

# WRC RESEARCH PORTFOLIO 2008/2009

## KSA 1 Research portfolio for 2008/09

Project No	Title	Contractor	Term
1690	Remote sensing as a tool to determine the legal compliance of surface and groundwater users in a catchments (NS)	<b>GEOSS.</b> ARC; Council for Geoscience; UCT; US	01/04/06 – 31/03/09
1751	A methodology for near-real time spatial estimation of evaporation(NS)	<b>CSIR.</b> UKZN; Water Watch; SASRIA	01/04/07 - 31/03/09
1763	The identification and delineation of high-yielding well-field areas in Karoo aquifers as future water supply options to local authorities.(S)	<b>Groundwater Africa.</b> SRK Consulting; Council for Geoscience; BKS (Pty) Ltd; Eric Hall & Associates	01/04/07-31/03/11
1851	Development and Application of Global Navigational Satellite Systems (GNSS) Methodology for Groundwater Resource Assessment (NS)	<b>Umvoto Africa (Pty) Ltd.</b> Purdue University; Department of Land Affairs;Overstrand Municipality;	01/4/08 - 31/03/11
1846	Optimised monitoring of groundwater - surface water - atmospheric parameters for enhanced decision making at a local scale (S)	CSIR.	01/4/08 - 31/03/11
1419	Flow conceptualisation and storage determination in the Table Mountain Group (TMG) aquifer systems (S)	UWC	01/04/03 – 31/03/09
1488	Protocol for assessing the sustainability of springs (NS)	Maluti Water	01/04/04 – 30/06/08
1565	Flow conceptualisation, recharge and storativity determination in Karoo aquifers (S)	SRK	01/04/05 – 31/03/09
1685	The use of <sup>222</sup> Rn as a hydrological tracer in natural and polluted environment (NS)	CSIR	01/04/06 – 31/03/09
1693	Basement aquifers in support of rural communities in Limpopo, North-West and Mpumalanga Provinces (with special emphasis on transboundary aquifer systems) (NS)	UP	01/04/06 – 31/03/10
1491	The water resources of South Africa, 2005 study (WR2005) (S)	SRK	01/04/04 – 31/03/09
1684	Towards improved estimates in water resource assessments using hyperspectral imagery to classify and map land-cover classes in Southern Africa (NS)	CSIR	01/04/06 - 31/03/09
1748	Hydropedological interpretation of the soils of selected catchments with the aim of improving efficiency of hydrological models (NS)	UFS	01/04/07 – 31/03/10
1752	Influence of catchment development on peak urban runoff(NS)	UP	01/04/07 – 31/03/10
1753	Land-Water Linkages: Agent-Based Modelling of Land Use Change and Its Impact on Water Resources in the Modder River Basin(NS)	Central University of Technology, Free State	01/01/07 – 31/12/09
1760	Measurement of the bulk flow and transport characteristics of selected fractured rock aquifer systems in South Africa (S)	UFS	01/04/07-31/03/11
1766	Field investigations to study the fate and transport of light non-aqueous phase liquids (LNAPLs) in groundwater(S)	UFS	01/04/07 – 31/03/11
1490	Synthesis and encapsulation of hydrological research findings into a DSS for application at co-operational/planning level (S)	UKZN	01/04/04 – 31/03/09
1840	Integrating water resource and water service management tools (S)	WRP Consulting Engineers	01/04/08 – 31/03/11
1759	Review and update of the SANCOLD Guidelines for the design of freeboard of dams(NS)	US	01/04/07 – 31/03/10
1764	The development and calibration of South Africa's National Standards for Water Retaining Structures (S)	US	01/04/07 – 31/03/10
1838	Identification, estimation, quantification and incorporation of risk and uncertainty in water resources management tools in South Africa (S)	Rhodes University	01/04/08– 31/03/11

1852	An investigation of the potential use of ocean colour remote sensing to assess the influence of variations in freshwater inputs to coastal ecosystems: Phytoplankton and Sediment Dynamics of the Natal Bight. (NS)	CSIR	01/04/08 – 31/03/09
1492	Model output statistics applied to multimodel ensemble long-range forecasts over South Africa (NS)	SA Weather Service	01/04/04 – 30/09/08
1566	Understanding and predicting hydroclimatic variability (S)	UCT	01/04/05 – 30/09/08
1681	The role of antecedent conditions in determining rainfall characteristics during the early part of the rainfall season (NS)	UCT	01/04/06 – 31/03/09
1747	Multidisciplinary analysis of hydroclimatic variability at the catchment scale(NS)	UCT	01/04/07 – 31/03/10
1697	An Investigation into the Effects of Atmospheric Pollutants on Surface Water Quality in the Eastern Regions of South Africa (NS)	UKZN	01/04/06 – 31/03/09
1692	GIS based assessment of non-point source pollution in Kuils-Eerste River Catchments, Cape Town. (NS)	UWC	01/04/06 – 31/03/09
1755	Water Quality Monitoring Data and Target Users: Maximising Value(NS)	CSIR	01/04/07 – 31/08/09

