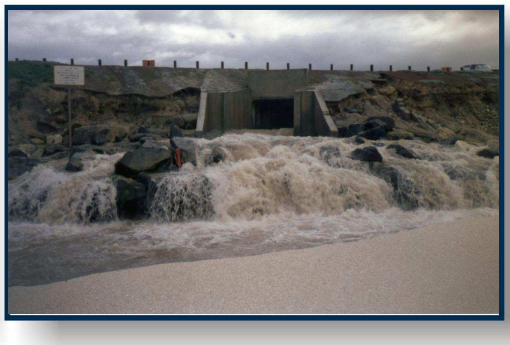
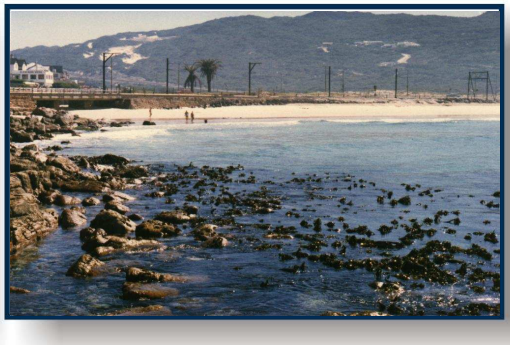
our future through science

PROPOSAL

A Case for Creating Iconic Status for False Bay:

Technical and Scientific Component



2 July 2010

CONTENTS

WWF SOUTH AFRICA

PROJECT FUNDING APPLICATION PACK

WWF-SA wishes to support and develop projects which align with its Strategic Focus (refer Annex 1), address high priority conservation needs, have a high chance of success and do not duplicate existing initiatives.

Project applications commonly go through a review process described below:

1. The applicant completes the attached application form.

2. The completed forms are returned to WWF-SA, preferably electronically. If the applicant does not have access to e-mail, the application should be posted, not faxed, as a number of quality photocopies must be made to send out to reviewers.

3. The application is sent to a number of reviewers with experience and insights into the focal topic of the project. This enables WWF-SA to gain a balanced view of the value and design of the project. The guidelines and matrix against which the project is evaluated by the reviewers are enclosed for your information (refer Annex 2).

4. Based on the reviewers' comments, the application is either considered for approval or returned to the applicant for revision or further development. In the latter case, following further development, the application is either considered for approval or sent out for a second review.

5. WWF-SA's decision is final. The applicant is then informed whether the project has been approved or is unsuccessful.

6. Please bear in mind that the funding application procedure takes time. A period of four months from initial enquiry to funding is the norm.

WWF SOUTH AFRICA

APPLICATION FOR PROJECT FUNDING

To be completed in English and returned by mail or e-mail (not fax) to:

Conservation, WWF-SA, Private Bag X2, Die Boord, Stellenbosch 7599
E-mail: csmith@wwf.org.za

- **Application forms should be clearly presented and concise, but detailed enough to allow informed review.**
- **Please use the blocks provided to fill in all information. DO NOT change the margins, format or fonts in any way.**
- **Please use lower case to complete the application form. DO NOT use bold.**

1. TITLE OF PROJECT

A Case for Creating Iconic Status for False Bay: Technical and Scientific Component

2. NAME, DESIGNATION, ORGANISATION, POSTAL ADDRESS, TELEPHONE, FAX AND E-MAIL OF PROJECT EXECUTANT (person conducting the project) and PROJECT LEADER (person who supervisors the project) (see Annexure 4, Addendum B for CV's)

Susan Taljaard, Senior Scientist (project executant and project leader)
CSIR, P O Box 320, Stellenbosch 7599
Tel 021 888 2494
Fac 021 888 2693
staljaar@csir.co.za

3. NAME, TELEPHONE, FAX AND E-MAIL OF MEMBERS OF PROJECT TEAM (see Annexure 4, Addendum B for CV's)

Lara van Niekerk: Tel 021 888 2491; Fax 021 888 2693; e-mail *lvnieker@csir.co.za*
Andre Theron: Tel 021 888 2511; Fax 021 888 2693; e-mail *atheron@csir.co.za*
Roy van Ballegooyen: Tel 021 888 2574; Fax 021 888 2693; e-mail *rvballeg@csor.co.za*
Pat Morant: Tel 021 888 2480; Fax 021 888 2693; e-mail *pmorant@csir.co.za*

Willem de Lange: Tel 021 888 2462; Fax 021 888 2693; e-mail *wdelange@csir.co.za*
Anton Naham: Tel 021 888 2403; Fax 021 888 2693; e-mail *anaham@csir.co.za*

4. DATE OF SUBMISSION TO WWF-SA

2 July 2010

5. DURATION OF PROJECT

6 months

6. FUNDS REQUESTED

Years	Amount (R) excluding VAT
Year 1	451 255
Year 2	-
Year 3	-
Total	451 255

7. CO-FUNDING AVAILABLE

Not applicable

8. PROJECT DESCRIPTION

8.1 Project summary:

The WWF, in collaboration with other partners (City of Cape Town [CCT] & CSIR), want to build a case to create iconic status for False Bay. One of the key reasons, amongst others, is to use this approach as an avenue for promoting and achieving sustainable use and collaborative management of this valuable resource. This initiative, however, will require commitment and financial support from numerous organisations, authorities and broader society. To acquire such commitment and support, an informed case needs to be put forward, based on sound technical and scientific information.

To enable WWF, as the promotion/marketing partner, to prepare such as case, the CSIR as the scientific and technical partner was requested to prepare proposal for the compilation of a "Technical Report" collating relevant technical and scientific information, knowledge and recommendations.

Under the leadership of the WWF, but in collaboration with CCT and CSIR, the scientific and technical information acquired above will be incorporated into a "Positioning Document", with the detailed Technical Report as an Appendix.

8.2 Background and motivation:

South Africa's new National Environmental Management: Integrated Coastal Management Act (24 of 2008) is a primary piece of legislation promoting sustainable use and collaborative management of its coastal resources. However, many other pieces of legislation also govern activities in and around the coastal marine system, such as the National Water Act (Act 36 of 1998), the Marine Living Resources Act (Act 18 of 1998) and the Biodiversity Act (Act 10 of 2004). As these acts are governed by different departments, by implication institutional structures driving coastal management become complicated. Complexities, as touched on above, pose real challenges to government and management institutions and warrants investigation into innovative and practical approaches to achieve truly integrated and collaborative management, particularly along urban coastal marine systems – also referred to as social-ecological-systems (SESs).

Within the above context, the proposed initiative of the WWF and CCT - to build a case towards creating iconic status for False Bay and, in doing so, promoting and achieving effective integrated management thereof - is clearly very topical. The CSIR have been approached by WWF and CCT to be a partner in this process, in particular to fulfil the role of scientific and technical partner.

8.3 Project objectives:

(1) To prepare a "Technical Report" containing the relevant technical and scientific information towards build a case for creating iconic status for False Bay
(2) Provide relevant technical and scientific information and recommendations for future development and implementation of a collaborative and integrated management programme for False Bay

8.4 Project outputs:

Technical report containing relevant technical and scientific information, knowledge and recommendations towards making a case for creating iconic status to False Bay

8.5 Project evaluation:

Project meetings with WWF and CCT (see project management activity)

8.6 Project indicators:

(1) Minutes of meetings (Activity 1)
(2) Inception Report (Activity 2)
(3) Draft Valuation Document (Activity 3)
(4) Technical Report (Activities 4 & 5)

8.7 Project methods:

The method will follow a desktop approach focusing on the collation and interpretation of existing information. This will be achieved through the following tasks:

Task 1: Inception meeting to confirm the work plan

Task 2: Valuation of key ecosystem services provided by False Bay coastal ecosystem

Task 3: Collation of existing information where the CSIR, in collaboration with the CCT and WWF will confirm the type of technical and scientific information for inclusion in the Technical Report. The CSIR will extract available scientific literature (e.g. using previous studies and conducting updated literature searches). CSIR also undertakes to collate information related to the international, national and provincial legal framework applicable to the management of False Bay. Interaction with the integrated development planning/spatial planning and planning departments of the CCT will also be important understanding development activities, growth, vision and factors that will impact on the iconic status.

Information and knowledge on aspects such as monitoring programmes, management strategies and institutions and socio-economic information – typically residing with authorities and related NGOs – should be provided through the WWF and CCT or by other role players to be identified by the parties (i.e. where such information has not yet been captured in easily accessible documentation outside the different departments and institutions). For example, relevant information and knowledge held within the CCT should be collated in-house and supplied to the CSIR. Similarly, information and knowledge held within government departments such as Water Affairs (DWA), Environment Affairs (DEA) and Agriculture, Forestry and Fisheries (DAFF) should be sourced through appointed contacts identified within those departments and supplied to the CSIR.

Task 4: Preparation of Technical Report, envisaged to address the following:

- Brief description of the coastal ecosystem, the important uses and ecosystem services provided by the False Bay coastal ecosystem
- Valuation of key ecosystem services provided by False Bay coastal ecosystem
- Activities/development posing potential threats to the False Bay coastal ecosystem
- Status of the False Bay coastal ecosystem and its current ability to provide key ecosystem services e.g. recreation
- Legal framework relevant to coastal management in False Bay
- Existing management initiatives operational in and around False Bay
- Existing management institutions involved in or relevant to coastal management in False Bay.

The report will also highlight scientific and technical information gaps and provide recommendations for future development and implementation of a collaborative and integrated management programme for False Bay and surrounds, based on experience gained by the CSIR in related projects. For future reference the Technical Report will also provide an inventory of available information and data on the False Bay coastal ecosystem. Further details are provided in Annexure IV.

8.8 Project schedule:

Activities	From	To
Contract signed	Month 1	Month 1
1: Project Inception meeting	Month 2	Month 2
2: Collation of existing information	Month 3	Month 5
3: Valuation study	Month 3	Month 5
4: Technical Report	Month 5	Month 6

9. PROJECT BUDGET

9.1 Project budget requested from WWF-SA:

Code	Item	Amount (R) excluding VAT		
		Year 1	Year 2	Year 3
01	S Taljaard	124740	-	-
01	L Van Niekerk	47520	-	-
01	A Theron	25920	-	-
01	R van Ballegooyen	21465	-	-
01	L Celliers	14310	-	-
01	W de Lange	101520	-	-
01	A Naham	67320	-	-
03	P Morant	31460	-	-
04	Travel	7500	-	-
06	Operating expenses	9000	-	-
08	Printing/Publication	500	-	-
	Sub -total (per year)	451255	-	-
	Total	451 255	-	-

9.2 Funding obtained elsewhere: (i.e. from sources other than WWF-SA)

Code	Item	Amount (R)		
		Year 1	Year 2	Year 3

	Sub-total (per year)			
	Total			

9.3 Entire project budget: (i.e. totals of A + B)

	Sub-total (excluding VAT) (per year)	451 255		
	Total (excluding VAT)	451 255		

10. STAKEHOLDER SUPPORT

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Name of Contact person	Organisation	Contact Details (Tel, Fax, E-mail)
CSIR requested by WWF to collaborate as science and technology partner		

11. PROJECT SUSTAINABILITY

This is a desktop assessment that has a clear ending. However, the output from this project will provide a valuable basis for the design and implementation of longer term projects related to the sustainable use and collaborative management of False Bay

12. REFERENCES CITED IN THE APPLICATION (if applicable)

Not applicable

13. VOLUNTEERS

Not applicable

14. PROJECT MARKETABILITY

Will the project generate a product? (e.g.: a publication – either scientific or popular such as a research report, brochure, workshop proceedings etc. a slide show; public lectures)	Yes
Is the project leader willing to participate in media interviews and host media visits?	Permission from central CSIR management will be required
Is the project suitable for a funder to visit?	Not applicable
Does the project lend itself to potential use in a funder's advertising	Yes

strategy?	
Are there any resources (e.g.: photographs; articles; publications) available to support WWF-SA's approach to a potential funder?	Yes, Technical Report
Is the project suitable for a signboard which acknowledges funders (including WWF-SA)?	Not applicable
Does the project warrant a launch event?	WWF may wish to do so
Does the applicant have any links with the media?	No
Does the lead organisation (or project itself) have a website which could be linked to WWF-SA's or a funder's website ?	No

ANNEX I

CONSERVATION STRATEGY OF WWF SOUTH AFRICA

2006 – 2010

Latest update: 1 November 2006

WWF-SA's Vision:

To inspire collective custodianship of our natural heritage with passion, integrity and enthusiasm

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WWF-SA focuses on the prevention of degradation of the South African natural environment, the conservation of biological diversity and the sustainable use of natural resources. This is achieved through financing, networking, programme management and project development by engaging effectively with strategic partners to access and share resources. In this way, WWF-SA seeks to optimally support conservation activities by facilitating the implementation of priority projects which achieve high conservation impact.

Significant changes have occurred in global environmental conservation strategies during the last decade. The challenge for the conservation community is to enhance the capacity and effectiveness of conservation organisations and to align environmental and biodiversity conservation at a landscape and programmatic level with socio-economic development. WWF-SA will integrate institutional capacity building and the sustainable use of natural resources to enhance sustainable livelihoods for all South Africans.

Globally, WWF has adopted a programmatic approach to conservation and will endeavour to invest 80% of its resources towards priority thematic programmes and the Global 200 ecoregions. Optimal initiatives will address synergies between the two approaches and focus on collaboration where programmes and ecoregion needs converge.

Considering the WWF One Global Programme (Annexure I.1), WWF-SA will align its conservation activities more closely with these approaches, and will identify relevant South African priority conservation needs for the future focus of WWF-SA.

WWF-SA's conservation efforts will be programmatic and proactive. Programmes will be developed with strategic partners and will address national, regional and international priorities. Funding will be sourced for the core costs of the programmes and for the programme activities. The programmes will be integrated across the organisation; communications, marketing, fundraising, education and support services are all needed if the programme targets are to be delivered.

Programme structures (see Annexures I.2 & I.3):

The core Conservation Unit will co-ordinate and integrate programme and project cycle management and will be represented on the Africa & Madagascar Programme Sub-Committee and the Southern African Sub-Regional Team of WWF. Project cycle management administration will be decentralised to the programmes, e.g. contracts will be drafted and managed by the programmes.

- Six programmes for Marine, Freshwater, Species, Climate Change, Conservation Education and Ecoregions (including Fynbos, Karoo, Grasslands and Forests) will be established.
- Each programme will have an internal working group which will include conservation, marketing, financing, communications and environmental education staff.
- Financing of each programme's operational budget and project support should be achieved through a programme-specific approach.

Programme Managers:

Rob Little	Species
Deon Nel	Marine & Freshwater (Aquatic Unit)
Aaniyah Omardien	Marine
Rodney February	Freshwater
Sue Taylor	Climate Change
Hettie Gets	Conservation Education
Thérèse Brinkcate	Ecoregions (Fynbos, Karoo, Grasslands & Forests)

Main programme activities:

- Align our conservation activities with the WWF One Global Programme and actively participate in the WWF Network's working groups.

- Develop a network of cooperation with government, industry, civil society, research institutions and other NGOs in southern Africa and globally.

- Facilitate the development and implementation of a strategic plan for addressing high-priority conservation needs in South Africa.

- Determine the strategic, pro-active and programmatic role of WWF-SA to support high priority conservation needs in South Africa.

- Work with relevant conservation partners to develop, resource, and implement high-priority conservation projects that deliver measurable progress against our targets.

- Develop and maintain an advocacy and policy framework that delivers progress against our targets through constructive engagement with all relevant stakeholders.

- Develop and maintain a communications strategy that draws attention to areas of concern, and mobilises conservation action through positive messages.

- Develop and maintain a fundraising strategy that can support the programme and priority conservation projects.

1. WWF-SA Marine Programme

The oceans cover 70% of the Earth's surface and act as a significant life support system for the world. Globally, the marine environment is a transport route, playground, source of resources, means of livelihood and store of biodiversity. South Africa's national responsibility is the conservation of coastal systems, the Benguela and Agulhas current ecoregions and waters within the Southern Oceans.

The WWF-SA Marine Programme will encompass the development and management of a cohesive and effective marine and coastal conservation support programme which is relevant to the marine conservation needs of South Africa and is aligned with international programmes and protocols. The *modus operandi* of the programme will be to consult with marine conservation partners to develop a strategic focus and plan for priority activities, to assist with the development of projects and to secure resources for their implementation. The geographical focus of the programme will be the inshore marine waters of South Africa, the Southern Ocean waters within the jurisdiction of South Africa as well as linked interventions up the western and eastern coasts of southern Africa.

VISION:

All South Africans work together to build a future in which healthy marine ecosystems provide long term social, economic and environmental benefits for all

Marine Programme Targets:

1. Establish and implement a network of effectively managed and ecologically representative[1] Marine Protected Areas (MPAs) by 2020.

2. Restore at least half the over-exploited and depleted fish stocks to sustainably managed levels by 2020, and maintain the status of all sustainably exploited fish stocks.

3. Apply an Ecosystem Approach to Fisheries (EAF) in South Africa and reduce associated negative environmental impacts of fishing practices to acceptable levels by 2012.

2. WWF-SA Freshwater Programme:

Freshwater is a precious resource, necessary for all life on Earth and yet its future is far from secure. The failure of modern society to deal with water as a finite resource has lead to the unnecessary destruction of rivers, lakes and wetlands that provide a life support system for the planet. South Africa is no different in its precarious undersupply of freshwater for human needs, now and in the future. The Department of Water Affairs and Forestry predicts that, at its present rate of consumption, South Africa will not have sufficient freshwater supplies to meet the rising demand by 2025.

