

Curriculum vitae: Mr BHJ SMIT

Name : **SMIT, BAREND HENDRIK JACOBUS**
Date of Birth : 15 March 1963
Profession/Specialisation : Landscape architect
Years with Firm : 13
Nationality : South African
Years experience : 30

Key qualifications

Barend is currently the head of Aurecon's Environmental Division at its Tshwane office in South Africa, taking full professional responsibility for, and managing the work of this team of professional and support staff who work on a range of projects from environmental assessments to implementation of environmental management plans nationally and internationally. He is also the Competency Leader for Environmental Works for Aurecon's Africa and Middle East regional team. Since graduating in 1985, he has gained 30 years' experience in the strategic management of environmental aspects relating to the construction of bulk water supply projects such as dams, pipelines and tunnels, but also relating to roads, industrial and residential developments, and recreation and tourism infrastructure.

Through the years, Barend gained extensive experience in leading, managing and conducting a range of environmental impact assessments, and the preparation and subsequent implementation of project specific environmental management plans. He has also managed social impact studies in the course of his work, and has experience in liaison with local communities in project areas. He gained significant experience in the contractual aspects of implementing environmental management plans as part of larger construction projects, and the procurement of specialist services for impact assessments. In addition, he has undertaken landscape designs especially for rehabilitation of rock quarries, borrow pits and spoil dumps in relation to tunnels, dams and roads, in addition to purely aesthetic landscape design.

Barend is experienced in working as part of consortiums or independent projects teams set up for large scale engineering projects.

Employment record

2001 - Date	Aurecon, Technical Director
1998 - 2001	VKE Engineers, Associate
1991 - 1998	VKE Engineers, Landscape Architect
1988 - 1991	Houwteq Pty Ltd, Environmental Officer
1985 - 1988	Department of Water Affairs, Design Services Division: Landscape Architect
1984 - 1985	Department of Water Affairs, Special Tasks Division: Technician
1982 - 1983	Ekokonsult (Pty) Ltd Landscape Architects and Environmental Planners, Student Vacation Work

Experience record

Afam power station due diligence (Nigeria) 09/2013 - 02/2014. *Project leader.* Aurecon was appointed by Televaras as Technical Advisor to undertake a technical assessment of the Afam Power Station and its refurbishment/development plans. Aurecon's services included independent technical assessment of the Afam IV and V power plants and the refurbishment and capacity recovery plans, review of the permitting and commercial agreements, environmental review, plant management strategy review, development of benchmark capital and O&M costs estimates for the refurbishment plans, and review of the project financial model. (Taleveras Group of Companies).

Wetland delineation to determine the extent of wetland or wet areas related to the proposed routes of the new Pangaea and Kanga 88Kv powerlines. (Mpumalanga Province, South Africa) 05/2013 - 03/2014. *Project Director.* Eskom proposed the establishment of two 88 kV substations (Pangaea and Kanga) in conjunction with two 88 kV loop-in, loop-out lines from the existing 88 kV Erasmus-Arbor line in order to ensure electric supply for the upcoming Kusile railway line. This railway line will be constructed as a private siding which is needed to transport limestone to the Kusile power station. Aurecon was appointed to conduct a level 1 wetland assessment to determine the extent of wetland or wet areas that are related to the proposed routes chosen for the construction of the Pangaea and Kanga 88Kv powerlines. (Eskom).

Environmental impact assessment (EIA) for the Swaziland Rail Link Project (South Africa and Swaziland) 02/2013 - 02/2014. *Project Director.* Aurecon is providing environmental services for the upgrade and new construction related to the Swaziland rail link project. A comprehensive environmental impact assessment (EIA) will ensure that the project is implemented in compliance with relevant national and provincial environmental legislation. Through the EIA process, potential negative impacts will be identified and mitigation determined in order to minimise the project's impact on the environment and the community. The EIA also provides an opportunity to enhance the beneficial impacts associated with the project. (Transnet Capital Projects).

Zulti South asset based community development programme (South Africa) 02/2013 - 05/2013. *Project Advisor.* The project entails the development of a framework that will be used to execute and project manage relocation and resettlement of impacted families, various fields of livelihood and burial sites in the exclusion zone, inside the mine lease area and services corridor for the Zulti South Project near Richards Bay. (Richards Bay Minerals (RBM)).

Kleinkopje environmental management programme report (EMPR) amendment (Mpumalanga Province, South Africa) 09/2012 - 10/2013. *Project Director.* Kleinkopje colliery is an open-pit mine situated eight kilometres south of Emalahleni. Aurecon was engaged to amend the environmental management programme report (EMPR) for the Kleinkopje colliery. (Anglo Coal Limited Johannesburg).

State of energy reports for Polokwane and Mbombela (Northern Province, South Africa) 05/2012 - 02/2014. *Environmental Project Leader.* The project entailed an investigation and report on the current supply and demand of energy usage in the cities of Polokwane and Mbombela, as a basis for generating appropriate energy usage and efficiency strategies. (South African Local Government Association (SALGA)).

Feasibility study for the treatment of acid mine drainage (AMD) (Gauteng Province, South Africa) 01/2012 - 02/2013. *Phase Leader: Environmental.* Aurecon was appointed to conduct a feasibility study to address the treatment of acid mine drainage (AMD) from Gauteng's underground mining basins, by removing salts and metals, to protect the receiving water resources and reduce the dilution releases from the Vaal Dam to the Vaal Barrage. The work included investigating future scenarios, analysing alternative infrastructure options and exploring alternatives for implementation. (Department of Water Affairs (DWA)).

Front-end loading (FEL4) study for Nacala Port (Nampula, Mozambique) 10/2011 - 11/2013. *Team Leader: Environmental Services.* Aurecon was appointed for the complete on-shore port front-end-engineering design (FEED) for the Nacala Port, consisting of bulk materials handling (BMH), bulk earthworks, rail embankment and utilities and transportation infrastructure. Aurecon undertook a number of general functions during its detailed design, including verifying and updating the design criteria documents generated during the Nacala Port front-end loading 3 (FEL 3) study and the engineering design to achieve the requirements for the construction phase. Responsible for ensuring the designs meet the requirements of the approved Environmental Management Plans, environmental specifications, environmental rehabilitation specifications and design, and detail landscape design for facilities. (Vale Mozambique Limitada).

Environmental Officer for the Kusile 400 kV tie-ins and tie-outs of the transmission line project, Bronkhorstpruit (Mpumalanga Province, South Africa) 05/2011 - 03/2013. *Project leader.* Eskom's Kusile power station under construction is to be linked to other transmission feeder lines and new connecting lines are required to the power station. Consolidated Power Projects (CONCO) were appointed as main contractor for the tie-in and out work as well as installation of droppers during this time. CONCO appointed Aurecon as permanent on-site Environmental Officer (EO) for the short duration of the project. This individual and his role are managed for the duration of the project. Time is spent on site to provide assistance with environmental issues and provide expertise to environmental challenges. (Consolidated Power Projects (Pty) Ltd).

Simandou project: FEL 2 study for a new 50 Mtpa railway (Nzerekore-Kerouane, Liberia and Guinea) 03/2011 - 11/2011. *Team Leader: Environmental Services.* Aurecon was appointed to conduct the conceptual (FEL 2) study for a new 50 Mtpa railway line. The scope of services included surveying existing data; field investigation, laboratory tests and topographic survey; hydraulic/hydrological studies; geological/geotechnical management; railway studies and geometric design, earthworks, drainage and contentions. Responsible for environmental rehabilitation specifications and design. (Vale (VBG -Vale BSGR Guinea) or VBG Logistics (Vale BSGR Logistics)).