1847	Tropical systems from the southwest Indian Ocean into southern Africa: Impacts, dynamics and projected changes. (NS)	ARC	01/04/08 – 31/03/11
1843	An evaluation of the sensitivity of socio-economic activities to climate change in climatically divergent South African catchments (S)	UKZN	01/04/08 – 31/04/11
1561	Persistent organic pollutants (POPs) in the environment ( )	North-West University	01/04/05 – 30/06/09
1568	Development of a model to assess the costs associated with eutrophication (S)	Umgeni Water	01/04/05 – 31/03/09
1686	Endocrine disruptive chemical (EDC) activity and health effects of identified Veterinary compounds in surface and groundwater (NS)	UP	01/04/06 – 31/03/09
1749	Development and testing of a health risk assessment framework to derive guidelines for endocrine disruptors (EDCs) in drinking water(S)	CSIR	01/04/07 – 31/03/09
1754	A National Survey of Mercury levels in South African Resources(NS)	CSIR	01/04/07 – 31/03/09
1756	Investigation into the effects of water quality (organic vs. inorganic) on the immune systems of humans(S)	UWC	01/03/07 – 28/02/10
1845	A comparison of the costs associated with pollution prevention measures to that required to treat polluted water resources (S)	CSIR	01/04/08 – 31/03/11
1683	Soil moisture from satellites: daily rainfall maps over RSA, for flash flood forecasting, drought monitoring, catchment management and agriculture (NS)	Pegram & Associates	01/04/06 – 31/03/09
1694	Sampling and monitoring protocol for radioactive elements (NS)	UWC	01/04/06 – 31/03/09
1504	Novel silicone rubber integrative passive field sampler (NS)	Venda Univ	01/04/04 – 31/03/09
1768	Investigation of the positive and negative consequences associated with the introduction of low-P detergents(S)	UKZN	01/04/07 – 30/09/08
1769	Development of a conceptual framework for the regulation of water quality within the context of an integrated, preventative management approach(S)	Zitholele Consulting(Pty) Ltd	01/04/07 – 31/03/09
1849	Management of human-induced salinisation in the Berg River catchment and development of criteria for regulating land use in terms of salt-generating capacity (NS)	UP	01/04/08 – 03/03/12
1850	Assessment of the toxicity of cyanobacteria in the Kruger National Park (NS)	ARC	01/04/08 – 31/03/09
1853	<i>Quality Control and Assurance Guideline for South African Toxicity Testing Laboratories</i> (NS)	CSIR	01/04/08 – 31/03/10
1854	Development of a risk indicator methodology to estimate the relative risk of pesticide contamination in South African water resources (NS)	CSIR	01/04/08 – 31/03/10
<b>Programme2: Urban and rural water resource management</b>			
1848	Nitrate removal for groundwater supply to rural communities (NS)	CSIR	01/04/08 – 31/03/09
<b>Programme 3: Integrated river flow and catchment hydraulics</b>			

1428	An investigation and formulation of methods and guidelines for the licensing of SFRAs with particular reference to low flows (S)	UKZN	15/01/04-31/10/08
1682	The impact of deep rooted trees on the hydrological balance of a small catchment in the KwaZulu-Natal midlands (NS)	CSIR	01/04/06 – 31/03/09
1765	Sedimentation and sediment yield maps for South Africa(S)	US	01/04/07 – 31/03/10
1767	<i>South African Handbook on Environmental Hydraulics(S)</i>	Ninham Shand	01/04/07 – 31/03/09
<b>Programme 1: Institutional governance and reforms</b>			
1563	Water resource management in rainwater harvesting: An integrated systems approach (S)	Source Strategic focus	01/04/05–31/03/09
1573	Development of the AWARE model for the Inkomati CMA (carry over) (S)	To be Solicited	
1689	A philosophy and strategy enabling learning for good ecosystem governance (NS)	CSIR	01/04/06 – 31/03/09
1762	The criteria necessary for the success of women in the water sector(S)	Palmer Development Group	01/04/07 – 31/03/09
1837	Exploring the lowest appropriate level of water governance in South Africa (S)	UWC	01/04/08 – 31/03/10
1855	Water allocation reform, instruments and processes for achieving equity and gender balance (NS)	Sinelwati Scientific cc	01/04/08 – 31/03/10
1839	The impact of IWRM on the lives of women and the poor in South Africa (S)	Ninham Shand	01/04/08 – 31/03/10
1842	Towards regulation of water resource management in South Africa (S)	Suspended	
1570	Econometric model to predict the effect that various water resource management scenarios would have on South Africa's economic development (S)	Conningarth Economist	01/04/05 – 30/09/08
1844	An investigation into the water infrastructure development financial allocation pathways in municipalities (S)	African Centre for Water Research	01/04/08 – 31/03/10
1758	Review of the involvements of national water institutions and civil society in international agreements in South Africa(S)	Pegasys Strategic Management	01/04/07 – 31/12/09
1841	The water sector institutional landscape by 2025 (S)	CSIR	01/04/08 – 31/10/10

#### KSA 2 Research portfolio for 2008/09

(Projects accepted for funding in April 2008 are marked with \* (asterisk) and S = solicited) (# = to end 2008)