The WWF-SA Freshwater Programme will encompass the development and management of a cohesive and effective freshwater conservation support programme which is relevant to the freshwater conservation needs of South Africa and is aligned with international programmes and protocols. The *modus operandi* of the programme will be to consult with freshwater conservation

[1] An ecological representative network of MPAs includes representative proportions of all marine habitats and ecosystem processes as required to protect each marine habitat type within each bioregion in perpetuity.

partners to develop and implement a strategic focus, plan priority activities, assist with the development of projects and to secure resources for their implementation.

VISION:

Healthy freshwater ecosystems in South Africa enhance the quality of life and people value nature as the source of water.

Freshwater Programme Targets:

1. **Conserving river basins and ecoregions**: Freshwater habitats and environmental processes are maintained or restored in at least 2 river catchments and/or ecoregions by 2010.

2. **Sustainable water use**: Water use policies and practices adopted by at least 2 industry sectors, contribute to conserving the environment of a priority river catchments and/or ecoregions by 2010.

3. **Conserving freshwater habitats:** 5 high priority freshwater habitats are protected and/or more sustainably managed by 2010.

3. WWF-SA Species Programme:

The world's fauna and flora lie at the heart of WWF's Mission to conserve biodiversity and the prime reason for the organisation's establishment in 1961. Whilst important in their own right, they also play fundamental roles in ecosystem processes and act as flagships for promoting and communicating important conservation and environmental issues. South Africa has a responsibility toward global priority species and plays a critical role in the understanding and regulation of sustainable use and trade in species.

The WWF-SA Species Programme will constitute the development and management of a cohesive and effective species conservation support programme which is relevant to the species conservation needs of South Africa and is aligned with international programmes and protocols. Relevant South African taxa of international priority are great whales, marine turtles, rhinos and the African elephant. The modus operandi of the programme will be to consult with species conservation partners to develop a strategic focus and plan for priority activities and to assist with the development of projects and to source project support resources.

VISION:

A society in which the intrinsic, aesthetic, economic and ecological values of species are recognized and respected and that as a result, environmental degradation and unsustainable use no longer threaten the survival of wild plants and animals and their critical habitats.

Species Programme Targets:

1. By 2010, South African populations of key threatened species are stabilized or increased, or their critical habitats safeguarded.

2. By 2010, at least 5 South African priority species are no longer endangered by over-exploitation.
3. Effective enforcement of regulations and monitoring of the trade in biological resources.
4. The concept of sustainable use of renewable natural resources is entrenched and practised by government and the private sector by 2008.

4. WWF-SA Climate Change Programme:

Climate change has already had an impact on ecosystems globally and spells extinction and vast changes for many species such as polar bears, Bengal tigers and amphibians. Locally, the fynbos and succulent karoo are facing drastic reductions in size due to short-term effects of climate change.

The WWF-SA Climate Change Programme will encompass the development and management of a cohesive and effective climate change support programme which is relevant to the climate change conservation needs of South Africa and is aligned with international programmes and protocols. The *modus operandi* of the programme will be to consult with climate change partners to develop a strategic focus, plan for priority activities, assist with the development of projects and to secure resources for their implementation.

VISION:

WWF's task is to protect nature from global climate change. By focusing its campaign on achieving a significant reduction in global carbon dioxide emissions, WWF expects to have triggered by 2030 a series of changes in society that will have transformed the supply and use of energy and raw materials compared to the beginning of the 21st century. Driven by pressure from civil society and the decisions of policymakers, businesses and investors to decarbonise society, we will be moving towards limiting dangerous climate change effects such as dramatic damage to ecosystems.

Climate Change Programme Targets:

1. WWF-SA will support initiatives underway to implement solutions leading to a significant reduction in carbon emissions, in particular from the combustion of fossil fuels.

2. WWF-SA will support the implementation of adaptation strategies in key ecoregions on the basis of national plans for the reduction of vulnerability to climate change.

5. WWF-SA Conservation Education Programme:

Conservation education (including EE) is recognised as an integral component in achieving environmental and biodiversity conservation targets and in attaining WWF-SA's vision "to inspire collective custodianship of our natural heritage with passion, integrity and enthusiasm. It is a holistic process and encompasses social, economic, ecological and political factors. It provides the method, style and context within which active learning, capacity building and behaviour changes are sustained.

VISION:

A society where appropriate lifelong environmental learning takes place across all sectors of society, to contribute towards sustainable lifestyle and livelihood choices.

Conservation Education Targets:

1. Support the implementation of South Africa's national school curricula.
2. Support the development of appropriate environmental education and training courses and programmes.
3. Support the development of appropriate environmental learning materials.
4. Support environmental education networking activities locally, nationally, regionally and globally.
5. Support the development and implementation of environmental education policy.
6. Support the environmental education elements in all WWF-SA's conservation programmes.
7. Engage appropriately with all six focus groups identified by the CEP.

6. WWF-SA Ecoregion Programme:

Ecoregions are landscapes with interlinked ecosystems that contain geographically confined assemblages of natural communities. Maintaining the health and evolutionary functioning of ecoregions is critical to maintaining human well being as they provide innumerable ecosystem services such as air, soil, water, food and buffers to Climate Change.

The WWF "Global 200" ecoregions were selected to provide a comprehensive representation of the world's habitats to conserve the broadest range of species and maintain the complex ecological and evolutionary processes that comprise the web of life. The WWF-SA Ecoregion Programme will comprise activities in three priority terrestrial "Global 200" ecoregion clusters represented in South Africa:

1. ***Fynbos*** (Lowland Fynbos and Renosterveld; Montane Fynbos and Renosterveld)
2. ***Karoo*** (Nama and Succulent Karoo)
3. ***Grasslands*** (Drakensberg Montane Shrublands and Woodlands; Highveld Grasslands)

In addition, the programme will also extend its work into the:

4. ***Forests*** ecoregions (including Knysna-Amatole Montane Forests, KwaZulu-Cape Coastal Forest Mosaic and the Maputaland Coastal Forest Mosaic).

The Programme will actively work with partners to support already developed or developing ecoregional action plans (CAPE, SKEP and the National Grasslands Biodiversity Programme). Key partners, with whom the Programme will work extremely closely, include the Table Mountain Fund for the Fynbos and the Leslie Hill Succulent Karoo Trust for the Succulent Karoo.

VISION

In 50 years time, the Fynbos, Karoo, Grasslands and Forest ecoregions of South Africa are well represented in formal protected areas with 10-15% of each ecoregion set aside for conservation. The remaining landscape is sustainably managed and maintained to support biodiversity and the well being and livelihoods of people on the landscape.

Ecoregion Programme Targets:

1. By 2015, a minimum of 10% of each ecoregion will be secured within adequately representative and viable formal protected areas which ensure ecological functioning across the landscape.

2. By 2015, a national programme providing non-financial incentives through stewardship initiatives is being implemented to support communities and landowners in conserving areas of biological significance in all three ecoregions.

3. By 2015, key production sectors and industries operating within priority areas will fully respect the conservation needs of endangered habitats and species and integrate biodiversity considerations into their policies, strategies, plans, procedures and operations.

4. By 2015, land use policy and practices support biodiversity conservation and sustainable natural resource management

Annexure I.1

WWF's One Global Programme

MISSION

WWF's Mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- Conserving the world's biological diversity;
- Ensuring that the use of renewable natural resources is sustainable; and
- Reducing pollution and wasteful consumption

VISION

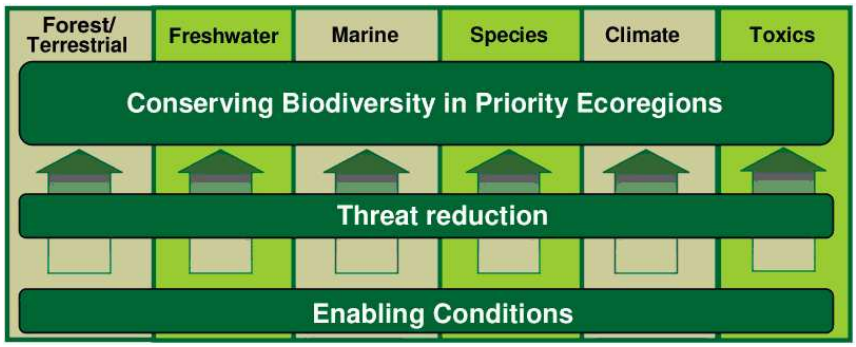
By 2050 the world will have:

- Conserved **biodiversity** and the natural processes that sustain it in the Global 200 ecoregions;
- Established **social and economic development** patterns that assure the sustainable and equitable provision of natural goods and services, improving livelihoods and quality of life for current and future generations;
- Eliminated or mitigated **critical threats** to species, habitats and ecological processes that derive from climate change, over-exploitation of resources, unsustainable consumptions, and pollution.

STRATEGY

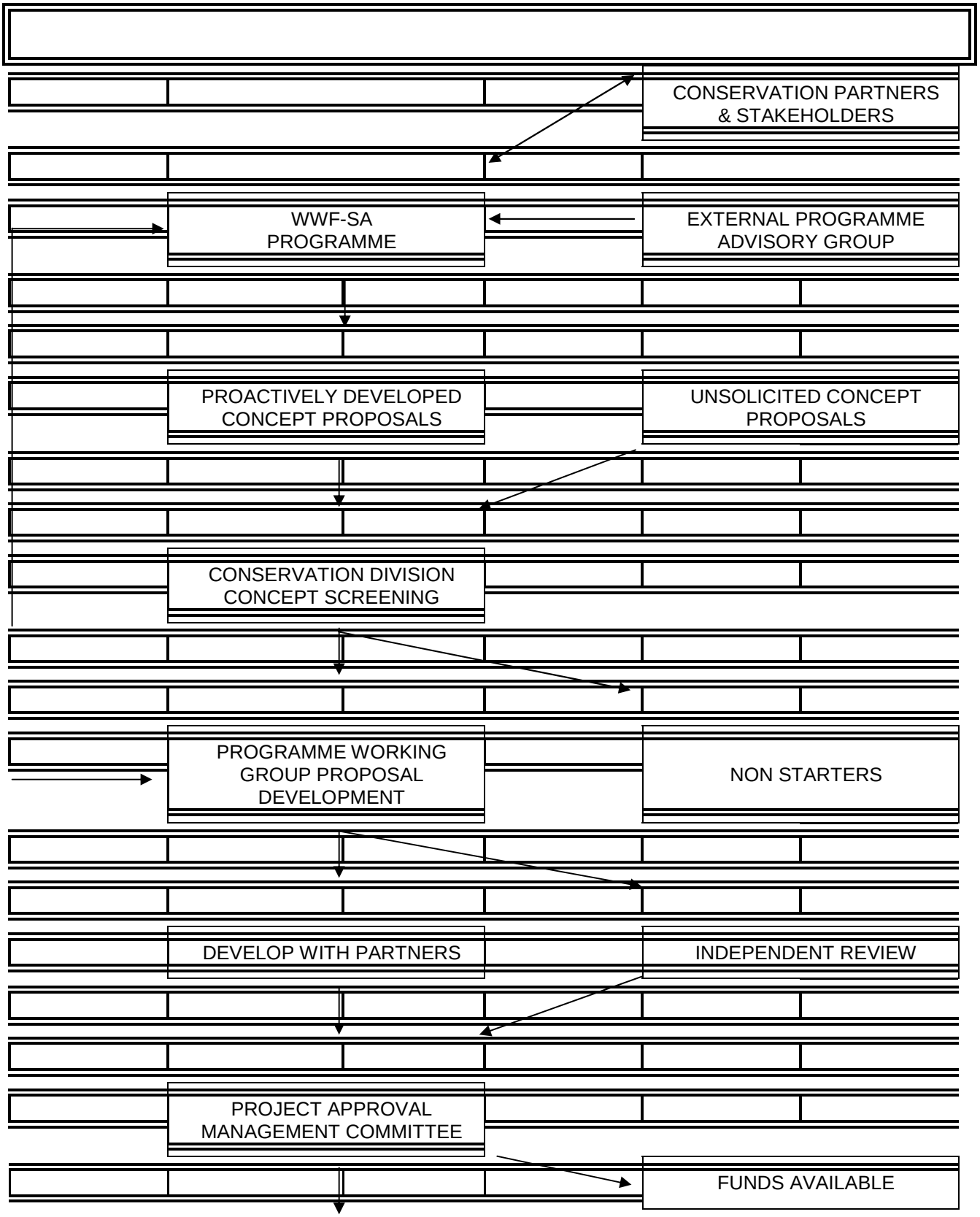
By 2015 WWF will:

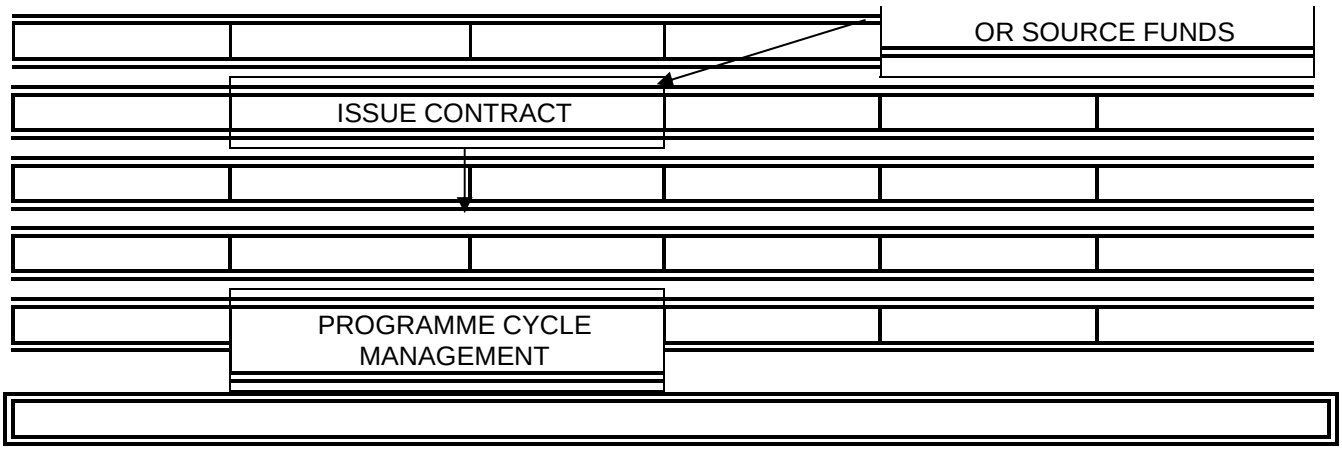
- Achieve **biodiversity conservation** in priority ecoregions.
- Ensure biodiversity conservation impact by **integrating** field-based actions with partnerships and targeted policies at local, regional and globa level;
- Measure success by tracking progress towards an integrated set of targets for priority ecoregions and related threat reduction and enabling conditions in a single global conservation programme



Annexure I.2

Programme implementation flow chart




OR SOURCE FUNDS
ISSUE CONTRACT
PROGRAMME CYCLE
MANAGEMENT

Annexure I.3

Programme implementation structures - Terms of reference

	Terms of Reference	Composition	Meet	Chair
Board Conservation Committee (ConsCom)	Provide guidance on the strategy for WWF-SA's role in South African conservation. Provide guidance on WWF-SA's strategic role within each programme. Review the conservation activities of WWF-SA to ensure that these are aligned with the conservation priorities decided upon. Review the appropriateness of WWF-SA's conservation partnership network & it's role with these partners. Assist in solving problems at a strategic level.	WWF-SA : Board Chair, CEO, Director Conservation External : Select conservation specialists. Brian Huntley & Morne du Plessis	Once a year	External (Morne du Plessis)
Conservation Division (ConsDiv) (all programmes)	Screen concepts according to programme strategy and targets. Provide guidance for project development. Ensure co-ordination across various programmes.	WWF-SA Conservation Division staff.	Every six weeks	Director: Conservation
Programme Working Groups (PWG) (Each Programme)	Develop partner networks. Develop and refine programme strategy. Define and implement WWF-SA's strategic role. Develop project proposals. Secure necessary financial resources for programme implementation. Submit recommendations to PAG. Present programme implementation progress to PRG annually. Develop and implement a marketing and communications strategy to ensure internal and external communications.	WWF-SA : Programme Manager and staff representation from each division for each PWG.	Every six months & as required	Programme Manager
Project Approvals at Management Committee (ManCom)	Assess available programme funds. Consider and approve project proposals in terms of programme strategy. Vet minutes of previous approvals and sign-off for audit purposes. Provide guidance to Programme Working Groups.	WWF-SA : ManCom Programme Managers present for proposals for consideration.	Once per month	CEO

ANNEX II

GUIDELINES FOR REVIEWING APPLICATIONS TO WWF-SA

Please treat this application as confidential.

To enable us to reach the best decision, please provide comprehensive answers to all the questions. Please note that not all the following criteria may be relevant to this specific proposal.