Detailed design of the Nacala Railway Corridor (Tete, Mozambique) 05/2011 - 07/2012. *Team Leader:*

Environmental Services. The project comprised the detailed design (FEL 4) for the Nacala Railway Corridor project. Aurecon previously developed FEL 1, 2 and 3 studies for the development of the corridor. The FEL 4 entailed the design of the entire railway line and its associated infrastructure, including the geometric design of the rail; cut and fill slope design and the design of the foundations, namely bridges, culverts and building structures. It also included the design of retaining walls; borrow pits; interference and access roads; building structural and electrical services; building wet and fire services; bulk water, sanitation and electricity and the mechanical design of pump stations. Responsible for ensuring the designs meet the requirements of the approved Environmental Management Plans, environmental specifications, environmental rehabilitation specifications and design, and detail landscape design for facilities. (Vale Moçambique Limitada).

Pre-feasibility study (FEL 2) to investigate the expansion of the iron ore corridor (Northern and Western Cape, South Africa) 04/2011 - 03/2012. *Team Leader: Environmental Services.* Aurecon was appointed to investigate the export of the iron ore capacity and the addition of manganese exports to the corridor. The study was for the development of the Hotazel-Postmasburg rail link. The scope of works included a depreciated optimised replacement cost (DORC) study, rail and port study, iron ore and manganese studies, terminal and marine development, financial modelling, risk assessments, project execution plan (PEP), feasibility study (FEL 3) and detailed engineering (FEL 4) and a preliminary design report. Responsible for providing environmental background and support regarding environmental impact mitigation measures to the engineering team. (Turner & Townsend).

Environmental authorisation process for the Sigma Theta powerline (KwaZulu-Natal Province, South Africa) 10/2010 - 08/2014. *Project Director.* The increased demand in load centres in KZN necessitates the strengthening of the transmission network. Aurecon was appointed by Eskom as the independent EAP to undertake the EIA for the construction of the 400kV line between the proposed Isundu substation near Pietermaritzburg to the proposed Mbewu substation near Empangeni. The project is part of the strengthening of the KZN transmission network by Eskom. (Eskom).

Environmental impact assessment and geohydrological and surface water investigations for Khanyisa power station (Mpumalanga Province, South Africa) 09/2010 - 01/2014. *Project Director.* Anglo American appointed Aurecon to perform an environmental impact assessment (EIA) for the proposed Khanyisa power station near Witbank in the Mpumalanga Province. As part of the EIA, several specialist studies were required to be included in documentation which would form part of the environmental authorisations for the proposed project. (Anglo Coal).

Demolition of a redundant plant for Procter & Gamble (Gauteng, South Africa) 06/2010 - 10/2010. *Environmental Site Specialist.* The project entailed tender documentation for the demolition of an existing redundant plant, to provide space for the construction of a new plant. The demolition work comprised the termination of all services; the demolition of an office building, industrial buildings and roads; and the preparation of the area for new construction. Aurecon appointed Deltaplan as a sub-consultant for the site survey work. Responsible for environmental impact assessment guidance during the demolition of the building. Involved for 4 person-months. (Procter & Gamble).

Engineering design (FEL 3) study of the railway line from Moatize to the Port of Nacala (Malawi and Mozambique) 04/2010 - 08/2011. *Team leader: Environmental Services.* The project entailed a basic engineering (FEL 3) study for the railway line between Moatize and the port of Nacala, including the upgrading and design of railway infrastructure. The railway connects the existing mine in Moatize to a new coal terminal in Nacala. The infrastructure was designed and built for 25 t loading to prepare the system for future expansions. Responsible for providing environmental background and support regarding environmental impact mitigation measures to the engineering team. (Vale Moçambique Limitada).

Environmental impact assessment (EIA) for the Nacala rail corridor (Malawi and Mozambique) 03/2010 - 09/2011. *Team Leader: Environmental Services.* The project entailed the completion of four environmental impact assessments (EIA's) for the upgrading of existing and the construction of new railway sections along the Nacala corridor from the Moatize Coal Mine in Tête Province, Mozambique, through Malawi, to the port of Nacala-a-Velha, and a new coal handling terminal. Responsible for supporting the EIA teams regarding environmental impact mitigation measures. (Vale Mocambique Limitada).

Concept study (FEL 1) to investigate the expansion of the Iron Ore Line in South Africa to 92 Mtpa (Northern and Western Cape, South Africa) 03/2010 - 08/2010. *Team Leader: Environmental Services.* In this project, a study was undertaken to identify the optimal solution for the expansion of the rail and port capacity of the existing iron ore export channel ("Orex Channel") to the Port of Saldanha. This included utilising the "Orex Channel" for future manganese exports. In addition, the project included the development of a new Environmental Impact Assessment application for the envisaged manganese ore export through the

channel. Responsible for providing environmental background and support regarding environmental impact mitigation measures to the engineering team. (BHP Billiton, Kumba Iron Ore, Assmang and BURK Mining Consortium).

Muela hydropower upgrading (Lesotho) 04/2009 - 12/2010. *Environmental Project Director.* The project consisted of a social and resettlement study focussing particularly on the social impacts of anticipated construction and related resettlement; this also included the compilation of an HIV/Aids management programme which could be implemented during the project implementation phase. Responsible for assistance in terms of the Environmental Impact Assessment (EIA), and general Geographic Information Systems (GIS) support. (Lesotho Highlands Water Commission).

Develop an environmental management plan (EMP) for the ash dumps at Kriel power station (Mpumalanga Province, South Africa) 11/2009 - 04/2015. *Project Director.* The Kriel power station employs wet ashing for the disposal of its ash. Presently two of the ashing dams have reached their capacity whilst the remaining ash dam will reach its capacity within the next four years. In order for the station to continue ashing in an environmentally responsible manner, one site has been identified adjacent to the current ash dam, within the Kriel power station premises, and the project will allow for an extension of the existing ash dams facility. An EIA process and subsequent environmental management report (EIR) needed to be undertaken that took into consideration construction, commissioning, operating and decommissioning impacts that will be submitted to the relevant authority. (Eskom).

Benoni Dams basic assessment (Gauteng, South Africa) 2009 - 2010. *Project Director.* Basic assessment for the widening of the Kleinfontein Dam Spillway in Benoni, Gauteng. Responsible for Geographic Information Systems (GIS) mapping requirements and project management. (Ekurhuleni Metropolitan Municipality).

Environmental Impact Assessment (EIA) for the Orange-Riet canal balancing Dam S1 (Free State, South Africa) 01/2009 - 02/2009. *Project Director.* Overseeing, managing and conducting a scoping and environmental impact assessment (EIA) process. (Department of Water Affairs).

Lesotho MCA Health Infrastructure Programme 2010 (Lesotho) 10/2009 - 09/2014. *Health, Safety and Environmental Manager.* This project involved the provision of programme management, construction supervision and environmental management services for the health infrastructure programme in Lesotho. This included the design of the National Reference Laboratory (NRL) and blood transfusion centre, the design of student and staff hostels at existing Lesotho Hospital, and the construction of 138 new health centres and 14 new outpatient departments (OPDs). (Millennium Challenge Account (MCA) - Lesotho).

Mokolo Crocodile Water Augmentation Project (Limpopo, South Africa) 09/2009 - 12/2014. *Team Leader: Environmental Services.* The project entailed comprehensive engineering services for the Mokolo Crocodile Water Augmentation Project (MCWAP), including the construction of two major bulk raw water transfer systems and associated infrastructure. The MCWAP supplies raw water to meet the demands of the new power station in Lephalale, mines and industry, and domestic users. The main components of the scheme are abstraction weirs, pump stations, pipelines and balancing storage. Responsible for leading and managing environmental team on the project with development of project specific environmental management plan, detailed environmental management pre-qualification documentation and specifications, tender evaluation and environmental monitoring during construction. (Trans-Caledon Tunnel Authority (TCTA)).