<b>THRUST 1: ECOSYSTEM PROCESSES</b>			
<b>Programme 1: Estuarine processes</b>			
K5	Title	Contractor	Term
1591	Biochemical processes in a groundwater fed inter-tidal ecosystem	University of Cape Town, Geology Dept.	01 Sept 2006 – 30 June 2009
<b>Programme 2: Riverine processes</b>			
1676	Periphyton flow-dynamics	University of Cape Town, Freshwater Research Unit,	01 Feb 2006 – 31 Dec 2010
* 1796	Deriving conservation targets for freshwater systems	Ezimvelo KZN Wildlife	01 April 2008 – 31 Mar 2010
*S1790	A Framework for the Classification of Drainage Networks in Savanna Landscapes	University of the Witwatersrand Centre for Water in the Environment,	01 April 2008 – 31 Mar 2010
<b>Programme 3: Wetland processes</b>			
S1584	National Wetland Programme : Phase II – Wetland Health & Integrity	University of Cape Town Freshwater Research Unit	01 Apr 2006 – 31 Mar 2010
1704	To investigate the capability of the Mfabeni Mire (St Lucia) to respond to climatic and land-use stresses and its role in sustaining discharge to downstream and adjacent ecosystems	Rhodes University	01 Apr 2008 – 30 Apr 2010
<b>Programme 4: Groundwater-dependent ecosystems</b>			

1586	Framework development for the sampling, classification and geographical occurrence of stygobiont amphipods in South Africa	North-West University, Zoology Department	01 Nov 2005 – 31 July 2010
<b>THRUST 2: ECOSYSTEM MANAGEMENT AND UTILISATION</b>			
<b>Programme 1: Ecological Reserve</b>			
1587#	Environmental water requirements for non-perennial systems (K5.414 continued)	University of the Free State, Centre for Environmental Management	01 Apr 2005 – 31 July 2008
*1797	Application and testing of a strategic adaptive management system for freshwater protection, associated with implementation of South Africa's national water policy	SA National Parks Scientific Services	01 July 2008 – 31 Mar 2011
*1798	Testing a prototype methodology for environmental water assessments in non-perennial rivers (continuation of K5/1587)	University of the Free State, Centre for Environmental Management	01 Apr 2008 – 31 Mar 2011
*1799	Water temperatures and the ecological Reserve	Rhodes University Institute for Water Research: & Freshwater Consulting Group	01 Jan 2008 – 31 Mar 2011
*S 1788# TARGET	Development of methods for Reserve determination of wetlands Phase I: Rapid Reserve	Fluvius Environmental Consultants	01 Jan 2008 – 31 July 2008
*1856	Development of a revised desktop Reserve Estimation Model 'Application of abiotic components of the Reserve within the SPATSIM program & other tools'	Rhodes University, Institute for Water Research	01 June 2008 – 31 July 2010
<b>Programme 2: Estuary management</b>			
1581#	The freshwater requirements of temporarily open / closed estuaries on the South Eastern and South Western Cape coasts	SA Institute for Aquatic Biodiversity	01 Apr 2005 – 31 July 2008
S1413#	Valuation of estuary services in SA	Nelson Mandela Metropolitan Univ, Economics	01 Apr 2004 – 30 Nov 2008
1679	CERM: East Kleinemonde Estuary modelling study	Anchor Environmental Consultants	01 Apr 2006 – 31 Mar 2009
1705	Estuaries and economic empowerment	UKZN Centre for Environment, Agriculture & Development	01 Apr- 2007– 31Mar 2010
<b>Programme 3: Ecosystem health</b>			
S1589#	The effects of streamflow manipulation on the intermediate hosts and vector populations of disease and the transmission of associated parasites	Institute of Natural Resources	01 Apr 2005 – 31 Mar 2008
1677	Conservation model for threatened fish species	University of Limpopo	01 Apr 2006 – 31 Mar 2009
S*1708	Development of an ecosystem risk assessment model to determine the risk of EDCs in the water environment	Rhodes University, Institute for Water Research	01 July 2007 – 30 June 2008
<b>Programme 4: Environmental water quality</b>			
1484#	Application of chronic (sub-lethal) toxicity endpoints to the development of resource quality objectives	Institute for Water Research, Rhodes University	01 Apr 2004 – 31 Mar 08
1675#	The application of ecological informatics modelling approaches to South African conditions with preliminary testing on algal blooms	North-West University	01 Apr 2006 – 31 May 2008
1707	Development of a diatom-based biomonitoring protocol for South African rivers and streams Phase III: Regional testing, method refinement & calibration; index formulation and river health programme accreditation	DH Environmental Consulting	01 Apr 2007– 31 Mar 2010
<b>Programme 5: Endocrine disrupting compounds (EDCs) in water sources</b>			
S1674 Target	Assessment of environmental exposure & health risk in an area where ongoing DDT spraying occurs	University of Pretoria, Department of Andrology	01 Apr 2006 – 31 Mar 2009

