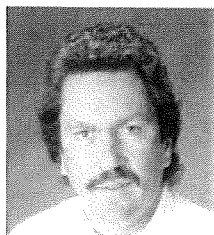


Peter Rosewarne

Principal Consultant



Profession: Hydrogeologist

Education: MSc (Hydrogeology), Rhodes, 1984
BSc Hons (Geol), London, 1974

**Registrations/
Affiliations** Pr Sci Nat (South Africa) 401474/83
Member IAH (Exec Comm SA Chapter 1999-2004)
Ground Water Division of the SA Geological Society,
(Western Cape Representative 1989 – 1990)
Member Institute of Waste Management
Member Water Institute of South Africa

Specialisation: Nuclear sites investigation: Groundwater resource evaluation; wellfield development and management; hydrogeological mapping; subsurface contamination; mine and construction dewatering: waste disposal site selection.

Expertise:

Peter Rosewarne has been involved in groundwater for the past 32 years. His expertise includes:

- Nuclear sites investigations, including licensing of candidate sites, quality guides and waste disposal;
- Evaluation and development of major aquifers, e.g. dolomites, Table Mountain Group, coastal aquifers;
- Municipal groundwater supply, groundwater resource evaluation and wellfield development, groundwater management, geological and hydrogeological mapping, coastal aquifer development;
- Mine and construction site dewatering, mine hydrogeological studies, mine water inflow reviews, subsidence risk assessment due to dewatering, and dewatering feasibility studies using computer modeling;
- Conceptualisation of hydrogeological problems;
- Subsurface contamination;
- Waste disposal site investigations;
- Numerical Modelling
- Project management.

Employment Record:

1982 – Present SRK Consulting. Senior to Principal Hydrogeologist.
1977 – 1982 Department of Water Affairs, Division of Geohydrology. Senior Hydrologist
1976 – 1977 Geological Survey of South Africa, Groundwater Section. Hydrogeologist.
1975 – 1976 Geological Survey of South Africa, Regional Section. Geologist.

Publications: Numerous publications on groundwater

Languages: English

Peter Rosewarne

Publications:

1. ROSEWARNE PN, WOODFORD A and GIRMAN J (2006). The Quest for Quantification of South Africa's Groundwater Resources. Hydrological Association of Namibia Conference, Windhoek.
2. WOODFORD A, ROSEWARNE PN and GIRMAN J (2006). How much Groundwater does South Africa Have? 59th Canadian Geotechnical Conference, 7th Joint CGS/IAH-CNC Groundwater Speciality Conference, Vancouver Canada.
3. O' BRIEN R and ROSEWARNE PN (2006). Characterisation and Remediation at the AECI Somerset West Site. WASTECON 2006, Cape Town.
4. ROSEWARNE PN, WOODFORD A and GIRMAN J (2005). How much Groundwater Does South Africa Have? SANCIAHS Conference, Midrand.
5. ROSEWARNE PN (2005): "Groundwater Use and Availability in South Africa". Biennial Groundwater Conf. Pretoria.
6. GIRMAN J and ROSEWARNE PN (2005): National Groundwater Resource Assessment: Phase 2". Biennial Groundwater Conf. Pretoria.
7. FORTUIN M, WOODFORD AC, ROSEWARNE PN and LOW AB (2004). Identification and Prioritisation of Type Areas for Detailed Research in Terms of the Regional Variability of the Groundwater and Ecological Characteristics of the Table Mountain Group Aquifer Systems. Water Research Commission Report no 1332/1/04, Pretoria.
8. ROSEWARNE PN (2002): "The Table Mountain Group Aquifer and its Potential for Supplementary Water Supply for Cape Town". IMIESA Vol 27 No 1.
9. PIETERSEN K and PARSONS R (Ed) (ROSEWARNE PN, key contributions). (2002). A Synthesis of the Hydrogeology of the Table Mountain Group – Formation of a Research Strategy. Water Research Commission Report no TT158/01, Pretoria.
10. ROSEWARNE PN and HAINES A (1999): "The Use of Quarries as Water Storage Reservoirs". Institute of Quarrying Annual Conf. Durban.
11. ROSEWARNE PN (1998): "Waste Disposal and Groundwater Supply: Services in Conflict". Urban Management Vol 29, No 10.
12. ROSEWARNE PN and MILLS E (1997): "The Use of Geophysical Techniques to Site High Yielding Water Supply Boreholes". South African Geophysical Association Conf. Swakopmund.
13. ROSEWARNE PN, LOMBERG C and KENDAL K (1996): "Application of Minimum Requirements: Case Studies from Port Elizabeth". Wastecon 96. Durban.
14. LOMBERG CR, ROSEWARNE PN, RAYMER DA and DEVEY DG (1996). Research into Groundwater Abstraction in the Port Elizabeth Municipal Area.
15. ROSEWARNE PN, LANGTON CL and DEVEY G (1993): "Aquifer Protection: The Port Elizabeth Experience". Int Groundwater Symp. Johannesburg.
16. ROSEWARNE PN (1993): "The Role of the Consultant in Water Resources Investigations". Municipal Engineer, Vol 24 No 7.
17. ROSEWARNE PN (1991): "Villiersdorp Tracer Project". Biennial Groundwater Convention. Johannesburg.
18. ROSEWARNE PN (1991): "Planning of Municipal Groundwater Supplies". Municipal Engineer.

