and MPhil in Environmental Management degrees both obtained from the University of Stellenbosch.

Employment record

03/2011 - Date Aurecon, Environmental Assessment Practitioner (EAP)
 02/2010 - 02/2011 Anèl Blignaut Environmental Consultants, Junior Environmental Assessment Practitioner (EAP)

Experience record

Cost estimates for solid waste management for the Kareeberg, Tsantsabane, Siyancuma and SiyaThemba Municipalities (Northern Cape Province, South Africa) 06/2012 - 08/2012. *Environmental Assessment Practitioner (EAP).* Many of South African municipalities do not properly manage the waste generated in their jurisdiction, and few comply with the National Environmental Management Waste Act (NEMA). Cost estimates were compiled to allow these municipalities to budget for the necessary environmental processes, upgrades, decommissioning of sites and the establishment of new sites. Responsible for site visits, compiling cost estimates to enable the municipalities to secure necessary budgetary requirements for sound solid waste management, fieldwork, report writing and identifying a way forward for these municipalities in terms of the required environmental processes. Involved for 1 person-month. (Mubesko Africa).

Update to Environmental and Social Impact Assessment (ESIA) for the construction of Ministry of Environment and Tourism (MET) staff houses at Ombika Gate of the Etosha National Park (Etosha National Park, Namibia) 06/2012 - 08/2012. *Environmental Assessment Practitioner (EAP).* The Millennium Challenge Account Namibia (MCA-N) is supporting the Ministry of Environment and Tourism (MET) with regard to infrastructure improvements in Etosha National Park (ENP). An Environmental and Social Impact Assessment (ESIA) study in 2010 by Aurecon identified and assessed all environmental and social impacts and developed required mitigation measures for all identified environmental issues for the site on the eastern side of the Ombika Gate (Ombika East). Both the site selection report and the follow-up site specific ESIA study were formally approved and environmental clearance granted by MET in accordance with the Environmental Management Act (EMA) of 2007. However, MET has formally requested that an alternate site on the west side of the road (Ombika West) be included in the assessment for the new staff village at Ombika (Okaukuejo Gate). Responsible for updating the ESIA report, assisting with report writing, presenting results to Interested & Affected Parties (I&APs), site visits and informing adjacent landowners of the additional study. Involved for 1 person-month. (Ministry of Environment and Tourism).

Construction Phase Environmental Management Programme (EMP) for the proposed office building for SANRAL on Erf 39688, Upper Oakdale (Western Cape Province, South Africa) 4/2012 - 05/2012. *Environmental Assessment Practitioner (EAP).* SANRAL required additional office space and proposed to develop a business park that would involve the construction of an office building of approximately 3000 m²; widening of the existing Mispel road, additional access roads, landscaping, lighting, parking bays, security and signage. The Environmental Management Programme (EMP) provided a link between the identified

impacts and the environmental management required during project implementation. Responsible for compiling the EMP, liaising with client and site visits. Involved for 1 person-month. (SANRAL).

Socio-Economic Impact Assessment (SEIA) for the proposed mining of the Z20 uranium deposit at Rössing Uranium Mine (Namibia) 09/2012. *Environmental Assessment Practitioner (EAP).* It is envisaged that the Z20 uranium deposit would be mined as a satellite open pit as it contains uranium bearing alaskite rocks, utilising conventional blast, load and haul methodology.

The proposed mining project would therefore entail the following:

- Mining of the Z20 ore body and disposal of Z20 waste rock;
- Expansion of the approved Acid Plant;
- Processing plant modifications;
- Changes to the present Tailings Storage Facility (TSF); and
- Establishment of a new High Density TSF on the Rössing Dome.

An infrastructure corridor were included in the assessment to link the Z20 site to the existing Rössing Uranium Mine across the Khan River, which would include a RopeCon/ RailCon aerial conveyor; an asphalt access road and other services which include a water supply -, power supply - and fuel supply pipeline. Responsible for the report compilation, both scoping report and Environmental Management Plan (EMP). Involved for 4 person-months. (Rössing Uranium).

Integrated Waste Management Plan and Section 24 G process to address the illegal waste disposal activities at Strandfontein High School, Mitchell's Plain (Western Cape Province, South Africa) 02/2012 - Date. *Environmental Assessment Practitioner (EAP).* The Department of Environmental Affairs and Development Planning (DEA&DP) Directorate: Environmental Compliance and Enforcement, issued Strandfontein Secondary School with a warning letter based on the illegal waste disposal activities on Erf 14927. In response to these illegal activities, the DEA&DP intervened and all disposal activities were ceased. An Integrated Waste Management Plan (IWMP) was compiled and a Section 24G process in terms of NEMA is being undertaken. Responsible for report compilation, liaising with authorities and site visits. Involved for 4 person-months. (Western Cape Education Department).