1680	Amphibian metamorphosis as a biological model to study the effect of endocrine contaminants on thyroid function	University of Stellenbosch Department of Zoology	01 Apr 2006 – 31 Mar 2008
1706	Environmental assessment in an area where ongoing DDT spraying occurs	Rhodes University, Institute for Water Research	01 Oct 2007 – 30 Sep 2009
<b>Programme 6: Socio-economic considerations</b>			
S1644	Framework and manual for the valuation of goods and services from aquatic ecosystems for the resource directed measures (RDM)	CIC International	01 Apr 2007 – 31 Mar 2009
1709#	Development and testing of a coherent, integrated and practicable set of indicators for the sustainable use and management of communal wetlands and their catchments, with a strong focus on rehabilitation.	Association for Water & Resource Development (AWARD)	01 Jan 2007 – 30 Jun 2008
* 1800	Knowing, caring, and acting: Making use of socio- cultural perspectives to understand and improve conservation	CSIR Natural Resources & the Environment	01 Jan 2008 – 31 Mar 2010
<b>Programme 7: Ecosystem governance</b>			
1710	Management effectiveness in implementing cross-sector policy objectives for conserving freshwater biodiversity	CSIR Natural Resources & the Environment	01 Jan 2007 – 31 Mar 2009
*S 1711	Shared rivers initiative Phase 1A KNP rivers	Association for Water & Rural Development (WARD)	1 Nov 2007 – 30 Oct 2010
*S 1783	Shared rivers initiative Phase 1B : Communication (holistic rivers programme)	CSIR Natural Resources & the Environment	01 Jan 2008 – 31 Mar 2010
* 1801	Identifying and enabling protection of national freshwater heritage ecosystems for South Africa	CSIR Natural Resources & the Environment, & SANBI	01 Mar 2008 – 31 May 2010
<b>THRUST 3: ECOSYSTEM REHABILITATION</b>			
<b>Programme 1: Wetland rehabilitation</b>			
SOL	Wetland 'Wise-Use'	To be advised	
*S 1789	Guidelines for the determination and management of wetland buffer zones	To be advised	

**KSA 3 Research Portfolio for 2008/09**  
(\* New Projects)

<b>THRUST 1: WATER SERVICES – INSTITUTIONAL AND MANAGEMENT ISSUES</b>			
<b>Programme 1: Cost-recovery in water services</b>			
Project No	Title	Contractor	Term
1614	The development of models to facilitate financial sustainability of water services provision by Water Services Authorities in rural areas, based on an investigation of full costs and income	Mvula Trust	01/04/05 – 31/08/07
1713	The impact of large consumer unit size on access to and affordability of water services in lower income urban areas in South Africa	Palmer Dev Group/Cape Town Office	01/04/07 – 31/03/08
1810(S)*	Guidelines on domestic water accounts	Sarah Slabbert Associate	01/04/08 – 31/03/10
1811(S)*	Guidelines on Pricing and debt management	Arcus Gibb (Pty) Ltd	01/04/08 – 31/03/10
<b>Subtotal</b>			
<b>Programme 2: Institutional and management issues – Water services</b>			
1784	Guidelines on the condition assessment of water services infrastructure	Jeffares and Green	01/10/07 – 31/09/09
1785	Review of technology used in asset management	Africon	01/10/07 – 31/03/09
1786	Development of an asset management toolkit	WRP	01/10/07 – 31/03/09
1814(S)*	Development of strategies for integrated water meter management	University of JHB	01/04/08 – 31/03/10
1812(S)*	Situation analysis of water services	PD Naidoo & Associates	01/04/08 – 31/03/10
<b>Programme 3: Innovative management arrangements – Rural water supply</b>			

1612	Best practice institutional and project guidelines based on national and international experience to manage the impact of gender in the South African rural water sector	Council for Geoscience	01/04/05 – 25/02/08
1666	Productive use of domestic water for sustainable livelihoods	Nemai Consulting	01/04/06– 31/03/08
1714	Guidelines for the integration of community-based procurement for providing operations and maintenance services for basic water and sanitation provision by municipalities	Cape Peninsula University of Technology	01/04/07 – 31/03/09
1815(S)*	Development of people-centred approaches	The Mvula Trust	01/04/08 – 31/03/09
<b>Programme 4: Regulation in the water services sector</b>			
1667	Review of regulatory aspects of the water services sector	AWI	01/04/06 – 31/03/08
1715	Development of a framework and model to regulate the competencies and training of managers and technicians in the provision of water services	University of the Witwatersrand	01/04/07 – 31/03/08
<b>Programme 5: Impact of water and sanitation interventions</b>			
1700	Toolkit to measure sociological, economic, technical and health impacts and benefits of 10 years of water supply and sanitation interventions in South Africa.	University of Johannesburg	01/04/06 – 31/03/08
<b>THRUST 2: WATER SUPPLY AND TREATMENT TECHNOLOGY</b>			
<b>Programme 1: Drinking water treatment technology</b>			
<b>Project No</b>	<b>Title</b>	<b>Contractor</b>	<b>Term</b>
1395	Upgrading existing South African plants to high-rate filters	Umgeni Water	01/04/02 – 31/12/08
1526	Biological filtration of iron & manganese from groundwater	Umgeni Water	01/04/04 – 31/03/07
1527	Development of enhanced floating media separation for drinking water production and pre-treatment in rural water supply	University of Stellenbosch	01/04/04 – 31/03/09
1592	The defouling of membranes by moving magnetic dipole polymer beads, containing nano magnetic particles, in a scouring motion across the membrane using external magnetic fields.	University of Stellenbosch	01/04/05 – 30/09/08
1716	Development of a durable and reliable wave-energy reverse osmosis pump	The Impact Free Water Group	01/04/07 – 31/03/10
1717	Two-stage reclamation of filter backwash water at treatment plants using source water with high algal content	University of Pretoria	01/04/07 – 31/03/09
<b>Programme 2</b>			
1598	The development of immersed membrane microfiltration systems for the treatment of rural waters and industrial waters	Durban Institute of Technology	01/04/05 – 31/12/08
1668	Compliance of non-metropolitan South African potable water providers with accepted drinking water quality and management guidelines and norms	University of Fort Hare	01/03/06 – 31/03/09
1718	A management information tool for the efficient operation and maintenance of small water treatment plants	Swartz Eng	01/04/07 – 31/03/09
1836(S)*	Application and performance of slow sand filtration	CPUT	01/04/08 – 31/03/11
<b>Programme 3: Drinking water quality</b>			
1534	New detection methods for EDCs	University of Stellenbosch	01/04/04 – 31/12/08
1719	Investigation of the distribution and diversity of South African toxic freshwater cyanobacteria with special reference to analysis of the neurotoxin BMAA and molecular genetic methods for microcystin screening	NMMU	01/04/07 – 31/03/09
1720	Situation and gap analysis of water quality testing in South Africa.	Jeffares & Green	01/04/07 - 31/03/09
1816*(S)	EDC bio-assay toolbox	Biostream UP	01/04/08 – 31/03/10
<b>Programme 4: Water distribution and distribution systems</b>			
1448	Grouted lining systems for the renovation of old steel pipelines and the design of new pipelines	Rand Water	01/04/03 – 30/09/08
1701	Assessment of the feasibility of using a dual water reticulation system in South Africa	University of Wits	01/04/06 – 31/03/08