19. ROSEWARNE PN, SMART M and BALZER T (1987): "Hydrogeological mapping of the Republic of Ciskei". Hydrological Sci Symp. Grahamstown.
20. ROSEWARNE PN and CONNELLY RJ (1984): "Groundwater development in the Transvaal Dolomites". Int Conf on Groundwater Technology. Johannesburg
21. BRACKLEY I, ROSEWARNE PN and GRADY L (1984): "Prediction of Surface Subsidence Caused by Lowering the Water Table in Dolomite". 3rd Int Symp on Land Subsidence. Venice.

Key Experience:**Peter Rosewarne****Hydrogeological/General Studies**

Name of Project: Nuclear 1
 Client: Eskom/Arcus Gibb
 Location: South Africa
 Project Description: EIA
 Project duration/date: 2007 – 2008
 Value of Project: Confidential
 Job Title and Duties: Specialist groundwater studies

Name of Project: Nuclear 1 sites licensing investigation
 Client: Eskom
 Location: South Africa
 Project Description: Assessment of suitability of three sites for licensing
 Project duration/date: 3 years
 Value of Project: Confidential
 Job Title and Duties: Project Manager and Technical Input

Name of Project: Nuclear Sites Investigation Programme Phase 1
 Client: Eskom
 Location: South Africa
 Project Description: Production of a Quality Manual and Business Case for Phase 2
 Project Duration: 5 months
 Value of Project: R 1 million
 Job Title and Duties: Project Manager and technical input

Name of Project: Pebble Bed Modular Reactor
 Client: Eskom/Arcus Gibb
 Location: Western Cape Province, South Africa
 Project Description: EIA
 Project duration/date: 2007-2008
 Value of Project: Confidential
 Job Title and Duties: Specialist groundwater study

Name of Project: WR 2005
 Client: Water Research Commission
 Location: South Africa
 Project Description: Updating and determining the surface water and groundwater resources of South Africa
 Project duration/date: 2005-2007
 Value of Project: ZAR 7 Million
 Job Title and Duties: Project leader: Groundwater

Name of Project: Groundwater Resource Evaluation phase 2
 Client: DWAF
 Location: South Africa
 Project Description: Evaluation of groundwater quantity; planning potential map; recharge; groundwater-surface water interaction; aquifer classification; groundwater use.
 Project duration/date: 2003 – 2005
 Value of Project: ZAR 2.6 million
 Job Title and Duties: Project manager and technical input

Key Experience:**Peter Rosewarne****Hydrogeological/General Studies**

Name of Project: Karoo Aquifers Characterisation
 Client: Water Research Commission
 Location: South Africa
 Project Description: Determining the hydrogeological characteristics of the Karoo aquifers of the Eastern Cape
 Project duration/date: 2005 – 2007
 Value of Project: ZAR 3.5 million
 Job Title and Duties: Project Manager

Name of Project: Vaal River System: Reconciliation strategies
 Location: DWAF
 Project Description: Gauteng and Northern Cape Province, South Africa
 Project duration/date: Determining the current and potential surface and groundwater resources of the Vaal Basin WMA
 Value of Project: 2005-2006
 Job Title and Duties: ZAR 7.5 million
 Determining the groundwater potential of the dolomite aquifers of the Vaal Basin WMA

Name of Project: Building Block 6: Water and Environmental Issues
 Client: World Bank
 Location: Mozambique
 Project Description: Integrated water resources assessment in southern Mozambique
 Project duration/date: 2004
 Value of Project: US\$100 000
 Job Title and Duties: Project hydrogeologist