Olifants River Water Resources Development Project, Phase 2 (ORWRDP-2) (Limpopo Province, South Africa) 09/2009 - 01/2014. *Environmental Specialist.* The second phase of the Olifants River Water Resources Development Project (ORWRDP-2) was an extensive water resource development project to supply water for domestic and industrial (mining) use in Limpopo. The project was divided into two main schemes. The first scheme comprised a 70 km-long pumping main from the Flag Boshielo Dam to Mokopane, including three 6 MW pump stations en route. The second scheme consisted of the abstraction and distribution of water from the De Hoop Dam to various end points. Both schemes were monitored and controlled from a single remote control point with all elements linked via approximately 180 km of fibre optic cable. Responsible for Environmental Impact Assessment (EIA) and environmental monitoring of construction. Involved for 6 person-months. (Trans-Caledon Tunnel Authority (TCTA)).

Environmental impact assessment (EIA) for proposed stone quarries in Ucuá and Quicabo (Conduril) (Angola) 06/2009 - 10/2010. *Environmental Project Director.* The project entailed the environmental impact assessment (EIA) for proposed stone quarries. Responsible for the project management of the environmental component as well as the EIA for the project. (Conduril Sucursal Luanda).

Raising of the northern boundary dam wall (Gauteng Province, South Africa) 04/2009 - 04/2013. *Environmental Project Director.* AngloGold Ashanti appointed Aurecon in 2008 to conduct the feasibility study to investigate the possibility of raising the existing 2.5 m earthfill dam as the storage capacity in the dam was too small and hence led to constant spills of the dirty stormwater originating from contaminated zones into the Wonderfontein spruit. The raised dam would also have to comply with Regulation 704 in terms of providing sufficient storage capacity to fully absorb the 1:50 year flood. Responsible for project management of all EIA related activities and Environmental Management Programme Report (EMPR) amendment. Involved for 9 person-months. (AngloGold Ashanti Ltd).

Zuikerbosch wastewater treatment works: upgrading Filter Block 1 (Gauteng, South Africa) 08/2008 - 06/2013. *Environmental Practitioner and GIS Support.* The site is an old sludge dam adjacent to the Zuikerbosch pumping station owned by Rand Water. The embankment failed a number of years before and discharged sludge into the Vaal River. The dam was then subjected to a form of rehabilitation by providing a gabion type of overflow structure in the zone where the breach occurred. Responsible for public participation, obtaining environmental authorisation for an exemption application while providing general geographic information systems (GIS) support to the project team. (Rand Water).

Updating of the bankable feasibility study (BFS) to evaluate the transport of coal from Moatize to Nacala (Tete, Mozambique) 10/2008 - 03/2009. *Environmental Project Director.* Aurecon was appointed to update the 2006 bankable feasibility study (BFS) to 14 million tons per annum, and to develop the rail capacity simulation and trade-offs model for the ramp-up period. Alternative heavy haul routes on Sections 2 and 3 had to be investigated before it was assumed that the base case route was the best route for the new tonnages. An options analysis of other modes of transport for these sections was conducted. The project also entailed a phased upgrade of the railway line from 4mt to 26mt; and an update of the existing port terminal BFS to a 26 Mtpa solution. The project also included master planning for a 40 Mtpa port terminal facility. Responsible for cost estimates for environmental and social mitigation and resettlement and identification of cost estimates for additional studies required to develop a full social impact assessment, social mitigation and resettlement plans. Involved for 4 person-months. (Vale Mozambique).

Open cycle gas turbine peaking power plants in KwaZulu-Natal and the Coega Industrial Development Zone (IDZ) (KwaZulu-Natal and Eastern Cape Provinces, South Af) 08/2008 - 12/2012. *Project Director.* The project entailed the construction of open cycle gas turbine peaking power plants in KwaZulu-Natal and the Coega Industrial Development Zone (IDZ) in the Eastern Cape, for the provision of electricity during peak demand. (Merz & McLellan).

Upgrading of Simon Vermooten Road (Gauteng, South Africa) 05/2008 - 02/2011. *Landscape Architect.* The project consisted of planning for the doubling and upgrading of a portion of Simon Vermooten Road over a total length of approximately 5.3km to a four-lane dual carriageway road. The project included the upgrading of Simon Vermooten Road between Waltloo Road and Pretoria Road (both intersections included) and the N4 Freeway intersection of the existing interchange, the doubling and upgrading of Simon Vermooten Road between Pretoria Road and the N4 Interchange and between the N4 Interchange and Lynnwood Road, as well as the upgrading of intersections/accesses from Simon Vermooten Road to 18 roads, streets and localities. Responsible for landscape design on this main arterial road as part of the upgrading to a dual carriageway. (Ninham Shand Semenya Furumele JV).

Phased rehabilitation of 7 000 km of rural roads in Sudan (South Sudan) 05/2008 - 12/2011. *Environmental Specialist.* The project's aim was to prepare a programme to improve access and ensure the maintenance of prioritised rural feeder roads in linking critical communities and social service centres, production areas and markets. Aurecon was appointed for the rehabilitation and re-establishment of the entire rural network over a period of five years. The proposed road improvements are expected to cover about 7 000 km of priority rural roads spread over South Sudan. Services offered included road inventory and mapping, a road condition survey and environmental and social impact assessments (ESIAs). The scope and cost of improvement works were provided, together with the prioritisation of roads for rehabilitation. Aurecon prepared a development plan, cost estimates and improvement packages for conventional or labour-based works. (Government of Southern Sudan: Ministry of Transport and Roads).

Duplication of the Vlakfontein (Benoni) - Mamelodi water supply pipeline: phase 1 (Gauteng, South Africa) 04/2008 - 04/2009. *Environmental Project Director.* Conducted the basic assessment for the construction of a water supply pipeline. Responsible for obtaining the environmental authorisation for the duplication of the water supply pipeline, phase 1. (Rand Water).

Fish impact study for the Drakensberg pumped storage scheme (KwaZulu-Natal, South Africa)

03/2008 - 05/2010. *Project Director.* The project entailed the study of the impacts of proposed changes in the scheme operating regime on fish biodiversity. Responsible for managing the project, report writing and client liaison. Involved for 3 person-months. (Eskom).

Morgenzon/Sivukile Wastewater Treatment Works (WWTW) (South Africa) 03/2008 - 06/2009. *Project Director.* Assisted with the Environmental Impact Assessment (EIA) for a proposed Wastewater Treatment Works (WWTW) for the town of Morgenzon. (Lekwa Local Municipality).

Development of Sonland Park, Extension 1 (Gauteng, South Africa) 10/2007 - 12/2009. *Environmental Project Director.* Aurecon was appointed to assist with the development of an approximately 90ha plot, including approximately 1600 erven residential township and 20ha mixed use development, in order to cater for a housing shortage in the area. Responsible for assisting in the environmental impact assessment (EIA). (Masingita Property Investment).

Basic assessments for the upgrading of the Valhalla reservoir (Gauteng Province, South Africa) 2007 - 2008. *Project Director.* The project consisted of a basic environmental assessment to obtain authorisation for the construction of a new reservoir adjacent to an existing reservoir.

Basic assessment for the upgrading of Laudium pipelines (Pretoria, Gauteng Province, South Africa) 2007 - 2008. *Project Director.* The project entailed basic a environmental assessment to gain authorisation for the upgrading and replacement of water mains.

Basic assessment for the upgrading of the Khutala Pump Station (Kriel, Mpumalanga Province, South Africa) 2007 - 2008. *Project Director.* This project included a basic environmental assessment to gain authorisation for the upgrading and replacement of water mains at this major Department of Water Affairs and Forestry (DWAF) pump station. (Department of Water Affairs and Forestry (DWAF)).