1702	Investigation of the state of plumbing used in South Africa	University of Johannesburg	01/04/06 – 31/03/08
1721	Inverse transients to determine deficiencies in pipelines	University of Pretoria	01/04/07 – 31/03/10
1722	Guidelines on how to determine and reduce apparent losses	Conward Consulting	01/04/07 -31/03/09
1818*	Durability of FC tanks	Partners in Development	01/04/08 – 31/03/09
1819*	Investigating private on-site water use and its impacts	Stellenbosch University	01/04/08 – 31/03/09
1820*	Determining the change in the hydraulic capacity of pipelines	University of Pretoria	01/04/08 – 31/03/11
1821*	Dual greywater and drinking water reticulation for high density urban residential dwellings.	University of the Witwatersrand	01/04/08 – 31/03/11
<b>THRUST 3: SUSTAINABLE MUNICIPAL WASTEWATER MANAGEMENT AND SANITATION</b>			
<b>Programme 1: Emerging technologies and solutions</b>			
<b>Project No</b>	<b>Title</b>	<b>Contractor</b>	<b>Term</b>
1537	To investigate the performance and kinetics of biological nitrogen and phosphorus removal with ultrafiltration membranes for solid-liquid separation	University of Cape Town	01/04/04 – 31/12/08
1658	Evaluation of a South African clinoptilolite for ammonia-nitrogen removal from secondary sewage effluent for pollution control.	University of Pretoria/ Department of Chemical Engineering	01/04/06 – 31/03/08
1746	Technological development and modelling of the upflow anaerobic sludge bed (UASB) for co-treating saline and sewage wastewaters in the BioSure™ process	University of Cape Town	01/07/07–30/06/08
1732	Energy from waste	University of Cape Town	01/04/07 – 31/03/08
1822*	Mass balances modelling over wastewater treatment plants III	University of Cape Town	01/04/08 – 31/03/10
1823*	FISHing for indigenous Anammox bacteria	Stellenbosch University CSIR - NRE	01/04/08 – 31/03/10
1824*	Effects of urine separation and treatment on wastewater effluent quality	CSIR – Stellenbosch	01/04/08 – 31/03/11
<b>Programme 2: Application of appropriate technologies and tools</b>			
1262	Practical implementation of external nitrification in biological nutrient removal activated sludge systems	University of Cape Town	01/01/2001 – 31/12/08
1657	A <i>status quo</i> assessment of the effectiveness of wastewater pond systems for containment and treatment of wastewaters and the development of practical operating guidelines.	Emanti Management (Pty) Ltd	01/04/06 – 31/03/08
1660	Design manual for small sewage treatment works	Waterscience cc	01/04/06 – 31/03/08
1661	Support to EU - EUROMBRA project: Development of an anaerobic membrane bioreactor.	University of Natal/Pollution Research Group	01/04/06 – 31/03/08
1730	Field guide for inspections at waterworks	Golder Associates	01/04/07 – 31/03/08
1825*	Denitrification in trickling filters	CSIR – Stellenbosch	01/04/08 – 31/03/10
<b>Programme 3: Stormwater and sewerage systems</b>			
1731	Stormwater ingress in South African sewer systems: understanding the problem and dealing with it.	Duzi-uMngeni Conservation Trust	01/04/07 – 31/03/09
1744	Development of a South African guide for the design and operation of waterborne sewerage systems	University of Pretoria	01/04/07 – 31/03/09
1826*(S)	Alternative technology for stormwater management	University of Cape Town	01/04/08 – 31/03/12
1827*(S)	Improving sewerage for South Africa	University of Cape Town	01/04/08 – 31/03/12
1828*(S)	Sewer master planning tools and guidelines	Univ. of Stellenbosch	01/04/08 – 31/03/10