Name of Project: Koo Valley irrigation scheme
 Client: Koo Irrigation Board
 Location: Montagu, Western Cape Province, South Africa
 Project Description: Development of wellfield to yield 2 million m³/a for emergency irrigation water.
 Project duration/date: 2001 - 2003
 Value of Project: ZAR 4 million
 Job Title and Duties: Project manager and technical input

Name of Project: Preliminary hydrogeological map and atlas
 Client: SADC Water Sector
 Location: SADC Region – 14 countries
 Project Description: Review of situation in SADC countries and compilation of a report recommending the way forward.
 Project duration/date: 2001 - 2002
 Value of Project: ZAR 750 000
 Job Title and Duties: Project manager and technical input

Name of Project: Handbook on Hydrogeology of the TMG Aquifer
 Client: Water Research Commission
 Location: Western and Eastern Cape Provinces, South Africa
 Project Description: Definition of hydrogeological properties of the TMGA and case studies
 Project duration/date: 2001
 Value of Project: ZAR 750 000
 Job Title and Duties: Key technical input

Key Experience:**Peter Rosewarne****Hydrogeological/General Studies**

Name of Project: Citrusdal artesian groundwater exploration
 Client: DWAF
 Location: Citrusdal, Western Cape Province, South Africa
 Project Description: Investigation and evaluation of artesian groundwater occurrence in the Olifants River Catchment, the so-called CAGE project.
 Project duration/date: 1998 – 2001
 Value of Project: ZAR 1 million
 Job Title and Duties: Technical input on TMG hydrogeology

Name of Project: Water Master Plan: Hex Valley
 Client: Hex Valley Irrigation Board
 Location: Western Cape Province, South Africa
 Project Description: Development of the groundwater component of a water master plan.
 Project duration/date: 1997
 Value of Project: ZAR 70 000
 Job Title and Duties: Project manager and technical evaluation

Name of Project: Paaltjies Beach Well Feasibility Study
 Client: World Bank
 Location: Walvis Bay, Namibia
 Project Description: Investigation and evaluation of the feasibility of developing shallow beach wells to supply a desalination plant
 Project duration/date: 1997
 Value of Project: ZAR 1 million
 Job Title and Duties: Project Manager and hydrogeology

Name of Project: NW Namibia groundwater project
 Client: DWAF (Nam)/African Development Bank
 Location: North West Namibia
 Project Description: Groundwater investigation, including characterization and quantification of resources and hydrogeological mapping in a 60 000 km² area.
 Project duration/date: 1993 – 1997
 Value of Project: ZAR 10 million
 Job Title and Duties: Project manager and technical input

Name of Project: Wellfield development and management for the Municipalities of Elands Bay, Beaufort West, Graaff Reinet, Ceres, Hermanus, St Francis Bay, Paterson, Alexandria, Citrusdal, Jamestown, Kenton-on-Sea, Burgersdorp, Greyton, Botriver.
 Client: Various
 Location: Western Cape Province, South Africa
 Project Description: Development of wellfields to yield up to 100 l/s for domestic use.
 Project duration/date: 1985 - current
 Value of Project: Various
 Job Title and Duties: Borehole siting, drilling and test pumping supervision, data analysis and reporting.

Name of Project: Emergency groundwater supply for the PWV Area
 Client: Rand Water Board / DWAF
 Location: Gauteng Province, South Africa
 Project Description: Development of wellfields to yield up to 600 l/s in the Transvaal Dolomites.
 Project duration/date: 1984 - 1985
 Value of Project: ZAR 6 million
 Job Title and Duties: Project management and technical input