Independent monitoring of Pecanwood Estate environmental management system (EMS) (Hartbeespoort, North West Province, South Africa) 06/2007 - 02/2009. *Specialist Advisor.* The project entailed an environmental management system (EMS) audit, reporting and recommendations on the Pecanwood Golf Estate at Hartbeespoort dam. Responsible for assisting Pecanwood Golf Estate and Exigent Engineering Consultants CC with the implementation of an ISO 14 001 compliant environmental management system for the estate. (Exigent Engineering Consultants).

Environmental management system (EMS) for Automotive Supplier Park in Rosslyn (Gauteng, South Africa) 02/2007 - 06/2011. *Project Director.* This project entailed the implementation of an Environmental Management System (EMS) at the Automotive Supplier Park (ASP). The Supplier Park Development Company was established in 2002 to develop and manage the Automotive Supplier Park. The project was one of the Gauteng Provincial Government's Blue IQ initiatives aimed at delivering strategic infrastructure in the South African automotive industry to stimulate sustainable economic growth and job creation in the province. (Supplier Park Development).

Extension of the Sunderland Ridge wastewater treatment works (WWTW) (Pretoria, Gauteng, South Africa) 01/2007 - 12/2011. *Project Director.* Aurecon was appointed to provide the engineering services for the extension of the Sunderland Ridge wastewater treatment works (WWTW) to 95 Ml/d. The purpose of the project was to provide a feasibility study for the 30 Ml/d extension; licence applications; environmental impact assessments (EIAs) and the relevant authorisations for the 30 Ml/d extension; and process design of the extension. Responsible to provide independent Environmental Control Officer (ECO) for the construction work that formed part of the extensions. (City of Tshwane).

Conceptual and detail design for the link lines, staging line and all civil structures and services between Salkor yard and the tippers in Saldanha Port (Saldanha Port, South Africa) 11/2006 - 03/2012. *Team Leader: Environmental Services.* The upgrading of capacity at the Saldanha Port to 93 Mtpa had to take place by 2013 and was undertaken in three phases. This project entailed the concept development and subsequently the detailed design for the railway portion of Phase 1A, which consisted of an upgrade from 29 Mtpa to 47 Mtpa. Responsible for providing environmental background and support regarding environmental impact mitigation measures to the engineering team. (Transnet Capital Projects).

Environmental Impact Assessment (EIA) for a landfill at the Rietfontein Weir (Mpumalanga Province, South Africa) 2006 - 2008. *Project Director.* Aurecon was appointed by the Department of Water Affairs and Forestry (DWAF) to complete an Environmental Impact Assessment (EIA) for a new landfill site to be used for disposing contaminated sludge from the dredging of the Rietfontein Weir. (Department of Water Affairs and Forestry (DWAF)).

Environmental Impact Assessment (EIA) for EIA for 66KV Lihobong power line (Lesotho) 09/2006 - 06/2010. *Project Director.* the objective of the project was to carry out an EIA for the new 40km power line reticulation to Lihobong Diamond Mine. Responsible for overseeing the project. (Platinum JV).

Development of contractor housing at the De Hoop dam (Limpopo, South Africa) 08/2006 - 12/2011. *Environmental Project Director.* Assisted in the basic assessment for the proposed development according to the Limpopo Department of Economic Development, Environment and Tourism. (Department of Water Affairs and Forestry (DWAF)).

Scoping environmental impact assessment (EIA) for the power line reticulation from As river mini hydropower projects (Free State Province, South Africa) 2006 - 2007. *Project Manager and Environmental Impact Assessment (EIA) Leader.* This project included an environmental impact assessment (EIA) and liaison with local communities for power line reticulation from two mini hydro power stations on the As River.

Detail design, upgrading and supervision of the construction of the Siphofaneni Bridge - St Phillips Road: Phase I, II, and III - preliminary, and detail technical design study, and assistance with tendering evaluation for works (Swaziland) 06/2006 - 10/2014. *Project Director - Environmental component.* The project consisted of construction of a new 300m two-lane bridge over the River Usuthu at Siphofaneni, a 1km link from the MR8 on the MR14 up to existing junction to St Phillips road, a 23km link from the MR14 junction to St Phillips, as well as a 7.7km link from St. Phillips road to the MR8 over the Usuthu River. Responsible for the compilation and implementation of the socio-economic impact assessment.

Involved for 4 person-months. (Delegation of the European Commission in Swaziland).

Environmental assistance to Golden Creek Property Developers (Gauteng South Africa) 2006. *Environmental Specialist.* Responsible for assisting in legal proceedings and acting as an expert witness in a legal appeal against the environmental authorisation of a regional waste landfill adjacent to a property owned by the developer. (Golden Greek Property Developers).

Upgrading of a sewer main in Noordwyk (Gauteng Province, South Africa) 2006. *Project Manager.* Aurecon was appointed to carry out an environmental authorisation exemption application and public consultation on this project, which comprised an upgrade of the existing sewer main that performed under capacity. (Johannesburg Water (Pty) Ltd).

Lesotho Highlands water project Phase II: feasibility study (Lesotho) 10/2005 - 11/2007. *Environmental Specialist.* The Treaty between the Government of the Republic of South Africa and the Government of the Kingdom of Lesotho, signed in 1986, defines the framework for implementing the Lesotho Highlands water project (LHWP). The project's objective was to transfer up to 70 cubic metres per second from the Senqu/Orange to the Vaal river system and to utilise this water transfer to generate hydropower in Lesotho.. Responsible to provide specialist input related to ongoing manpower requirements for the environmental monitoring of the Lesotho Highlands Water Project (LHWP). (Lesotho Highlands Water Commission (LHWC)).

Development of two hydropower stations near Bethlehem (Free State Province, South Africa) 09/2005 - 08/2010. *Project Director and Environmental Control Officer (ECO).* Bethlehem Hydro (Pty) Ltd appointed Aurecon to undertake the detailed design, construction supervision and project management duties for two small hydropower stations located near the town of Bethlehem, Free State Province, South Africa. The first scheme is a run of river scheme located on the Ash river and the second scheme was constructed on the flank of the existing Sol Plaatje dam. The two schemes were constructed simultaneously, offering significant cost savings to the project. Barend was appointed as an independent Environmental Control Officer (ECO) for the construction work that was part of the establishment of two new mini hydropower stations on the As River. (Bethlehem Hydro (Pty) Ltd).

Environmental Management Plan (EMP) for the Gautrain Rapid Rail Link (Gauteng Province, South Africa) 2005 - 2006. *Project Manager.* The Bombela Consortium appointed Aurecon to develop a requisite ISO 14 001 compliant Environmental Management Plan (EMP) for the construction and operation of this rapid rail link between Johannesburg, Pretoria and the OR Tambo International Airport (ORTIA).

The augmentation of the Moreleta Spruit outfall sewer (Gauteng Province, South Africa) 01/2005 - 02/2014. *Phase Leader: Environmental Impact assessment.* The Moreleta Spruit outfall sewer had insufficient capacity to handle the flow of sewage, resulting in regular spillage of raw effluent. Aurecon was

appointed for the feasibility and preliminary design of the Moreleta Spruit outfall sewer to determine the most viable option for refurbishment and upgrading. The detailed design, environmental impact assessment (EIA), geotechnical investigation and project risk assessment of the required works were completed in Phases 1 and 2. Phase 3 involved the rehabilitation of outfall/collector sewer pipes in the Moreleta Spruit catchment area. (City of Tshwane Metropolitan Municipality (CTMM)).

Operational Environmental Control Officer (ECO) for the Cosmo City project (Gauteng Province, South Africa) 2005. *Project Manager.* In this project, the City of Johannesburg required an operational Environmental Control Officer (ECO) for its Cosmo City project. Responsible for monitoring and reporting on the level of environmental compliance of all operational service providers, training residents on the efficient use of energy, and maintaining facilities. (City of Johannesburg).