<b>Programme 4: Management of wastewater and faecal sludges</b>			
1540	Influence of sludge conditioners on the soil- conditioning properties of sewage sludge	University of Pretoria	01/04/04 – 31/03/07
1622	The development of <b>Volume 3</b> ( <i>Land and Ocean Disposal</i> ) <b>Volume 4</b> ( <i>Use in Commercial Products</i> ) and <b>Volume 5</b> ( <i>Incineration</i> ) of the 2 <sup>nd</sup> edition of the <i>South African Wastewater Sludge Guidelines</i>	Zitholele Consulting	01/04/05 – 31/03/08
1723	Guidelines for the utilisation and disposal of water treatment residues	Golder Associates Africa	01/04/07 – 31/03/09
1724	Sustainable and beneficial use of biosolids land application strategies: Quantifying nitrogen and phosphorus plant-soil mass balances	University of Pretoria	01/06/07 – 31/06/10
1829*	Investigating the potential of deep row entrenchment of pit latrine and wastewater treatment works sludge for forestry and land rehabilitation purposes.	Partners in Development (Pty) Ltd	01/04/08 – 31/03/11
<b>THRUST 4: INDUSTRIAL AND MINE-WATER MANAGEMENT</b>			
<b>Programme 1: Quantification of water use and waste production</b>			
Project No	Title	Contractor	Term
1627	A first order assessment of the quantity and quality of non-point sources of pollution associated with the industrial mining and power generation sectors	Pulles Howard and de Lange	01/04/05 – 31/03/08
1830*	An assessment of how water quality and quantity will be affected by mining method and mining of the Waterberg coal reserves	Univ. of the Free State	01/04/08 – 31/03/09
<b>Programme 2: Regulatory mechanisms to improve industrial and mine-water management</b>			
1366	Valuing water for South African industries: A production function approach	CSIR	01/04/02 – 30/09/07
1624	Geochemical sampling and analyses for environmental risk assessments using the Wits Basin as a case study	Pulles Howard and de Lange Inc.	01/04/05 – 30/09/08
1733	Development of guidelines for the eThekweni metro to facilitate legal compliance with respect to industrial waste management	Nancy Oosthuizen Consulting	01/04/07 – 31/03/08
1734	Protocol for quantitative assessment of industrial effluents for discharge permitting	University of KwaZulu-Natal	01/04/07 – 31/03/11
<b>Programme 3: Minimising impact of waste on the water environment</b>			
1659	Reclamation of water from flooded Witwatersrand gold mines by selective dewatering of key underground compartments.	Golder Associates Africa (Pty) Ltd	01/04/06 – 31/12/08
1655	Arsenate resistance in microbial communities developing in maturing FA-AMD solids.	University of the Western Cape/ Department of Microbiology	01/04/06 – 31/03/08
1735	Refinement of the decision support system for metalliferous tailing disposal facilities	Golder Associates Africa (Pty) Ltd	01/05/07 – 31/05/09
1736	Consideration of the impact of classification and landfilling of hazardous waste.	CSIR	01/04/07 – 31/03/09
<b>Programme 4: Minimising waste production</b>			
1363	The promotion of biodegradable chemicals in the textile industry using the score system: Phase 1 - Pilot study	University of Natal	01/04/02 – 31/09/07
1553	The introduction of cleaner production technologies in the mining industry	Digby Wells and Associates	01/04/04 – 31/03/08
1625	Development of a complete process integration framework for wastewater minimisation in multipurpose batch plants	University of Pretoria -	01/04/05 – 31/03/07
1626	Cleaner production evaluation system and optimisation for metal finishing	Durban Institute of Technology	01/04/05 – 31/03/08
1669	An Investigation to Innovative approaches to brine handling	Proxa (Pty) Ltd	01/04/06 – 31/03/08
1673	A pilot study into upstream cleaner production technologies for the petroleum refining industry to meet the requirements of the waste discharge charge system (WDCS)	Process Optimisation and Resource Management (PRO&RM)	01/04/06 – 31/03/08