1. What high priority conservation need does the project address? How, and to what extent, does it contribute to this conservation need?
2. To what extent is this project innovative and novel?
3. Does the project have clear objectives and measurable outputs?
4. Could this project be potentially catalytic beyond its local impact?
5. To what extent is the project's organisational capacity secure?
6. Is there any evidence of capacity enhancement and knowledge transfer?
7. What evidence is there that the project has the support and involvement of relevant stakeholders?
8. What is your assessment of the project's sustainability in the long-term or its likelihood of remaining donor dependent?
9. How clear, realistic and cost-effective are the proposed budget and time-frame?
10. Are your comments to remain confidential, or may the project executant be given your name and contact details should s/he wish to discuss the project with you?

Please supply us with a succinct recommendation statement regarding this application.

Overall Recommendation to WWF-SA:

Reviewer's Name : ……

Organisation : ……

Designation : ……

ANNEX III

BUDGET ITEMS - CODES AND DEFINITIONS

Code	Item	Description
01	Salaries	Total allocated per project staff member.
02	Temporary staff	Individuals not necessarily employed for the full duration of the project.
03	Sub-Contractor(s)	Name of the consultant/consulting firm; hourly / daily rate and number of hours / days required. Exclude consultants contracted to undertake project evaluation (see Code 10).
04	Travel and Subsistence	Itemised travel expenses: air fares, vehicle running expenses, vehicle hire, hotels, etc. Exclude consultant travel.
05	Capital expenditure	All items of equipment of an “inventory” nature (value over R1 000). Items of disposable equipment or with a value of less than R1 000 should be included under 06.
06	Operating expenses	All project expenses not covered by other sections, including telephone, postage, stationery, administration levies, fuel, consumables, small items of equipment (less than R1 000).
07	Education / Training	Include audio-visual material, training manuals, course fees, etc.
08	Printing / Publication	Include printing, design and distribution costs.
09	Project Promotion	Costs related to donor / media visits.
10	Project Evaluation	Include consultants, questionnaire surveys, or any other project monitoring activities.

ANNEX IV

CSIR DETAILED PROPOSAL

A Case for Creating Iconic Status for False Bay: Technical and Scientific Component

CSIR document reference number: JZCM114 ST03
2 July 2010

1. BACKGROUND

In earlier years, utilization of the sea and its resources was limited to few uses (e.g. fishing and navigation) that rarely influenced one another, hence the traditional sector-based approach to ocean and coastal management sufficed. However, rapidly increasing utilisation of the ocean and coastal environment, created conflict among uses (for example the waste assimilation or 'sink' function is not compatible with the bathing /surfing function) that could not be adequately addressed within sector-based management structures, hence the need for collaborative, integrated coastal management (ICM). While the concept of ICM is no longer "new", its implementation, together with the associated management policy and tools, require continued adaptation to account for regional and global change impacts in the developing economies of southern Africa (Figure 1).

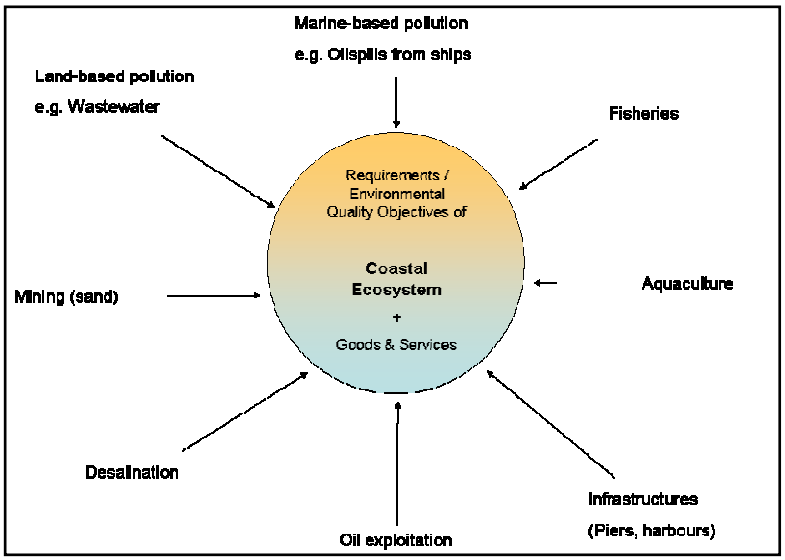


Figure 1: Illustration of key global change vectors with potential negative impacting on coastal marine systems

Further, the vectors of global change and the management of such change are complex. For example, overfishing is an activity occurring within the coastal marine system while wastewater fluxes can originate from locations far removed from the coast (e.g. adjacent land catchments) (Figure 2). While the focus of ICM programmes are the coastal marine system (understood as the shoreline, estuaries and coastal marine environment), such programmes may need to link into others – those which manage activities adjacent or far removed from the coastal system but with potential footprints therein - to ultimately achieve successful outcomes (e.g. catchment management programmes).

South Africa's new National Environmental Management: Integrated Coastal Management Act (24 of 2008) is a primary piece of legislation promoting ICM. More specifically at the local (or municipal) level, the ICM Act 2008 requires municipalities to develop and implement integrated municipal coastal programmes (section 48) and estuary management plans (section 34) which should be linked to, for example integrated development plans (IDP) and spatial development framework (SDF) regulated under the Municipal Systems Act (Act 32 of 2000).

In South Africa many other pieces of legislation also govern activities in and around the coastal marine system, such as the National Water Act (Act 36 of 1998), the Marine Living Resources Act (Act 18 of 1998) and the Biodiversity Act (Act 10 of 2004). As these acts are governed by different departments, by implication institutional structures driving ICM become complicated. Complexities, as touched on above, pose real challenges to government and management institutions and

warrants investigation into innovative and practical approaches to achieve truly ICM, particularly along urban coastal marine systems – also referred to as social-ecological-systems (SESs). Scientific and technical innovation - in support of ICM - is also the theme of one of CSIR's current research programmes entitled: *Global Change - Towards an integrated approach for managing African urban coasts.*

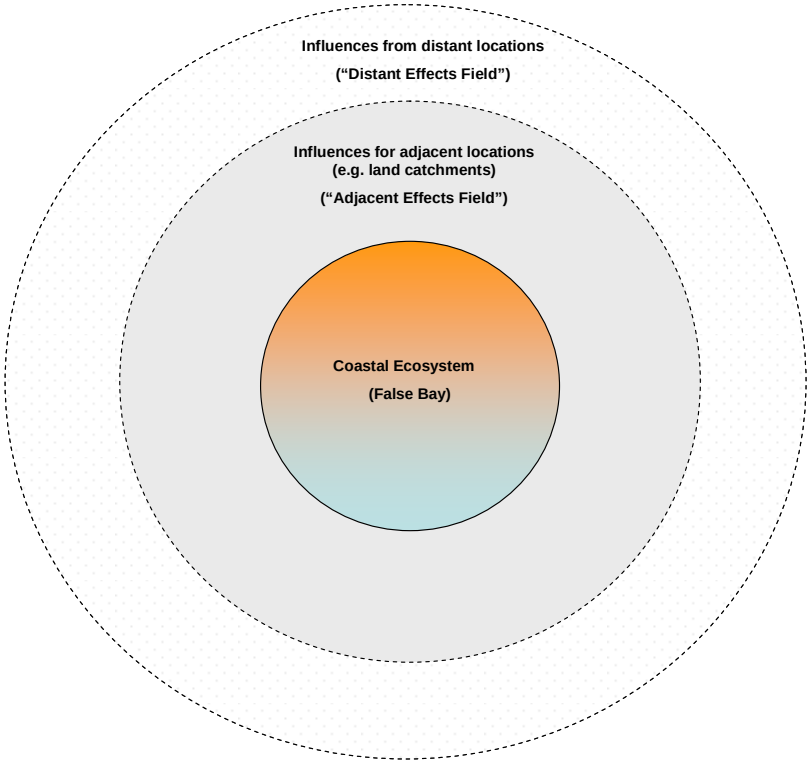


Figure 2: Illustrating the concept of different spatial scales influencing coastal ecosystem

Within the above context, the proposed initiative of the WWF and City of Cape Town (CCT) - to build a case towards creating iconic status for False Bay and, in doing so, promoting and achieving effective integrated management thereof - is clearly very topical. The CSIR have been approached by WWF and CCT to be a partner in this process, in particular to fulfil the role of *scientific and technical partner*.

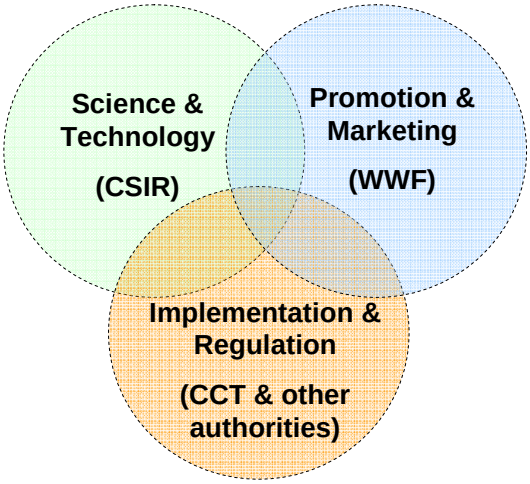


Figure 3: The envisaged partnership

2. UNDERSTANDING THE BRIEF

The brief for this proposal was derived from discussions between the WWF, CCT and the CSIR in April and June 2010.

It is understood that the WWF, in collaboration with the other partners, wants to build a case to create iconic status for False Bay. One of the key reasons, amongst others, is to use this approach as an avenue for promoting and achieving sustainable use and collaborative management of this valuable resource. This initiative, however, will require commitment and financial support from numerous organisations, authorities and broader society. To acquire such commitment and support, an informed case needs to be put forward, based on sound technical and scientific information.

To enable WWF, as the promotion/marketing partner, to build such as case, the CSIR as the scientific and technical partner was requested to prepare a "Technical Report" containing relevant technical and scientific information. During this first phase of the initiative the aim is to consolidate and interpret available technical and scientific information on the coastal marine system (False Bay) that will be of relevance in the creation of iconic status of the system and, subsequently, towards achieving sustainable use and collaborative management of the icon. It is understood that this should be a *desktop assessment based on readily available information*, rather than initiating any detailed measurement programmes or scientific studies (although such detailed technical or scientific studies may become relevant at later stages of the process). Specifically, the first phase should include a desktop *value assessment of ecosystem services reliant on the False Bay coastal system* – considered crucial technical support to build a case of this sort. Further it is understood that the CSIR team should also *provide scientific and technical guidance on future management of False Bay – the icon* - based on their experience in other related studies such as the development of the South Africa's National Programme of Action to protect the marine environment from land-based activities (commissioned the then DEAT) and the development and implementation support provided in estuary management plans (as part of the C.A.P.E. Estuaries Programmes) (referring to Addendum A).

Under the leadership of the WWF, but in collaboration with CCT and CSIR, the scientific and technical information acquired above will be incorporated into a "Positioning Document", with the detailed Technical Report as an Appendix.

3. PROPOSED WORK PLAN

3.1 Description of activities

Within the context of the above we propose the following tasks:

Task 1: Inception meeting

This meeting is considered important in order to confirm the work plan, i.e. tasks, responsibilities and scheduling. This meeting should be attended by WWF, CCT, the CSIR project team and other role players which may be nominated by the parties.

Task 2: Valuation of key ecosystem services provided by False Bay coastal ecosystem

The proposed approach for this valuation is a desktop based benefit transfer study on selected ecosystem goods and services in the study are. Only secondary and published data (i.e. no new primary data will be collected by means of survey questionnaires) will be used along with selected expert panel discussions. The following outline is proposed :

- Delimit and describe the study area.
- Describe the current state of ecosystems within False Bay
- Identify all ecosystem goods and services provided by ecosystems in False Bay
- Identify relevant ecosystem goods and services to be valued
- Quantify these goods and services in physical terms (e.g. quantity of fish caught, number of surfers, visitors to beaches, viewsheds)
- Methodological review and allocation of appropriate economic valuation method to each of the good or service
- Valuation process (will between the goods and services)
- Aggregation to calculate an overall value of the goods and services provided by the ecosystems in False Bay
- Sensitivity analysis (to test assumptions)
- Discussion of potential loss of value arising from loss of ecosystem functionality due to over-exploitation or mismanagement
- Description of 'budget motivation pathway' that will propose a way of using the value estimates to justify the cost of the proposed ICM plan.

Task 3: Collation of existing information

The CSIR, in collaboration with the CCT and WWF will confirm the type of technical and scientific information for inclusion in the necessary for inclusion in the Technical Report.

The CSIR will extract available scientific literature (e.g. using previous studies and conducting updated literature searches). CSIR also undertakes to collate information related to the international, national and provincial legal framework applicable to the management of False Bay. Interaction with the integrated development planning/spatial planning and planning departments of the CCT will also be important understanding development activities, growth, vision and factors that will impact on the iconic status.

Information and knowledge on aspects such as monitoring programmes, management strategies and institutions and socio-economic information – typically residing with authorities and related NGOs – should be provided through the WWF and CCT or by other role players to be identified by the parties (i.e. where such information has not yet been captured in easily accessible documentation outside the different department and institutions). For example, relevant information and knowledge held within the CCT should be collated in-house and supplied to the CSIR. Similarly, information and knowledge held within government departments such as Water Affairs (DWA), Environment Affairs (DEA) and Agriculture, Forestry and Fisheries (DAFF) should be sourced through appointed contacts identified within those departments and supplied to the CSIR.

Task 4: Preparation of Technical Report

Based on the available information collected during Tasks 2 & 3 CSIR will compile a Technical Report (broadly following a Pressure-State-Response approach). It is envisaged that the report will address:

- Brief description of the *coastal ecosystem,* the important *uses and ecosystem services* provided by the False Bay coastal ecosystem ("Sketching the playing field");

- *Valuation of key ecosystem services* provided by False Bay coastal ecosystem ("Valuing the playing field");
- *Activities/development posing potential threats* to the False Bay coastal ecosystem (the "Pressures");
- *Status* of the False Bay coastal ecosystem and its current ability to provide key ecosystem services e.g. recreation (the "State");
- *Legal framework* relevant to coastal management in False Bay (the "Response");
- Existing *management initiatives* operational in and around False Bay (the "Response")
- *Existing management institutions* involved in or relevant to coastal management in False Bay (the "Response").

The report will also highlight *scientific and technical information gaps* and provide recommendations for future development and implementation of a collaborative and integrated management programme for False Bay and surrounds, based experience gained by the CSIR in related projects such as the development of the South Africa's National Programme of Action to protect the marine environment from land-based activities (commissioned the then DEAT), the development and implementation support provided in estuary management plans (as part of the C.A.P.E. Estuaries Programmes and Design of Model for ICM implementation in South Africa (PhD dissertation in progress) (see also Annexure IV.1).

For future reference the Technical Report will also provide an *inventory of available information and data* on the False Bay coastal ecosystem.

5. PROPOSED PROJECT TEAM (CSIR)

The following CSIR staff members will form part of the CSIR project team:

INDIVIDUALS	EXPERTISE
Neville Sweijd	Competency Area Manager (Strategic communication)
Susan Taljaard	Project leader Marine and estuarine water quality Marine and estuarine marine management
Roy van Ballegooyen	Coastal water circulation
Lara van Niekerk	Estuarine hydrodynamics Estuary management
Andre Theron	Sediment dynamics Coastal vulnerability to development
Willem de Lange	Economic valuation
Anton Nahman	Economic valuation
Pat Morant	Coastal management Ecosystem functioning
Louis Celliers	Institutional arrangements re ICM (City of Cape Town)

Abbreviated *Curriculum Vitae* of the proposed project team are attached as Annexure IV.2.

6. DELIVERABLES

The deliverable of this project will be a Technical Report. The CSIR will provide 5 hard copies, as well as a CD containing the electronic version (in MSWord and PDF formats).

7. PROPOSED SCHEDULING

Scheduling of Task will be finalised in consultation with the client, but a preliminary schedule is as proposed as follows:

TASK	MONTH AFTER CONTRACT SIGNING						
	1	2	3	4	5	6	7
Contract signed							
Task 1: Project Inception meeting							
Task 2: Valuation study							
Task 3: Collation of existing information							
Task 4: Technical Report							

8. PROPOSED BUDGET

A proposed budget and cost breakdown are provided below:

TASK	BUDGET (ZAR excluding VAT)		
	Professional fees	Running	Sub-total
Project Management (project meetings)	21 240	500	21 740
Task 1: Project Inception (preparation & meeting)	29 160	500	29 660
Task 2: Valuation study	162 360	10 000	172 360
Task 3: Collation of existing information	83 705	3 000	86 705
Task 4: Technical Report	137 790	3 000	140 790
	434 255	**17 000**	**451 255**

14% VAT	**63 176**
TOTAL BUDGET (including VAT)	**R 514 431**

9. ASSUMPTIONS

It is understood that this project will be based on available information and knowledge only, i.e. no new data or detailed data analyses will be undertaken.

Whilst the CSIR could identify the type of information required for the Technical Report, it is assumed that existing information and knowledge on aspects such as monitoring programme, management strategies and institutions and socio-economic information residing with specific organization will be made available to the CSIR on request. In particular this includes information residing with the WWF, CCT, national and provincial departments department of Water Affairs, Environment Affairs, Forestry and Local and Provincial Government.