Proposed photovoltaic solar energy facilities near De Aar (Northern Cape Province, South Africa) 09/2011 - Date. *Environmental Assessment Practitioner (EAP).* Mulilo Renewable Energy proposed to construct three photovoltaic solar energy facilities near De Aar, which would enable them to be taken into consideration as an Independent Power Producer (IPP). The Integrated Resource Plan (IRP) 2010 allows for an additional 14 749MW of renewable energy in the electricity mix in South Africa by 2030, and Mulilo wanted to participate in this programme. The proposed facilities would be able to generate 169MW collectively. Responsible for compiling the scoping reports, the Basic Assessment Report (BAR), conducting the Public Participation Process (PPP) and liaising with all stakeholders. Involved for 4 person-months. (Mulilo Renewable Energy (Pty) Ltd).

Cost estimates for solid waste management for the Knysna, Cape Agulhas and Prince Albert Municipalities (Western Cape Province, South Africa) 06/2011 - 08/2011. *Environmental Assessment Practitioner (EAP).* Many of South African municipalities do not properly manage the waste generated in their jurisdiction, and few comply with the National Environmental Management Waste Act (NEMA). In order to identify non-compliance activities in the waste management systems of the Prince Albert, Phokwane, Cape Agulhas and Kannaland Municipalities, a site visit was undertaken and a cost estimates compiled. The cost estimates allowed these municipalities to budget for the necessary environmental processes, upgrades, decommissioning of sites and the establishment of new sites. Responsible for site visits, compiling cost estimates to enable the municipalities to secure necessary budgetary requirements for sound solid waste management, fieldwork, report writing and identifying a way forward for these municipalities in terms of the required environmental processes. Involved for 3 person-months. (Mubesko Africa).

Operational phase management plan of the Sandown Shoprite Checkers in Parklands (Western Cape Province, South Africa) 04/2011 - 05/2011. *Environmental Assessment Practitioner (EAP).* As a prerequisite to get the building plans for the Sandown Shoprite Checkers approved, an Operational Environmental Monitoring Programme (OEMP) had to be submitted to the City of Cape Town. The OEMP addressed key issues of on-site stormwater management, landscaping and management of a portion of public open space and a retention pond containing floating islands. Responsible for compiling an operation phase management plan. Involved for 1 person-month. (Shoprite Checkers).

Basic assessment process for the upgrade of Stokery Road in Wellington (Western Cape Province, South Africa) 04/2011 - Date. *Environmental Assessment Practitioner (EAP).* Drakenstein Municipality was

aiming to upgrade a 1.4km section of Stokery Road, starting 200m from the intersection with Main Road 27, Champagne Street, up to the intersection with Main Road 219, Main Street. The geometric layout was upgraded from a 9.2m surfaced road to a 14.8m surfaced road, with 1.8m surfaced sidewalks. This allows for two 3.4m lanes per direction to accommodate the left and right turning of heavy vehicles, and for safer pedestrian usage. The stormwater system upgrade included a concrete culvert to replace the current unlined channel on the western side. Responsible for completing the application form, the Basic Assessment Report (BAR) and the Environmental Management Plan (EMP). Involved for 3 person-months. (Drakenstein Local Municipality).

Borrow pit inspection in Oudtshoorn (Western Cape Province, South Africa) 03/2011 - 03/2011. Environmental Assessment Specialist (EAP). The project entailed assisting with the screening evaluation of potential borrow pit sites in the Oudtshoorn Municipal District. The three potential borrow pit sites were assessed in a high level screening process according to suitability from an environmental perspective to take it to the next level of geological investigation. Responsible for assisting the team leader with the compilation of the feedback/screening report of the potential sites that were investigated, and assisting with field work. Involved for 0.5 person-months.

Education

2011 : MPhil Environmental Management, University of Stellenbosch, South Africa
 2009 : BSc Conservation Ecology, University of Stellenbosch, South Africa

Career enhancing courses

2012 : Certificate in Business Writing for Professionals, University of Cape Town, South Africa

Professional affiliations

Associate Member, Institute of Waste Management of Southern Africa (IWMSA)
 Member, International Association for Impact Assessments South Africa (IAIASA)
 Certified Natural Scientist, South African Council for Natural Scientific Professions (SACNSP)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

Referees

Company	Contact Person	Telephone nr.
Anèl Blignaut Environmental Consultants	Anèl Blignaut	+27 82 751 9596 anel@dpeng.co.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

Curriculum vitae: Ms FLG SHIHEPO

Name : **SHIHEPO, FRANSINA LINEEKELA GRACE**
 Date of Birth : 24 January 1981
 Profession/Specialisation : Environmental Consultant/ Environmental Planning and Management
 Years with Firm : 2
 Nationality : Namibian
 Years experience : 10

Key qualifications

Grace is currently employed as an Environmental Consultant at Aurecon's Cape Town office. With an MSc in Environmental Science, specialising in Environmental Planning and Management, Grace has over eight years' experience within the field of environmental science.