Vaal River Eastern Sub-system Augmentation Project (VRESAP) (Mpumalanga Provinces, South Africa) 11/2004 - 11/2008. *Project Manager and EIA Leader on part time secondment to the Trans-Caledon Tunnel Authority (TCTA).* The project entailed the design and construction supervision of the Vaal River Eastern Sub-system Augmentation Project (VRESAP), an emergency water transfer scheme abstracting water from the Vaal Dam and pumping it to the Knoppiesfontein diversion structure over a distance of 115km. From the diversion structure the water is gravitated to the Bosjesspruit and Trichardsfontein Dams near Secunda. very tight timelines. Responsible for managing the complete environmental impact assessment (EIA). (Trans-Caledon Tunnel Authority (TCTA)).

Feasibility study for Rivière Pistache dam and related treatment and bulk distribution infrastructure (Island of Rodrigues, Mauritius) 03/2003 - 09/2004. *Environmental Impact Assessment (EIA) Leader.* The Island of Rodrigues, situated approximately 500km east of Mauritius, experienced severe seasonal shortages of potable and irrigation water, despite regular tropical cyclones. Aurecon, in association with Servansingh Jadav and Partners (Mauritius), was appointed by the Rodrigues Regional Assembly (RRA) in March 2003 to carry out a feasibility study for a dam and related treatment and bulk distribution infrastructure. Responsible for a complete environmental impact assessment (EIA) for a 42m high concrete face rockfill dam (CFRD) and the distribution network to supply water to this water-deprived Indian Ocean Island. (Rodrigues Regional Assembly (RRA)).

Environmental control of the construction of the Doornkraal Reservoir (Polokwane, Limpopo Province, South Africa) 02/2003 - 02/2009. *Project Manager and Environmental Control Officer (ECO).* Aurecon was appointed by Anglo Platinum Ltd as a construction environmental management control officer for the new 30MI reservoir on the outskirts of Polokwane. (Potgietersrus Platinums Ltd).

Design and construction supervision for the Berg River dam and supplement scheme (Western Cape Province, South Africa) 02/2003 - 02/2014. *Environmental Specialist and part time secondment to the Trans-Caledon Tunnel Authority (TCTA).* The Berg water project was implemented to augment the water supply of the Greater Cape Town Metropolitan area in the Western Cape Province, South Africa. The brief involved a dam type selection study, detailed design and construction supervision of the dam and supplement scheme. Responsible for compiling a comprehensive and integrated Environmental Management Plan (EMP) for the implementation of the 60m high concrete face rockfill Berg River Dam. (Trans-Caledon Tunnel Authority (TCTA)).

Scoping Environmental Impact Assessment (EIA) for the upgrading of the Road K46 and a new bridge over the Jukskei River (Gauteng, South Africa) 2002 - 2003. *Project Manager.* Aurecon was appointed by Gautrans to conduct a scoping Environmental Impact Assessment (EIA) as part of the approval process for upgrading this major arterial road. (Gautrans).

Upgrading of the existing water treatment works and pump station at Doorndraai dam (Northern Province, South Africa) 09/2002 - 01/2004. *Project Manager and Environmental Control Officer (ECO).* The project was concerned with Doorndraai water supply scheme in the Limpopo Province. Aurecon's responsibilities included preliminary and detailed design of pump station, mechanicals and reservoir, as well as the tender documentation and adjudication. It also included contract administration and construction monitoring. Responsible for construction environmental management control (Anglo Platinum Ltd).

Development of the Polokwane water supply scheme (Northern South Africa) 09/2002 - 11/2007. *Project Manager and Environmental Control Officer (ECO).* Aurecon was appointed by Anglo Platinum Management Services to provide engineering services for the development of the Polokwane water supply scheme. Acted as the construction environmental management control officer for the new 60km, 500mm diameter effluent pipeline from Polokwane to Makopane. (Anglo Platinum Management Services).

Scoping Environmental Impact Assessment (EIA) for the raising of Flag Boshielo Dam (Limpopo Province, South Africa) 2002 - 2004. *Environmental Impact Assessment (EIA) Specialist and Reviewer.* This project provided specialist Environmental Impact Assessment (EIA) services to a study team for the scoping EIA for raising Flag Boshielo Dam by 5m to increase its storage capacity from 100 million cubic metres to 188 million cubic metres, thereby increasing the dam's yield from 56 million cubic metres per annum to 72 million cubic metres per annum. Responsible for mentoring and skills transfer.

Extensions to Caledon Nature Reserve's administration buildings: scoping Environmental Impact Assessment (EIA) (Free State Province, South Africa) 2002. *Project Manager and Environmental Impact Assessment (EIA) Leader.* Aurecon was appointed by an architect to conduct an Environmental Impact Assessment (EIA) scoping assessment on proposed extensions to the office facilities, water supply and wastewater treatment.

Alexandra Renewal Project: scoping Environmental Impact Assessment (EIA) for three new pedestrian bridges over the Jukskei River (Gauteng, South Africa) 2002. *Project Manager.* Aurecon was appointed by the Johannesburg Road Agency to conduct a scoping Environmental Impact Assessment (EIA) as part of the approval process for this vital link between the communities on both sides of the Jukskei River. (Johannesburg Roads Authority).

Scoping Environmental Impact Assessment (EIA) for the Winburg Wastewater Treatment Works (WWTW) (Winburg, Free State Province, South Africa) 2002. *Project Manager and Environmental Impact Assessment (EIA) Leader.* This project conducted the required scoping Environmental Impact Assessment (EIA) to get authorisation for a new Wastewater Treatment Works (WWTW) in the town of Winburg.

Scoping Environmental Impact Assessment (EIA) for the As River mini hydropower projects (Free State Province, South Africa) 2002. *Project Manager and Environmental Impact Assessment (EIA) Leader.* The project covered an Environmental Impact Assessment (EIA) and liaison with local communities as part of feasibility investigations for the establishment of two new mini hydropower stations on the As River.

Upgrading of the stormwater system in Phomolong Township (Welkom, Free State Province, South Africa) 2002. *Project Manager.* The project included an environmental authorisation exemption application and public consultation for this project, which sought to formalise stormwater systems in this previously disadvantaged community.

Upgrading of the stormwater system in Meloding Township (Virginia, Free State Province, South Africa) 2002. *Project Manager.* The project entailed an environmental authorisation exemption application and public consultation for this project, which aimed to formalise stormwater systems in this previously disadvantaged community.

Upgrading of a sewer main in the Saaiplaas Mining Village near Harmony (Free State Province, South Africa) 2002. *Project Manager.* The project consisted of an environmental authorisation exemption application and public consultation for the upgrade of an existing sewer main that was leaking.

Scoping Environmental Impact Assessment (EIA) for the upgrading of the Nuwejaarspruit, Harrismith (Free State Province, South Africa) 2002. *Project Manager and Environmental Impact Assessment (EIA) Leader.* The project included an environmental assessment of measures to reduce erosion induced by water releases from the Sterkfontein Dam into the Nuwejaarspruit. During construction, this project was extended to include construction monitoring and rehabilitation.

Environmental Impact Assessment (EIA) for the extension (40MI to 60MI) of the existing Sunderland Ridge Wastewater Treatment Works (WWTW) (Pretoria, Gauteng, South Africa) 2002. *Project Manager.* During this project, the Environmental Impact Assessment (EIA) was completed as part of the environmental authorisation process to obtain approval for the extensions to this regional Wastewater Treatment Works (WWTW).

Alexandra Renewal Project: scoping Environmental Impact Assessment (EIA) for the upgrading of London Road (Gauteng, South Africa) 2002. *Project Manager.* Aurecon was appointed by the Johannesburg Road Agency to conduct a scoping Environmental Impact Assessment (EIA) as part of the approval process for the upgrading of this major arterial road through Alexandra, a previously disadvantaged area. (Johannesburg Roads Agency).