Key Experience:**Peter Rosewarne****Mining**

- Name of Project: Ryst Kuil Uranium Mine Bankable Feasibility Study
 Client: UraMin Inc
 Location: Western Cape, South Africa
 Project Description: Determining mine water control and supply measures and impact of mining on the environment
 Project duration/date: 2007-2008
 Value of Project: ZAR3 million
 Job Title and Duties: Project Manager and technical input
- Name of Project: Jwaneng open pit dewatering review
 Client: Debswana
 Location: Botswana
 Project Description: Review of dewatering work carried out and 5 year strategic plan
 Project duration/date: 2007
 Value of Project: ZAR0.3 million
 Job Title and Duties: Project Manager and technical input
- Name of Project: Environmental impact of deepening and expanding a limestone quarry
 Client: PPC
 Location: Western Cape
 Project Description: Numerical simulation of various pit sizes and depth regarding impact on the local groundwater regime
 Project duration/date: 2007
 Value of Project: ZAR150 000
 Job Title and Duties: Project Manager and technical input
- Name of Project: Marula Platinum Mine Hydrogeological Studies
 Client: Marula Platinum Mine
 Location: Mpumalanga Province, South Africa
 Project Description: Review of conceptual and numerical modeling and monitoring programme
 Project duration/date: 2006
 Value of Project: ZAR 350 000
 Job Title and Duties: Review and technical input
- Name of Project: Murowa Diamond Mine hydrogeological study
 Client: Rio Tinto
 Location: Zimbabwe
 Project Description: Groundwater resource assessment, dewatering design and contamination assessment.
 Project duration/date: 2000
 Value of Project: ZAR 1.5 million
 Job Title and Duties: Project manager and technical input
- Name of Project: Sadiola open pit gold mine hydrogeological investigation
 Client: Anglogold
 Location: Mali
 Project Description: Hydrogeological evaluation, design and installation of a dewatering system and mine water supply wellfield.
 Project duration/date: 1999 – 2001
 Value of Project: US\$100 000
 Job Title and Duties: Project manager and technical input

Key Experience:**Peter Rosewarne****Mining**

- Name of Project: De Hoek, Zoutkloof and Riebeeck West limestone quarries
 Client: PPC
 Location: Piketberg, Western Cape Province, South Africa
 Project Description: Evaluation of end-use options for the above quarries, which included detailed pit water balance calculations and compilation of environmental management plan reports.
 Project duration/date: 1997
 Value of Project: ZAR 100 000
 Job Title and Duties: Project manager and technical input
- Name of Project: Ujina, Rosario and Pullalli hydrogeological studies
 Client: CMDIC
 Location: Chile
 Project Description: Conceptual and numerical modeling of inflows to open pit copper mines
 Project duration/date: 1994 – 1996
 Value of Project: US\$ 100 000
 Job Title and Duties: Project manager and technical input
- Name of Project: Cooke 3 Section
 Client: Randfontein Estates Gold Mine
 Location: Gauteng Province, South Africa
 Project Description: Prediction of the effects on structures of lowering of the water table by dewatering.
 Project duration/date: 1983
 Value of Project: ZAR100 000
 Job Title and Duties: Senior hydrogeologist
- Name of Project: Phoenix, Tsikondeni and Amersfort coal mine hydrogeology
 Client: Various
 Location: Mpumalanga, Limpopo
 Project Description: Hydrogeological assessment and inflow predictions for coal mines.
 Project duration/date: 1982 - 1983
 Value of Project: R250 000
 Job Title and Duties: Senior hydrogeologist
- Name of Project: Block 1 open cast coal mine hydrogeological study
 Client: Anglo American
 Location: Vereeniging, Gauteng Province, South Africa
 Project Description: Hydrogeological assessment, inflow prediction and dewatering design.
 Project duration/date: 1982
 Value of Project: R150 000
 Job Title and Duties: Senior hydrogeologist
- Name of Project: Ryst Kuil Uranium Prospect
 Client: UraMin Inc
 Location: Beaufort West
 Project Description: Determination of groundwater supply potential, pit inflows and environmental impacts of open pit and underground mining
 Project duration/date: 2007-2008
 Value of Project: ZAR5 million
 Job Title and Duties: Project Manager and Technical Input

Key Experience:**Peter Rosewarne****Mining**

Name of Project: Deepening of Riebeeck West limestone quarry
Client: PPC
Location: Western Cape
Project Description: Assessment of increased groundwater inflows and environmental impacts of deepening and expanding the existing quarry
Project duration/date: 2007
Value of Project: ZAR155 000
Job Title and Duties: Project Manager, numerical flow modelling

Key Experience:**Peter Rosewarne****Subsurface Contamination and Waste Disposal**