1832*(S)	Technical guidelines for the implementation of cleaner production initiatives (for point sources of pollution) in support of determining an incentive charge for municipal effluent charges	Process Optimisation and Resource Management (PRO&RM)	01/04/08 – 31/03/10
<b>Programme 5: Improved ability to predict and quantify effects</b>			
1460	Development of water balances for operational and post-closure situations for gold-mine residue deposits to be used as input to pollution- prediction studies for such facilities	Pulles Howard & de Lange	01/04/03 – 31/09/08
1554	Study of the kinetic development of oxidation zones of tailings dams with specific reference to the Witwatersrand gold-mine tailings dams	Pulles Howard and de Lange	01/04/04 – 30/09/07
1628	Prediction of how different management options will affect drainage water quality and quantity in the Mpumalanga coal mines up to 2040	Golder Associates Africa (Pty) Ltd	01/04/05 – 31/03/08
1663	Origin of sodium and its applications to water quality prediction in the South African coal mine environment.	University of Fort Hare/Department of Geology	01/04/06 - 31/03/08
1833(S)*	Environmental sustainability of inland industrial complexes	CSIR	01/04/08 - 31/03/11
<b>Programme 6: Beneficiation &amp; treatment of industrial and mining effluents</b>			
1623	Continued evaluation of the integrated managed passive water treatment system (IMPI) long -term monitoring of VCC passive treatment plant and three-dimensional characterisation of decommissioned sulphate-reducing units.	Pulles Howard and de Lange Inc.	01/01/05 – 31/03/08
1725	'Health for Purpose' in wetlands treating waste streams	University of Cape Town	01/04/07 - 31/03/11
1726	Beneficiation of agri-industry effluents	University of Cape Town	01/04/07 – 31/03/10
1727	Novel technology for the recovery of water and solid salts from hypersaline brines: Eutectic freeze crystallisation	University of Cape Town	01/04/07 – 31/03/10
1728	Cellulose fermentation products as energy source for biological sulphate reduction	CSIR	01/04/07 – 31/03/08
1729	Reactor design for metal precipitation in mine- water treatment	University of Cape Town	01/04/07 – 31/03/08
1834*	Towards passive treatment solutions for the oxidation of sulphide and subsequent sulphur removal from acid mine drainage	Rhodes University	01/04/08 – 31/03/11
<b>THRUST 5: SANITATION AND HYGIENE EDUCATION</b>			
<b>Programme 1: Advocacy health and hygiene education</b>			
1653	Assessment of the effect of drinking water quality on the health of people living with HIV/AIDS.	University of Venda	01/04/06 -31/03/09
1656	A guideline document for the implementation of sanitation health and hygiene education programmes in informal settlements.	Nemai Consulting	01/04/06 -31/03/08
1672	Develop the guideline: <i>Management of Microbial Water-borne Diseases Vol 5: What We and Our Children Ought to Know.</i>	University of Venda	01/04/06 - 31/03/08
1737	A guideline document for emergency infection of drinking water	Tshwane University of Technology	01/04/07 - 31/03/10
1738	Assessment of WATSAN and hygiene in relation to home/community based care services for HIV AIDS infected individuals in rural and peri-urban areas	University of Venda	01/12/07 - 31/10/09
1813	How does the HIV/AIDS epidemic in South Africa impact on WATSAN	University of the Western Cape	1/01/08 - 31/03/10
<b>Programme 2: Peri-urban sanitation research</b>			
1664	Effective demand for alternative sanitation options in peri-urban settlements.	Sigodi Marah Martin (Pty) Ltd	01/04/07 - 31/03/09
1632	Financial sustainability of sanitation services	Partners in Development	01/04/05 – 31/03/07
1654	Sustainable options for community level management of greywater in settlements without on-site waterborne sanitation.	University of Cape Town	01/04/06 - 31/03/09
1741	Examine the understanding and interpretation of sanitation policy and programmes	Hlathi Development Services	01/04/07 – 31/03/09
1742	What do we do to accelerate sanitation?	Development Services	01/04/07 31/03/09

1743	Free basic sanitation – is it possible?	Hlathi Development Services	01/04/07 – 31/03/09
<b>Programme 4: Technical sustainability of sanitation services</b>			
1745	Understanding the sludge accumulation in VIPs and other on-site sanitation systems and strategies to manage desludging in the future when pits are full.	Partners in Development	01/04/07 – 31/03/10
1781	Develop more robust and lighter VIP structures	University of Pretoria	01/04/07 - 31/03/10

#### KSA 4 Research Portfolio for 2008/09

Project no	Title	Contractor	Term
1482**	Standards and guidelines for improved efficiency of irrigation water use from dam wall release to root zone application	ARC/Institute of Agricultural Engineering	01/04/04–31/03/09
1574	Adapting the wetting front detector to the needs of small-scale furrow irrigation and providing a basis for the interpretation of salt and nutrient measurements in the water sample	University of Pretoria, Plant Production & Soil Science	01/04/05–31/03/08
1577	Increasing water use efficiency of irrigated sugarcane production by means of good agronomic practices	SASRI	01/04/05–30/09/08
1578	Integrating and upgrading of SAPWAT and PLANWAT to create a powerful and user-friendly irrigation planning tool	PICWAT cc	01/04/05–31/03/08
1650	Guidelines for irrigation management in pasture production	CSIR, Natural Resources and the Environment	01/04/06–31/03/11
1772	Scoping study on water use of crops/trees for biofuels	University of KwaZulu-Natal, School of Bio-resources Engineering and Environmental Hydrology	01/04/07–31/03/08
1770**	Water use of fruit tree/orchard crops	CSIR, Natural Resources and the Environment	01/04/07–31/03/13
1771**	Water use of drought-tolerant food crops	University of KwaZulu-Natal, Crop Science	01/04/07–31/03/13
1639	Guidelines for sustainable use of greywater in small-scale agriculture and gardens in South Africa	University of KwaZulu-Natal, School of Biological and Conservation Sciences	01/04/05–31/03/09
1773**	A quantitative investigation into the link between irrigation water quality and food safety	University of Stellenbosch, Food Science	01/04/07–31/03/12
1802*	Interaction between aquaculture and water quality in on-farm irrigation dams: Extended monitoring and mitigating procedures to manage environmental impact	University of Stellenbosch, Division of Aquaculture	01/04/08–31/03/12
<b>THRUST 2: WATER UTILISATION FOR FUELWOOD AND TIMBER PRODUCTION</b>			
<b>Programme 1: Water-efficient production methods and systems in agro-forestry, woodlands and forestry plantations</b>			
1462**	Water use in relation to biomass of indigenous tree species in woodland, forest and/or plantation conditions	CSIR, Natural Resources and the Environment	01/04/03–31/03/08
1480	Agro-forestry systems for improved food production through the efficient use of water	CSIR, Natural Resources and the Environment	01/04/05–31/03/09
1803*	The impact of re-establishing indigenous plants and restoring the natural landscape on sustainable rural employment and land productivity through payment for environmental services	ASSET Research	01/04/08–31/03/13
<b>THRUST 3 : WATER UTILISATION FOR POVERTY REDUCTION AND WEALTH CREATION IN AGRICULTURE</b>			
<b>Programme 1: Sustainable water-based agricultural activities in rural communities</b>			
1351**	The effect of the introduction of agro-forestry species on the soil moisture regime of traditional cropping systems in rural areas. Phase II: On-farm trials of alternative agro-forestry systems	CSIR, Natural Resources and the Environment	01/04/02–31/03/11