Accommodation in the Memel Nature Reserve: Environmental Impact Assessment (EIA) (Free State

Province, South Africa) 2002. *Project Manager and Environmental Impact Assessment (EIA) Leader.* The Memel Nature Reserve is a Ramsar Convention on Wetlands registered wetland area, but does not have any accommodation facilities. Aurecon was appointed by an architect to conduct an Environmental Impact Assessment (EIA) for the proposed development of accommodation facilities, water supply and wastewater treatment.

Alexandra Renewal Project: scoping Environmental Impact Assessment (EIA) for the upgrading of Da Gama Road and a new bridge over the Jukskei River (Gauteng, South Africa) 2002. *Project Manager.* Aurecon was appointed by the Johannesburg Road Agency to conduct a scoping Environmental Impact Assessment (EIA) as part of the approval process for the upgrading of this major arterial road through Alexandra, a previously disadvantaged area. (Johannesburg Road Agency).

Alexandra Renewal Project: Hofmeyer Road upgrading and the construction of a new bridge over the Jukskei River (Gauteng, South Africa) 2002. *Project Manager.* Aurecon was appointed by the Johannesburg Road Agency to conduct a scoping Environmental Impact Assessment (EIA) as part of the approval process for the upgrading of this major arterial road through Alexandra, a previously disadvantaged area. (Johannesburg Road Agency).

Study to restore the storage capacity of three Algerian dams (Various Provinces, Algeria) 2002. *Environmental Specialist.* A study on the dams Meurat, Hammiz and Beni Bahdel was carried out to establish the optimal approach to restore the storage capacity lost due to siltation. The evaluated alternatives included the dredging and disposal of silt adjacent to the dam, raising the dam walls, constructing new dams and implementing the appropriate catchment management practices.

Alexandra renewal project: scoping Environmental Impact Assessment (EIA) of the upgrading of Rautenbach Road (Gauteng, South Africa) 2002. *Project Manager.* Aurecon was appointed by the Johannesburg Road Agency to conduct a scoping Environmental Impact Assessment (EIA) as part of the approval process for the upgrading of this major arterial road through Alexandra, a previously disadvantaged area. (Johannesburg Roads Authority).

Environmental Management Plan (EMP) and Environmental Control Officer (ECO) for the construction of a new bridge over the Levuvu River (Limpopo Province, South Africa) 2002. *Project Manager.* The project entailed the provision of an Environmental Management Plan (EMP) and independent monitoring of the environmental compliance of construction activities.

Environmental Control Officer (ECO) for the Alexandra Renewal Project (Gauteng, South Africa) 2002. *Project Manager.* The City of Johannesburg required the services of an Environmental Control Officer (ECO) for the Alexandra Renewal Project. Responsible for monitoring and reporting the level of environmental compliance of all projects that formed part of the Alexandra Renewal Project. Also responsible for training a Historically Disadvantaged Individual (HDI) ECO as part of the project. (City of Johannesburg).

Report on the benefits of ISO 14001 certification for industry in Greater Maputo (Maputo, Mozambique) 2002. *Environmental Specialist.* Responsible for compiling a substantive report on the likely benefits for industry in gaining ISO 14001 certification on behalf of Fundo De Investimento E Património Do Abastecimento De Água (FIPAG), the water supply investment and assets fund in Mozambique, as a sub-consultant to Salomon Ltd.

Environmental Management Programme Report (EMPR) for borrow pits on the P277-1 Thoyandou Road (Limpopo Province, South Africa) 2002. *Project Manager.* Responsible for compiling Environmental Management Programme Reports (EMPRs) as part of the mining authorisation for borrow pits along this road to be used in the upgrading and surfacing of the road.

Soweto highway off-ramp: environmental fatal flaw analysis (Soweto, Gauteng Province, South Africa) 2002. *Project Manager.* Appointed by the engineering consultants to assess options for a new off-ramp from the highway.

Feasibility study for a community slate mine (Dinokana, North West Province, South Africa) 2002. *Project Manager of Environmental Studies.* Appointed by the Development Bank of Southern Africa (DBSA) as part of a consortium of firms to investigate the feasibility of community slate mining in the Dinokana Tribal Area. Also responsible for an environmental fatal flaw analysis and environmental management guidelines for community mining activities. (Development Bank of Southern Africa (DBSA)).

Technikon Service Station development (Bloemfontein, Free State Province, South Africa) 2002.

Environmental Specialist. Appointed by the developer of this filling station in the city of Bloemfontein. Responsible for facilitating the approval processes between a number of authorities and the developer.

Development of Griffiths Grounds (Bloemfontein, Free State Province, South Africa) 2002. *Landscape Architect.* Appointed by the engineering company to develop a remedial landscape plan in consultation with interested and affected parties. Also responsible for creating specifications for the rehabilitation aimed at restoring the landscape, which was damaged by previous indiscriminate construction activities.

Bassonia Rock Residential Estate development (Alberton, Gauteng Province, South Africa) 2002. *Project Manager.* Appointed by the property developer as a construction environmental management control officer for the construction of infrastructure for this housing estate.

Development of the Terms of Reference (TOR) for the Maputo Environmental Management Framework (EMF) (Maputo, Mozambique) 2002. *Environmental Specialist.* Responsible for compiling the Terms of Reference (TOR) for the proposal call for the Maputo Environmental Management Framework (EMF) as sub-consultant to Salomon Ltd. (Salomon Ltd).

Pecanwood Golf Estate ISO 14001 Environmental Management System (EMS) (Hartbeespoort, North West Province, South Africa) 2001 - 2003. *Project Manager.* The project consisted of the development and implementation of an ISO 14001 Environmental Management System (EMS) for this prestigious golf estate. A unique feature of this project was that the system had to be user friendly for both sophisticated service providers and relatively unsophisticated contractors, and so pro-forma policies and documents were developed to be used by these contractors for reporting. The assignment was later extended to provide implementation support for a one year period.

The design and implementation of a water management plan for the Komati river basin (South Africa and Swaziland) 03/2001 - 05/2004. *Environmental Specialist.* The Komati Basin Water Authority (KOBWA) is responsible for the management of the water resources of the Komati basin, in accordance with the treaties between Swaziland and South Africa. They appointed the Maguga Dam Joint Venture (MDJV), lead by Aurecon, to implement a water management plan. Responsible for developing and implementing further studies to refine the ecological reserve, baseline conditions and ongoing monitoring strategies. Also responsible for procuring consultants to implement specific monitoring on behalf of the Water Authority. (Komati Basin Water Authority (KOBWA)).

Visual impact assessment for Owlswood Broiler Farm (Buffelspoort, North West Province, South Africa) 2001. *Landscape Architect.* Appointed by the landowner to take responsibility for conducting a visual impact assessment and making recommendations on softening the visual impact of the structures.

Bergoord Development, Wapadrand (Pretoria, Gauteng Province, South Africa) 2001. *Project Manager and Landscape Architect.* The project, carried out by a property developer, was aimed at finding an environmentally sound concept for the development of a large property in the Bronberg area that supported two endangered species. A development option with very low density "in the bush" type housing units, without any impact on specific habitat requirements of the endangered species, was developed. The entire area was managed as a "bavaria" (conservation area) with a view to protect the habitat. The focus of this development was on residents who wished to support conservation in the area where they lived.

Bassonia Rock Residential Estate development (Alberton, Gauteng Province, South Africa) 2001. *Project Manager and Landscape Architect.* The landowner appointed Aurecon to facilitate the approval of development applications by the Gauteng environmental authorities. This process resulted in the development of a site-specific Environmental Management Plan (EMP) based on the outcomes of a visual impact (the site is located high on the Klipriviers Mountain) assessment and biological assessment. This EMP satisfied authorities and the development rights were granted.