10. CONTRACT TERMS AND CONDITIONS

The *domicilium citandi et executandi* of the parties for all purposes of, and in connection with this proposal are as follows:

CSIR:

11 Jan Cilliers Street
Stellenbosch 7600

P O Box 320
Stellenbosch 7599

WWF South Africa:

Millennia Park, 16
Stellentia Avenue
Stellenbosch 7600

Private Bag X2
Die Boord 7613

This proposal is valid for 3 months after submission (i.e. until end of September 2010) which will allow the CSIR to complete the proposed work within the 2010/2011 financial year ending March 2011. Should approval of the project occur after September 2010, CSIR may need to adjust the proposed budget (Section 8) to allow for possible professional fee and disbursement increases (see Section 8).

The general conditions under which the CSIR undertakes contract work apply (refer to Annexure IV.3). Written acceptance of this Proposal, including the CSIR's General Conditions of Contract, by the WWF may constitute the contract agreement for this project.

Payment scheduling will be confirmed with the WWF on approval of the proposal.

Annexure IV.1

CSIR's Relevant Experience

National Programme of Action (2008)

The CSIR was commissioned by the Department of Environmental Affairs & Tourism to draft South Africa's National Programme of Action (NPA) Document on land-based activities and sources of pollution that influence the marine environment. The NPA was developed in response to a call from the Global Programme of Action for Protection of the Marine Environment from Land-based Activities (GPA).

Preparation of Environmental Quality Objectives and Standards for the Coastal Zone of the Western Indian Ocean (WIO) region (2007)

The United Nations Environment Programme (UNEP) and Global Environment Facility (GEF) through the Project "Addressing Land-based Activities in the Western Indian Ocean" (WIO-Lab) appointed the CSIR to assist in formulating appropriate Environmental Quality Guidelines/Standards for the coastal zone of the Western Indian Ocean region. In accomplishing the proposed project, the CSIR has to closely collaborate with the WIO-LaB Project Management Unit (PMU) and in particular it's Regional Working Group on Water, Sediment and Biota Quality Assessment and Monitoring (RWG) established by the WIO-LaB Project.

Transboundary Diagnostic Analysis (TDA) for the WIO Region linked to influence of Land-based activities on the Marine Environment (2007)

The United Nations Environment Programme (UNEP) and Global Environment Facility (GEF) through the Project "Addressing Land-based Activities in the Western Indian Ocean" (WIO-Lab) appointed the CSIR as a member of the Task team responsible for the drafting of the Transboundary Diagnostic Analysis (TDA) for the WIO region, specifically addressing the marine pollution issues.

Development of a Generic Framework for the Estuarine Management Plans, focusing on the Cape Floristic Region (CFR) (2006-2007)

The CSIR has been appointed by the Cape Action for People and the Environment (C.A.P.E) Estuaries Programme to develop a generic format for an estuarine management plan (EMP) as well as to develop guidelines for the preparation of individual EMPs focusing on the Cape Floral Region (CFR), but with wider application to the rest of South Africa's estuaries.

Development of a common set of water and sediment quality guidelines for the coastal zone in the BCLME region and a Base-Line Assessment of Sources and Management of Land-Based Marine Pollution in the BCLME region (2005-2006)

As part of the BCLME Programme the CSIR was commissioned to undertake the above-mentioned studies in consultation with key stakeholders in each of the participating countries, namely Angola, Namibia and South Africa.

The primary purpose of these projects was to propose a standardised management framework for marine pollution (in particular land-based pollution sources) for the BCLME region, as well as to assess the availability of related data and information in each of the three countries. Also required was a set of recommended quality guidelines that could be applied in the coastal areas of the region.

Operational Policy for the Disposal of Land-Derived Wastewater to the Marine Environment of South Africa (2002 – 2004)

To fulfil its legal obligation in terms of the management and control of land-derived wastewater in coastal waters, the Department of Water Affairs and Forestry (DWAF) commissioned the CSIR to develop an operational policy, specifically focusing on the treatment and disposal of land-derived wastewater in the coastal marine environment (including estuaries, the surf-zone and offshore coastal waters) of South Africa.

Development of a proposed National Estuarine Management Protocol for South Africa (2003)

The CSIR, with contributions from various lead authorities, was responsible for the development of the proposed National Estuarine Management Protocol which is currently a requirement in the National Environmental Management: Integrated Coastal Management Bill. The proposed National Estuarine Management Protocol follows an adaptive management approach which requires: 1) the setting of strategic vision and management objectives, 2) the development of management strategies,3) the implementation of the strategies, 4) the monitoring of the estuary and 5) an evaluation or assessment of the results. The proposed National Estuarine Management Protocol also called for the development of Estuarine Management Plans.

Development of the National Methods for the Determination of (fresh) Water Requirements for Estuaries in South Africa, as well as the implementation thereof (1999-2007)

The CSIR was a member of the core team responsible for development of the Methods for the Determination of the Ecological Water Requirements for Estuaries required under the National Water Act of 1998. The methodology required the development of standardised estuarine health assessment procedures, which looked at aspects such as: hydrology, hydrodynamics, habitat/sediment, microalgae, macrophytes, invertebrates, fish and birds.

The CSIR was also leading a Water Research Project (2003) on the refinement of Resource monitoring procedures for estuaries for application in the Ecological Water Requirement determination and implementation process.

In addition, the CSIR was either coordinated or was part of project team that applying these methods on estuaries throughout South Africa e.g. Keurbooms, Orange, Olifants, Breede, Nahoon, Palmiet Tsitsikamma, Kromme, Seekoei, Swartkops, Mvoti, Mloti, Tongati and others.

Vulnerability and adaptation assessment of physical effects of climate change on Western Cape coast (2005, 2007)

These projects undertaken for the Western Cape government and the Intergovernmental Panel on Climate Change (IPCC) involved the analysis of potential coastal zone climate change impacts and possible response options that required expertise and experience on analysis, vulnerability and adaptation options of coastal & marine physical environment to climate change.

Development setback lines and evaluation of beaches (bathing safety and suitability for development) (1992-2006)

These type of projects have been undertaken for a number of municipalities along the south African coasts – including the City of Cape Town – requiring expertise and experience on assessing bathing safety factors & suitability for development, beach dynamics & physical coastal processes.

A Marine Water Quality Management Framework for Saldanha Bay (West coast, South Africa) (2002 – 2004)

The Saldanha Bay Water Quality Forum Trust commissioned the CSIR to conduct a study to prepare a Marine Water Quality Management Plan for Saldanha, including the Langebaan Lagoon. The project includes:

- Synthesis of existing information related to marine water quality management in the area
- Numerical modelling studies to address specific issues, e.g. setting discharge standards (or critical limits) for land-based marine pollution sources issues in the 'problem areas
- Development of a management framework for marine water quality in Saldanha Bay.

Solutions to wind blown sand and overtopping problems (2002)

This project, undertaken for the City of Cape Town, required understanding and analyses of real world problems and user requirements within the coastal zone, develop a range of proposed conceptual solutions and select the most suitable/feasible beach improvement schemes.

State of Coast Report for City of Cape Town (2001)

In 1998 the former Cape Metropolitan Council (CMC) initiated the development of an Integrated Metropolitan Environmental Policy (IMEP) for the Cape Metropolitan Area. The IMEP is the overarching policy, from which more detailed sectoral strategies will be developed. This report contributes to the first phase of the formulation of the Coastal Zone Strategy. The development of a Coastal Zone Strategy for the City of Cape Town is being undertaken in two phases. The first phase involves the gathering of relevant information to inform the development of the strategy and the second phase comprises the formulation of programmes and strategies to address the coastal management issues identified in Phase 1. The CSIR was commissioned to undertake the Phase 1 which had the following outcomes:

- The definition and mapping of the coastal zone of the City of Cape Town; and
- The description and the assessment of the current state of the coastal zone, compiled in a State of the Coast Report.

Water Quality Review for False Bay (Cape Town, South Africa) (2000)

The False Bay Water Quality Advisory Committee (FBWQAC) commissioned the CSIR to review existing information related to water quality in False Bay and make recommendations on the research needs for False Bay. It was particularly stated that the water quality of False Bay should remain the core focus of this study, within the overall context of other catchment management activities in the Cape Metropolitan area. The scope of the projected included:

- Review of existing information
- Policy and Legislation review, pertaining to the discharge and dumping of pollutants at sea (national and international)
- State of the Water Quality in False Bay, using the review information
- Recommendations on Future studies

In consultation with the FBWQAC working group, it was decided to address the above scope of work by producing a number of specialist reports and an inventory of available data and literature pertaining to water quality in False Bay, as well as an Executive summary report which included an overview of the specialists assessments, an evaluation of the state of the environment in False Bay and recommendations for future research to ensure optimum water quality in False Bay.

Development of Marine Water Quality Guidelines for South Africa (1995)
This project was coordinated by the CSIR on commission of the Department of Water Affairs and Forestry. It included cooperation with expertise in marine water quality, as well as consultation with key stakeholders.

Study to investigate the physical environmental factors and bathing suitability of the beaches along False Bay (1986)
In 1986 the CSIR undertook a study to investigate the physical environmental factors and bathing suitability of the beaches along False Bay. These factors included beach widths, nearshore wave climate, sand grain size and sediment transport. A point rating system was then used to compare the beaches objectively and to propose different beach usages. Together with other town planning considerations, this classification was intended to assist planners in directing funds for coastal developments.

Valuation of goods and services provided by coastal ecosystems

- An economic valuation of the biodiversity of the Wild Coast and assessment of potential financing mechanisms for its conservation.
- The economic value of and impacts associated with a change in the environmental quality of the Kongweni Estuary at Margate, KwaZulu Natal; including an MSc dissertation and peer-reviewed publication on 'Valuing blue flag status and estuarine water quality in Margate, South Africa.'
- Sand supply from rivers within the eThekwini jurisdiction: Implications for coastal sand budgets and resource economics. Included a valuation of the goods and services associated with the estuaries and coastal zone of eThekwini, and an assessment of the social/external costs of sand mining in terms of the loss of these services.
- Goukou Estuary Management Plan, including a socio-economic situation assessment of the economic value of the goods and services provided by the estuary.

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TALJAARD, S, VAN BALLEGOOYEN, R C and MORANT, P D (2000) False Bay Water Quality Review. Volume 2: Specialist Assessments and Inventories of Available Literature and Data. Report to the False Bay Water Quality Advisory Committee. CSIR Report ENV-S-C 2000-086/2. CSIR Environmentek, Stellenbosch, South Africa.

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VAN NIEKERK, L and TALJAARD, S (2007) Proposed generic framework for Estuarine Management Plans. C.A.P.E. Estuaries Management Programme.

Annexure IV.1

Curriculum Vitae

CURRICULUM VITAE

1. FULL NAME:	NEVILLE ANTHONY SWEIJD

2. PERSONAL DETAILS:	
Date of birth	11 July 1964
Place of Birth	Cape Town, South Africa
Citizenship	South African (I.D. 640711 5049 083)
Highest Qualification	PhD (Marine Science), UCT, 1999
Professional Registration	The South African Council for Natural Scientific Professions (SACNASP): 400277/08
Current Post	Competence Area Manager, Coasts & Oceans Competence Area, Council for Scientific and Industrial Research
Current Work Address	CSIR, PO Box 320 Stellenbosch 7599, South Africa
Current Home Address	15 Bryn Rd, Lakeside, 7945
Contact details	Telephone (H): +27(021) 7885352
	Telephone (W): +27(021) 8882555
	Facsimile (W): +27(021)8882648
	Telephone (M): +27(082) 9689660
	E-mail (W):nsweijd@csir.co.za
	Email (H): nsweijd@gmail.com
Matriculation	Rondebosch Boys High School, 1982, Cape Senior Certificate with a distinction in Biology.
Marital status	Married, 2 children.

3. TERTIARY EDUCATION:	
1985:	B.Sc. Zoology, University of Cape Town
1986:	B.Sc. (Hons) Zoology, Rhodes University
1991:	M.Sc. Zoology, Rhodes University.
	Title of dissertation: The digestive mechanisms of an intertidal grazer, the sea urchin *Parechinus angulosus*.
	GRADUATED CUM LAUDE
1999:	PhD Zoology, University of Cape Town
	Title of dissertation: Molecular markers and abalone seeding as tools for the conservation and management of the South African abalone (perlemoen), *Haliotis midae* Linn., resource.
	AWARDED THE PURCELL PRIZE FOR THE BEST DISSERTATION IN ZOOLOGY AT UCT IN 1999

4. EMPLOYMENT AND PROFESSIONAL EXPERIENCE	
2007-2008:	Research Group Leader, Coastal System Research Group, Council for Scientific and Industrial Research
2002- 2007:	Director, Benguela Environment Fisheries Interaction and Training Programme (BENEFIT). (2nd term)
	NAMIBIA NATIONAL SCIENCE AWARDS"BEST RESEARCH ORGANIZATION 2005".
2000-2001:	Co-ordinator (Manager): International Ocean Institute –SA, Department of Botany, University of the Western Cape, RSA.
1998-2000:	Research Officer, Department of Zoology, University of Cape

SUSAN TALJAARD

PROFESSION: Marine (including estuarine) Water Quality Scientist
NAME OF FIRM: CSIR (Natural Resources and the Environment)
POSITION: Senior Scientist
YEARS WITH FIRM: 20+
NATIONALITY: South African
MEMBERSHIP PROFESSIONAL SOCIETIES: South African Council for Natural Scientific Professions

KEY QUALIFICATIONS

- Research in water quality aspects of the South African coastal zone, including estuaries
- Decision support in marine and estuarine water quality management, such as specialist input to impact assessment studies, development and implementation of management plans and policy development.

EDUCATION AND PROFESSIONAL STATUS

Qualification	Institution	Year
BSc	University of Port Elizabeth	1981
Bsc (Hons)	University of Port Elizabeth	1982
MSc (Biochem)	University of Port Elizabeth	1987
Project Management Training Course	GROMAN consulting group	1990
Integrated Environmental Management (IEM): Theory and Practice Course	The Environmental Evaluation Unit, University of Cape Town	1991
Development Procedures, Policies and Documentation: An Information mapping	Information Mapping Inc., Waltham, Massachusettes. 3-day workshop.	1994
Business Presentation Skills	Business Presentation Skills (PTY) LTD, Sandton	1994

EMPLOYMENT AND EXPERIENCE RECORD

Period	Organisation details and responsibilities/roles
1983-1986	Assistant Researcher, National Research Institute for Oceanology, CSIR, Stellenbosch
1987-1988	Researcher, Ematek, CSIR, Stellenbosch
1988-1996	Project Leader , Ematek, CSIR, Stellenbosch
1996- 2005	Project Leader, CSIR, Environbmentek, Stellenbosch (Coast Programme)
2005-	Senior Scientist, CSIR, Natural Resources and the Environment (NRE), Stellenbosch

RECENT PROJECT EXPERIENCE

2009	Development of an Estuarine Management Plan for Verlorenvlei (C.A.P.E – Project team member)
2009	Revision of Recreation Water Quality Guidelines for Coastal Marine Waters in SA (Department of Environmental Affairs – Project leader)
2009	Palmiet Estuary – Rapid Ecological Reserve Determination (Department of Water Affairs – Water Quality Specialist)
2009	Impact Assessment on Chevron Refinery marine outfall, Milnerton (Chevron – Project leader)
2008	Transboundary Diagnostic Analysis for WIO Region linked to influence of land-based activities (Task Team Member responsible for Marine Pollution – UNEP/GEF)
2008	Development of Environmental Quality Objectives/Standards for Coastal Zone of WIO Region (UNEP/GEF – Project leader)
2008	Sundays Estuary - Intermediate Ecological Reserve Determination (South African National Park – Water Quality Specialist)

2008	Knysna Estuary - Intermediate Ecological Reserve Determination (DWAF – Water Quality Specialist)
2008	Swartvlei Estuary - Rapid Ecological Reserve Determination (DWAF – Water Quality Specialist)
2008	Great Brak Estuary - Intermediate Ecological Reserve Determination (DWAF – Water Quality Specialist)
2008	Goukamma Estuary - Rapid Ecological Reserve Determination (DWAF – Water Quality Specialist)
2008	South Africa's National Programme of Action to Protect Marine Environment from Land-based Activities (Project leader – Department of Environmental Affairs and Tourism, South Africa)
2007	Luanda Bay Systems Project (Angola) – Towards a marine water quality management plan (Project leader –UNEP/GEF)
2007	Development of legislation guidelines as part of Generic Framework for Estuarine Management Plans in CFR (C.A.P.E. – Specialist)
2007	Development of a Generic Framework for Estuarine Management Plans in CFR (C.A.P.E. –Project team member)
2006	Impact Assessment on Chevron Refinery marine outfall, Milnerton (Chevron – Project leader)
2004-2006	Benguela Current Large Marine Ecosystem: Development of common set of water and sediment quality guidelines (UNOPS – Project leader)
2004-2006	Benguela Current Large Marine Ecosystem: Management framework for and desktop assessment of land-based marine pollution sources (UNOPS – Project leader)
2004 - 2006	Kromme/Seekoei river estuaries - Comprehensive Ecological Reserve Determination (DWAF – Water Quality Specialist)
2004 - 2006	Olifants River Estuary - Comprehensive Ecological Reserve Determination (DWAF – Water Quality Specialist & Integrative Writing)
2004	St Lucia Estuary - Rapid Ecological Reserve Determination (DWAF – Water Quality Specialist)
2003	Mhlanga & Tsitsikamma estuaries - Rapid Ecological Reserve Determination (DWAF – Integrative writing)
2003	Orange Estuary - Rapid Ecological Reserve Determination (DWAF – Water Quality Specialist)
2003	Impact Assessment on Caltex Refinery marine outfall, Milnerton (Caltex – Project leader)
2003	Development of Monitoring Protocols for implementation as part of the Ecological Reserve Determination Process in estuaries of SA (WRC – Project Leader)
2002-2004	Development of an Operational policy for the disposal of land-derived water containing waste to the marine environment of SA (DWAF- Project leader)
2002-2003	Development of a Marine Water Quality Management Plan for Saldanha Bay (Saldanha Bay WQ Forum Trust - Project leader)
2002	Mdloti Estuary Rapid Ecological Reserve Determination (DWAF –Integrative writing)
2002	Baseline marine water quality studies for Phillips Cameroon EIA (oil exploration) (provided water quality specialist input)
2002	Baseline marine water quality studies for Perenco Cameroon EIA (oil exploration) (provided water quality specialist input)
2001-2003	RDM determination on estuaries Thukela Estuary - Intermediate Ecological Reserve Determination (CES – CSIR Project leader)
2001-2003	Development of framework for cooperative governance in SA estuaries (WRC – Project team member)
2001(2004)	Lecture (plus notes) on the use Marine WQ Guidelines (IOI course held at UWC, WQ specialist) - Updated lecture material in 2004
2001	Coastal Policy for City of Cape Town (City of Cape Town – Marine WQ specialist)
2001	Breede River Estuary - Intermediate Ecological Reserve Determination (Ninham Shand – WQ Specialists & Integrative writing)
2001	Development of State of Environment Indicators for SA – Coastal and Marine (DEAT, project team member)