Grace has previously worked as a Project Assistant for the United Nations Development Programme (UNDP) in Namibia under the Namibian Renewable Energy Project (NAMREP), in conjunction with the Ministry of Mines and Energy. NAMREP focused on promoting the use of renewable energy technologies in local communities as a measure to mitigate and adapt to climate change. While with NAMREP, Grace was part of the Namibian Team that conducted an assessment on the Investments and Financial Flows (I&FF) in order to adapt (agriculture) and mitigate (energy) climate change in the country. She also worked as Entomology Technician for the Namibian National Museum, where her responsibilities were to conduct entomological research that entailed acquisition of specimen, data collection and processing as well as publication of research results. Liaising with local and foreign researchers and coordinating educational awareness programmes.

Employment record

10/2012 - Date Aurecon, Environmental Consultant
 07/2009 - 09/2010 UNDP/MME Namibian Renewable Energy Programme (NAMREP), Project Assistant: Technical and Information
 06/2008 - 02/2009 Desert Minerals Exploration, Geological Field Officer
 08/2004 - 05/2008 National Museum of Namibia, Entomology Technician

Experience record

Proposed provincial borrow pits in the Western Cape (Western Cape Province, South Africa) 11/2012 - Date. *Environmental Consultant.* The project comprised the development of Environmental Management Programmes (EMPs) for borrow pits in the Western Cape. Responsible for composing Basic Assessment Reports (BARs) for the borrow pit sites. (Provincial Government of the Western Cape (PGWC)).

Social and Environmental Impact Assessments (SEIAs) for Z20 Mining Corridor (Swakopmund, Namibia) 10/2012 - Date. *Environmental Consultant.* The project involved undertaking Social and Environmental Impact Assessments (SEIAs) for the proposed mining of the Z20 uranium deposit as a satellite open pit, including the mining of the Z20 ore body and disposal of Z20 waste rock; the expansion of approved acid plant; processing plant modifications; changes to the present Tailings Storage Facility (TSF); and establishment of a new high-density TSF. Responsible for incorporating comments into the draft scoping report. (Rio Tinto Rössing Uranium).

Environmental Impact Assessment (EIA) for the hydropower station on the farm Riemvasmaak (Northern Cape Province, South Africa) 02/2012 - Date. *Environmental Consultant.* Aurecon was appointed to undertake the Basic Assessment (BA) process and compile an Environmental Management Plan (EMP) for the proposed hydropower station on the farm Riemvasmaak (remainder of Farm No 497 and portion of Farm No 498) on the Orange River near Augrabis. Responsible for assisting in the compilation of draft scoping reports. (Hydro Electric Power (Pty) Ltd).

Working for Wetlands (South Africa) 08/2011 - Date. *Environmental Consultant.* The project entailed conducting Environmental Impact Assessments (EIAs) for the rehabilitation of specific wetlands in all provinces of South Africa. The two main objectives of the Working for Wetlands project are wetland conservation and poverty reduction through job creation and skills development. Using funding from the Extended Public Works Programme (EPWP), Working for Wetlands' key objective is to support and enable

the protection, rehabilitation and sustainable use of South Africa's wetlands through cooperative governance and partnerships. Responsible for updating the Basic Assessment Reports (BARs). (South African National Biodiversity Institute (SANBI)).

Education

2012 : MSc Environmental Science: Environmental Planning and Management, Institute for Water Education, Netherlands (UNESCO-IHE)
 2006 : BTech: Nature Conservation, Polytechnic of Namibia
 2003 : NDip Natural Resource Management: Nature Conservation, Polytechnic of Namibia

Career enhancing courses

2011 : Project Management Certificate, UNESCO-IHE Institute for Water Education

Professional affiliations

Candidate Natural Scientist, South African Council for Natural Scientific Professions (SACNASP)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Good	Good	Good
Oshiwambo	Excellent	Excellent	Excellent

Publications

Shihepo FLG, 2012. "Coordination of Land Use Management in Relation to Water Resources in Iishana Sub-basin, Namibia". MSc Thesis, UNESCO-IHE, Delft, the Netherlands.

Hoveka E, and Shihepo FLG, 2010. "Handbook for Agricultural Extension Workers to Promote the Use of Renewable Energy Technologies in Namibia". Namibia Renewable Energy Project (NAMREP)/United Nations Development Programme (UNDP) Namibia and Ministry of Mines and Energy.

Shihepo FLG, Eiseb S, and Cunningham P, 2006. "Fleas (Insecta: Siphonaptera) Associated with Small Mammals in Selected Areas in Northern Namibia". Polytechnic of Namibia.

Referees

Company	Contact Person	Telephone nr.
NAM-PLACE/MET Namibia	Mr Jonas Heita	+264 812 537 642/jheita@namplace.org.na
UNESCO-IHE	Dr Wim Douven	+31 15 215 1712/w.douven@unesco-ihe.or

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

Signature of Staff Member

Date