Scoping Environmental Impact Assessment (EIA) for a residential and golf course development (Dainfern Extension 21, Randburg, Gauteng Province,) 2001. *Environmental Impact Assessment (EIA) Leader.* The project comprised the development of a golf course and housing estate with related uses on a 225ha site.

Pecanwood Estate Extension 17 scoping Environmental Impact Assessment (EIA) (Hartbeespoort, North West Province, South Africa) 2001. *Project Manager and Environmental Impact Assessment (EIA) Leader.* The project included a scoping Environmental Impact Assessment (EIA) for rezoning agricultural land adjacent to the existing Pecanwood Golf Estate for a low density office complex, upmarket school and equestrian centre.

Environmental due diligence report for repairs to the Sterkspruit River N3 Bridge (KwaZulu-Natal Province, South Africa) 2000. *Environmental Specialist.* Appointed by the engineering consultant to conduct an environmental due diligence report on proposed methods for carrying out repairs to the N3 Road Bridge over the Sterkspruit River following a serious collision, large diesel spill and fire on the bridge resulting in damage to the bridge, approaches and the river's environment.

Scoping Environmental Impact Assessment (EIA) for the rehabilitation and reconstruction of the Tsomo River Bridge on Road T246 near the village of Lufuta (Cala/Xalanga District, Eastern Cape, South Africa) 2000. *Environmental Impact Assessment (EIA) Leader.* The project comprised the upgrade of the Tsomo River Bridge to reduce overtopping and the washing away of approaches to the bridge. Two of the three piers were removed to double the width of the clear openings and a new bridge deck, supported by the remaining centre bridge pier and the existing east and west abutments, was constructed on top of the existing bridge deck.

Environmental scan for the proposed realignment of the Road K73 (Midrand, Gauteng Province, South Africa) 2000. *Project Leader.* Aurecon was appointed by Sage Properties to conduct an environmental scan for a proposed realignment of approximately 8km of the Road K73. (Sage Properties).

Scoping Environmental Impact Assessment (EIA) for the development and operation of the services area comprising a sewage treatment plant and potable water treatment plant, Pecanwood Golf Estate (Hartbeespoort, North West Province, South Africa) 2000. *Environmental Impact Assessment (EIA) Leader.* To cope with an anticipated increase in loading, a new sewage treatment and water purification plant with a capacity of 585 cubic metres per day and 25.2 cubic metres per hour respectively, was developed.

Scoping Environmental Impact Assessment (EIA) for Extension 9 of the Pecanwood Golf Estate (Hartbeespoort, North West Province, South Africa) 2000. *Environmental Impact Assessment (EIA) Leader.* The development entailed the reclamation of land below the full supply line of the Hartbeespoort Dam to construct a peninsula approximately 2ha in size into the dam.

Rehabilitation of construction sites of the Matsoku Tunnel component of Phase 1B of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1999. *Environmental Auditor.* The project entailed the development and implementation of a rehabilitation strategy and specifications for one major and one satellite construction site, and one large tunnel spoil dump. (Matsoku Diversion Partnership (MDP)).

Landscape design for the new main road in Teanong (Tembisa, Gauteng Province, South Africa) 1999. *Landscape Architect.* Responsible for the landscape design along this main arterial road as part of the general upgrading of the road infrastructure.

Scoping Environmental Impact Assessment (EIA) erosion for protection works along the As River downstream of the delivery tunnel's north outfall channel to the Saulspoort Dam (Bethlehem, Free State Province, South Africa) 1999. *Environmentalist.* The project comprised an earth dam 19m high and 195m long with a reinforced concrete and Roller Compacted Concrete (RCC) overflow section and stilling basin; an earth flank wall 80m long; a 120m long, 5m high weir with a 27m long Reinforced Concrete (RC) overflow section and a 3m high crest; a 285m long 5m, high earth embankment weir with a 90m long central rockfill overflow section, and the upgrading of an existing farm dam, which was breached to prevent the river from silting.

Scoping Environmental Impact Assessment (EIA) for the upgrading of the delivery tunnel's north outfall channel (Clarens, Free State Province, South Africa) 1999. *Environmentalist.* The project concerned the upgrading of the delivery tunnel's north outfall channel and constructed a gabion weir across the As River approximately 80m downstream of the existing concrete outfall structure.

Environmental Auditor for the Matsoku Diversion component of Phase 1B of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1998 - 2001. *Environmental Auditor.* Aurecon was appointed by the consulting engineering consortium for this project as an external environmental auditor responsible for biannual audits of compliance with the Environmental Management Plan (EMP). (Matsoku Diversion Partnership (MDP)).

Detailed landscape design around the main buildings of the Saldanha Steel Mini Steel Mill (Saldanha, Western Cape Province, South Africa) 1998. *Environmental Manager of the Project Team.* Responsible for managing a team of landscape architects preparing ecologically appropriate and water wise designs for

various building complexes at the mill.

Establishment of the Saldanha Steel Mini Steel Mill on a greenfields site (Saldanha, Western Cape Province, South Africa) 1996 - 1999. *Environmental Manager of the Project Team and Environmental Control Officer (ECO).* This project was a finalist in the Environmental Planning Professionals Interdisciplinary Committee's National Premium Award for excellence in environmental management. Responsible for managing the compilation of an Environmental Management Plan (EMP) and then implementing this plan on Engineering Procurement Construction Management (EPCM) and turnkey contracts as part of the project team, up to proofing the facility. Also responsible for fulfilling the role of Environmental Control Officer (ECO) reporting to an independent environmental monitoring committee.

Rehabilitation of construction sites of the delivery tunnel's south component of Phase 1A of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1996 - 1997. *Environmental Monitor.* The project comprised the development and implementation of a rehabilitation strategy and specifications for three major construction sites and two large tunnel spoil dumps. (Lesotho Highlands Tunnel Partnership (LHTP)).

Environmental Impact Assessment (EIA) for the Likalaneng Weir (Likalaneng, Lesotho) 1996. *Environmentalist.* The project conducted an Environmental Impact Assessment (EIA) for this small weir in the Likalaneng River and formed part of the advanced infrastructure for the implementation of Phase 1B of the Lesotho Highlands Water Project (LHWP). (Lesotho Highlands Tunnel Partnership (LHTP)).

Environmental Impact Assessment (EIA) for the Mohale Tunnel component of Phase 1B of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1996. *Environmental Impact Assessment (EIA) Leader.* Responsible for conducting the Environmental Impact Assessment (EIA) for this 35km long, 2m diameter water transfer tunnel project. Also responsible for managing various specialist studies, and assessing and compiling recommendations for the management of residual impacts. (Lesotho Highlands Tunnel Partnership (LHTP)).

Environmental auditing for the Mohale Tunnel component of Phase 1B of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1996 - 2000. *Environmental Auditor for the Lesotho Highlands Tunnel Partnership (LHTP).* Aurecon was appointed by the consulting engineering consortium for this project as an external environmental auditor responsible for biannual audits of compliance with the Environmental Management Plan (EMP) and groundwater monitoring plan.

Environmental Management Plan (EMP) for the Mohale Tunnel component of Phase 1B of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1996. *Environmental Specialist.* Responsible for compiling an extensive Environmental Management Plan (EMP) for the implementation of the Mohale Tunnel project. (Lesotho Highlands Tunnel Partnership (LHTP)).

Environmental Impact Assessment (EIA) for the Matsoku Diversion component of Phase 1B of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1996. *Environmentalist.* Responsible for providing general support to the Environmental Impact Assessment (EIA) leader and carrying out specialist studies on the rehabilitation and visual impact assessment on this weir and tunnel project. (Matsoku Diversion Partnership (MDP)).