2000-2003	Development of Ecological Reserve Determination Methodology for Estuaries (DWAF – Project leader for final version)
2000	WQ Management Plan, Thesen Island, Knysna Lagoon (Chris Mulder Ass. – WQ Specialist)
2000	Impact Assessment Studies (WQ) SFF Oil Terminal, Table Bay (SFF- WQ Specialist)
2000	Impact assessment on Caltex Refinery marine outfall, Milnerton and Performance evaluation on Caltex Refinery marine outfall, Milnerton (Caltex – Project leader)
2000	RDM determination on estuaries: Nahoon Intermediate RDM (IWR – Integrative writing)
2000	False Bay WQ Review (City of Cape Town – Project leader)
1999	Impact Assessment Studies (WQ) SFF Oil Terminal, Saldanha Bay (SFF- WQ Specialist
1998	Feasibility studies on marine outfalls: Mombasa, Kenya (feasibility study) (Gibb Eastern Africa – Project coordination of CSIR's component)
1998	Estuarine Flow Requirement (EFR) study: Palmiet (Ninham Shand – WQ Specialist/Integrative writing
1998	EFR Swartkops Estuary (Ninham Shand –Integrative writing)
1996	Feasibility studies on marine outfalls: Baie du Tombeau, Mauritius (feasibility study) (Gibb Eastern Africa - Project coordination of CSIR's component)
1995	Coordinate the development of Marine WQ Guidelines for SA (DWAF – co project leader)

LANGUAGE

Language	***Speaking***	***Reading***	***Writing***
English	Proficient	Proficient	Proficient
Afrikaans	Proficient	Proficient	Proficient

PUBLICATIONS

Author and co-author of over 11 articles in scientific journals, chapters in books and conference proceedings. Author and co-author of over 80 technical reports for external contract clients and research projects. Presented over 19 papers and poster presentations at local and international conferences. A full publications list is available on request.

ROY C VAN BALLEGOOYEN

Proposed position in project:	ICM, Governance, Sustainable Development Tools, Data Analysis and Data Management related to development in the Coastal Zone (Dredging, Mining, Desalination and Energy)
Name of organisation:	Natural Resources and the Environment, CSIR
Profession:	Physical Oceanographer/Applied Mathematician
Position in Firm:	Senior Coastal Scientist
Date of Birth:	10 January 1961
Years with Firm:	11 years

BIOGRAPHICAL SKETCH

Over the past 24 years he has been employed by three maritime research institutes (CSIR, Institute for Maritime Technology, University of Cape Town) undertaking both academic/applied research and consultancy projects. He has published in international journals and presented many papers at both local and international conferences. The two areas of research he has contributed most to are the circulation around southern Africa both in shelf-seas and the deeper ocean, with more recent contributions in hydrodynamics and water quality of the coastal ocean and estuarine environments. In a more applied role, he has:

- participated in numerous **Environmental Impact Assessments** and **Strategic Environment Assessments** in southern Africa and Africa, with a focus on the oil and gas industry, port development, mining and desalination projects. His involvement has included:
    - a role as a **marine specialist** undertaking mainly three-dimensional numerical modelling to assess the impact of pollutants in the marine environment (hydrodynamic, water quality and sediments dynamics modelling)
    - a more **integrative role** (i.e. co-ordination of marine impact assessment studies) involving both **impact assessment** and **engineering design** in projects potentially having an impact on the marine environment. In this role he has developed knowledge of **policy, legislation and guidelines of relevance to marine water quality** and has gained extensive experience in applying the broader principles of Integrated Coastal Management during the project life-cycle of a number of large projects.
- **operational oceanography experience** in both deep and shallow water environments (i.e., environmental design criteria, oil spills, hot water and sewerage effluents, sediment plume modelling, estuarine freshwater releases, solar heating for aquaculture, desalination)
- a good knowledge of **data analysis techniques** (tidal analysis, spectral analysis, EOF analysis), a broad knowledge of **marine instrumentation and associated analysis techniques** as well as and **extensive sea-going** (14 open ocean and shelf cruises, some as chief scientist) and **field experience** (Mozambique, Angola, Cameroon)

The above project experience has provided him with practical experience and a deep insight into typical project life-cycles, engineering design issues and ICM policies, legislation and guidelines of relevance to the assessment and management of development projects likely to affect the marine environment.

EDUCATIONAL QUALIFICATIONS

Dale College, King William's Town

1978 - Matriculation with A aggregate

University of Cape Town

1981 - BSc (majors in applied mathematics and physical oceanography)
1982 - BSc (honours) in applied mathematics (with distinction)
1988 - Data Analysis -Advanced training workshop on the statistical analysis of long term data series
1996 - Master of Science in physical oceanography (with distinction)

1996 - Project Management - Continued Engineering Education program (16 week part-time course)

Trade and Industrial Policy Strategies (TIPS)

2003 Economics of the Environment, Winter School, 5-9 May 2003, Trade and Industrial Policy Strategies (TIPS), Cape Milner, Cape Town

Other short courses

2002 Intellectual Property and commercialization

Southern Education and Research Alliance and Cilla (CSIR Innovation and Leadership Learning Academy) - 20 Sept 2002

2002 Strategic Management of Innovation

Cilla (CSIR Innovation and Leadership Learning Academy) - 30 Sept 2002.

2003 Critical business theories of business decision-making -

Business Education Design (Pty) Ltd – 21 May 2003

2003/5 CSIR Mentorship Program – CSIR/Reach Africa (participation as mentor to young engineer in the Coastal Processes Group, i.e. mentorship training in mentor-mentee partnership)

PROFESSIONAL QUALIFICATIONS

- Prof. Natural Scientist registered with the SA Council of Natural Scientific Professions
- Member of the South African Society for the Atmospheric Sciences
- Member of the SA Data Centre for Oceanography (SADCO) Steering Committee (1994, 2000 to present)
- SA Committee for Antarctic Research Marine Research Task Group (1993/4)
- Has undertaken reviews for Journal of Geophysical Research, Deep-Sea Research and South African Journal for Marine Research.

KEY EXPERIENCE

He has undertaken a numerous projects related to Environmental/Engineering Design and Decision Support (10), Risk Assessment and Contingency Planning (4), Water Quality Management (4) comprising mainly marine outfalls and port development, Environmental Screening and Impact Assessments (27) comprising mainly oil and gas industry and port development projects, Strategic Environmental Assessments and marine litigation.

In addition to his involvement is the above more applied projects, he has undertaken a number of research projects including a marine forecasting pilot study, an assessment of the role of freshwater in marine environments and is involved in the CSIR Urban Coasts project (in which it is intended that he develop national guideline documents for the assessment and management of both dredging and desalination projects).

The table below presents an abridged list of Roy van Ballegooyen's project experience relevant to this proposal where only the major projects of relevance are listed.

Year	Project	Client/Stakeholder	Role
Environmental/Engineering Design and Decision Support			
2005/6	Current and wave simulations for the environmental and engineering design of the Saldanha Bay iron-ore development project, Port of Saldanha	Transnet Capital Projects	Project leader, no direct modelling role.
2003	Water Quality Study for Site Selection Process, Soyo, Angola.	Angola LNG Project, ChevronTexaco	Project Leader/Marine environment specialist
2002	Development of a decision support tool for determining operational time for the Namdeb inshore mining project	Namdeb, Namibia	Modelling specialist
2001	Sable Field Development Project: Environmental design and operational criteria and provision of a 10 year hindcast winds, waves and currents	Bluewater Energy Services B.V. The Netherlands	Metocean/physical oceanography specialist
1999	Assessment of proposed harbour extensions (hydrodynamic, water quality, sediment transport and wave resonance)	PORTNET - Port of Saldanha	Marine environment/ modelling specialist
1997	Solar heating simulations of seawater for aquaculture	Namaqualand Mines	Project leader/ Modelling

Year	Project	Client/Stakeholder	Role
	ponds, Namibia		specialist
1995	Desalination plant feasibility study, Namibia	UCT Centre for Marine Studies / Parkman	Marine environment specialist
Risk Assessment and Contingency Planning			
2002/3	Cameroon National Oil Spill Contingency Plan	World Bank	Metocean/modeling specialist
2002	Assessment of risk posed by the Port of Nqgura and the Coega IDZ on Marine Growers abalone farm.	National Ports Authority / Coega Development Corporation	Project Management, Risk Assessment / Water Quality Specialist
Water Quality Management – Marine Outfalls			
2004	Environmental fatal flaw analysis of a proposed slimes discharge to the marine environment	SA Ticor (Heavy Mineral mining)	Project leader/marine environment & water quality specialist
2002	Assessment of changes in optical properties of seawater in the vicinity of Aliwal Shoal associated with the Sappi effluent	Sappi-Saiccor	Hydrodynamic modelling specialist
1999	Design of a pipeline monitoring program using predictive modelling of water quality	East London TLC	Marine environment/ modelling specialist
1998	Second Mombasa and coastal water supply, engineering and rehabilitation Project: Sewerage, drainage and sanitation –compliance assessment of a marine outfall using 3D numerical modelling (Kenya)`	Gibb Eastern Africa Ltd	Marine environment/ modelling specialist
Water Quality Management – General			
2000	False Bay water quality review: Policy and legislation, state of water quality in the False Bay and recommendations for future research.	Cape Metropolitan Council/ Department of Water Affairs	Marine environment/ modelling specialist
1999	Assessment of management strategies/impacts of effluents/runoff from the Mozal site on the Matola River and Espirito dos Santo estuary, Mozambique	Mozal, Mozambique	Project leader for field survey/ modelling specialist
Environmental Screening and Impact Assessment – Oil and Gas Industry			
2007	Marine Specialist studies for the Environmental Impact Assessments and Environmental Management Plans for the proposed Coega Integrated Liquified Natural Gas to Power Project	ESKOM (national power utility), South Africa	Project leader for marine specialist studies/water quality modeling (still underway)
2005/7	Data Gathering and Gap Analysis for Modelling of the Cumulative Effects of Offshore Petroleum Exploration and Production Activities on the Marine Environment in the BCLME Region.	(BCLME) Benguela Current Large Marine Ecosystem Program, UNDP/GEF funded	Environmental and marine modeling specialist
2006/7	Oil spill modeling and impact assessment for De Beers horizontal mining vessel operating in South African Sea Areas mining licence areaML3/2003 and the Namibian Atlantic 1 mining licence area.	De Beers Marine	Project Leader/ Modeling specialist
2005	Kudu Power Plant EIA: Assessment of a proposed cooling water discharge at Uubvley near Oranjemund, Namibia	NamPower	Marine environment and water quality specialist
2004	Kudu Power Plant EIA: Assessment of a proposed cooling water discharge at Site D near Oranjemund, Namibia	NamPower	Marine environment and water quality specialist
2003	Qualitative EIA for Site Selection Process, Soyo, Angola.	Angola LNG Project, ChevronTexaco	Marine environment specialist
2003	Coega Integrated LNG to Power Project Pre-feasibility Environmental Screening: Water Discharges to the Marine Environment	ESKOM (national power utility) South Africa	Marine environment /Water quality specialist
1998	Preliminary investigation of environmental impacts of seawater cooling system for the Kudu Gas Project, Namibia	Kudu Gas Project Dev. Team / Walmsley Env. Con.	Marine environment specialist
Environmental Impact Assessment – Miscellaneous			
2007/8	Marine Specialist studies of the potential environmental impacts of a proposed Reverse	PD Naidoo and Associates /SRK	Project leader/ modeling specialist

Year	Project	Client/Stakeholder	Role
	Osmosis Desalination Plant brine discharge into Saldanha Bay (Iron-ore export expansion project)	Joint Venture for Transnet Capital Projects	
2007/8	Marine Specialist studies into the shoreline stability, shipping risk, marine water quality, dredging and dredge disposal impacts of the Saldanha Bay iron-ore development project, Port of Saldanha	PD Naidoo and Associates for Transnet Capital Projects	Project leader/ hydrodynamic & water quality modelling specialist (still underway)
2006	Marine Specialist studies into the dredging and dredge disposal impacts of the Ben Schoeman berth deepening project, Port of Cape Town	SRK consulting for Transnet Capital Projects	Project leader/ modeling specialist
2005/6	Modelling design of a dredge monitoring program for the Berth 306 development in Richards Bay	National Ports Authority	Modeling specialist (still underway)
1997	Sediment plume modeling Elizabeth Bay, Namibia	Namdeb	Modelling specialist
Strategic Environmental Assessments			
2004	Richards Bay Strategic Environmental Assessment	National Ports Authority, Port of Richards Bay	Hydrodynamic and water quality modelling specialist
Marine Litigation – Specialist Studies			
2001/2	Reconstruction of metocean conditions for BOS 400 incident	Zietsman Lloyd and Hemsted Inc. for Deneys Reitz Attorneys	Metocean specialist/ Hydrodynamic modeling specialist
2001/2	Assessment of wind conditions during the South Seas Driller incident	Woodhead, Bigby and Irving for National Ports Authority	Metocean specialist/ expert testimony
Contract Research / CSIR Internal Research Projects			
2008 -2010	River Influenced Bights and Bays	CSIR	Modelling Specialist
2008-2010	Urban Coasts (includes the development of guidelines relevant to dredging and desalination)	CSIR	Marine and Modelling Specialist
2006-2007	Regional Coastal Ecosystem Assessment for Development (ReCEAD)	CSIR	Contract Manager/ Modelling Specialist
2003/5	Regional marine forecasting pilot study (ROPeS)	CSIR	Project leader/ Modelling Specialist

LANGUAGES

Language	***Speaking***	***Reading***	***Writing***
English	*Proficient*	Proficient	Proficient
Afrikaans	*Proficient*	Proficient	Proficient

PUBLICATIONS

Beside numerous presentations at both international and national conferences, Roy van Ballegooyen has authored or co-authored 15 papers in refereed scientific journals, 7 peer-reviewed/published conference proceedings, 11 research/technical reports and a book chapter (Environmental data requirements of maritime operations in the Benguela coastal ocean: In: Large Marine Ecosystems, Vol. 14, (Forecasting And Data Assimilation in the Benguela and Comparable Systems), book chapters besides 65 consultancy reports and 2 semi-popular articles. A full list of publications is available on request.

ANDRé THERON

Proposed position in project:	Specialist on physical coastal processes, sediment dynamics and estuarine morphology
Name of organisation:	CSIR
Profession:	Civil Engineer
Position in Firm:	Senior Research Engineer
Date of Birth:	3 April 1959
Years with Firm:	18 years

EDUCATIONAL QUALIFICATIONS

1981	Civil Engineer Degree	University of Stellenbosch
2004	Masters degree in water engineering (coastal engineering thesis)	University of Stellenbosch

EXPERIENCE RECORD

1990-date CSIR, Stellenbosch.
PRESENT POSITION: Projects Manager, Coastal & Estuarine Senior Research Engineer.
RESEARCH & CONTRACTS: Coastal engineering, sediment dynamics, nearshore hydrodynamics, coastal erosion, coastal protection, coastal developments, estuarine hydro- and sediment-dynamics, climate change impacts & response, environmental studies/impacts.

1984-1989 Water engineering. Department of Water Affairs.
Planning and design of irrigation schemes as well as general engineering services.
Operations engineer in charge of Berg River-Saldanha, Swartland and Voëlvlei schemes.
Assistant site engineer for construction of Rûensveld West water supply scheme, purification plant and housing scheme.
Long-term planning of water resource developments (urban, industrial & agricultural).

1982-1984 Structural Engineering, programming. S A Navy. Mainly the design and compilation of computer programmes for the design of concrete and wooden structures.

PEER-REVIEWED CONFERENCE PROCEEDINGS & JOURNAL ARTICLES

Luger, S, A, Schoonees, J S and Theron, A K. (2002). Optimising the disposal of dredge spoil using numerical modelling. *Proceedings* 28 Intern. Conf. on Coastal Eng., ASCE, Cardiff. Vol 3: 3155-3167.