1465	Sustainable techniques and practices for water harvesting and conservation and their effective application in resource-poor agricultural production in KwaZulu-Natal Province	Zakhe Agricultural College	01/04/03–31/03/08
1477	Best management practices for small-scale subsistence farming on selected irrigation schemes and surrounding areas through participatory adaptive research in Eastern Cape Province	University of Fort Hare, Soil Science	01/04/04–31/03/09
1478	Sustainable techniques and practices for water harvesting and conservation and their effect application in resource poor agricultural production in Eastern Cape Province	University of Fort Hare, Agricultural Economics	01/04/04–31/03/09
1575	Participatory development of training material for agricultural water use in homestead farming systems for improved livelihoods	Rural Integrated Engineering (Pty) Ltd	01/04/05–31/03/09
1579**	Nutritional value and water use of indigenous crops for improved rural livelihoods	University of Pretoria, Centre for Nutrition	01/04/05–31/03/10
1648**	Assessment of the social and economic acceptability of rainwater harvesting and conservation practices in selected peri-urban and rural communities	University of the Free State, Agricultural Economics	01/04/06–31/03/11
1775**	Rainwater harvesting and conservation (RWH&C) for rangeland and cropland productivity in communal areas in selected provinces in the semi-arid area of South Africa	ARC, Institute of Soil, Climate and Water	01/04/07–31/03/13
1776	Development of a comprehensive learning package for education on the application of water harvesting and conservation (WH&C)	Umhlaba Consulting Group, Agricultural and Rural Development	01/04/07–31/03/12
1777	Scoping study on indigenous water harvesting and conservation (WH&C) practices	Umhlaba Consulting Group, Agricultural and Rural Development	01/04/07–31/03/08
1804*	Improving plowholder livelihood and scheme productivity on smallholder canal irrigation schemes in Limpopo province	Tshwane University of Technology, Agricultural Management	1/04/08–31/03/12
<b>Programme 2: Integrated water management for profitable farming systems</b>			
1354	Management for new establishment of profitable small-scale farming with reference to the Lower Orange River	University of the Free State, Agricultural Economics	01/04/02–31/03/08
1580**	Revitalisation of provincial fish hatcheries and training facilities to promote profitable aquaculture	Rhodes University, Ichthyology and Fisheries Science	01/04/05–31/03/10
1649**	Development of training material for extension in irrigation water management	University of Pretoria, Agricultural Economics, Extension and Rural Development	01/04/06–31/03/11
1778	Awareness creation, implementation plans and guidelines for management of sustainable on-farm and on-scheme water measurement	WSM Leshika (Pty) Ltd	01/04/07–31/03/11
1779	Assessment of the contribution of water use to value chains in agriculture	University of the Free State, Agricultural Economics	01/04/07–31/03/12
1805*	The development and testing of an integrated set of models to evaluate the financial/economic impact of irrigation water curtailment decisions on participant farm case studies in the Crocodile Catchment	CPH Water	01/04/08–31/03/11
1806*	Technology transfer on the technical aspects and cost estimating procedures of surface and sub-surface drip irrigation systems	Agricultural Research Council	01/04/08–31/03/11
<b>THRUST 4: WATER RESOURCE PROTECTION AND RECLAMATION IN AGRICULTURE</b>			
<b>Programme 1: Sustainable water resource use on irrigation schemes and within river catchments</b>			
1647	Managing salinity associated with irrigation in selected areas in South Africa	University of the Free State, Soil, Crop and Climate Sciences	01/04/06–31/03/10
<b>Programme 2: Impact assessment and environmental management of agricultural production</b>			

1516	Modelling non-point source pollution in agriculture from field to catchment scale	Sigma Beta	01/04/04–31/03/08
1646**	Applications of rainfall forecasts for agriculturally related decision making in selected catchments	University of KwaZulu-Natal, School of BEEH	01/04/06–31/03/11
1807*	The impacts of unpaved access roads on runoff, sediment fluxes and soil water movement within timber plantations	Aquagreen Consulting	01/04/08–31/03/11
1808*	Definition of process zones and connectivity in catchment scale NPS processes	University of KwaZulu-Natal	01/04/08–31/03/10