Detailed landscape design of the delivery tunnel's north outfall channel view site as part of the Lesotho Highlands Water Project (LHWP) (Clarens, Free State Province, South Africa) 1996. *Landscape Architect.* The project consisted of the development of a low maintenance but aesthetically pleasing view site from where water being transferred in the Lesotho Highlands Water Project (LHWP) could be viewed. This project received the Concrete Manufacturer's Premium Award for innovative design.

Rehabilitation of construction sites of the delivery tunnel's north component of Phase 1A of the Lesotho Highlands Water Project (LHWP) (Free State Province, South Africa) 1995 - 1997. *Environmental Officer for the Highlands Delivery Tunnel Consultants (HDTC).* This project entailed the development and implementation of a rehabilitation strategy and specifications for three major construction sites and two large tunnel spoil dumps.

Environmental Management Programme Report (EMPR) for a sand borrow pit on farm Botterkloof (Free State Province, South Africa) 1993. *Landscape Architect.* Responsible for compiling an Environmental Management Programme Report (EMPR) as part of the mining authorisation for a large sand borrow pit used as part of the construction of the Lesotho Highlands Water Project (LHWP) delivery tunnel north component.

Environmental Control Officer (ECO) for the delivery tunnel's north component of Phase 1A of the Lesotho Highlands Water Project (LHWP) (Free State Province, South Africa) 1991 - 1996. *Environmental Control Officer (ECO) for the Highlands Delivery Tunnel Consultants (HDTTC).* Aurecon was appointed as the Environmental Control Officer by the consulting engineering consortium for this project. This project won the Environmental Planning Professionals Interdisciplinary Committee's National Premium Award for excellence in environmental management. Responsible for monitoring the project in accordance with Environmental Impact Assessment (EIA) requirements, developing an Environmental Management Plan (EMP), conducting monitoring and managing data, and reporting to an external environmental monitoring committee.

Environmental Control Officer (ECO) for the delivery tunnel's south component of Phase 1A of the Lesotho Highlands Water Project (LHWP) (Lesotho) 1991 - 1996. *Environmental Monitor for the Lesotho Highlands Tunnel Partnership (LHTP).* Aurecon was appointed as Environmental Control Officer (ECO) by the consulting engineering consortium for this project. Responsible for monitoring the project in accordance with Environmental Impact Assessment (EIA) requirements, developing an Environmental Management Plan (EMP), and conducting, monitoring and managing data.

Houwteq (Pty) Ltd, Haasvlakte development facility and Overberg missile testing range development projects (Western Cape Province, South Africa) 1990 - 1991. *Environmental Officer.* Responsible for managing in-house and contracted teams implementing rehabilitation work on disturbed areas in the unique "fynbos" environment where these facilities were located. Also responsible for designing and constructing indigenous aesthetic landscapes around some facilities.

Houwteq (Pty) Ltd, Haasvlakte development facility and Overberg missile testing range development projects (Western Cape Province, South Africa) 1988 - 1991. *Environmental Control Officer (ECO).* This project won the Environmental Planning Professionals Interdisciplinary Committee's National Premium Award for excellence in environmental management. As the on-site Environmental Control Officer (ECO), responsible for implementing the Environmental Management Plan (EMP) for the construction and operation of these large armaments (missiles and low orbit satellites) development facilities by a subsidiary of the Armscor (now Denel) group. Also responsible for reporting to an independent environmental monitoring committee.

South African Department of Water Affairs and Forestry's (DWA's) standard environmental specifications (South Africa) 1987. *Team Member.* Responsible for specifications and quality control of large scale procurement of grass seed for the rehabilitation of disturbed areas.

Novo pump station and Modder River water transfer scheme (Free State Province, South Africa) 1984 - 1987. *Environmental Impact Assessment (EIA) Team Member.* Responsible for acting as a member of the Department of Water Affairs' team which conducted a voluntary Environmental Impact Assessment (EIA) on this project that was a further extension of the Knellpoort Dam project. Also responsible for environmental surveys along the Modder River, and assessment of erosion potential of river sections and the impact on agricultural potential of riparian properties.

Landscaping various regional office complexes of the South African Department of Water Affairs and Forestry (DWA) (South African) 1984 - 1987. *Landscape Architect.* Responsible for providing technical assistance to the Department of Water Affairs and Forestry's (DWA) regional offices with regard to landscape master planning of its facilities and implementation thereof. (Department of Water Affairs and Forestry (DWA)).

South African Department of Water Affairs and Forestry's (DWA) standard environmental specifications (South Africa) 1984 - 1987. *Team Member.* Responsible as a member of the Department of Water Affairs and Forestry's (DWA) team, for the preparation of standard environmental rehabilitation specifications and later environmental management specifications to be used in departmental projects. Specifically responsible for visiting various departmental construction sites to evaluate work methods.

Palmiet pump storage scheme (Western Cape Province, South Africa) 1984. *Landscape Architect.* This project won the Environmental Planning Professionals Interdisciplinary Committee's National Premium Award for excellence in environmental management. Responsible, as a member of the Department of Water Affairs (DWA) head office team, for monitoring the environmental rehabilitation programmes.

Knellpoort Dam environmental assessment (Free State Province, South Africa) 1984. *Environmental Impact Assessment (EIA) Team Member.* Responsible, as a member of the Department of Water Affairs' (DWA) team, for conducting a voluntary Environmental Impact Assessment (EIA) on this 50m high off-

channel storage Roller Compacted Concrete (RCC) arch gravity dam and desilting works. Also responsible for recording and rescuing rock art in the dam basin and transporting rescued art to an appropriate museum. Further responsible for locating and laying out the operations' staff housing near the dam wall.

Education

1985 : B Landscape Architecture, University of Pretoria (UP), South Africa

Career enhancing courses

2008 : Powerspeaking, The Voice Clinic
2008 : Key Skills for Effective Managers, CBM Training
2007 : Environmental Law Update, North-West University Potchefstroom Campus
1999 : Business Finances for Non-Financial Managers, Continuing Education Committee of SAACE
1993 : Underground Environmental Control, Chamber of Mines S.A
1992 : Integrated Environmental Management, -
1992 : Environmental Law, -
1990 : Integrated Environmental Management, Legal and Administrative Principles, University of Cape Town (UCT), South Africa
1987 : Legal and Administrative Aspects of Integrated Environmental Management (IEM), Practical Techniques, University of Cape Town (UCT), South Africa

Professional affiliations

Member, South African Affiliate of the International Association for Impact Assessment (IAIASa)
Registered Professional Landscape Architect, South African Council for the Landscape Architectural Profession (SACLAP)
Member and Former President, The South African Institute of Landscape Architects
Member, Gauteng Society of Landscape Architects
Member, International Federation of Landscape Architects

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent
Dutch	Fair	Fair	Fair

Publications

Rossouw, N. Smit, BHJ. and Lochner, P. 2006. "Environmental Monitoring Committees (EMCs): Purpose, Function, and Structure, Proceedings of the International Association for Impact Assessment South African Annual Conference, Kwa Maritane, South Africa.". -.

Smit, BHJ. and Visser, L. 2005. "Socio-Economic Aspects of Dam Design, Proceedings of the 2005 SANCOLD Conference, Stellenbosch, South Africa.". -.

Viljoen, BC. Melville, AL. and Smit, BHJ. 2001. "Management of the Environmental Effects of Hydro Discharge on the Ash River; Proceedings of the Hydro 2001 Conference, Italy.". -.

Smit, BHJ. 1995. "Environmental Monitoring and Rehabilitation of the Delivery Tunnel Contracts of the Lesotho Highlands Water Project, Proceedings of the TUNCON '95 Conference, Midrand, South Africa.". -.

Referees

Company
VKE Engineers

Contact Person
Mr BC Viljoen

Telephone nr.
+27 82 331 4200

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

Signature of Staff Member

Date