Schoonees, J S and Theron, A K (1993). Review of the field-data base for longshore sediment transport. Coastal Eng. Journal, Vol. 19: 1-25.

Schoonees, J S and Theron, A K (1994). Accuracy and applicability of the SPM longshore transport formula. *Proceedings 24th International Conference On Coastal Engineering*, ASCE, Kobe, Japan. Vol. 3: 2595-2609.

Schoonees, J S and Theron, A K (1995). Evaluation of 10 cross-shore sediment transport/ morphological models. Coastal Eng. Journal, Vol. 25: 1-41.

Schoonees, J S and Theron, A K (1996). Improvement of the most accurate longshore transport formula. *Proceedings 25th Intn. Conf. On Coastal Eng.,* Orlando, Florida. ASCE, Volume 3, Chapter 282, page 3652-3665.

Schoonees, J S Theron A K and Coppoolse R C (1999). Temporary groynes for measuring longshore transport in False Bay. *Proceedings,* International Conference on Coastal Sediments '99, ASCE, Long Island, New York. Vol. 2: 971 – 986.

Schoonees, J S and Theron, A K (2002). Development of an accurate longshore sediment transport model. J. SA Institute of Civil Eng. 44 (3): 12-17

Schoonees, J S, Theron, A K and Bevis, D. (2006). Shoreline Accretion and Sand Transport at Groynes Inside the Port of Richards Bay. Coastal Engineering Journal (Elsevier) 53 (2006) 1045–1058.

Theron, A K (1994). Sea level rise, impacts and the use of Bruun's erosion rule. J SA Inst Civ Eng, Vol 36, No 3, Fourth Quarter 1994: 6-10.

Theron, A.K., Coppoolse, R.C. and Schoonees, J.S. (1994) Low-cost coastal protection measures using textiles. *Proceedings* 28th International Navigation Congress (PIANC), Seville, Spain. Section II - Subject 4, pp109-118.

Theron, A K and Schoonees, J S (1998). Defining an unusual littoral regime to optimise dredging at East London. *Proceedings,* 26 th International Conference on Coastal Engineering, ASCE, Copenhagen, Denmark Vol 3: 3479-3489.

Theron, A K, Schoonees, J S, Burggraaf, A and Raw, A J (1998). Harbour sedimentation and dredging optimisation at some Southern African ports. *29 PIANC*, Netherlands, Section II, Subject 5: 47-55.

Theron, A K and Schoonees, J S (1999). Sand Transport Through and Around the Main Breakwater at East London. *Proceedings,* Fourth International Symposium on Coastal Engineering and Science of Coastal Sediment Processes, Coastal Sediments '99*,* New York, ASCE. Volume 3: 2371 – 2384.

Theron, A K, Schoonees, J S and Manini, D (1999). Successful prototype testing of low-cost dike/beachwall protection. *Proceedings,* International Conference on Coastal Structures '99, ASCE, Santander, Spain. Vol. 2: 1027 – 1035.

Theron, A K, Schoonees, J S and Claassens, H (2002). Port of East London: design and optimisation of the sand traps. *Journal of SA Inst Civ Eng*, Vol 44(4): 8-15.

Theron, A K, Schoonees, J S, Huizinga, P and Phelp, D T (2003). Beach Diamond Mining Design at the Rocky Namaqualand Coast. *Proceedings*, 4th Coastal Structures Conference, ASCE, Portland, Oregon, 2003.

Theron A K and Schoonees J S (2007). Sand Transport at and Shoreline Response to a Breakwater Attached to a Large Tidal Pool at Monwabisi, Cape Town. *Journal* of the South African Institution of Civil Engineering, June 2007 Vol 49 No 2: 2-9.

EXAMPLES OF TECHNICAL/POLICY REPORTS

Audouin M A, Taljaard S, Dunkley E C, Lochner P A, Le Maitre D C, Theron A K, Schoonees J S, Rabie A and Van Zyl H (2001). First edition: City of Cape Town: State of the coast: Coastal zone strategy development - Phase 1. *CSIR Report* No ENV-S-C 2001-071, Environmentek, Stellenbosch, South Africa.

Beck J S, Kemp A, Theron A K, Huizinga P and Basson G R (2004). Hydraulics of Estuarine Sediment Dynamics in South Africa: Implications for Estuarine Reserve Determination and the Development of Management Guidelines. WRC Report No. 1257/1/04. Pretoria, South Africa.

Midgley, G.F., Chapman, R.A., Hewitson, B., Johnston, P., de Wit, M., Ziervogel, G., Mukheibir, P., van Niekerk, L., Tadross, M., van Wilgen, B.W., Kgope, B., Morant, P.D., Theron, A.K., Scholes, R.J., Forsyth, G.G. (2005) *A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-economic Effects of Climate Change in the Western Cape.* Report to the Western Cape Government, Cape Town, South Africa. CSIR Report No. ENV-S-C 2005-073, Stellenbosch.

Soltau C and Theron A K (2006). Development Setback Lines for the Northern Beaches, Richards Bay, and Evaluation of the uMhlathuze Beaches. *CSIR Report* NRE/ECO/ER/2006/0048/C. CSIR, NRE, Stellenbosch, South Africa.

Theron, A.K. (1995) Coastal dynamics in KwaZulu-Natal: Part 1. KwaZulu-Natal north and south coast beach evaluation. Town and Regional Planning supplementary Report No 41, The Town and Regional Planning Commission, Pietermaritzburg, South Africa. Pp 62

Theron, A K (2003). Setback line for the coastal zone: Cave Rock to Msimbazi River Mouth. *CSIR Report* ENV-S-C 2003-112. Environmentek, Stellenbosch. pp 44.

Theron, A K (2003). Setback line for the coastal zone: Msimbazi- to Mahlongwana River Mouth, and Mgeni- to Ohlanga River Mouth. *CSIR Report* EMAS-C 2003-088. Environmentek, Stellenbosch. pp 47

Theron A K (2007). Chapter 2: Review of information on sediment dynamics of South African estuaries. In: A review of information on temporarily open/closed estuaries in the warm and cool temperate biogeographic regions of South Africa, with particular emphasis on the influence of river flow on these systems. Whitfied A and Bate G, eds. Water Research Ccmmission, WRC Report No. 1581/1/07, ISBN 978-1-77005-518-6. Gezina.

Van Ballegooyen RC, Taljaard S, Van Niekerk L, Lamberth SJ, Theron AK and Weerts S. (2007). Freshwater flow dependency in South African marine ecosystems: a proposed assessment framework and initial assessment of South African marine ecosystems. Water Research Ccmmission, WRC Report No. KV 191/07, ISBN 978-1-77005-585-8. Gezina.

Theron, A.K. and Bornman, T.G. (2008). Appendix D. Specialist Report: Coastal processes and sediment dynamics. In: van Niekerk, L., Bate, G.C. and Whitfield, A.K. (eds). East Kleinemonde Estuary Reserve determination study: Technical report. Department of Water Affairs and Forestry, Pretoria.

LANGUAGES

Language	*Speaking*	*Reading*	*Writing*
Afrikaans	excellent	excellent	excellent
English	excellent	excellent	excellent
German	poor	poor	poor

PUBLICATIONS

Andre Theron has authored or co-authored about 140 publications: papers, research, technical and contract reports in the relevant fields of expertise. A full list of publications is available on request.

LARA VAN NIEKERK

Proposed position in project: Estuarine Dynamics and Management
Name of organisation: CSIR
Profession: Estuarine Scientists
Position in Firm: Senior Researcher
Date of Birth: 13 October 1968
Years with Firm: 11 years

BIOGRAPHICAL SKETCH

Lara van Niekerk specializes in the physical dynamics and Ecological Water Requirements of estuaries, amongst others the Orange and Kunene River Estuary. She have also been instrumental in the development of technologies, strategic/operational policies (protocols) and legislation required for the effective management of South Africa's estuaries. Lara, in collaboration with other key scientists, have developed and Estuarine Management Training module for South African authorities. She also have extensive project management experience.

EDUCATIONAL QUALIFICATIONS

Year	Degree	Institution
1999	BSc	UNISA
2000	BSc Hons (cum laude)	University of Stellenbosch
2007	M Sc (cum laude)	University of Stellenbosch

KEY EXPERIENCE

The table below presents an abridged list of Lara van Niekerk's project experience **relevant** to this proposal:

Date	Project description	Role	Client
2009	Estuarine Management Training Course	Developer and Presenter	FETWater Programme
2008	Estuarine Management Training Course	Developer and Presenter	Nelson Mandela Metropolitan University and FETWater Programme
2008	Protection of the Marine Environment from Land-based Activities National Programme of Action (NPA) for South Africa	Specialist	South African Department of Environmental Affairs and Tourism (DEAT), Marine and Coastal Management
2007-09	Ecological Flow Requirement determination on estuaries: Great Brak and Goukamma Intermediate RDM (Resource Directed Study)	Project manager and Specialist	South African Department of Water Affairs and Forestry (DWAF)
2007-08	Ecological Flow Requirement determination on estuaries: Keurbooms Rapid RDM	Project manager and Specialist	Bitou Municipality
2007-09	Ecological Flow Requirement determination on estuaries: Knysna and Swartvlei Intermediate RDM	Specialist	DWAF
2006-08	WRC Intermitted open/ closed Estuaries East Kleinemonde	Specialist	South African Institute of Aquatic Biodiversity and Water Research Commission (SA)
2006	CAPE Estuaries programme: Development of generic Estuarine Management Plans	Project leader	GEF
2005	A status quo, vulnerability and adaptation assessment of the physical and socio-economic effects of Climate Change in the Western Cape	Specialist	Provincial Government of the Western Cape

Date	Project description	Role	Client
2005 -08	BCLME Angola Estuaries project	Specialist and Task team	DEAT, Marine and Coastal Management
2005	Eastern Cape Estuaries Programme: Training module/material for Estuarine managers on a local level)	Project manager and specialist	University of KwaZulu Natal
2004	National State of the Coast	Specialist	DEAT, Marine and Coastal Management
2004	Benefit Orange/Cunene Co-operative governance Project -	Specialist	
2004	National State of the Coast	Specialist	
2004-05	Ecological Flow Requirement determination on estuaries: St Lucia Rapid RDM	Project manager and specialist	DWAF
2004	South Coast Estuaries project	Specialist	DEAT, Marine and Coastal Management
2004-07	Great Brak Estuary Review and Management Plan	Specialist and project manager	PetroSA and DWAF
2003-04	Ecological Flow Requirement determination on estuaries: Orange Rapid RDM	Specialist and project manager	DWAF
2003-06	Ecological Flow Requirement determination on estuaries: Kromme and Seekoei Intermediate RDM	Specialist	DWAF
2003-06	Ecological Flow Requirement determination on estuaries: Olifants Intermediate RDM	Specialist	DWAF
2003	Ecological Flow Requirement determination on estuaries: Mhlanga Rapid RDM	Specialist	DWAF
2003	Ecological Flow Requirement determination on estuaries: Tsitsikamma, Groot and Klipdrift Rapid RDM	Specialist	DWAF
2002	Ecological Flow Requirement determination on estuaries: Mloti Rapid RDM	Specialist	DWAF
2002	Phase 1: Selection of Environmental Indicators for a State of the Coast National Monitoring programme	Part of core specialists team	(DEAT, Marine and Coastal Management
2001-03	Ecological Flow Requirement determination on estuaries: Thukela Intermediate RDM	Specialist	DWAF & Coastal and Environmental Services
2001-03	Co-operative Governance of Estuaries project, which is developing a National Estuarine Management Protocol for South Africa	Project manager	Eastern Cape Management Program, Institute of Natural Resources for the Water Research Commission
2001-02	National State of the Environment Indicators for the South African Coastline	Part of core team of specialists.	DEAT
2001	SA-ISIS Indicators for the Estuaries of South Africa project	Specialist	DEAT
2001	GEF MSP Sub-Saharan Africa Project for the Development and Protection of The Coastal And Marine Environment In Sub-Saharan Africa	National Specialist	Advisory Committee on Protection of the Sea (ACOPS)
2001	Ecological Flow Requirement determination on estuaries: Breede Intermediate RDM	Specialist	Ninham Shand for DWAF
2000	Ecological Flow Requirement determination on estuaries: Nahoon Intermediate RDM	Specialist	IWR for DWAF
2000-2008	Methodologies for the Protocols for the Resource Directed Measures for estuaries as required by the National	Core team Specialist	DWAF

Date	Project description	Role	Client
	Water Act (No. 36 of 1998)		
2000-2002	Classified and prioritized South African estuaries on the basis of health and conservation priority status for determination of the estuarine fresh water reserve	Specialist	DWAF
1998	Estuarine Flow Requirement (EFR) determination on Mhlatuze Estuary	Specialist	DWAF
1998	Estuarine Flow Requirement (EFR) determination on Nhlabane Estuary	Specialist	DWAF
1998	Estuarine Flow Requirement (EFR) determination on Mkomazi Estuary	Specialist	DWAF
1998	EFR Swartkops Estuary	Specialist	Ninham Shand for DWAF
1998	Estuarine Flow Requirement (EFR) determination on Palmiet	Specialist	DWAF
1997	Estuarine Flow Requirement (EFR) determination on Olifants Estuary	Specialist	DWAF
1996-…	Great Brak Estuary Monitoring Project where indicators are used to estimate the health of the system and manage the mouth conditions of the system	Co-manager	DWAF & Mossgas
1996-98	Klein River Estuary Monitoring Project where there is extensive interaction with the local community and experiments with local community monitoring of some physical indicators	Project manager and specialist	Hermanus Municipality

LANGUAGES

Language	***Speaking***	***Reading***	***Writing***
English	*Excellent*	Excellent	Good
Afrikaans	Excellent	Excellent	Excellent

PUBLICATIONS

In addition to the contract reports listed above, Lara van Niekerk has authored or co-authored 7 papers in refereed scientific journals, ~40 research reports and 2 book chapters besides consultancy reports and semi-popular articles. A full list of publications is available on request.

WILLEM DE LANGE

Firm	:	CSIR: Natural Resources and the Environment
Profession	:	Agricultural Economist
Specialization	:	Environmental and Resource Economics
Position in Firm	:	Senior researcher
Year appointed	:	2006
Nationality	:	South African
Year of Birth	:	1977
Language Proficiency	:	Afrikaans, English

KEY QUALIFICATIONS

- 2000: BScAgric (Agric.Econ.; Economics; Business Management; Statistics and Psychology) (Stell.)
- 2001: HonsBScAgric (Agric.Econ and Econ.) (Stell.)
- 2002: MScAgric (Agric.Econ) (Stell.)
- 2005: PhDAgric (Agric.Econ) (Stell.)

FIELDS OF INTEREST AND EXPERTISE

Environmental and resource economics:

- Natural resource valuation and management
- Decision support methodology development for resource management (multi-criteria decision-making)
- Water allocation policy analysis and development
- Institutional transformation in water management
- Environmental impact assessments
- Natural resource stock and flow valuation
- Ecosystem service valuation
- Restoration initiatives of natural capital stocks and flows
- Spatial presentation of derived value
- Environmental and resource economic applications to sustainability science
- Behavioural economic applications to environmental and resource management decision-making

Agri-business management:

- Agri-business plan evaluation
- Multi-period stochastic budgeting (various industries in agriculture)
- Risk profiling and investment management
- Irrigation project evaluation
- Aquaculture reticulation system evaluation (rainbow trout)

Rural development:

- Land redistribution and development (LRAD) evaluations in the Western Cape province
- LRAD and related AgriBEE initiative planning, financing and implementation
- Investigating socio-economic dynamics in rural areas
- Small farmer irrigation project evaluation

EMPLOYMENT

Period	**Organisation details and responsibilities/roles**
2004-2006	Economist; Western Cape Department of Agriculture, Elsenburg
2006+	Senior researcher, Natural Resources and the Environment, CSIR

RECENT PROJECTS

- Evaluation beyond valuation: Economics for sustainability in South Africa (CSIR- Department of Science and Technology; ZAR350k)

- Economics and ecology of ecosystems: Unlocking the complexity needs of sustainable development at the system scale (International Panel on Climate Change; ZAR75k)
- Mapping benefit flows in the Inkomati water management area, South Africa (CSIR- Department of Science and Technology; ZAR350k))
- Economic impacts of increased water tariffs for the Western Cape economy (Department of Science and Technology; ZAR375k))
- Estimating the opportunity cost of sand mining in the eThekweni municipality (eThekweni Municipality, Durban; ZAR200k))
- Restoration of natural capital in the Baviaanskloof mega reserve, South Africa (CSIR- Department of Science and Technology; ZAR550k)
- Cost-benefit analysis on biological control research in South Africa (Department of Water Affairs and Forestry; ZAR750k)
- The role of economic instruments in driving changes in waste management (CSIR-Department of Science and Technology; ZAR350)
- A comparison of the costs associated with pollution prevention measures required to treat polluted water resources (CSIR-Department of Science and Technology; ZAR570k)
- Sustainability economics applied to bio-fuel in South Africa (CSIR-Department of Science and Technology; R1300k)
- Climate change response strategy for the Western Cape (Department of Environmental Affairs and Development Planning; ZAR40k)
- Applying remote sensing to value water in the Sandveld, Western Cape (Department of Agriculture; ZAR150k)
- Assessment and valuation of ecosystem services in the Succulent Karoo biome (SKEP; R115k)

2009-2010 PUBLICATIONS (complete list available on request)

De Lange, W.J., Wise, R.M., Forsyth, G.G. and Nahman, A. (2009) Integrating socio-economic and biophysical data to support water allocations within river basins: An example from South Africa. *Environmental Modelling and Software.* 25(1):43-50.