- Name of Project: Chevron Underground Storage Tank Project
 Client: Chevron
 Location: South Africa
 Project Description: Assessment of soil and groundwater contamination risk at retail sites
 Project duration/date: 2006-2009
 Value of Project: ZAR 1 million+
 Job Title and Duties: Project manager and technical input
- Name of Project: High level nuclear waste repository
 Client: Confidential
 Location: South Africa
 Project Description: Determining geological, structural and hydrogeological parameter values required for assessing the suitability of candidate sites for high level nuclear waste disposal
 Project duration/date: Nov 2005 – February 2006
 Value of Project: Confidential
 Job Title and Duties: Determination of hydrogeological parameter values
- Name of Project: Saldanha Hazardous Waste Site Feasibility Study
 Client: VDM Transport
 Location: Western Cape Province, South Africa
 Project Description: Establishment of baseline groundwater flow and quality to assess the feasibility of establishing a hazardous waste site near Saldanha
 Project duration/date: 2005
 Value of Project: ZAR 150 000
 Job Title and Duties: Project manager and technical input
- Name of Project: Hazardous Waste Landfill Site
 Client: Chevron
 Location: Cacuaco, Angola
 Project Description: Assessment of groundwater impacts from wastes from the off-shore oil industry
 Project duration/date: 2003
 Value of Project: USD \$600k
 Job Title and Duties: Principal Hydrogeologist
- Name of Project: Spoornet Storage Depot
 Client: Spoornet
 Location: Cape Town, Western Cape Province, South Africa
 Project Description: Site characterisation and remediation plan for hydrocarbon contamination
 Project duration/date: 2000
 Value of Project: ZAR 60 000
 Job Title and Duties: Project manager and technical input
- Name of Project: Oilkol Recycling Depot
 Client: Oilkol
 Location: Virginia, Free State Province, South Africa
 Project Description: Characterisation and remediation of contamination at oil recycling depot
 Project duration/date: 1998
 Value of Project: ZAR 75 000
 Job Title and Duties: Project manager and technical input

Key Experience:**Peter Rosewarne****Subsurface Contamination and Waste Disposal**

- Name of Project: Groundwater monitoring
 Client: Various
 Location: Western Cape Province, South Africa
 Project Description: Monitoring at Stellenbosch, Malmesbury, Arlington, Aloes Waste Disposal Sites
 Project duration/date: 1995 -
 Value of Project: Various
 Job Title and Duties: Project manager and technical input
- Name of Project: AECI Somerset West subsurface contamination
 Client: AECI Limited
 Location: Somerset West, Western Cape Province, South Africa
 Project Description: Characterization and remediation at a 1200ha multi-purpose industrial site on which there was explosives, fertilizer, pesticides, acids and other chemicals production. Major contaminants include lead, arsenic, mercury, sulphur and explosives.
 Project duration/date: 1994 - current
 Value of Project: ZAR 5 million
 Job Title and Duties: Project manager and technical input
- Name of Project: Caltex Refinery
 Client: Chevron
 Location: Cape Town, Western Cape Province, South Africa
 Project Description: Investigation on impacts of Refinery activities on soil and groundwater. Site characterisation and monitoring
 Project duration/date: 1994. 2001-2003
 Value of Project: USD 50k
 Job Title and Duties: Project manager and technical input
- Name of Project: Determination of candidate sites for sub-regional landfills
 Client: Various
 Location: Western, Northern and Southern Cape Provinces, South Africa
 Project Description: Evaluation of soils, geology, land-use, surface and groundwater to locate candidate landfill sites for the West Coast District Council, Paarl, Breede River Winelands and Port Elizabeth
 Project duration/date: 1994 -
 Value of Project: Various
 Job Title and Duties: Project manager and technical input
- Name of Project: Characterisation of existing landfill sites for the Municipalities of Tulbach, Cape Town, Malmesbury, Prince Albert, Port Elizabeth, Elim, Gansbaai
 Client: Various municipalities
 Location: Western Cape Province, South Africa
 Project Description: Investigation of soils, geology and groundwater conditions
 Project duration/date: 1992 -
 Value of Project: Various
 Job Title and Duties: Hydrogeologist

Key Experience:**Peter Rosewarne****Civils Dewatering**

Name of Project: Core Effluent Project:Chevron Refinery
Client: Chevron
Location: Cape Town, Western Cape Province, South Africa
Project Description: Investigation of soil and groundwater properties for dewatering design
Project duration/date: 2005
Value of Project: ZAR 250 000
Job Title and Duties: Project manager and technical input. Numerical modeling

Name of Project: Ngqura Harbour Development
Client: National Ports Authority
Location: Coega, Eastern Cape
Project Description: Evaluation of dewatering design and monitoring
Project duration/date: January 2003 to June 2004
Value of Project: ZAR 750 000
Job Title and Duties: Project manager and technical review

Name of Project: Cullinan Hotel
Client: Murray and Roberts
Location: Foreshore, Cape Town, Western Cape Province, South Africa
Project Description: Determining the groundwater inflow potential and remedial measures for the basement excavation
Project duration/date: 1998
Value of Project: ZAR25 000
Job Title and Duties: Project hydrogeologist