De Lange, W.J., Nahman, A., and Wise, R. (2009) Securing a sustainable future through a new global contract between rich and poor. *Sustainable Development*. DOI: 10.1002/sd.413.

Nahman, A., **De Lange, W.J.** and Wise, R. (2009) Environmental and resource economics in South Africa – Status quo and lessons for developing countries. *South African Journal of Science,* 105:350-355.

Peter, C., **De Lange, W.J.,** Musango, J.K., April, K. and Potgieter, A. (2009) Applying Bayesian modelling to assess climate change effects on biofuel production. *Climate research,* 40:249-260. DOI: 10.3354/cr00833.

Egoh, B.N., Reyers, B., Carwardine, J., Bode, M., O'Farrell, P.J., Wilson, K.A., Possingham, H.P., Polasky, S.M., Rouget, M, **De Lange, W.J.** and Cowling, R.M. (2010) Safeguarding biodiversity and ecosystem services in South Africa's Little Karoo. *Biological Conservation. DOI: 10.1111/j.1523-1739.2009.01442*

De Lange, W.J. and Theron, A.K. (article in press) Rapid appraisal of the social cost of sand mining: methodology and application. *South African Journal of Economic and Management Sciences.* ##(#):###-###.

De Lange, W.J.; Veldtman, R. and Allsopp, M.H. (submitted) Forage substitution elasticity of *Eucalyptus Cladocalyx* for the South African deciduous fruit industry. *PloS One.* ##(#):##-##.

O'Farrell, P.J.; Le Maitre, D.M.; Reyers, B.; Milton, S.J.; Colvin, C.; Maherry, A.; Egoh, B.; Atkinson, D.; **De Lange, W.J**.; Blignaut;, J.M. and Cowling, R.M. (accepted) Multifunctional landscapes in a semi arid environment: Biodiversity, ecosystem services, and beneficiaries. *Landscape Ecology. ##(#):###-*

De Lange, W.J. and Van Wilgen, B.W. (accepted) An economic assessment of the contribution of biological control to the management of invasive alien plants and to the protection of ecosystem services in South Africa. *Biological Invasions.* ##(#):##-##.

Wise, R.W.; Peter, C.; **De Lange, W.J**.; von Maltitz, G. And Brent, A. (submitted) Going beyond panaceas to promote sustainability in the South African energy sector. *PNAS* ##(#):##-##.

Nahman, A. and **De Lange WJ** (submitted) Using inclusive wealth to compare alternative development paths: The case of natural capital restoration in the Baviaanskloof, South Africa. *Environmental and Resource Economics*, ##(#):##-##.

De Lange, W.J. (2009) Water as an economic currency – Zooming in on value drivers. ScienceScope, 4(2):28-29.

Nahman, A. and **De Lange WJ** (2010) Applying inclusive wealth to inform sustainable development in the Baviaanskloof, South Africa: progress to date and documentation of the process. CSIR project JECOS67, CSIR report number: CSIR/NRE/RBSD/EXP/2010/0017/A

ANTON NAHMAN

Firm	:	CSIR: Natural Resources and the Environment
Profession	:	Environmental/Resource Economist
Specialization	:	Economic Valuation; Environmental policy and project analysis; Economics of pollution and waste
Position in Firm	:	Researcher/Scientist: Environmental and Resource Economics
Year appointed	:	2006 (and 2004/05 as intern)
Nationality	:	South African
Year of Birth	:	1981
Language Proficiency	:	English, Afrikaans

EDUCATION AND KEY QUALIFICATIONS

Qualification	Institution	Year
• BA (Economics, Philosophy, Organisational Psychology) (with distinction)	Rhodes University	2003
• BA (Honours) (Economics) (with distinction)	Rhodes University	2004
• MSc (International Development: Environment and Development) (with distinction)	University of Manchester	2006

RESEARCH TRACK RECORD

Project reports

Year	Title	Client
2005	Explicit knowledge management - key issues that Environmentek experiences, priorities and recommendations	Parliamentary grant
2005	The economic impacts associated with a change in the environmental quality of the Kongweni Estuary at Margate KZN - Final report	Department of Environmental Affairs & Tourism: Marine & Coastal Management
2005	Wild Coast Conservation and Sustainable Development Project - An economic valuation of the biodiversity of the of the Wild Coast and assessment of potential financing mechanisms for its conservation	The Wilderness Foundation
2006	Summary report on the "Blue Skies" Workshops held from June 2001 to January 2006	TEAMP Blue Skies Programme
2007	Mineral waste - the required governance environment to enable re-use. Final report	Parliamentary Grant
2007	Environmental and resource economics in SA: a review	Parliamentary Grant
2008	Economic instruments for solid waste management in South Africa : opportunities and constraints to implementation. Final report	Parliamentary Grant
2008	Economic instruments for solid waste management in developing countries : a literature review. Final report.	Parliamentary Grant
2008	Economic instruments for solid waste management in South Africa : summary report. Final report.	Parliamentary Grant
2008	Sustainability science	Parliamentary Grant
2008	Sand supply from rivers within the eThekwini jurisdiction, implications for coastal sand budgets and resource economics	Ethekwini Municipality
2008	The flow of benefits to people provided by ecosystems at multiple scales: a spatial and economic assessment	Parliamentary Grant
2008	An evaluation of economic and non-economic techniques for assessing the importance of biodiversity to people in developing countries	UK Department for Environment, Food and Rural Affairs
2008	Valuing water for South African Industries: A production function approach	Water Resources Commission
2009	An approach for comparing the costs of pollution prevention to that of water treatment in a section of the Upper Crocodile	Water Resources Commission

	River.	
2009	Addressing challenges with waste service delivery in SA: discussion document towards National Waste Collection Standards and Policy on free basic refuse removal.	Parliamentary Grant
2009	Costing the Integrated Waste Management Bylaw with specific reference to airspace savings.	City of Cape Town
2009	Environmental Resource Economics: Conference Synthesis Report	The Table Mountain Fund
2009	The non-economists' guide to how economists measure inclusive wealth.	Parliamentary Grant
2009	Assessing the monetary impact of water pollution on commercial irrigation in the Loskop Water User Association	Water Resources Commission
2010	Applying Inclusive Wealth to inform sustainable development in the Baviaanskloof, South Africa: Progress to date and documentation of the process	Parliamentary Grant
2010	Towards understanding the true costs of waste to South African society: A case study of the true costs of landfills in the City of Cape Town	Parliamentary Grant
2010	Review and critique of the estimated economic values of externalities associated with using coal for electricity production in South Africa	Department of Science and Technology
2010	Socio-economic assessment of the ecosystem goods and services provided by the Goukou Estuary	CapeNature

Peer-reviewed journal papers

Published

- Nahman, A. & Antrobus, G. (2005). The Environmental Kuznets Curve: A Literature Survey. *South African Journal of Economics.* 73 (1), 105-120.
- Nahman, A. & Antrobus, G. (2005). Trade And The Environmental Kuznets Curve: Is Southern Africa a Pollution Haven? *South African Journal of Economics.* 73 (4), 803-814.
- Nahman, A. & Rigby, D. (2008). Valuing blue flag status and estuarine water quality in Margate, South Africa. *South African Journal of Economics.* 76 (4), 721-737
- De Lange, W., Nahman, A. and Wise, R. Securing a sustainable future through a new global contract between rich and poor. Published online in *Sustainable Development*. In press. DOI: 10.1002/sd.413
- De Lange, W., Wise, R., Forsyth, G. and Nahman, A. Integrating socio-economic and biophysical data to support water allocations within river basins: An example from South Africa *Environmental Modelling & Software.* 25, 43–50
- Nahman, A. Wise, R. and De Lange, W. Environmental and resource economics in South Africa: Status quo and lessons for developing countries (*South African Journal of Science.* 105 (September/October 2009), 350-355
- Nahman, A. Extended producer responsibility in the packaging industries in South Africa: Current approaches and lessons learned (*Resources, Conservation and Recycling*. 54 (2010) 155–162
- Nahman, A. and Godfrey, L. Economic instruments for solid waste management in South Africa: opportunities and constraints (*Resources, Conservation and Recycling*. 54 (2010) 521–531)

Submitted/Under Review

- De Lange, W., Nahman, A. and Theron, A. Rapid appraisal of the social cost of sand mining: methodology and application (under review at *South African Journal of Science*)
- Nahman, A. and De Lange, W. Using inclusive wealth to compare alternative development paths: The case of natural capital restoration in the Baviaanskloof, South Africa (under review at *Environmental and Resource Economics*)
- De Lange, W. and Nahman, A. Modern consumerism: Too much of the wrong thing (under review at *Science*)

Conference papers

- Godfrey, L. & Nahman, A. (2007). Are developing countries ready for first world waste policy insturments? Paper presented at the 11th International Waste Management and Landfill Symposium held in Cagliari, Italy in October 2007.
- Nahman, A, and Godfrey, L. (2008) Are economic instruments the solution to sustainable waste recycling in South Africa? Presented at the 9th Bi-ennial Waste Conference, 6-10 October 2008, Durban.
- Nahman, A., Godfrey, L. and Wise, R. Market-based instruments in South Africa: A review (p: 137-146). In: Aravossis, K., Brebbia, C.A. and Gomez, N. (2008). Environmental Economics and Investment Assessment II: Proceedings of the 2nd international conference on Environmental Economics and Impact Assessment, held in Cadiz, Spain, 28-30 May 2008

- De Lange, W., Nahman, A. and Theron, A. External costs of sand mining in rivers: Evidence from South Africa. Presented at the Environmental and Resource Economics Conference, 21-22 May 2009, Cape Town. http://www.capeaction.org.za/uploads/Microsoft_PowerPoint_-_Nahman,A_PowerPressed.pdf

Books & Book chapters

- De Lange, W.J.; Wise, R. and Nahman, A. (2008) Evaluation beyond valuation: Towards a new framework for assessing social-ecological tradeoffs in South Africa. (p: 243-278) In: Burns, M. and Weaver, A (2008) Exploring sustainability science: A Southern African perspective. Sun Press, African Sun Media, Stellenbosch, South Africa.

PATRICK MORANT

Nationality	British
Profession	Environmental Scientist
Specialisation	Coastal environmental management and impact assessment
Position in firm	Project Manager
Years with firm	23 years
Language proficiency	English (mother tongue); Afrikaans (basic); Swahili (basic); French (basic)

KEY FIELDS OF EXPERTISE

- Coastal environmental management, environmental impact assessment and environmental planning (opportunities and constraints analysis).
- Estuarine ecology and wetland classification.

SKILLS AND EXPERIENCE

- Twenty six years experience of coastal environmental management and environmental impact assessment in southern Africa, particularly in the oil and gas sector in Africa.
- Wetland ecology and classification; management of estuarine ecosystems.
- Ornithology: Primarily in management of bird ringing (banding) studies in southern Africa and the sub-Antarctic.

EDUCATION AND PROFESSIONAL STATUS

BSc. Zoology and Microbiology, University of Cape Town, 1968
BSc. (Hons), Microbiology, University of Cape Town, 1969
MSc. Environmental studies, University of Cape Town, 1982

Professional member: South African Institute of Ecologists and Environmental Scientists.
Registered Natural Scientist, South African Council for Natural Scientists.
Member: Southern African Ornithological Society.
Member: Southern African Society of Aquatic Scientists.
Member: Southern African Marine Science Society.

EMPLOYMENT RECORD

1982 - date:	Principal Environmental Consultant, CSIR.
1982:	Overseas travel: South America, USA, UK.
1981:	Full-time M.Sc. student, University of Cape Town.
1977 - 1981:	Officer-in-Charge, South African Bird Ringing Unit (SAFRING) Cape Town.
1976:	M.Sc. student, School of Environmental Studies, University of Cape Town.
1970 - 1976:	Food microbiologist, Metal Box Co. (South Africa), Cape Town.

PROJECT EXPERIENCE RECORD (ABRIDGED) - dates show study completion

2008	Environmental Impact Assessment of the proposed seismic survey in Block 1/06, Angola for Tullow Angola B.V.
2008	Environmental Risk Review for LNG and CNG supplies for the PetroSA GTL and Eskom power plants, Mossel Bay *for* PetroSA.
2008	Reviews for oil and gas EIAs and Environmental Screening Studies for projects in Angola, Libya and South Africa
2008	Compilation of the environmental description section for the Environmental Impact Assessment of Sonangol P&P's planned decommissioning and abandonment of the Canuku Oilfield in Block 3, Angola *for* Lwandle Technologies
2008	Compilation of the environmental description section for the environmental Impact Assessment of Sonangol's exploration drilling campaign in Block 34, Angola *for* Lwandle Technologies
2007	Project Regional Oil Spill Planning in the BCLME Region for the GEF-funded Benguela Current Large Marine Ecosystem Programme (BCLME).

2007	Preliminary environmental assessment of a single point mooring in St Helena Bay for Transnet Projects.
2006	Environmental management programme report for exploration/appraisal drilling in the Kudu Gas Production Licence No 001 on the continental shelf of Namibia for Energy Africa Kudu Limited.
2006-5	Monitoring of the effectiveness of the Cuntala artificial reef in Block 2, offshore Angola for Chevron.
2006	Environmental management programme report for development of the Kudu Gas Field on the continental shelf of Namibia for Energy Africa Kudu Ltd.
2006	Marine environmental description for Environmental Impact Assessment of Marathon Oil's liquefied natural gas plant, Malabo, Equatorial Guinea for Continental Shelf Associates, Florida, USA.
2005	Environmental Impact Assessment of seismic surveys in the Luderitz Licence Area for Hunt Oil Company.
2005	Technical and economic feasibility assessment of poverty alleviation projects on the coasts of KwaZulu-Natal and Eastern Cape Province *for* the National Department of Environmental Affairs and Tourism.
2005	Assessment of the physical and socio-economic effects of climate change in the Western Cape *for* The Government of the Western Cape Province.
2005	Integrated Environmental Management Information Series: Documents No. 17-21 *for* The Department of Environmental Affairs and Tourism, South Africa.
2004	Environmental Fatal Flaw analysis of a heavy minerals prospect on the continental shelf of northern KwaZulu-Natal, South Africa *for* Tisand (Pty) Ltd.
2004	Operational Policy for Disposal of Land-derived Water Containing Waste to the Marine Environment of South Africa *for* Department of Water Affairs and Forestry, South Africa.
2004	Environmental Impact Assessment for the proposed Kudu CCGT power plant, Oranjemund, Namibia *for* Namibian Power Corporation (NamPower).
2004	Cuntala well protector platform pilot artificial reefing project offshore Angola: first monitoring survey, 2004 *for* Texaco Panama Inc. Angola.
2004	Environmental Impact Assessment for the proposed Kudu gas field development project, offshore Namibia *for* Energy Africa Kudu Limited.
2004 to 2000	Numerous baseline environmental descriptions, EIAs and EMPs for seismic surveys, petroleum exploration activities and pipeline developments in Angola, South Africa, Namibia, Ghana, Gabon, Gambia, Equatorial Guinea, Cameroon and Republic of the Congo *(projects not listed in full in this abridged CV).*
2003	Review of (1) Final Environmental Impact Report, (2) Environmental Management Programme Report and (3) Social and Macro-Economic Development Plan for Ibhubesi Gas Field, offshore South Africa *for* Petroleum Agency SA.
2003	Environmental Due Diligence study, Kwanda Base, Soyo, Angola *for* Cabinda Gulf Corporation.
2003	Walvis Bay Local Agenda 21 Project, Namibia: Coastal Area Study – Review of Ecology Study *for* COWI, Lyngby, Denmark/Danida.
2003	National Oil Spill Contingency Plan, Cameroon *for* Comité de Pilotage et de Suivi des Pipelines (CPSP), Yaoundé, Cameroon.
2002	Integrated Environmental Management Information Series: Documents No. 1-6 *for* The Department of Environment Affairs and Tourism, South Africa.
2002	Environmental fatal flaw analysis of heavy mineral prospect southern Mozambique *for* Rio Tinto Iron & Titanium, Quebec.
2002	Review of Local Agenda 21 Project, Walvis Bay, Namibia *for* COWI Consultants/Daneda, Denmark.

2001 EIA and Plan of Abandonment for Cuntala Well Protector Platform, Block 2, Angola (Addendum Report) *for* Texaco Panama Inc. Angola.

2001 EIA and EMP for geophysical prospecting and sampling for heavy minerals on the continental shelf of northern KwaZulu-Natal, South Africa *for* Richards Bay Minerals.

2001 Environmental due diligence of planned liquid natural gas plant site, Luanda, Angola *for* Texaco Angola Natural Gas Inc.

2001 Report on the natural environment of the Orange River mouth for the Orange River Mouth Development Plan (in association with Pulles Howard and de Lange) *for* the Gariep Spatial Development Initiative, Northern Cape Province.

2001 South African country report for the Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa project *for* the Advisory Committee on Protection of the Sea (ACOPS), London, UK.

2000 State of Environment Assessment for Robben Island *for* Robben Island Museum.

2000 EIA of tourism on Marion Island *for* the Prince Edward Islands Management Committee, Department of Environmental Affairs and Tourism (South Africa).

2000 EMP Report for marine diamond mining in offshore concession Blocks C and E in Diamond Area 2, Namibia *for* Okakoverua Coast Diamonds (Pty) Ltd.

2000 EMP Programme Report for marine diamond mining in Licence Area No. 2491, Namibia *for* Together Quando Mining Consortium (Pty) Ltd.

Note: A detailed list of publications, as well as additional projects undertaken from 1984 to 1999, is available on request.

CURRICULUM VITAE: LOUIS CELLIERS

Firm	:	CSIR Natural Resources and the Environment (NRE)
Profession	:	Coastal and Marine Scientist
Specialization	:	Coastal Science & Management Integration
Position in Firm	:	Senior Scientist
Year appointed	:	2010
Nationality	:	South African
Year of Birth	:	1971
Language Proficiency	:	English and Afrikaans

KEY QUALIFICATIONS

- B.Sc. (Agric) Microbiology
- M.Sc. (Agric) Microbiology
- PhD.

EDUCATION AND PROFESSIONAL STATUS

Qualification	Institution	Year
• B.Sc. (Agric) Microbiology	University of Pretoria	1990-1993
• M.Sc. (Agric) Microbiology	University of Pretoria	1994-1996
• PhD.	University of Natal	1998-2001

Memberships:

- Registered as member of the Western Indian Ocean Marine Science Association

EMPLOYMENT AND EXPERIENCE RECORD

Period	Organisation details and responsibilities/roles
April 2010 - ongoing	Senior Researchers: Council for Scientific and Industrial Research, Natural Resources and the Environment
September 2008 April	Specialist, SSI engineers and Environmental Consultants
March 1998 - August 2008	Senior Scientist, South African Association of Marine Biological Research, Oceanographic Research institute
February 1996 - May 1996	Scientist, ESKOM Technology Group
September 1995 - January 1996	Technology Transfer Scientist, Intech 180 Corporation

Recent Project Experience:

Year	Description, client, role
2009	Development of a Coastal Management Programme for the KwaDukuza Municipality. Principal Investigator
2009	Coastal Assessment of the TH land Holdings: Tinley Manor to Tugela River. Tongaat Hulett. Principal Investigator
2009	Development of an Estuary Management Protocol for the Isipingo Estuary. eThekwini Municipality. Principal Investigator
2009	Conducting a Short Course in Coastal Geographic Information. NACOMA Course Presenter.
2009	Risk Assessment for the Establishment of a Coal Transit Station at Mer Rouge, Port Louis, Mauritius. Central Electricity Board of Mauritius. Principal Investigator
2009	Integrated Coastal Management Act 2008: Developing a Toolkit for Implementation. SSI. Principal Investigator

PUBLICATIONS

Author and co-author of more than 20 articles in scientific journals, chapters in books and conference proceedings. Author and co-author of more than 10 technical reports for external contract clients. Presented over 10 papers at local and international conferences. A full publications list is available on request.

Annexure IV.3

CCIR General Contract Conditions

*In these general contract conditions, "CSIR" means **The CSIR**, a juristic person, established in accordance with the Scientific Research Council Act, Act No. 46 of 1988*

1. PURPOSE OF THE PROPOSAL

1.1 The purpose for the request of the work as set out in the accompanying Proposal must be disclosed to the satisfaction of the CSIR, and the CSIR is hereby authorized by the client to make whatever enquiries it deems fit to establish such purpose.

1.2 The contents of the Proposal are confidential, and shall not be divulged to any unauthorized third party.

1.3 Any reference hereto to "Contract" shall mean the Proposal as accepted by the Client, together with these general conditions of contract.

2. GOODS AND SERVICES

2.1 Services shall be rendered, subject to the client's acceptance of:

i. the scope of the work, and, where applicable, the procedure to be followed, as set out in the Proposal;

ii. the proposed duration and date of commencement of the work;

iii. the agreed price and conditions of payment;

iv. all other conditions contained in the attached written Proposal.

2.2 Any materials, apparatus or equipment delivered by or on behalf of the client to the CSIR, or to the premises of a sub-contractor of the CSIR, after acceptance of the Proposal, shall be accepted, retained and used at the client's risk. The client will be responsible to take out the necessary Insurance cover applicable to the situation.

2.3 Unless otherwise stated in the Proposal or the parties agree otherwise in writing, the CSIR shall have no obligation to commence the carrying out of the work or services before all materials or goods in the agreed form and numbers have been placed at CSIR's disposal.

2.4 The prices are based on the prevailing cost of material and labour and are subject to alteration should there be any changes in any of the following factors or circumstances subsequent to the date of this Proposal, which may have an effect on the price at the time of delivery:

i. exchange rates;

ii. price of goods quoted or of any part of the work sub-contracted to a third party and import duty, freight and cartage.

2.5 The period and terms for the replacement of defective parts or goods are limited to the period and terms of the express guarantee contained in the Proposal, and under no circumstances will any claim be entertained for any consequential damage or loss of any kind whatsoever.

2.6 Unless otherwise stated in the Proposal, the place of delivery of the goods is the CSIR's main campus in Pretoria, and all costs of delivery to the Client's premises will be for the account of the Client.

2.7 Ownership of the goods, all equipment, component, spares and materials will remain with the CSIR until such time as the full contract price has been paid to the CSIR. The Client accepts the sole risk and responsibility for the goods from date of delivery.

2.8 The Client shall not be entitled to reduce the contract price, or contract amount, or scope of work stated in the Proposal without the CSIR's prior written consent. If the Client reduces the scope of work or the goods ordered, the Client shall still remain liable for the full contract price, unless the CSIR agrees otherwise in writing.

3. REPORTS

3.1 The contents of any interim reports issued by the CSIR are confidential unless the CSIR and the client agree to disclose such report. No reference may be made to the CSIR or any of its operating units or centres, or employees in any marketing materials, or for any other purpose whatsoever without the CSIR's prior written consent.

3.2 The final report will, subject to Clause 6 below, be the property of the client and may be published by it, provided that the CSIR shall be indemnified by the Client against any claims for damages that may result from the publication of that report.

3.3 The CSIR shall not publish any results without the Client's consent. CSIR shall be entitled to use the technical information derived from the work, and to publish same, but shall not to identify the Client or the investigation in

doing so, without the prior approval of the Client.

4. ACCEPTANCE OF CONDITIONS

Acceptance of the Proposal shall be deemed to include acceptance of the Conditions contained herein, and the person accepting the Proposal on behalf of the Client, where applicable, warrants that he/she is duly authorized so to act on behalf of the Client and also warrants that the legal entity of the Client is as stipulated in the Proposal. Should it subsequently appear that he/she was not in fact properly authorized or that incorrect information was supplied with regard to the Client's legal status, he/she will be liable as surety and co-principal debtor, in his/her personal capacity, as against the CSIR, for the fulfillment of all the obligations contained herein, and will in his/her personal capacity be bound by all the terms and conditions contained in both the Proposal and herein.

5. PAYMENT

5.1 If the attached Proposal stipulates an advance payment, the CSIR will not commence work as set out in the Proposal until the said advance payment has been received by the CSIR. Any delay occasioned by a late payment, shall be added to the contract period.

5.2 All other payments will be strictly net within 30 (THIRTY) days of the date of invoice, or the date on which payment is due to the CSIR, in terms of the Proposal. Any amount not paid on due date shall bear interest at a rate of 2 % (TWO PERCENT) above the prime overdraft rate (per annum) charged by ABSA Bank from time to time, calculated and compounded daily in advance as from the due date.

5.3 All payments shall be made without deduction or set-off of whatsoever nature and no discounts for early settlement will be allowed on the amounts due to CSIR.

5.4 Should the Client fail to pay any instalment punctually on due date or commit a breach of any of the provisions of this contract, the CSIR shall be entitled to forthwith claim payment of the full outstanding balance of the contract price without any notice to the Client, as well as all legal costs incurred on the scale as between attorney and own client, including collection commission.

6. INTELLECTUAL PROPERTY

6.1 It is recorded that any Intellectual Property, created prior to the date of acceptance of the attached Proposal, shall vest exclusively with the party/parties who at that stage owned the same.

6.2 Intellectual property that may arise from the work shall vest in CSIR. No agreement in respect of the transfer of Intellectual Property shall be of any force and effect, unless reduced to writing and signed by both parties.

6.3 For purposes of this clause "Intellectual Property" means: the patents, designs, know-how, copyright and trade marks which relate to the goods or services; whilst:-

i. the "know-how" means all confidential information of whatever nature relating to the Intellectual Property and its exploitation as well as all other confidential information generally relating to the manufacture, use and sale of the goods including technical information, manufacturing technique and designs, specifications, formulae, systems, processes, information concerning materials and marketing and business information generally;

ii. "the patents" means the registered patents and patent applications;

iii. "the trade marks" means the registered trade marks and trade mark applications;

iv. “the designs” means the registered designs and design applications, and any other registerable inventions/trade or brand names and designs;

v. “copyright” means copyright in computer software programmes, computer data bases, data messages, and reports.

7. CONFIDENTIALITY

7.1 For purposes of this clause, “Confidential Information” means information that (i) relates to the Disclosing Party’s past, present or future research, development, business activities, products services and technical knowledge relating to the work, and (ii) either has been identified in writing as confidential, or is of such a nature, or has been disclosed in such a way that it is obvious to the other party that it is claimed as confidential. The party disclosing the confidential information is referred to as “the Disclosing Party” and the party receiving such information as “the Recipient”.

7.2 The parties shall:

i. treat as strictly confidential and secret any and all information given or made known to them during the contract period.

ii. keep all Confidential information secret towards third parties and only use it in co-operation with each other for the purpose expressly agreed upon by the Parties and to disclose same to their employees only on the basis of the need to know;

iii. accept responsibility for the observance by their employees of the secrecy undertakings contained herein;

7.3 The above undertakings shall not apply to:

i. Information which at the time of disclosure is published or otherwise generally available to the public;

ii. Information which the Recipient can show was in its possession at the time of disclosure by the Disclosing Party;

iii. Information rightfully acquired from others who did not obtain it under pledge of secrecy to either of the parties;

iv. Information contained in any final report issued by the CSIR in terms of Clause 3.2 above, which is governed by the contents of Clause 3; and

v. Information which the Recipient is obliged to disclose in terms of a court order, subpoena or other legal process.

7.4 In the event that the Recipient is required by legal process to disclose any of the Confidential Information, covered by this clause 7, it shall provide the disclosing party with prompt notice of such requirements so as to enable the disclosing party to seek a protective order or waive compliance with the provisions of this clause. In the event that a protective order or other remedy is obtained, the Recipient shall use all reasonable efforts to ensure that only the information covered by such order or other remedy is disclosed. Whether or not a protective order or other remedy is obtained or a party has waived compliance with the provisions of this Contract, the Recipient shall take all reasonable steps to ensure that only that portion of the information that it is legally required to disclose is so disclosed.

8. NO WARRANTIES

CSIR does not warrant the merchantability or commercial viability of the work completed or deliverables as specified in the Proposal.

9. LIMITATION OF LIABILITY

Subject to the provisions of Clause 2.2 above, any claim for damages, including, but not limited to, loss of income, consequential or incidental damages, against the CSIR, whether in delict or based on this Contract, shall be limited to an amount equal to the contract price or the amount actually paid by the client to the CSIR in respect of the work performed in terms of this contract, whichever is the lesser.

10. FORCE MAJEURE

10.1 The CSIR shall not be responsible for any loss, injury, delay or damage or casualty suffered or incurred by the Client, because of the failure of the CSIR to comply or delay in complying with the terms of this Contract which are the result of causes beyond its reasonable control, including but not limited to natural calamities, strikes, fires, acts of government bodies, delays in use or sources of supply or any commercial impracticability of any nature whatsoever.

10.2 During any period of non-performance in terms of Clause 10.1, the relevant terms and conditions of this Contract will be suspended.

10.3 Should the duration of non-performance in terms of Clause 10.1, go beyond a period of 6 (SIX) months, either party may cancel the Contract , without any right of recourse as against each other, save in respect of work already executed.

11. NON-WAIVER

No relaxation or indulgence granted by the CSIR and no omission by the CSIR timeously or diligently to enforce any right under this agreement shall be deemed to amount to a waiver of that or any other rights.

12. GOVERNING LAW AND DISPUTE RESOLUTION

12.1 Regardless of the place of execution, performance or domicile of the parties, this Contract and all modifications and amendments thereof shall be governed by and construed under and in accordance with the laws of the Republic South Africa.

12.2 In the event of any dispute arising from this agreement, the dispute shall be adjudicated by a competent High Court in South Africa, (unless otherwise agreed between the parties at the time by means of a written arbitration or other agreement); and for these purposes the Parties agree to the exclusive jurisdiction of South African Courts for the adjudication of such disputes.

13. BREACH AND TERMINATION

13.1 In the event of any of the parties committing a material breach of any of the terms and conditions of this Contract, and remaining in default for a period of SEVEN (7) days after receipt by it of written notice from the other party calling for such breach to be remedied, the party delivering such notice shall be entitled, without prejudice to any other rights it may have in terms of this Contract or in law, to terminate this Contract by written notice to that effect given to the other party.

13.2 Any party may terminate this Contract at any time by giving to the other ("the defaulting party") notice of such termination if:

i. the defaulting party is, other than for the purposes of reconstruction or amalgamation, placed under voluntary or compulsory liquidation or under judicial management or under receivership or under the equivalent of any of the foregoing;

ii. a final and unappealable judgement against the defaulting party remains unsatisfied for a period of fourteen (14) days or more after it comes to the notice of the management of the defaulting party;

iii. the defaulting party make any arrangement or compromise with its creditors generally, or ceases, or threatens to cease, to carry on business;

13.3 The Contract may at any time be terminated by mutual and written consent between the parties.

13.4 Any termination of this Contract shall not absolve the parties from the obligation to observe the confidentiality measures and other restraints as set out herein. It is specifically recorded that the provisions of clauses 6, 7, 8 and 9 shall survive, in perpetuity, the termination of this Contract for whatever reason.

14. DOMICILIUM CITANDI ET EXECUTANDI

The Parties hereto respectively choose as their *domicilium citandi et executandi* for all purposes of, and in connection with this Contract, the addresses stated in the attached Proposal accepted by the CSIR.

15. NOTICES

Any notice to be given hereunder shall be given in writing and may be given either personally or may be sent by post, telex or facsimile and addressed to the relevant party at its *domicilium* or to such other address as shall be notified in writing by any of the parties to the other from time to time. Any notice given by post shall be deemed to have been served on the expiry of 7 (SEVEN) working days after same is posted by recorded delivery post or air mail. Any notice delivered personally or sent by telex or facsimile shall be deemed to have been served at the time of delivery or sending.

16. SEVERABILITY

In the event that any one or more of the provisions of this Contract shall, for any reason, be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Contract , but this Contract shall be construed as if such invalid, illegal or unenforceable provisions had never been contained herein, unless the deletion of such provision or provisions would result in the entire Contract being invalid, illegal or unenforceable.

17. VAT AND WITHOLDING TAX

17.1 Unless stated otherwise in the Proposal or agreed to by the parties, all fees and amounts stated in the Proposal are exclusive of Value Added Tax, which shall be paid by the Client upon submission of the relevant tax invoice.

17.2 Any withholding tax as levied by any foreign country shall, where applicable, be for the account of and payable by the Client.

18. ELECTRONIC COMMUNICATIONS AND TRANSACTIONS ACT

18.1 No data message (as defined in the Electronic Communications and Transactions Act, 25 of 2002), including an e-mail, SMS, and recorded voice message, sent by the Client to CSIR, shall amend these contract conditions, or the rights and duties of the parties in any manner, unless such data message is reduced to paper and signed by both parties or their duly authorized signatories.

18.2 Data messages (as defined above) sent by the Client to CSIR shall be deemed to be received by CSIR only when CSIR responds thereto, and for purposes of this clause an auto-response shall not be a response by CSIR.

18.3 Legal notices and/or disclaimers linked to, accessible from or attached to a data message (as defined above) sent by CSIR to the Client shall be deemed part of these contract conditions and shall override and replace any such notices or disclaimers linked to, accessible from or attached to any data message sent by the Client in a return message.

19. ENTIRE AGREEMENT

19.1 This document, together with the Proposal, contains the entire contract between the parties and no party shall be bound by any undertaking, representation or warranty not recorded herein.

19.2 No alteration, variation, addition or agreed cancellation of this contract shall be of any force or effect unless reduced in writing and signed by both parties and their duly authorized signatories.

ACCEPTANCE SHEET

CSIR CONTRACT PROPOSAL

OUR REF: JZCM114-ST03

I, the undersigned ……[*Full names of Signatory*], on behalf of …… [*The Client*] by my signature hereto, and in my capacity as …… being duly authorized to do so, hereby accept the CSIR's Project Proposal No JMCP114-ST03 and all the CSIR's General Conditions of Contract contained in the attached Project Proposal as binding on ……..[*The Client*].

Signed at: .....

Date: .....

Signature: .....

For: ……., duly authorised

AS WITNESSES:

(1) ..... *(2)* .....

Signed at: .....

Date: .....

Signature: .....

For: The CSIR, duly authorised

AS WITNESSES:

(1) ..... *(2)* .....

Please sign this page in full, initial each page of the quotation/project proposal and fax the signed copy to us. Please also return the signed original document(s) to the address of the CSIR as specified in the accompanying Quotation/Proposal.